International Journal of Advanced Smart Convergence Vol.14 No.1 53-65 (2025)
http://dx.doi.org/10.7236/IJASC.2025.14.1.53

IJASC 25-1-6

Leveraging Self-Disclosure and Utility Theory for Extracting Different Types of User Information with Conversational Agents

Eunseo Yang[1], Eunyeoul Lee[1], Yunjung Lee[2], Xiuyan Zhu[3], Uran Oh[*]

[1]*M.A. Program, Department of Artificial Intelligence and Software, Ewha Womans University, Korea*
[2]*PhD Program, Department of Computer Science and Engineering, Ewha Womans University, Korea*
[3]*PhD program, Department of Artificial Intelligence and Software, Ewha Womans University, Korea*
[*]*Associate Professor, Department of Computer Science and Engineering, Ewha Womans University, Korea*

y.eunseo@ewhain.net, e.lee@ewhain.net, yunjung_lee20@ewhain.net, xiuyan.zhu@ewha.ac.kr, uran.oh@ewha.ac.kr

Abstract

The more precisely an AI system collects and analyzes user information, the more effectively it can tailor future recommendations for each user. However, gathering comprehensive information for individual users remains a significant challenge because they may have concerns about privacy or find the process bothersome. To encourage users to willingly provide diverse and meaningful personal information, we applied two widely discussed concepts in psychology and economics to conversational agents: Self-Disclosure and Utility Theory. Our study revealed that while both conversational strategies influenced user experience, the Utility Theory strategy, when combined with questions targeting opinions and emotions, enhanced users' willingness to disclose personal information and improved their overall disclosure experience. These results highlight the importance of tailoring conversational strategies to information types to encourage self-disclosure effectively. Based on these findings, we propose design considerations for efficiently gathering user information through conversation.

Keywords: *User information disclosure, Conversational agents, Chatbots, Interaction design, Self-disclosure, Utility Theory, Interviews, Survey*

1. Introduction

AI-based recommendation systems are integral to various industries, where personalized services driven by

Manuscript Received: January. 10, 2025 / Revised: January. 15, 2025 / Accepted: January. 21, 2025
Corresponding Author: uran.oh@ewhain.ac.kr
Tel: +82-3277-6896, Fax: +82-02-3277-3535
Associate Professor, Department of Computer Science and Engineering, Ewha Womans University, Korea

user data are key to competitiveness [13, 34, 47]. These systems depend on high-quality user data, but collecting detailed preferences and decision rationales remains challenging. This data is critical for delivering tailored and precise customization, enabling highly personalized services [5]. The challenge is even greater in sensitive fields like finance and healthcare due to privacy concerns and limitations in current data collection methods. Effective strategies are needed to address these issues.

Web-based surveys are common for data collection but often suffer from low engagement and incomplete responses [6, 18, 40]. To overcome these challenges, chatbots have recently emerged as a potentially more effective method for gathering information from users [2, 25, 32]. Research results indicate that chatbots, by providing anonymity and offering users a familiar conversational environment, can elicit higher response rates and more voluntary information provision compared to traditional surveys [4, 25]. Additionally, studies have examined how different conversational styles of chatbots affect user self-disclosure [20, 28, 31, 41, 43]. Although these conversational strategies have been studied, there is limited work on optimizing these strategies for different types of information while improving user experience. Privacy concerns [42] and the challenge of capturing diverse user intentions also remain unresolved [33].

To bridge these gaps, this study adopts two psychological and economic theories for chatbot design: Self-Disclosure, which fosters intimacy and openness through reciprocal sharing, and Utility Theory, which encourages information sharing by emphasizing the benefits of disclosure outweighing perceived risks. Specifically, this study examines how these strategies influence users' willingness to share Facts, Opinions, and Emotions in sensitive domains such as finance.

A user study with 18 participants focused on financial information was conducted, where each participant interacted with chatbots employing one of three strategies: Baseline, Self-Disclosure, or Utility Theory. Participants completed chatbot sessions designed around Facts, Opinions, and Emotions and later evaluated their experiences through surveys and interviews.

The results reveal that the type of information requested by the chatbot significantly impacts the user experience during information disclosure. While the Utility Theory approach increased perceptions of usefulness and the willingness to share additional information, Self-Disclosure, contrary to previous findings [10, 31, 44], heightened privacy concerns in the financial domain, reducing user experience. For example, earlier studies suggested that emotionally warm and self-revealing chatbots foster trust and deeper engagement [10, 31]. However, our findings indicate that in sensitive contexts like finance, self-disclosure strategies may inadvertently amplify privacy anxieties, aligning with critiques that anthropomorphic cues can sometimes backfire in high-risk domains [42].

