

Scenario-Based Approach to AI's Agency to Perform Human-Specific Tasks

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Abstract. *The development of service robots and chatbots has changed the way companies interact with their customers. Several automated tasks have been taken over by AI, such as communication with customers, processing of orders and also other automated tasks. To measure the impact AI will have on our society, we have analyzed AI's agency by testing different scenarios of AI's ability to perform human-specific tasks such as having own political opinions, religious beliefs and other situations which go beyond the simple execution of tasks. The results show that consumers perceive a low probability that AI has such thoughts. However, AI with stronger anthropomorphic characteristics is more likely to have agency to perform these types of tasks. According to our study, a human-like appearance enhances the perception that AI can have political views, religious beliefs and an own identity. Moreover, people consider that AI with anthropomorphic characteristics should be responsible for their mistakes and punished if they do something wrong. In spite of this, AI, independent of its anthropomorphic characteristics, is not believed to have the ability to solve mankind problems such as reducing pollution, stabilizing the world economy or to ensure world peace. Our research also shows that men are more inclined to attribute agency to AI compared to women, which perceive a lower AI agency.*

Keywords: AI, consumer, anthropomorphism, agency,

Introduction

The continuous development of AI has changed the business environment by implementing and integrating them in companies in different activities and processes. Studies show that different types of AI are being progressively included in the company activities because of their numerous advantages such as high accessibility, adaptability, fairness, and lower cost (Longoni & Cian, 2022; McLeay et al., 2021). Although it may depend on industry and work environment, AI could develop skills and abilities similar to those of humans. Introducing a robot into an existing team could be embraced as highly professional and an investment in the future, as well as questionable in terms of capabilities and the sentiment of replacement among existing workers (Huang & Rust, 2018). In order to make them look like front-line workers capable of performing traditional human service tasks, there is a tendency to anthropomorphize AI to better resemble human appearance and interactivity (Ciechanowski et al., 2019; Chong et al., 2021). Even if some users understand that AI are not people, they continue to communicate with them as if they were real people. These findings argue that some people find it reassuring to interact with chatbots as if they were friends

(Chong et al., 2021). They also find that the human-like appearance enhances social presence, credibility, and competence, while the bot-like appearance lowers customers' expectations of AI behavioral competence (Chong et al., 2021). Moreover, the increased tendency to anthropomorphize AI could lead to the idea that AI will develop their own opinions and preferences. Starting from this development, in our research we focus on analyzing AI's agency related to different human specific tasks. Based on a brainstorming, we have developed items related to AI's agency and measured people's perception depending on anthropomorphic characteristics. The paper begins with a literature review followed by the methodology and result of research and ends with discussions and conclusions.

Literature review

Artificial intelligence is defined as the ability of devices to perform human-specific tasks such as cognition and reasoning, problem-solving, learning and the ability to communicate, as well as perception and action (Huang & Rust, 2018). Because of these abilities, artificial intelligence is increasingly present in many activities of consumers' life, playing different roles. For instance, several authors have found that chatbots are increasingly used by businesses to improve user experience, to automate tasks and improve customer service (Lee and Li, 2023; Song et al., 2023). Studies have demonstrated that artificial intelligence, machine learning and cloud computing have revolutionized business-consumer interactions, enabling chatbots to provide consumer advisory services in all phases of the shopping experience (Granulo et al., 2020; Longoni & Cian, 2022; McLeay et al., 2021; Rad et al., 2023).

Including AI in business-consumer interaction still faces several challenges. Some authors have acknowledged that although consumers are increasingly using AI, they are still reluctant to use it for a variety of tasks that humans can still execute well (Castelo et al., 2019; Pelau et al., 2021). According to Wirtz et al. (2018), the acceptance of a service robot will depend greatly on how well it performs the tasks that are determined by society. Studies on the adoption of service robots (Belanche et al., 2020; Van Doorn et al., 2017) suggest that consumer acceptance of AI chatbots may be influenced by a number of factors, including chatbot type, interaction mode and the relationship between chatbots and humans.

