

Utilizing Artificial Intelligence-Powered Chatbots for Enhanced Customer Support in Online Retail

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Abstract- In many e-commerce contexts, live chat interfaces have become popular as a way to communicate with consumers and provide real-time customer support. Conversational software agents, commonly known as Chatbots, are systems created to converse with users in natural language and are often based on artificial intelligence (AI). These systems have replaced human chat service agents in many cases. Although AI-based Chatbots have been widely used due to their time and cost savings, they have not yet met consumer expectations, which may make users less likely to comply with chatbot requests. . We empirically study, through a randomized online experiment, the impact of verbal humanoid design cues and a direct approach on compliance with user requirements, based on Social Reactions and Attachment Commitment Theory. Our results show that consumers are more likely to cooperate with chatbot service response requests when there is humanity and consistency. Furthermore, the results demonstrate that social presence plays a mediating role between humanoid design cues and user compliance.

Keywords: Artificial intelligence, Chatbot, Anthropomorphism, Social presence, Compliance, Customer service

I. INTRODUCTION

Numerous information scientists and market researchers investigated the effects of utilizing artificial intelligence (computer based intelligence) in different countries' marketing areas [1]. In 2018, Blake Morgan, a customer experience futurist, looked at three different ways that computer based intelligence improves customer experience. She begins by noticing that a great deal of consumers likes speaking with a remote helper before, during, or after making a purchase [2]. Second, involving individualized services for each consumer has demonstrated to be successful in helping them make buying decisions. At long last, however similarly as critically, man-made intelligence provides associations

with customer knowledge, enabling them to change their arrangements appropriately (Morgan, 2018). However, a 2018 survey from InMoment features that 75% of consumers fear tailored advertisements. Additionally, throughout their study, Mannino et al. (2015) illustrated the dangers associated with adopting AI in business [3]. "If machines surpass human workers in speed, dependability, and cost in numerous fields, the labor market will probably undergo a significant disruption unprecedented since the Industrial Revolution."

Further developing the customer experience has become a troublesome undertaking for an enterprise because of the continuous development in consumer expectations [4]. Businesses expecting to acquire a competitive edge in customer service ought to consider more choices than basically giving material through the perfect channel at the ideal time. They have to be researching fresh approaches to remove consumers' problems throughout the whole buying procedure as well as giving efficient customer support.

Definition of Key Terms

The reader may come across unfamiliar business and technology-related words or acronyms throughout this research. This is a succinct summary taking into account the majority of them:

- **AI:** The creation of machines capable of carrying out intricate activities that are typically completed by humans. AI is able to make judgments that ordinarily demand human ability by using amazing patterns and algorithms rather than designing robots to carry out particular jobs [9].
- **Machine learning:** Branches of artificial intelligence whereby computers are endowed with the capacity to learn from data, identify novel

patterns, and make precise predictions without the need for explicit programming [10]. A prior part in the "introduction" section gives an example of this kind of technology (online shopping or booking).

- **Customer service:** The demonstration of supporting clients who need to purchase or use a certain item. Stated differently, the corporation assists a client in selecting the product that best suits his needs or instructs the consumer on how to utilize the goods [11]. This kind of service is meant to draw in new clients and provide superior.

II. LITERATURE REVIEW

Oracle (2017) [12] provided an explanation of AI's function in customer experience. According to this, "AI brings customer data to life; it employs machine intelligence to sort through, evaluate, and understand large data in ways that are beyond the capabilities of mere mortals". Furthermore, finally, cloud arrangements namelessly gather information from external parties. To generate worthwhile leads, prospects, and long haul clients, this information are being processed. Returning to our original theme, gathering insightful data about each client facilitates providing very individualized customer care.

Top retail executives were the subject of study by Klein et al. (2017) [13] to examine how AI technology is changing consumer interactions. The creators claim that "AI-powered customer service is the new reality for retailers" based on quantitative evidence. Consumers who shop don't wait for the store to know; instead, they simply switch to a competitor that offers a better item or service. They emphasized that 87% of companies need to work more at offering a consistent experience, using data from Zendesk (2018). While AI isn't a panacea for all problems, it does have a significant beneficial influence on providing a consistent customer experience.