This study contributes to the research on AI chatbot-based user information collection and provides practical insights for designing recommendation-oriented chatbot dialogues that enhance user experience. Through qualitative analysis, it examines the impact of information types and communication strategies on user behavior in sensitive domains such as finance. The findings highlight the importance of designing chatbot interactions that balance user comfort, privacy concerns, intimacy, usefulness, and willingness to share information. Additionally, the study emphasizes the need for domain-specific optimization in chatbot dialogue design and lays a foundation for future research on trust building, sustained engagement, and the ethical considerations of AI-mediated interactions.

2. Related Work

2.1 Self-Disclosure in Chatbot Design

Persuasion techniques from Human-Human Interaction (HHI) provide valuable insights for chatbot design [26]. Among these, self-disclosure is crucial for building trust and intimacy [11, 36], positioning chatbots as social actors rather than mere information tools [39]. Research on self-disclosure in chatbots can be grouped into three key areas. First, studies show that anthropomorphic cues—such as human-like avatars or profile images—encourage users to share more personal information by eliciting empathy and reducing perceived distance [23, 27, 46]. Second, an emotionally responsive and warm interaction style further lowers psychological barriers, increasing comfort and willingness to disclose [10, 31]. Third, longitudinal studies suggest that initial curiosity often deepens into meaningful relationships over time, fostering progressively richer self-disclosure [12, 38, 44]. These findings indicate that well-crafted self-disclosure strategies can enhance user engagement, trust, and the depth of shared information.

2.2 Utility Theory to Encourage User Engagement

Utility Theory posits that individuals weigh perceived benefits against risks, choosing options that maximize their utility [17, 37]. Similar concepts in social psychology, like Social Exchange Theory, argue that perceived rewards and costs shape willingness to interact [1, 19]. In HCI, clearly articulating benefits can improve user satisfaction and trust. For instance, when service robots explicitly communicate their advantages, users show increased trust and willingness to use them [24]. Likewise, chatbots that highlight concrete rewards—such as personalized recommendations or tailored advice—boost user engagement and satisfaction [22]. Even simple incentives, like monetary rewards or targeted health guidance, can raise survey response rates and participation levels [7, 21].

These insights imply that chatbots may effectively encourage users to share their information by combining the Self-Disclosure strategy, which builds rapport and lowers barriers, with the concept of Utility Theory, which clarifies the benefits users can expect from a specific action. This study goes beyond merely examining the effectiveness of these two strategies by additionally considering the types of information chatbots request from users. We explore how these strategies and information types influence user experience, providing important insights for designing more engaging and effective conversational experiences with recommendation chatbots.

3. Method

3.1 Conditions

We assessed the following three conversational strategies: Baseline, Self-Disclosure strategy applying the concept of Self-Disclosure in Human-Human Interaction (HHI), and Utility Theory strategy applying the concept of Utility Theory. The application of these concepts to each chatbot is outlined below. Furthermore, we investigated the effects of each chatbot type across different user information types—Fact, Opinion, and Emotion. Examples for each combination are summarized in Table 1.

Table 1. Example Messages from a Chatbot Designed Based on Conversational Strategies and Information Types

Conversational Strategies	Information Type	Example Dialogue
Baseline	Fact	What is your monthly income?
	Opinion	Do you think investing in stocks is risky? I'm curious if you're investing in stocks and, if so, how you think one should invest.
	Emotion	How do you feel about the recent rise in living costs due to inflation? How has this situation affected your daily life?
Self-Disclosure	Fact	What is your monthly income? I'm a freelancer and I usually make around 2 million won per month, though it varies.
	Opinion	Do you think investing in stocks is risky? I'm curious if you're investing in stocks and, if so, how you think one should invest. I personally invest in a few stocks—five shares in tech companies—but I'm quite nervous about market volatility. What do you think about stock investment?
	Emotion	Recently, inflation has made grocery shopping burdensome for me, and I'm worried about my rising living costs. How do you feel about the increase in living costs due to inflation? How has this situation affected your daily life?
Utility Theory	Fact	What is your monthly income? Based on your monthly income, I can recommend an ideal ratio for savings, investments, living expenses, and emergency funds.
	Opinion	Do you think investing in stocks is risky? I'm curious if you're investing in stocks and, if so, how you think one should invest. If you provide more details, I can suggest a stock portfolio tailored to your investment preferences.
	Emotion	How do you feel about the recent rise in living costs due to inflation? How has this situation affected your daily life? I can also recommend strategies

		to manage your living expenses efficiently and cope with inflation. Let's explore ways to reduce costs while enhancing financial stability.

3.1.1 Conversational Strategies

We assessed three conversational strategies.

• Baseline: A chatbot without any strategy as a controlled condition.