In this context, it is important to define in how far consumers identify AI as entities with own agency, that have own thoughts and emotions and are able to make own decisions and act based to their own beliefs and consciousness. Agency is defined as people's ability to control their own actions and their effects on others (Legaspi et al., 2024; Chong et al., 2021; Bandura et al., 2018). AI's agency is important because people tend to rely on this ability of AI to perform tasks based on their own decisions. Especially anthropomorphic features are frequently associated with real persons that may induce a sense of agency. According to some studies, children often misunderstand the capabilities and functionality of technologies due to their anthropomorphic qualities and the personification of agents (Druga & Ko, 2021; Sommer et al., 2019). Especially younger children naturally associate human-like attributes with robotic or AI-powered entities, believing that they exhibit cognitive, moral, social, or emotional states, according to the literature on human-robot interaction. Children's perceptions of conversational assistants are not limited to seeing them as either uniquely human or inanimate objects; rather, they perceive them as simultaneously combining features from both categories (human-like and non-human), which is consistent with how children perceive features of humanoid robots (Festerling & Siraj, 2020; Girouard-Hallam & Danovitch, 2023).

Agency can also have important implications, depending on the role that AI plays in the interaction with the human consumer. Previous studies on the service roles that AI-chatbots perform (Kim and Kramer, 2015) classify them into three distinct anthropomorphic roles (assistants, coaches, and collaborators). Chong et al. (2021) argue that the anthropomorphic role of the AI-chatbot as an assistant can enhance clients' abilities by performing routine tasks on their behalf. But at the same time, Shank et al. (2021) found that individuals have different perceptions of AI agents compared to human agents performing identical service roles. Zhu et al. (2022) argue that chatbots that exhibit autonomy, adaptability, and empathy will be perceived as more effective in assisting consumers in reducing the ambiguity of their requests. On the other hand Mori et al. (2012) draw attention to the fact that anthropomorphism of technology should be approached with caution because of the possible negative effects of integrating systems with human-like characteristics. Ciechanowski et al. (2019) found that compared to a basic chatbot design, animated and humanoid chatbots generated stronger uncanny valley effects (i.e., participants viewed the chatbot as "weird") and were rated less favorably. At the same time, deception is found to have increased significantly and customers are more likely to behave unethically when dealing with AI agents (Giroux et al., 2022; Kim et al., 2023). According to research that has examined how consumers interact with humans and other technologies (such as machines, robots, and AI agents), it has been observed that they are more likely to act unethically toward technologies, (Giroux et al., 2022; Kim et al., 2023). For example, Sharkey & Sharkey (2010) argue that there are ethical implications, as anthropomorphism can be interpreted as a kind of deception, which could encourage children to exaggerate the capabilities of the AI-assisted systems they use.

However, research has shown that AI chatbots cannot replicate the flexibility of human thinking, cannot cope with ambiguity (Li & Du, 2017) or uncertain situations, which reduces customer trust in them (Zhu et al. 2022; Niculescu et al., 2022). Therefore, consumers with less certainty about their desires are less likely to use AI chatbots for consultations in the prepurchase stage online. Added to this is the lack of empathy of bots' that, according to Luo et al. (2019) makes consumers consider chatbots less trustworthy for product recommendations.

Methodology

The objective of our research is to determine whether AI is perceived as having agency and making its own decisions. To do this, based on a brainstorming, we have developed a set of items that can define the agency of AI, referring to the ability of AI to have decision power in fields specific to human behavior and if AI should be responsible for its own decisions. The first category of items referred to the ability of AI to have own political views, religious beliefs and the ability to pray as well as to have its own identity. Another category of items tests whether AI should be responsible for its actions and even be punished in case it makes the wrong decisions. A last category of items tested if AI may have superpowers that could impact mankind such as the power to reduce pollution or crime rates as well as to stabilize the world economy or assure world peace. We acknowledge the fact that all these situations are potential scenarios for the development of AI, but in order to determine the future place of AI in society, it is important to observe how people perceive these situations. In addition to this, we have tested the perception of these scenarios in two anthropomorphic conditions: once for strong and weak anthropomorphic features of AI.