The impact of providing a positive customer experience on the business was examined further by Klein et al. (2017) [13]. As per surveys, 86% of grown-ups will spend more on an item assuming they are brand faithful, 70% of consumers will tell "a supposed inferior item assuming they've had "cheerful" experiences with that brand." As indicated by the three discoveries, giving excellent customer service will support revenue, foster a devoted clientele, and broaden the organization's clientele through informal exchange marketing. To put it another way, providing excellent customer service "may create a huge competitive edge."

Research Questions

The accompanying research questions serve as a guide for our investigation:

RQ1: How can anthropomorphic speech cues influence user compliance with AI-based chatbot requests in

consumer self-service?

RQ2: How does the foot-in-the-door approach to customer self-service influence user request compliance when interacting with an AI-based chatbot?

We demonstrate that human-designed voice cues and strategy adoption both improve user cooperation with a chatbot's service response request in an online experiment we conducted with 200 participants. Thus, as a self-service technology, we show how anthropomorphism and the demand for consistency may be leveraged to influence user behavior in chatbot interactions.

Hypotheses development

H1a: Users are more likely to respond to a chatbot's request for feedback when it has more communicative humanoid design elements.

H1b: User compliance to verbal anthropomorphic design cues will be modulated by social presence.

H2: User cooperation with the chatbot's response request ("foot-in-the-door effect") is increased once the user has accepted and fulfilled a relatively small request.

H3: The foot-in-the-door impact will be moderated by social presence, meaning that more social presence will increase the influence on user compliance.

III. RESEARCH METHODOLOGY

Schematic of an Experiment

A between-subject, full-factorial design with two ADCs × two FIDs was used to compare treatments both family member and outright, as well as to distinguish individual and cooperation influences on client consistence [14]. A randomized online experiment was used to evaluate the hypotheses in the context of online banking customer care chatbots, which provide clients solutions to often asked queries. We chose this setting because, among other things, CA promises to handle every minute of service channels conveniently and affordably. Daily service, context will become increasingly significant for future utilizations of CAs.

For this reason, users were able to freely enter their personal data into the chat interface, and IBM Cloud AI processed, understood, and responded to user inputs in a normal and efficient manner. As effective as possible compared to other modern AI applications, like Apple's Siri or Amazon's Alexa, albeit written down. For instance, intents and feelings may be gleaned from user statements' natural language using the IBM Watson Assistant. Following processing of the user's input, a response choice is automatically selected and presented to the user.

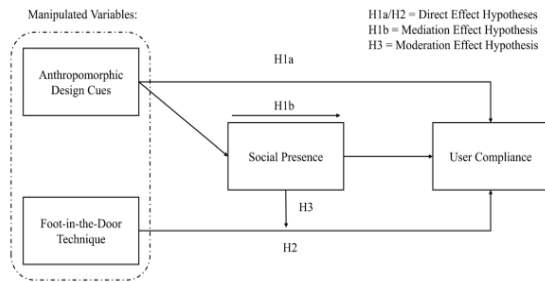


Figure 1: Research Framework

Control and Adjustment of Independent Variables

Each member was given the same duties and the same dialogue when it came to controlling the ADC. However, members with advanced ADC control experienced differences in the presence and absence of accompanying features. This is consistent with previous research on the humanoid attribution used by her ADC by language with chatbot: identity, banter, and compassion.

Identity: The way a chatbot expresses itself to a user affects how they perceive it. For instance, earlier studies have shown a positive correlation between likeability and a CA's use of first-person singular pronouns, which signals an identity. Since utilizing first-person singular pronouns is a trait solely shared by humans, we contend that when a chatbot uses first-person solitary pronouns and even a name to reveal its identity, it not only makes the user see it as more anthropomorphic but also boosts its likeability.

Smalltalk: It takes time and work for all parties involved for a connection to develop between persons. It does not happen overnight. Smalltalk is a proactive tool that may be used to build rapport and close the emotional gap between people. In the beginning, the speaker makes a claim and gestures for the listener to comprehend it. In order for the speaker to presume that the audience has comprehended the message, the listener might then reply by indicating that they have understood it. The performers might establish a common ground for the discourse by engaging in small chat. A CA engaging in little conversation is in this manner anticipated [15].