• Self-Disclosure strategy: A chatbot with self-disclosure strategy, where chatbot first discloses its own information (predefined characteristics of the chatbot) before asking participants to share theirs.

• Utility Theory strategy: A chatbot applying Utility Theory, it sends a message offering potential benefits based on collected information. After the conversation, the chatbot provides the promised information using ChatGPT.

3.1.2 Information Types

We examined the effects of these strategies across three types of information.

• Fact Information: Objective, specific user information such as demographic data (e.g., age, income). This information helps build a user profile more efficiently and accurately, allowing for quick understanding.

• Opinion Information: Personal opinions on specific topics. This information offers insight into user preferences, life attitudes, and core values.

• Emotion Information: Information about the user's feelings and emotions. This helps in understanding the user's mood in specific situations and aids in creating an emotional user profile.

3.2 Participants

We recruited 18 participants (7 males, 11 females; M = 25.23, SD = 3.47) with prior experience interacting with LLM-based chatbots. They received 7.5U SD for their participation.

3.3 Experimental Setup

We employed the Wizard of Oz (WoZ) method to simulate chatbots with various conversational strategies on Discord [15]. This approach ensured that variations in user self-disclosure and experience were directly attributable to the designed strategies, avoiding limitations of current LLM-based systems. A human researcher simulated responses, maintaining consistent quality and precise application of Self-Disclosure and Utility Theory strategies.

Finance was selected as the conversation topic because it is sensitive, amplifying the impact of strategies information types, as confirmed in a pilot study. Scenarios were designed in accordance with GDPR guidelines [16] and prior research [8].

The chatbot's reactions to user responses were also designed to align with the chosen strategies. In the Baseline strategy, simple responses (e.g., 'I see', 'Alright') were given. For Self-Disclosure, the chatbot shared similar experiences, such as, 'Your income is similar to mine.' In the Utility Theory strategy, the chatbot

offered personalized benefits, such as, 'I'll create a tailored portfolio based on your investment style'. Examples are provided in Table 1.

3.4 Procedure

Participants were assigned to a chatbot with one of three conversational strategies: Baseline, Self-Disclosure, and Utility Theory. Each participant engaged in three separate sessions with the assigned chatbot, each focusing on a different type of information: Fact, Opinion, and Emotion. Each session consisted of 8 questions related to the respective information type. The order of the sessions was randomized for each participant. After each session, participants rated their chatbot in terms of privacy concerns, disclosure comfort, intimacy, usefulness, and willingness to share their information on a 7-point Likert scale and provided explanations for their ratings. The entire process was conducted remotely via Discord [15] and Zoom [48], and each session was recorded. On average, the experiment lasted 90 minutes. We investigated the effects of Conversational Strategies and Information Types on user disclosure. This section presents findings based on subjective responses and participant feedback.

4. Findings

We investigated the effects of Conversational Strategies and Information Types on user disclosure. This section presents the findings based on subjective responses from surveys and results from interviews. The subjective ratings were collected for each conversational strategies for each information type, and the result is presented in Figure 1. Privacy concerns were highest when dealing with factual information, and correspondingly, disclosure comfort was lowest for factual information. Additionally, regardless of the type of information, the Utility Theory strategy resulted in the most favorable overall user experience. In contrast, the Self-Disclosure strategy tended to elicit a somewhat negative user experience, as the intimate approach was perceived as inconsistent with the chatbot's intended purpose in financial discussions.

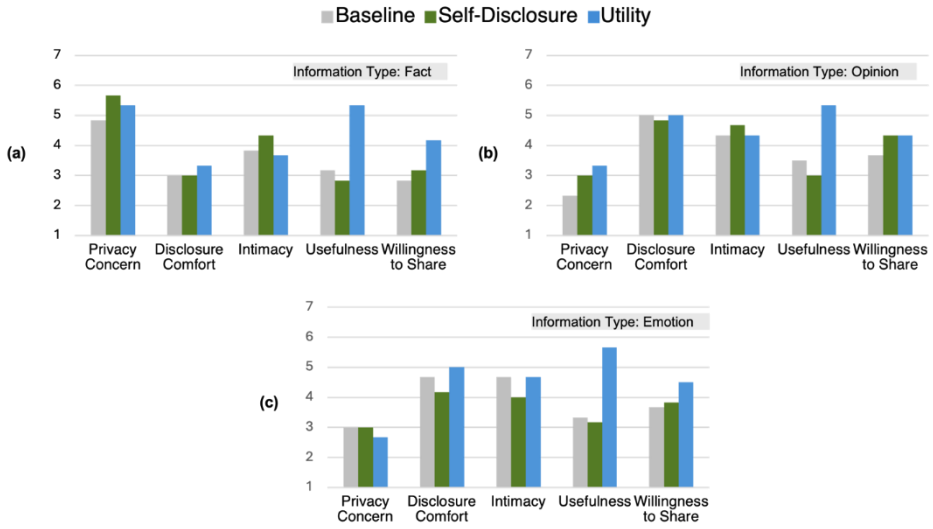

Figure 1. A usability evaluation using a 7-point Likert scale assessed the impact of three strategies (Baseline, Self-Disclosure, Utility Theory) and three information types (Fact, Opinion, Emotion) across five dimensions: Privacy Concern, Disclosure Comfort, Intimacy, Usefulness, and Willingness to Share More Information.