In order to test empirically this objective, an online survey with two conditions (anthropomorphic vs. non-anthropomorphic) has been designed. In both conditions, the respondents have watched a picture of AI with strong and weak anthropomorphic appearance. After

seeing the pictures, the respondents had to evaluate the mentioned constructs. All items have been measured with the help of a 7-point Likert scale, where 1 represents total disagreement and 7 represents total agreement. Data collection for this research took place between October and November 2023. A number of 489 valid responses have been received (268 women and 221 men).

Results and discussions

The results of the research show the main differences between the perceptions of the respondents for AI with strong and weak anthropomorphic physical appearance on subjects regarding higher sense of implication such as interest in politics, religion, as well as the responsibility of AI for its own actions. The result is based on our discriminant analysis performed with the help of the t-test function in Excel, which can be observed in Table no. 1. The perception of the respondents is first of all gender-based, differentiating between men and women. It can vary greatly between them in terms of age, cultural background, interest in technology development and past experiences. This study is based on how men and women perceive AI ability to have agency. All item values are below average, which indicates that people tend to consider that AI has no agency. However significant differences have been found between the strong and weak anthropomorphic conditions. Some of the answers may indicate a fine line in the transformation and future impact of AI.

The item with the highest average value refers to the ability of AI to have political views. The highest scores are attributed to the humanoid robot related to the situation that it may have political views. Women and men believe that a humanoid AI could express political ideologies better than a classic robot ($M_{\text{women a}}=3.08$, $M_{\text{men a}}=3.45$, $M_{\text{women b}}=2.60$, $M_{\text{men b}}=2.93$). It can be observed that there is a significant difference between the condition with strong and weak anthropomorphism ($p=0.005$). The fact that AI may have political views leads to the situation in which they could express emotions, are engaged in continuous learning and reflecting and transform their personal beliefs into strong, augmented opinions. Self-learning is an objective of AI development, which aligns with specific political ideologies through data. Consequently, robots can reflect or also amplify human perspectives with the help of the existing data on which they are trained. This fact could lead to the perception of the consumers of potential ethical implications in various domains, including politics.

Artificial intelligence, as seen and known today, does not possess spirituality or self-consciousness, so in theory it cannot engage in praying or choose its own religion. However, it could be programmed to simulate prayers based on predefined patterns. There is a significant difference on how men and women perceive the spirituality of AI. Men rather consider that a humanoid robot could pray, although at lower values, which indicated the fact that the human-like appearance of a robot has more chances of touching upper consciousness ($M_{\text{women a}}=2.62$, $M_{\text{men a}}=3.01$, $M_{\text{women b}}=2.20$, $M_{\text{men b}}=2.33$).

The affirmation that humanoid robots could have their own identity is partially agreed by men, with lower values compared to women ($M_{\text{women a}}=2.41$, $M_{\text{men a}}=3.21$, $M_{\text{women b}}=2.07$, $M_{\text{men b}}=2.37$). AI, regardless of their appearance, are operating based on algorithms, data and programming created by humans. AI can simulate certain aspects of identity, such as generating responses or texts in a consistent manner, leading the consumer to an association with human identity. Self-awareness and consciousness are put in question, as seen by the under-average results of the answers. Therefore, any semblance of identity exhibited by robots is nowadays a result of its programming rather than an inherited characteristic.

The lower values scored by the affirmation that AI should be punished with imprisonment, by both genders ($M_{\text{women a}}=2.53$, $M_{\text{men a}}=3.17$, $M_{\text{women b}}=1.98$, $M_{\text{men b}}=2.41$) indicate the fact, that there is a common belief about self-intent or the moral agency of humanoid or classical robot. The concept of punishing robots with imprisonment does not apply neither to women nor men. However, the creators or operators of robots can be held accountable for the actions that result in harm or illegal activities.