Procedure

The members were placed in a customer service scenario where their task was to inquire with a chatbot about using their debit card overseas while in the United States. There were six phases in the experimental protocol (Fig. 2):

1. The members were given a brief overview of the experiment alongside directions on the most proficient method identify yourself to the chatbot and query the required data.
2. The chatbot used ADC to greet members under humanoid attribution conditions. Additionally, Chatbots rarely engaged in conversations asking about the user's well-being (e.g., "How are you?") and whether or not they had previously used a

chatbot (e.g., "Have you used a chat bot before?"). The chatbot indicated understanding and empathy by signaling a reaction based on user reactions and normal language processing and understanding by AI.

3. How can it assist the user, the chatbot inquired the user then answered the question that was requested of them: The chatbot would inquire as to the user's desired nation of use if the user had just enquired about using the debit card generally. After answering the query, the chatbot inquired as to in the event that the user had any extra queries. Assuming the user indicated that they had more, it would be advised that they contact the authority website for phone consultations with the support team to get more thorough explanations. If not, the chatbot would only express gratitude to the user for their use.

Dependent Variables, Verification Procedures, and Control Factors

As a binary dependent variable, User Compliance was estimated using a point estimator P that was derived from:

$$P(\text{user compliance}) = \frac{\sum_{k=1}^n X_k}{n}$$

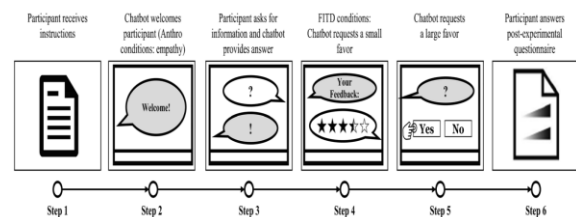


Figure 2: The purpose of the experiment is to examine whether consumers are more likely to comply with a more manageable request if they have previously agreed to and completed it.

Where n is the all-out number of particular members in that condition that completed the interaction (that is, chose "Yes" or "No" in response to the chatbot's request for intentional service feedback). A binary variable called x_k has values of 1 for participant compliance (i.e., choosing "Yes") and 0 for participant denial of the request (i.e., choosing "No").

Every scale showed satisfactory reliability values ($\alpha > 0.7$). Additionally, all of the examined measures demonstrated satisfactory convergent validity, according to a confirmatory factor analysis. Furthermore, as the average variance retrieved from each scale was greater than the multiple squared correlations, the findings demonstrated that all conditions for discriminant validity were satisfied; we evaluated the participants' perceived level of realism.

IV. ANALYSIS AND RESULTS

Sample Detail

Three Euro 20 Amazon certificates were raffled out as a way to reward participation. The raffle was optional, and participation was asked for at the conclusion of the survey. The trial began with 300 individuals. Out of them, we eliminated 32 (10%) individuals who dropped out of the trial and an additional 97 (31%) participants who failed at least one check. There were no obvious technological problems throughout the chatbot conversation that would have forced us to exclude more users. The utilized data's descriptive statistics are compiled in Table 1.

Control Variables' Descriptive Statistics

	Mean	SD
Demographics		
Age	42.64	8.56
Gender (Females)	56%	
Mediator		
Social Presence (SP)	4.25	2.36
Controls		
Trusting Disposition (TD)	5.69	2.36
Personal Innovativeness (PerInn)	5.26	2.51
Product Involvement (ProInv)	6.95	2.48
Conversational Agents Usage (CA Usage)	3.48	2.67

Notes: N = 200; SD = standard deviation

Table 1: Summary of Demographic, Mediator, and

Table 2: Use of Parallel Calculated Regression to Examine User Compliance

	Block 1			Block 2		
	Coefficient	S.E.	Exp(b)	Coefficient	S.E.	Exp(b)
Intercept						
Constant	1.786	2.654	3.365	-1.956	0.978	1.657
Manipulations						
ADCs				2.364**	1.368	4.875
FITD				1.875*	1.357	3.844
Controls						
Gender	-2.315*	1.456	1.745	-2.356*	1.489	1.148
Age	1.114	1.125	2.651	-1.119	1.147	0.118
TD	1.292	1.485	2.452	1.456	1.274	0.365
PerInn	1.236	1.565	2.654	1.452	1.245	0.254
ProInv	-1.154	1.241	1.465	-1.154	1.274	1.857
CA Usage	1.145	1.232	2.157	1.156	1.266	0.145
2 Log Likelihood	156.732			145.148		
Nagelkerke's R ²	1.215			0.326		
Omnibus Model χ^2	12.857			25.425**		