4.1 Highest Privacy Concern with Fact Information

Our experiment found that while there was little difference in privacy concerns across strategies, there was a difference depending on the type of information requested. Especially participants expressed higher privacy concerns when the chatbot asked for numerical Fact information, such as asset levels or income. Through interviews, they expressed that disclosing detailed numerical information about themselves to the chatbot made them feel particularly vulnerable to harm if their information were exposed, leading them to avoid self-disclosure.

"Compared to other matters, issues related to assets (Fact) make me more cautious and sensitive. In particular, numerical information raises concerns about hacking or information leakage." (P14)

Furthermore, our study found that even when addressing sensitive financial questions, approaching users by asking for subjective thoughts felt relatively less threatening, resulting in lower privacy concerns.

"Because it wasn't asking for detailed figures like numbers, but rather how I think about specific situations—that is, it had a strong subjective aspect—I wasn't worried about providing my opinion." (P14)

"I don't think providing my emotional status would pose a threat to me. It feels like talking about my daily life to a friend, so I didn't feel it was dangerous to talk to the bot." (P10)

4.2 Disclosure Discomfort with Fact Information and Self-Disclosure Strategy

There were differences based on the type of information requested similar to the evaluation of privacy concerns. Participants felt more comfortable when asked for Opinion and Emotion information compared to when asked for Fact information.

"I don't like talking about my income status, and I didn't feel comfortable even with the chatbot." (P16)

Notably, a participant reported that Self-Disclosure strategy chatbot's continuous sharing of its own circumstances while asking about sensitive personal information was confusing.

"This conversational style made it difficult to understand the chatbot's purpose, thereby increasing discomfort with information disclosure." (P10)

4.3 Limited Impact of Strategies and Information Types on Intimacy

Regarding Intimacy, similar results were obtained across all strategies and information types. In our interview, however, three participants (P8, P12, P18) reported lower intimacy with chatbots inquiring about Fact information, as these conversations felt more sensitive. In this metric, Self-Disclosure strategy elicited mixed reactions. Two participants felt a sense of intimacy due to the chatbot's self-disclosure and sharing of its own situation, while others found it suspicious and unclear in its purpose when it approached them to inquire about personal information. Furthermore, when the chatbot's human-like characteristics (e.g., set occupation and income level) differed from the participant's situation, they reported decreased intimacy. Thus, it was revealed that adopting Self-Disclosure strategy for chatbots, especially when inquiring about specific information on sensitive topics, can elicit polarized reactions.

"Even though it was virtual, the chatbot sharing its own story first made it feel friendly. Sharing familiar situations helped create a sense of familiarity." (P4)

"Well, from the chat, it says it's a freelancer with income, but I'm currently a college student without much income, so I actually felt a sense of distance." (P11)

But most of our participants tended to focus more on the chatbot's conversation topics, tone, empathy, and natural language understanding capabilities rather than the type of information requested when evaluating the chatbot's level of familiarity.

4.4 Enhanced Perceived Usefulness Achieved through Utility Theory Strategy

Usefulness was higher for Utility Theory strategy, while Baseline and Self-Disclosure strategy scored relatively lower. Interview results revealed that the assessment of chatbot usefulness was related with the amount of information users provided to the chatbot. Participants, feeling discomfort with sensitive questions, were reluctant to provide their personal information, which led them to question the potential benefits they could derive from the interaction.

"(When conversing with a chatbot inquiring about Fact information type) Some of the questions were about personal information that I couldn't (or wouldn't) provide, so I didn't think I could obtain useful information." (P16)

4.5 Highlighting Usefulness to Increase Willingness to Share More Information

Finally, for enhancing willingness to share additional information, Utility Theory strategy was effective across all types of information. Those who found the chatbot particularly useful were more inclined to disclose further information. For instance, participants seeking financial advice or who found the chatbot's information applicable to their personal circumstances expressed a greater willingness to share more details.