Low scores are registered in the perception that robots could ensure world peace. A more humanoid AI wins in the perception of the respondents about the assurance of world peace ($M_{\text{women a}}=2.59$, $M_{\text{men a}}=3.33$, $M_{\text{women b}}=2.16$, $M_{\text{men b}}=2.65$). The humanoid AI could have the potential to contribute positively to global efforts for peace by analyzing data, identifying patterns and providing insights that may form decision-making processes. For example, robots can help to resolve conflicts by analyzing historical data and suggesting diplomatic strategies. AI could also be used for early warning systems or to facilitate communication between different parties. However, achieving world peace is a complex challenge that involves a wide range of capabilities.

Table 1. The differences in acceptance of women and men towards humanoid and classic robots regarding work-related themes

| Item | Average women | | Average men | | p-value |
|--|--------------------|-------------------|--------------------|-------------------|--------------|
| | humanoid robot (a) | classic robot (b) | humanoid robot (a) | classic robot (b) | |
| This AI may have political views | 3,08 | 2,60 | 3,45 | 2,93 | 0,005 |
| This AI can pray | 2,62 | 2,20 | 3,01 | 2,33 | 0,001 |
| This AI has its identity | 2,41 | 2,07 | 3,21 | 2,37 | 0,001 |
| This AI should answer for its mistakes | 3,11 | 2,66 | 3,66 | 3,29 | 0,039 |
| This AI should be punished with imprisonment | 2,53 | 1,98 | 3,17 | 2,41 | 0,000 |
| This AI has the ability to reduce crime rates | 2,88 | 2,85 | 3,81 | 3,11 | 0,090 |
| This AI has the ability to reduce pollution | 2,96 | 3,16 | 3,82 | 3,41 | 0,800 |
| This AI has the ability to stabilize the world economy | 2,67 | 2,58 | 3,44 | 2,85 | 0,093 |
| This AI has the ability to ensure world peace | 2,59 | 2,16 | 3,33 | 2,65 | 0,002 |
| I feel safe in a robotic future | 2,59 | 2,29 | 3,34 | 3,11 | 0,182 |

Source: Authors' own research.

Conclusion

The results of our research show that anthropomorphic features enhance AI agency and that men have a higher tendency to attribute agency to AI. As it can be observed in the results of our study, there is a significant difference between the attribution of agency to AI with strong anthropomorphic characteristics compared to AI with weak humanoid characteristics. For both decisions related to political views, religious beliefs and identity, as well as the responsibility of AI for its own actions, respondents perceive that AI with stronger anthropomorphic features rather has agency. These believes are stronger for men compared to women for all items. The questions related to the superpower of AI such as reducing crime rates or pollution or the stabilization of world economy and world peace, have lower average values compared to previous categories. For these items, there is no significant value between the two anthropomorphic conditions, however, men rather believe that AI has the power to solve these situations. The results also show that human specific emotions and thoughts are rather attributed to AI compared to super-powers.

Our results have important implications for the future development and integration of AI in society and in the business field. Attributing a certain agency to AI gives them power of decision and it changes the way in which human consumers interact with them. The higher the AI agency is, the more people will communicate with them as with humans. For instance, in situations with low agency, in which the AI will perform the tasks commanded by the human consumer, the communication will be simple, less empathetic and it will rely more on the creativity and decision making of the human consumer. In situations with high agency, AI will have a higher creative contribution to the interaction with the human consumer and thus, communication will be more empathetic and will have to consider AI preferences. Practically, the AI perceived agency will shape the type of future relation with the human consumer. For this reason, it is important to understand how agency is perceived and to acknowledge the factors that affect it.

The limitations of our study refer to the general consideration of agency. Based on a brainstorming, we tried to identify the main items that can express AI's agency. In future research, we aim to research deeper the different facets of agency and measure their impact on the way AI makes decisions and on the relationship with the human consumer.