Notes: * $p < 0.05$; ** $p < 0.01$; N = 200

Finally, we used Harman's one-factor sampling test to test for normal method bias. Two factors with eigenvalues greater than 1 were identified not a significant issue in this study, since the first component accounted for less than 50% of the total variance, or 16.61% of the variance (Figure 3).

Analysis of Primary Effects

First, on the dependent variable, we carried out an investigation using a hierarchical paired regression with two stages "user compliance." to assess the significant effect hypotheses. After entering all controls, we added the FITD and ADC controls. A statistically significant direct influence on user compliance was shown by both treatments ($p < 0.05$). People in the ADC condition were almost four times more likely to comply with goal requests. Consequently, our results show that members are significantly more likely to comply with chatbot requests when they are presented with the FITD approach or an anthropomorphically built chatbot.

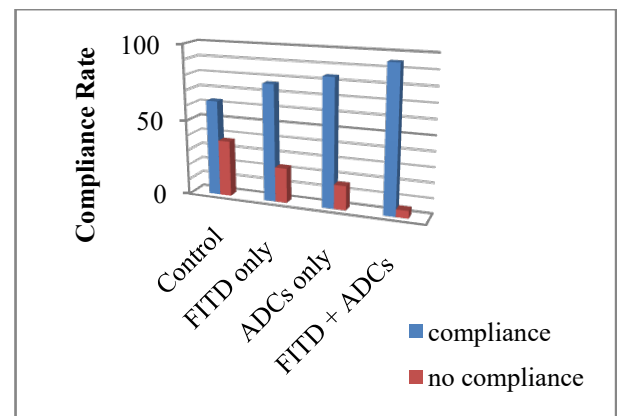


Figure 3: Findings for User Compliance as the Dependent Variable

Examination of Mediating Effects

We contended that ADCs would influence User Compliance via heightened Social Presence in order to support our mediation theory. Our hypothesis was that

when ADCs are present, a user's social presence rises and grows, increasing the likelihood that they would consent to a request. Using the bootstrap mediation approach, we carried out the mediation test. In the analysis, we took into account all control variables as well as the manipulations (ADCs and FITD).

User compliance rose as a result of ADCs' greater social presence (Figure 4).

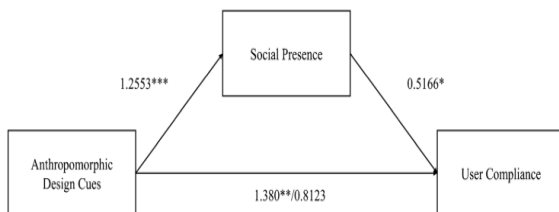


Figure 4: Analysis of Mediation Effects

Exploration of Moderating Effects

According to our hypothesis in H3, Our moderation analysis's findings demonstrated that social presence had no moderating influence on the relationship between FITD and user compliance, meaning that there was no discernible interaction effect between the two ($b = 0.2305$; $p > 0.1$). As a result, our results contradict H3.

DISCUSSION

The research also discovered that social presence directs the effect of ADCs on client consistence, implying that users may be more receptive to conforming to or accommodating requests and suggestions from CAs that more closely resemble humans in order to satisfy these demands. Nonetheless, the user's sense of social presence has no direct impact on the efficacy of the FITD approach.

As AI develops, intelligent CAs will play an increasingly bigger role in the future, impacting decision-making, onboarding, and technology adoption experiences for users. This study is a first empirical look at CAs in customer service settings; next research should concentrate on compliance demands particular to the context and ways to persuade users to stop interacting with Chatbots after their question has been answered. Future studies may need to examine the impact in other cultural situations since the sample was limited to Indian people.