"If I can receive the help I need, I'd be willing to disclose a certain amount of personal information." (P13)

"I believe it's important to consistently prepare for future financial plans, like predicting market volatility. So, I think I'd be willing to share my personal information." (P15)

One of the participants mentioned that they would only be willing to share additional information if they could consistently verify the usefulness of the chatbot's responses. This implies that it may be important to continuously assess the quality of the information provided by the chatbot before disclosing personal data.

"I'd only be willing to disclose if the information I receive is proven useful; otherwise, I'm not. I don't trust it yet. I'll keep observing how well it performs." (P15)

Interview results also showed that privacy concerns were the most influential factor in participants' decisions regarding their willingness to provide additional information. It was found that directly inquiring

about personal information, especially numerical data, as in the case of Fact information, triggered privacy concerns. Thus, for sensitive topics, asking about emotions and opinions rather than requesting direct personal data was effective for information gathering.

"(When conversing with a chatbot inquiring about Fact information type) I felt like I was exposing all aspects of my personal life. In this case, I have no intention of disclosing my personal information." (P6)

These findings suggest that participants' responses vary based on the type of information requested and the strategy employed. Utility Theory strategy consistently achieved higher scores, demonstrating its positive. impact on both perceived usefulness and willingness to share personal information.

5. Discussion

5.1 Utilizing Emotions and Opinions than Facts

This study suggests the possibility that questioning methods focused on Emotion and Opinion can reduce users' privacy concerns while simultaneously increasing their willingness to disclose additional information. When the chatbot initiated conversations centered on Emotion and Opinion, participants reported feeling more at ease and providing richer information compared to conversations focused on numerical data or identifiable factual information. One participant mentioned, "Talking about emotions felt like talking to a friend, so I felt comfortable, and it didn't feel threatening." (P10) Therefore, when dealing with sensitive topics, adopting a more indirect approach could be an effective strategy to reduce users' concerns while inferring the necessary information for future recommendations.

5.2 Reconsidering Self-Disclosure in Sensitive Contexts

Previous studies have emphasized that the self-disclosure strategy enhances intimacy and trust [28– 31, 35], and our survey results also confirmed that the Self-Disclosure strategy induced more intimacy compared to the baseline and Utility Theory strategies. However, interviews revealed that the Self-Disclosure strategy led to negative user experiences in goal-oriented contexts, such as financial conversations. Combining sensitive questions with a friendly attitude made the chatbot's purpose seem ambiguous, leading users to perceive its intent as unclear and suspicious. One participant noted, "The way the chatbot tried to connect with me while asking about my financial status felt unnecessary and confusing." (P10) According to previous research, a clear purpose and intent are essential to build trust in goal-oriented interactions like financial services [9]. Participants in our study also expressed a preference for focusing solely on relevant information and engaging in intuitive and efficient communication without unnecessary conversational elements. This suggests that designing chatbot scenarios to build intimacy may not provide significant benefits when addressing sensitive topics.

5.3 Considerations for Applying Utility Theory

The Utility Theory strategy effectively reduced privacy concerns and increased the willingness of users to disclose additional information by clearly communicating incentives and perceived value, outperforming other strategies. Interviews revealed that the key factor influencing users' willingness to share information was their recognition of the chatbot's usefulness. Previous studies have shown that users are more likely to share personal information when clear benefits, such as personalized services, are provided [3, 14, 45]. This study shows that this tendency can also be applied to chatbot design in sensitive financial contexts. Specifically, consistently

and clearly communicating how the information would be used and the expected benefits at each request reduced users' privacy concerns and enhanced their recognition of the chatbot's utility. These findings highlight the importance of emphasizing transparency and perceived utility as key elements in the chatbot design process

6. Limitations & Future Works

This study has several limitations. First, it focused on one-time interactions, leaving questions about long-term effectiveness unanswered. While participants experienced all three information types (Fact, Opinion, Emotion), they did not experience all strategies, limiting insights into the interaction between strategy and information type. Additionally, the small sample size of 18 participants restricts the generalizability of the findings, and results from financial contexts may not fully apply to other sensitive topics. Future research should explore how Self-Disclosure and Utility Theory strategies perform in long-term interactions and across diverse sensitive topics. Examining various strategy-information combinations with larger, more diverse samples could enhance generalizability. Applying Social Penetration Theory (SPT), which posits that deeper relationships form through progressively intimate disclosures, could offer insights into user self-disclosure patterns over time.

7. Conclusion

This study explored the influence of chatbot conversational strategies and information types on users' self-disclosure. Using a LLM-based chatbot to generate financial scenarios and structuring questions around Fact, Opinion, and Emotion information, we examined user behavior through a study involving 18 participants. Two conversational strategies—Self-Disclosure, aimed at fostering intimacy, and the concept of Utility Theory, designed to emphasize usefulness—were compared across three information types. The findings reveal that the Utility Theory strategy, combined with an approach focusing on opinion- and emotion-related questions, positively influenced personal information disclosure. This approach enhanced the user experience and increased their willingness to provide additional information. This highlights the importance of aligning conversational strategies with information types, demonstrating how the right strategies can enhance user self-disclosure while improving the collection of rich user profiles for personalized recommendations.