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References

- Andries, V., & Robertson, J. (2023). Alexa doesn't have that many feelings: Children's understanding of AI through interactions with smart speakers in their homes. *Computers and Education: Artificial Intelligence*, 5, 100176. <https://doi.org/10.1016/j.caeai.2023.100176>
- Bandura, A. (2018). Toward a Psychology of Human Agency: Pathways and Reflections. *Perspectives on Psychological Science*, 13(2), 130-136. <https://doi.org/10.1177/1745691617699280>
- Belanche, D., Casalo, L. V., Flavián, C., & Schepers, J. (2020). Service robot implementation: A theoretical framework and research agenda. *The Service Industries Journal*, 40(3-4), 203-225. <https://doi.org/10.1080/02642069.2019.1672666>
- Castelo, N., Bos, M. W., & Lehmann, D. R. (2019). Task-dependent algorithm aversion. *Journal of Marketing Research*, 56(5), 809-825. <https://doi.org/10.1177/0022243719851788>
- Chong, T., Yu, T., Keeling, D. I., & de Ruyter, K. (2021). AI-Chatbots on the services frontline addressing the challenges and opportunities of agency. *Journal of Retailing and Consumer Services*, 63, 102735. <https://doi.org/10.1016/j.jretconser.2021.102735>
- Ciechanowski, L., Przegalinska, A., Magnuski, M., & Gloor, P. (2019). In the shades of the Uncanny Valley: An experimental study of human-chatbot interaction. *Future Generation Computer Systems*, 92, 539-548. <https://doi.org/10.1016/j.future.2018.01.055>
- Druga, S., & Ko, A. J. (2021). How do children's perceptions of machine intelligence change when training and coding smart programs? *Interaction Design and Children*. (pp. 49-61). <https://doi.org/10.1145/3459990.3460712>

- Festerling, J., & Siraj, I. (2020). Alexa, what are you? Exploring primary school children's ontological perceptions of digital voice assistants in open interactions. *Human Development*, 64(1), 26–43. <https://doi.org/10.1159/000508499>
- Girouard-Hallam, L., & Danovitch, J. (2023). Children's interactions with virtual assistants: Moving beyond depictions of social agents. *Behavioral and Brain Sciences*, 46, E34. <https://doi.org/10.1017/S0140525X22001649>
- Giroux, M., Kim, J., Lee, J. C., & Park, J. (2022). Artificial Intelligence and declined guilt: Retailing morality comparison between human and AI. *Journal of Business Ethics*, 178(4), 1027–1041. <https://doi.org/10.1007/s10551-022-05056-7>
- Granulo, A., Fuchs, C., & Puntoni, S. (2020). Preference for human (vs. robotic) labor is stronger in symbolic consumption contexts. *Journal of Consumer Psychology*, 31(1), 72–80. <https://doi.org/10.1002/jcpy.1181>
- Huang, M.-H., & Rust, R. T. (2018). Artificial Intelligence in service. *Journal of Service Research*, 21(2), 155–172. <https://doi.org/10.1177/1094670517752459>
- Kim, H. C., & Kramer, T. (2015). Do materialists prefer the “brand-as-servant”? the interactive effect of anthropomorphized brand roles and materialism on consumer responses. *Journal of Consumer Research*, 42(2), 284–299. <https://doi.org/10.1093/jcr/ucv015>
- Lee, K.-W., & Li, C.-Y. (2023). It is not merely a chat: Transforming chatbot affordances into dual identification and loyalty. *Journal of Retailing and Consumer Services*, 74, 103447. <https://doi.org/10.1016/j.jretconser.2023.103447>
- Legaspi, R., Xu, W., Konishi, T., Wada, S., Kobayashi, N., Naruse, Y., Ishikawa, Y. (2024). The sense of agency in human–AI interactions, *Knowledge-Based Systems*, 286, 111298, <https://doi.org/10.1016/j.knosys.2023.111298>
- Li, D., & Du, Y. (2017). *Artificial Intelligence with Uncertainty*. Boca Raton: CRC Press, Taylor & Francis Group. <https://doi.org/10.1201/9781315366951>
- Li, T.-G., Zhang, C.-B., Chang, Y., & Zheng, W. (2024). The impact of AI Identity Disclosure on consumer unethical behavior: A social judgment perspective. *Journal of Retailing and Consumer Services*, 76, 103606. <https://doi.org/10.1016/j.jretconser.2023.103606>
- Longoni, C., & Cian, L. (2020). Artificial intelligence in utilitarian vs. hedonic contexts: The “word-of-machine” effect. *Journal of Marketing*, 86(1), 91–108. <https://doi.org/10.1177/0022242920957347>
- Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Machines vs. humans: The impact of artificial intelligence chatbot disclosure on customer purchases. *Marketing Science*, 38(6), 937–947. <https://doi.org/10.1287/mksc.2019.1192>
- McLeay, F., Osburg, V. S., Yoganathan, V., & Patterson, A. (2021). Replaced by a robot: Service implications in the age of the machine. *Journal of Service Research*, 24(1), 104–121. <https://doi.org/10.1177/1094670520933354>
- Mori, M., MacDorman, K., & Kageki, N. (2012). The uncanny valley [from the field]. *IEEE Robotics & Automation Magazine*, 19(2), 98–100. <https://doi.org/10.1109/mra.2012.2192811>
- Niculescu, M.; Pelau, C.; Pop, S. 2022. Social appreciation of the interaction with an anthropomorphic robot, *Proceedings of the International Conference on Business Excellence*, 16(1), 1475-1482, <https://doi.org/10.2478/picbe-2022-0135>
- Pelau, C.; Ene, I.; Pop, M.I. 2021. The Impact of Artificial Intelligence on Consumers' Identity and Human Skills, *Amfiteatru Economic*, 23(56), 33-45, <https://doi.org/10.24818/EA/2021/56/33>