V.CONCLUSION AND FUTURE DIRECTION

In this study, we conduct an online experiment to show that both the incorporation of voice anthropomorphic design cues and the foot-in-the-door method improve user cooperation when a chatbot requests service feedback was carried out. Our findings open up further research into how artificial intelligence-based CAs can leverage the

effects of anthropomorphism and the need for a consistent design of electronic marketplaces and customer services to improve user compliance pave the way for Therefore, this study contributes to our knowledge about CA as a humanoid information agent in service industries. AI-powered chatbots for e-commerce have a bright future ahead of them. The consumer experience is about to change due to advancements in multi-modal interfaces, emotional intelligence, and personalization. Robust analytics, cross-platform interoperability, and ethical rules will guarantee the responsible and smooth implementation of chatbots. Customer service will be revolutionized, and online buying will be more convenient and satisfying, thanks to strategies for fostering user trust and investigating chatbot cooperation.

REFERENCES

- [1] T. Nadana Ravishankar et al "Empirical Assessment and Detection of Suicide Related Posts in Twitter using Artificial Intelligence enabled Classification Logic" (ACCAI) | 979-8-3503-1590-5/23/\$31.00 ©2023 IEEE | DOI: 10.1109/ACCAI58221.2023.10201110.
- [2] Leon Ciechanowski, Aleksandra Przegalinska, MikolajMagnuski, Peter Gloor,In the shades of the uncanny valley: An experimental study of human–chatbot interaction,Future Generation Computer Systems, Volume 92, 2019, Pages 539-548, ISSN 0167-739X.
- [3] Theo Araujo, Living up to the chatbot hype: The influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions,Computers in Human Behavior, Volume 85, 2018, Pages 183-189, ISSN 0747-5632
- [4] Maxime Clément, Matthieu J. Guittou, Interacting with bots online: Users' reactions to actions of automated programs in Wikipedia, Computers in Human Behavior, Volume 50,2015, Pages 66-75, ISSN 0747-5632, https://doi.org/10.1016/j.chb.2015.03.078.
- [5] T. Nadana Ravishankar et al "Empirical Assessment and Detection of Suicide Related Posts in Twitter using Artificial Intelligence enabled Classification Logic" (ACCAI) | 979-8-3503-1590-5/23/\$31.00 ©2023 IEEE | DOI: 10.1109/ACCAI58221.2023.10201110.
- [6] Araujo, T. (2018). Living up to the chatbot hype: The influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions. Computers in Human Behavior, 85, 183–189.
- [7] Benlian, A., Klumpe, J., &Hinz, O. (2019). Mitigating the intrusive effects of smart home assistants by using anthropomorphic design features: A multimethod investigation. Information Systems Journal.
- [8] Bentley, P.J., Brundage, M., Häggström, O., Metzinger, T. (2018), Should we fear artificial intelligence? (Rep.) In-depth analysis. European Parliamentary Research Service. DOI: 10.2861/412165
- [9] G. R et al, "An Effective Copyright Management Principle using Intelligent Wavelet Transformation based Water marking Scheme," (ACCAI), Chennai, India, 2022, pp. 1-7, doi: 10.1109/ACCAI53970.2022.9752516
- [10] InMoment. (2018), What Brands Should Know About Creating Memorable Experiences (Rep). Available from: http://www.inmoment.com/wpcontent/uploads/2018/02/2018_C X_Trends_Report-1.pdf. [Last accessed on 2019 May 22].
- [11] R. Sathya Vignesh et al, "Secured Data Access and Control Abilities Management over Cloud Environment using Novel Cryptographic Principles" , (ACCAI) | 979-8-3503-1590-5/23/\$31.00 ©2023 IEEE | DOI: 10.1109/ACCAI58221.2023.10199616.

- [12] S. Rosaline et al, "Predicting Melancholy risk among IT professionals using Modified Deep Learning Neural Network (MDLNN)," (CSNT), Apr. 2022, Published, doi: 10.1109/csnt54456.2022.9787571
- [13] Mannino, A., Althaus, D., Erhardt, J., Gloor, L., Hutter, A., Metzinger, T. (2015), Artificial Intelligence: Opportunities and Risks. Policy Paper by the Effective Altruism Foundation. p1-16.