Acknowledgement

This work was supported by the IITP(Institute of Information & Communications Technology Planning & Evaluation)-ITRC (IITP-2025-RS-2020-II201460) and Artificial Intelligence Convergence Innovation Human Resources Development (Ewha Womans University; No. RS-2022-00155966).

References

[1] I. Altman, *Social Penetration: The Development of Interpersonal Relationships*, Holt, Rinehart, & Winston, 1973.

[2] P. B. B. Brandtzæg, M. Skjuve, K. K. Dysthe, and A. Følstad, "When the social becomes non-human: Young people's perception of social support in chatbots," in *Proc. 2021 CHI Conf. Human Factors Comput. Syst.*, 2021, pp. 1–13. DOI: https://doi.org/10.1145/3411764.3445318

[3] L. Baruh, E. Secinti, and Z. Cemalcilar, "Online privacy concerns and privacy management: A meta-analytical review," *J. Commun.*, vol. 67, no. 1, pp. 26–53, 2017. DOI: https://doi.org/10.1111/jcom.12276

[4] R. Belen-Saglam, J. R. C. Nurse, and D. Hodges, "An investigation into the sensitivity of personal information and implications for disclosure: A UK perspective," *Front. Comput. Sci.*, vol. 4, 2022, Art. no. 908245. DOI: https://doi.org/10.3389/fcomp.2022.908245

[5] J. R. Bettman, M. F. Luce, and J. W. Payne, "Constructive consumer choice processes," *J. Consum. Res.*, vol. 25, no. 3, pp. 187–217, 1998. DOI: https://www.jstor.org/stable/10.1086/209535

[6] Q. S. Booker, J. D. Austin, and B. A. Balasubramanian, "Survey strategies to increase participant response rates in primary care research studies," *Family Pract.*, vol. 38, no. 5, pp. 699–702, 2021. DOI: 10.1093/fampra/cmab070

[7] D. Calvaresi, J.-P. Calbimonte, E. Siboni, S. Eggenschwiler, G. Manzo, R. Hilfiker, and M. Schumacher, "Erebots: Privacy-compliant agent-based platform for multi-scenario personalized health-assistant chatbots," *Electronics*, vol. 10, no. 6, p. 666, 2021. DOI: https://doi.org/10.3390/electronics10060666

[8] L. Carmichael, S.-M. Poirier, C. K. Coursaris, P.-M. Léger, and S. Sénécal, "Users' information disclosure behaviors during interactions with chatbots: The effect of information disclosure nudges," *Appl. Sci.*, vol. 12, no. 24, Art. no. 12660, 2022. DOI: https://doi.org/10.3390/app122412660

[9] A. P. Chaves and M. A. Gerosa, "How should my chatbot interact? A survey on social characteristics in human-chatbot interaction design," *Int. J. Human-Comput. Interact.*, vol. 37, no. 8, pp. 729–758, 2021. DOI: https://doi.org/10.1080/10447318.2020.1841438

[10] S. Choi and J. Zhou, "Inducing consumers' self-disclosure through the fit between Chatbot's interaction styles and regulatory focus," *J. Bus. Res.*, vol. 166, Art. no. 114127, 2023. DOI:https://doi.org/10.1016/j.jbusres.2023.114127

[11] N. L. Collins and L. C. Miller, "Self-disclosure and liking: A meta-analytic review," *Psychol. Bull.*, vol. 116, no. 3, pp. 457, 1994. DOI: https://doi.org/10.1037/0033-2909.116.3.457

[12] E. A. J. Croes and M. L. Antheunis, "Can we be friends with Mitsuku? A longitudinal study on the process of relationship formation between humans and a social chatbot," *J. Soc. Personal. Relat.*, vol. 38, no. 1, pp. 279–300, 2021. DOI: https://doi.org/10.1177/0265407520959463

[13] T. Davenport and J. Harris, *Competing on Analytics: Updated, with a New Introduction: The New Science of Winning*, Harvard Business Press, 2017.

[14] T. Dienlin and S. Trepte, "Is the privacy paradox a relic of the past? An in-depth analysis of privacy attitudes and privacy behaviors," *Eur. J. Soc. Psychol.*, vol. 45, no. 3, pp. 285–297, 2015. DOI:https://doi.org/10.1002/ejsp.2049

[15] Discord, "Discord: Your Place to Talk and Hang Out," [Online]. Available: https://discord.com/. [Accessed: Aug. 23, 2024].