- Rad, D., Cuc, L.D., Feher, A., Joldeș, C.S.R., Bâtcă-Dumitru, G.C., Șendroiu, C., Almasi, R.C., Chis, S., & Popescu, M.G. (2023). The Influence of Social Stratification on Trust in Recommender Systems. *Electronics*, 12(10), 2160, <https://doi.org/10.3390/electronics12102160>
- Saseanu, A.S., Gogonea, R.M. and Ghita, S.I. (2024). The Social Impact of Using Artificial Intelligence in Education. *Amfiteatru Economic*, 26(65), 89-105, <https://doi.org/10.24818/EA/2024/65/89>
- Shank, D. B., Bowen, M., Burns, A., & Dew, M. (2021). Humans are perceived as better, but weaker, than Artificial Intelligence: A comparison of affective impressions of humans, AIS, and computer systems in roles on teams. *Computers in Human Behavior Reports*, 3, 100092. <https://doi.org/10.1016/j.chbr.2021.100092>
- Sharkey, N., & Sharkey, A. (2010). The crying shame of robot nannies. *Interaction Studies*, 11(2), 161–190. <https://doi.org/10.1075/is.11.2.01sha>
- Sommer, K., Nielsen, M., Draheim, M., Redshaw, J., Vanman, E. J., & Wilks, M. (2019). Children’s perceptions of the moral worth of live agents, robots, and inanimate objects. *Journal of Experimental Child Psychology*, 187, 104656. <https://doi.org/10.1016/j.jecp.2019.06.009>
- Song, M., Zhang, H., Xing, X., & Duan, Y. (2023). Appreciation vs. apology: Research on the influence mechanism of chatbot service recovery based on politeness theory. *Journal of Retailing and Consumer Services*, 73, 103323. <https://doi.org/10.1016/j.jretconser.2023.103323>
- Van Doorn, J., Mende, M., Noble, S. M., Hulland, J., Ostrom, A. L., Grewal, D., & Petersen, J. A. (2017). Domo arigato Mr. Roboto: Emergence of automated social presence in organizational frontlines and customers’ service experiences. *Journal of Service Research*, 20(1), 43–58. <https://doi.org/10.1177/1094670516679272>
- Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., & Martins, A. (2018). Brave new world: Service robots in the frontline. *Journal of Service Management*, 29(5), 907–931. <https://doi.org/10.1108/josm-04-2018-0119>
- Zhu, Y., Zhang, J., Wu, J., & Liu, Y. (2022). AI is better when I’m sure: The influence of certainty of needs on consumers’ acceptance of Ai Chatbots. *Journal of Business Research*, 150, 642–652. <https://doi.org/10.1016/j.jbusres.2022.06.044>