**Abstract**

The customer service industry is supported strongly by conversational chatbots whose usability strongly correlates with the user’s capacity to trust them. This trust can be interpreted in two distinct senses; trusting the bot to function reliably and entrusting it with sensitive information. The following report examines the previously established relationship between the delay in a chatbot’s responses and the impact on the user’s trust in the first sense (reliable function).

To accomplish this, we integrated Google forms with an online version of our chatbot which offered delayed responses, then one form, then fast responses, then a final form (or vice versa for the response speeds). There was also a concluding form for demographic data. Thus, this within-subjects study showed half the participants fast responses first, and half delayed responses first to limit any intrinsic bias in this regard. Using the qualitative data collected on Likert scales on the questionnaires, we measured the participants’ perceived trustworthiness of each bot. We found no statistically significant trend between delayed responses and the user’s trust. However, this could be due factors specific to this experiment such as the small number of participants, the online version of the chatbot, or the relatively low noticeability of the delay compared to other salient features of the conversational experience.

**Introduction and theoretical background.**

Artificial intelligence poses a paradigm-altering threat across industries and existentially. The rise of artificially intelligent technologies has prompted increasing interest in the safety of their development process and outcomes. The field is poised to disrupt sectors in manufacturing, healthcare, economics, research and beyond. It is likely that the future of research will be predicated upon artificially intelligent tools for recognizing complex patterns, dealing with large volumes of data, and deriving insights in ways we could never imagine. Moreover, these devices are finding their way into our homes and personal lives whether we realize it or not. Recommendation systems, social media, and smart-home products allow for more inventive means of offloading repeated cognitive tasks. With such influence over so many aspects of our public and private lives, it is crucial that the technologies we build be trustworthy[[1]](#footnote-1).

There are also commercial incentives to pursuing this goal. The introduction of artificial intelligence into the business sphere offers many avenues for automation. For example, it has become increasingly frequent for customer service communications to begin with a chatbot interaction[[2]](#footnote-2). The perceived anthropomorphism of these chatbots significantly contributes to their success in this regard. This is attributed to the fact that interactions perceived to be anthropomorphic typically feel more genuine and more facilitative of user compliance compared to clearly inhuman chatbots. Of the dimensions of anthropomorphism that can be measured in chatbots, one of the most pertinent would be the ability to trust it. Due to the innate relationship between the anthropomorphism of a chatbot and the fact that this depends on a user’s trust, it is worth determining the factors that contribute to increased trust in online chatbots.

In this context, two interpretations of trust can be distinguished: that of trusting the bot to function properly and entrusting it with sensitive information. The first is derived from our deciding whether a tool is reliable or not, whereas the second is more concerned with the personal responsibility of our interlocutor and whether the user can – in some sense – be betrayed. Though these two interpretations are not mutually exclusive, the following paper is concerned primarily with the first interpretation. This is due to its comparative simplicity and its relatively clear operationalization, as well as the fact that TrAKX deals solely with impersonal information.

To find a variable that had a presumable relationship with a user’s trust, we began with a brief scan of some of the relevant literature. Notably, the paper *Faster Is Not Always Better: Understanding the Effect of Dynamic Response Delays in Human-Chatbot Interaction* found that “dynamic response delays can not only increase users’ perception of humanness and social presence, but also lead to greater satisfaction with the overall chatbot interaction”[[3]](#footnote-3). This conversational subtlety seemed sufficiently nondescript such that it would be amenable to a within-subjects design, as well as being clearly linked to a perceived sense of anthropomorphism in the chatbot. Thus, investigating such a variable effectively doubled our participant population and could be distinctly motivated in terms of the particular sense of trustworthiness we sought to explore.

More specifically, the following paper investigates whether dynamically calculated delays in a chatbot’s response times are conducive to an increase in a user’s ability to trust in the reliability of a chatbot. To explicitly situate this work among the relevant literature, this is an attempt to mirror the results of *Faster is Not Always Better* to test whether the correlation holds between this sense of trustworthiness and a response delay in our chatbot. As an exercise for Part II of the Methods in Artificial Intelligence Research course, we also identify sources of error (both methodological and random) and their associated effects to explain discrepancies between our study and the aforementioned.

1. European Commission. (2018). *ETHICS GUIDELINES FOR TRUSTWORTHY AI.* Brussels: High-Level Expert Group on Artificial Intelligence [↑](#footnote-ref-1)
2. Adam, M., Wessel, M., Benlian, A., (2020) *AI-based chatbots in customer service and their effects*

   *on user compliance*. Springer Electronic Markets. [↑](#footnote-ref-2)
3. Gnewuch, U., Morana, S., Adam, M. T. P., and Maedche, A. (2018). *Faster Is Not Always Better:*

   *Understanding the Effect of Dynamic Response Delays in Human-Chatbot Interaction*, in Proceedings of

   the 26th European Conference on Information Systems (ECIS), Portsmouth, United Kingdom, June 23-28. [↑](#footnote-ref-3)