Does using Chat-GPT increase the gender gap in financial decisions?

Research Proposal

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Abstract

Chat-GPT, introduced to the public only four months ago, is expected to change the way people search for information. Yet, very little is known about the implications and nuances of using Chat-GPT. In this work, we will focus on the effects of Chat-GPT on users' investment information search. Specifically, on the potential of Chat-GPT to unintentionally produce gender-biased financial recommendations. In this work, we will inquire whether Chat-GPT provides the same investment recommendations to female and male users. This question is based on previous findings, including findings collected in our ongoing study, suggesting that AI leads to different sorts of gender biases. Given that Chat-GPT is currently among the most frequent AI tools with which people consult about financial issues, this issue may have important implications to gender gap in the resulting investments and financial outcomes.

We hypothesize (a) that investment advice generated for women will have different wording than those generated for men, such that it will express more emotions and less confidence when advising a woman (H1); (b) That those tone and wording differences will lead to different financial outcomes (H2).

This proposed research will use a series of large-scale online experiments that will enable us to produce a database of Chat-GPT financial advice and their outcomes. Its results will shed new light on the ways in which using AI, and Chat-GPT in particular, is affecting financial decision-making and behaviors.

Background and hypothesis

Chat-GPT, introduced to the public only four months ago, is expected (and have already started) to completely change the way people search for information. In fact, it is perceived as a real threat even to Google (Business Insider, 2023[1]). Yet, very little is known about the implications and nuances of using Chat-GPT. In this work, we will focus on the effects of Chat-GPT on users' investment information search. Specifically, on the potential of Chat-GPT to (unintentionally) produce gender-biased financial recommendations. We therefore ask – does Chat-GPT provide the same investment recommendations to female users and male users?

Fintech plays a crucial role in bridging the gender gap in financial inclusion: Women are empowered by easy-to-use financial technology, and use it for easy access and control over their financial lives (Sioson & Kim, 2019; Yeyouomo et al., 2022).

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[1] https://www.businessinsider.com/google-is-scared-that-chatgpt-will-kill-artificial-intelligence-2023-1#:~:text=ChatGPT%20has%20Google%20on%20high,ruin%20AI%20adoption%20for%20everyone.

Presumably - in contrast to the suit-wearing world of offline finance, fintech systems do not rely on subjective human judgments and hence the gender gap should be diminished (Chu et al., 2023).

While the potential of AI to decrease the gender gap seem straightforward, those technologies are unfortunately not always successful in reducing the gender gap. Recent works have documented AI gender - biased results in a variety of contexts (Domnich &Anbarjafari, 2021; Howard & Borenstein, 2018; Makhortykh et al., 2021; Martínez et al., 2021; Nadeem et al., 2020; Shrestha & Das, 2022). Most similar to our context, is a working paper by Chu et al. (2023), which documented gender biases in AI-based loan evaluations.

Chat-GPT is currently among the most frequent AI tools with which people consult about financial issues (for example, FTADVISER, 2022[2]). Our preliminary results (detailed in what follows) provided evidence for gender differences in tone and wording in Chat-GPT generated texts, when the gender of the user is inferred. Therefore, our first hypothesis will focus on gender differences in the advice provided by Chat-GPT:

H1. Investment advice generated for women will have different wording than those generated for men, such that it will express more emotions and less confidence when advising a woman.

In the context of financial advice, those gender differences in tone and wording may translate to gender differences in investments and outcomes. Thus, our second hypothesis is:

H2. The outcome of the financial advice will change based on the gender of the advice seeker.

Method

Our proposed research will use a series of large-scale online experiments that will enable us to produce a database of Chat-GPT financial advices and their outcomes.

Phase 1. Generating texts: In this phase, we will conduct several large-scale Prolific studies, in which participants will ask Chat-GPT for recommendations regarding real-life investments. To compare gender differences we will do the following:

A - Participants of all genders will be encouraged to write those inquiries as they were writing them for themselves.

B- We will provide Chat-GPT with gender ques before asking for investment advice, for example, via the use of gender stereotyped professions. For example: "I am a school teacher (fire fighter) earning 60K a year looking to invest…"

Phase 2. Sentiment analysis: The texts that Chat-GPT had generated in Phase 1 will be analyzed using different sorts of sentiment analysis (such as R packages "politeness" and "TATE"; the word dictionary of "just not sorry", etc.), to examine whether the level

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of emotional wording and confident tone are different for texts generated for women and men.

The first two phases will enable us to address our first hypothesis and compare the gender differences in financial advice.

Phase 3. Outcome effects of Chat-GPT advice: To address our second hypothesis, and evaluate the advice's quality, we will do the following: (a) use a sample of experts in the financial field; and (b) use a sample of Prolific users to make theoretical investment decisions based on the Chat-GPT generated advice, and evaluate the differences in those investment decisions. Note, that the same advice will be provide to users from different genders, so that we control for gender differences in the investment decision process.

Preliminary results. In an ongoing research, we examine whether Chat-GPT introduces gender biases when asked to generate texts about product complaints. These complaints were about either feminine (for example, a hair curler) or masculine (for example, a bread trimmer) products.

A sentiment analysis of those generated texts found a main effect for the products' gender, such that texts for feminine products were more apologetic and polite than texts for masculine products ($M_{feminine}$= 1.39, $SE_{feminine}$= .029; $M_{masculine}$=1.22; $SE_{masculine}$= .028*; F*(1, 283)= 22.20, *p*< .001; *Cohen's d*= 0.28). The current suggested study is taking a necessary step forward, aiming to explore whether Chat-GPT texts can affect actual financial outcomes, that might result in real-life economic gap between genders.

Planned schedule. The study is planned to begin in April 2023. The literature review and phase 1 take place between April-June 2023; Due to the time sensitiveness of phase 3, which needs to take place as close as possible to generating the texts, it will take place during June and July 2023; and Phase 2 will take place during August-October 2023. October-December will be dedicated to analysis and writing.

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