[16] European Union, "General Data Protection Regulation (GDPR)," [Online]. Available: https://gdpr.eu/. [Accessed: Sep. 12, 2024].

[17] P. C. Fishburn, *Utility Theory for Decision Making*, Defense Technical Information Center, 1970. [Online]. Available: https://apps.dtic.mil/sti/citations/AD0708563. [Accessed: Oct. 1, 2024].

[18] D. Heerwegh and G. Loosveldt, "An evaluation of the semiautomatic login procedure to control web survey access," *Soc. Sci. Comput. Rev.*, vol. 21, no. 2, pp. 223–234, 2003. DOI: https://doi.org/10.1177/0894439303021002008

[19] G. C. Homans, "Social behavior as exchange," *Am. J. Sociol.*, vol. 63, no. 6, pp. 597–606, 1958.

[20] Q. Hu and Z. Pan, "Is cute AI more forgivable? The impact of informal language styles and relationship norms of conversational agents on service recovery," *Electron. Commer. Res. Appl.*, vol. 65, Art. no. 101398, 2024. DOI: https://doi.org/10.1016/j.elerap.2024.101398
[21] J. M. James and R. Bolstein, "Large monetary incentives and their effect on mail survey response rates," *Public Opin. Q.*, vol. 56, no. 4, pp. 442–453, 1992. DOI: https://doi.org/10.1086/269336
[22] H. Jiang, Y. Cheng, J. Yang, and S. Gao, "AI-powered chatbot communication with customers: Dialogic interactions, satisfaction, engagement, and customer behavior," *Comput. Human Behav.*, vol. 134, Art. no. 107329, 2022. DOI: https://doi.org/10.1016/j.chb.2022.107329
[23] E. Kang and Y. A. Kang, "Counseling chatbot design: The effect of anthropomorphic chatbot characteristics on user self-disclosure and companionship," *Int. J. Human-Comput. Interact.*, vol. 40, no. 11, pp. 2781–2795, 2024. DOI: https://doi.org/10.1080/10447318.2022.2163775
[24] H. Kim, K. K. F. So, and J. Wirtz, "Service robots: Applying social exchange theory to better understand human-robot interactions," *Tourism Manage.*, vol. 92, Art. no. 104537, 2022. DOI: https://doi.org/10.1016/j.tourman.2022.104537
[25] S. Kim, J. Lee, and G. Gweon, "Comparing data from chatbot and web surveys: Effects of platform and conversational style on survey response quality," in *Proc. 2019 CHI Conf. Human Factors Comput. Syst.*, 2019, pp. 1–12. DOI: https://doi.org/10.1145/3290605.3300316
[26] Y. Kumar, R. Jha, A. Gupta, M. Aggarwal, A. Garg, T. Malyan, A. Bhardwaj, R. R. Shah, B. Krishnamurthy, and C. Chen, "Persuasion strategies in advertisements," in *Proc. AAAI Conf. Artif. Intell.*, vol. 37, 2023, pp. 57–66. DOI: https://doi.org/10.1609/aaai.v37i1.25076
[27] J. Lee and D. Lee, "User perception and self-disclosure towards an AI psychotherapy chatbot according to the anthropomorphism of its profile picture," *Telematics Informatics*, vol. 85, Art. no. 102052, 2023. DOI: https://doi.org/10.1016/j.tele.2023.102052
[28] S. Y. Lee and J. Choi, "Enhancing user experience with conversational agent for movie recommendation: Effects of self-disclosure and reciprocity," *Int. J. Human-Comput. Stud.*, vol. 103, pp. 95–105, 2017. DOI: https://doi.org/10.1016/j.ijhcs.2017.02.005
[29] Y.-C. Lee, N. Yamashita, and Y. Huang, "Designing a chatbot as a mediator for promoting deep self-disclosure to a real mental health professional," *Proc. ACM Hum.-Comput. Interact.*, vol. 4, no. CSCW1, pp. 1–27, 2020. DOI: https://doi.org/10.1145/3392836
[30] Y.-C. Lee, N. Yamashita, Y. Huang, and W. Fu, "'I hear you, I feel you': Encouraging deep self-disclosure through a chatbot," in *Proc. 2020 CHI Conf. Human Factors Comput. Syst.*, 2020, pp. 1–12. DOI: https://doi.org/10.1145/3313831.3376175
[31] K.-H. Liang, W. Shi, Y. J. Oh, H.-C. Wang, J. Zhang, and Z. Yu, "Dialoging resonance in human-chatbot conversation: How users perceive and reciprocate recommendation chatbot's self-disclosure strategy," *Proc. ACM Hum.-Comput. Interact.*, vol. 8, no. CSCW1, pp. 1–28, 2024. DOI: https://doi.org/10.1145/3653691
[32] X. Ma, J. Hancock, and M. Naaman, "Anonymity, intimacy and self-disclosure in social media," in *Proc. 2016 CHI Conf. Human Factors Comput. Syst.*, 2016, pp. 3857–3869. DOI: https://doi.org/10.1145/2858036.2858414
[33] Y. Malhotra, D. F. Galletta, and L. J. Kirsch, "How endogenous motivations influence user intentions: Beyond the dichotomy of extrinsic and intrinsic user motivations," *J. Manag. Inf. Syst.*, vol. 25, no. 1, pp. 267–300, 2008. DOI: https://doi.org/10.2753/MIS0742-1222250110
[34] E. Malthouse and C. Hofacker, "Looking back and looking forward with interactive marketing," pp. 181–184, 2010. DOI: https://doi.org/10.1016/j.intmar.2010.04.005

[35] J. Meng and Y. Dai, "Emotional support from AI chatbots: Should a supportive partner self-disclose or not?" *J. Comput.-Mediat. Commun.*, vol. 26, no. 4, pp. 207–222, 2021. DOI: https://doi.org/10.1093/jcmc/zmab005

[36] Y. Moon, "Intimate exchanges: Using computers to elicit self-disclosure from consumers," *J. Consum. Res.*, vol. 26, no. 4, pp. 323–339, 2000. DOI: https://doi.org/10.1086/209566

[37] I. Moscati, *Measuring Utility: From the Marginal Revolution to Behavioral Economics*, Oxford Studies in History of Economics, 2018. DOI: https://doi.org/10.1080/1350178X.2019.1647596

[38] G. Park, J. Chung, and S. Lee, "Effect of AI chatbot emotional disclosure on user satisfaction and reuse intention for mental health counseling: A serial mediation model," *Curr. Psychol.*, vol. 42, no. 32, pp. 28663–28673, 2023. DOI: https://doi.org/10.1007/s12144-022-03932-z

[39] B. Reeves and C. Nass, *The Media Equation: How People Treat Computers, Television, and New Media Like Real People*, Cambridge, UK: Cambridge Univ. Press, 1996.

[40] M. Schonlau, B. J. Asch, and C. Du, "Web surveys as part of a mixed-mode strategy for populations that cannot be contacted by e-mail," *Soc. Sci. Comput. Rev.*, vol. 21, no. 2, pp. 218–222, 2003. DOI: https://doi.org/10.1177/0894439303021002007

[41] W. Shi, X. Wang, Y. J. Oh, J. Zhang, S. Sahay, and Z. Yu, "Effects of persuasive dialogues: Testing bot identities and inquiry strategies," in *Proc. 2020 CHI Conf. Human Factors Comput. Syst.*, 2020, pp. 1–13. DOI: https://doi.org/10.1145/3313831.3376843

[42] J. Shibchurn and X. B. Yan, "Investigating effects of monetary reward on information disclosure by online social networks users," in *Proc. 47th Hawaii Int. Conf. Syst. Sci.*, 2014, pp. 1725–1734. DOI: 10.1109/HICSS.2014.220

[43] M. Skjuve, A. Følstad, and P. B. Brandtzæg, "A longitudinal study of self-disclosure in human-chatbot relationships," *Interact. Comput.*, vol. 35, no. 1, pp. 24–39, 2023. DOI: https://doi.org/10.1093/iwc/iwad022

[44] M. Skjuve, A. Følstad, K. I. Fostervold, and P. B. Brandtzæg, "My chatbot companion-a study of human-chatbot relationships," *Int. J. Human-Comput. Stud.*, vol. 149, Art. no. 102601, 2021. DOI: https://doi.org/10.1016/j.ijhcs.2021.102601

[45] M. Taddicken, "The 'privacy paradox' in the social web: The impact of privacy concerns, individual characteristics, and the perceived social relevance on different forms of self-disclosure," *J. Comput.-Mediat. Commun.*, vol. 19, no. 2, pp. 248–273, 2014. DOI:https://doi.org/10.1111/jcc4.12052

[46] T. Tsumura and S. Yamada, "Influence of agent's self-disclosure on human empathy," *PLoS One*, vol. 18, no. 5, Art. no. e0283955, 2023. DOI: https://doi.org/10.1371/journal.pone.0283955

[47] M. Wedel and P. K. Kannan, "Marketing analytics for data-rich environments," *J. Mark.*, vol. 80, no. 6, pp. 97–121, 2016. DOI: https://doi.org/10.1509/jm.15.0413

[48] Zoom, "Zoom: One platform to connect," [Online]. Available: http://zoom.com/. [Accessed: Aug. 23, 2024]