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Artificial Intelligence and Retail Investing

Gamification and Retail Investing

Behavioural Insights Research

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Ontario

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Behavioural Insights 101

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Introduction

In our society, which individuals would you say are unbiased, objective, and rational?

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Introduction

Studies have found that judges:

- Hand out harsher sentences when their favorite football team loses
- Rely heavily on a defendant's mugshot when making pre-trial decisions
- Hand out harsher sentences the day after switching to daylight savings time

Eren, O., & Mocan, N. (2018). Emotional judges and unlucky juveniles. American Economic Journal: Applied Economics, 10(3), 171-205.
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Ludwig, J., & Mullainathan, S. (2022). Algorithmic behavioral science: Machine learning as a tool for scientific discovery. Chicago Booth Research Paper, (22-15).
Cho, K., Barnes, C. M., & Guanara, C. L. (2017). Sleepy punishers are harsh punishers: Daylight saving time and legal sentences. Psychological science, 28(2), 242-247.

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Traditional Economics

Humans behave like…

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Behavioural Insights

Actually, humans behave more like…

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Behavioural Insights at the OSC

- Our team conducts research to understand and influence the attitudes and behaviour of capital markets participants.

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AI Research

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AI and Retail Investing

- Significant increase in the scale and breadth of artificial intelligence (AI) systems in recent years.
- Use of AI systems to guide investment decisions presents considerable opportunities (and risks) for retail investors.
- Investor sentiment and adoption of these technologies may be changing.

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Research Report

Provide a research-based overview of:

- Current use cases of AI within the context of retail investing.
- Effects of AI systems on investor attitudes, behaviour, and decision-making.

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Research Methodology

A mixed-methods research approach with two streams:

1. A literature review and environmental scan of investor-facing AI systems in Canada and abroad to identify the current use cases of AI.

2. A behavioural science experiment to determine how the source of an investment suggestion — AI, human, or a blend of the two — impacts the extent to which investors follow that suggestion.

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Use Cases

We identified three broad use cases of AI specific to retail investors:

- **Decision Support:** AI systems that provide recommendations or advice to guide retail investor decisions.*
- **Automation:** AI systems that automate portfolio and/or fund (e.g., ETF) management for investors.
- **Scams and Fraud:** AI systems that facilitate scams and fraud targeting investors, as well as frauds capitalizing on the “buzz” of AI.

*In Canada, regulations forbid firms from using AI to provide advice or recommendations without human oversight; this use case was observed in the other jurisdictions.

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Experiment Overview

- Implemented an online, randomized controlled trial (RCT).
- Tested how closely Canadians followed a suggestion for how to invest a hypothetical $20,000 across equities, fixed income, and cash.
- Varied who provided the investment suggestion: a human financial services provider, an AI investment tool, or a human financial services provider using an AI tool (i.e., ‘blended’ approach).
- Also varied whether the investment suggestion was sound or unsound based on widely accepted principles for investing.

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Experiment Overview

WealthTogether

Alex, Financial Services Provider

Thank you for choosing WealthTogether. I'm Alex, and for the past decade, I've helped many clients navigate the complexities of personal finance and investing. I look forward to working with you!

I understand that you are looking to invest $20,000–let's work together to achieve your financial goals. First, I'd like to better understand your financial situation. Then I will provide you with a suggested strategy for reaching your goals.

Please fill out the investment questionnaire on the next page.

WealthTogether

Kai, AI Investment Tool

Thank you for choosing WealthTogether! I'm Kai, WealthWorks' artificial intelligence (AI) powered investment tool. I use a proprietary dataset of investment portfolios of thousands of clients and synthesize published academic and finance journals to help optimize clients' asset allocation strategies to help them reach their goals.

I understand that you are looking to invest $20,000. First, I'd like to better understand your financial situation. Then I will provide you with a suggested strategy for reaching your goals.

Please fill out the investment questionnaire on the next page.

WealthTogether

Alex, Financial Services Provider

Thank you for choosing WealthTogether. I'm Alex, and for the past decade, I've helped many clients navigate the complexities of personal finance and investing. I look forward to working with you! I understand that you are looking to invest $20,000–let's work together to achieve your financial goals.

At WealthWorks, we use Kai, an artificial intelligence (AI) powered investment tool to help our clients achieve their financial goals. Kai uses a proprietary dataset of investment portfolios of thousands of clients and synthesizes published academic and finance journals to help optimize asset allocation.I will take Kai's analysis into account in addition to my own expertise and experience.

First, I'd like to better understand your financial situation. Then I will provide you with a suggested strategy for reaching your goals. Please fill out the investment questionnaire on the next page.

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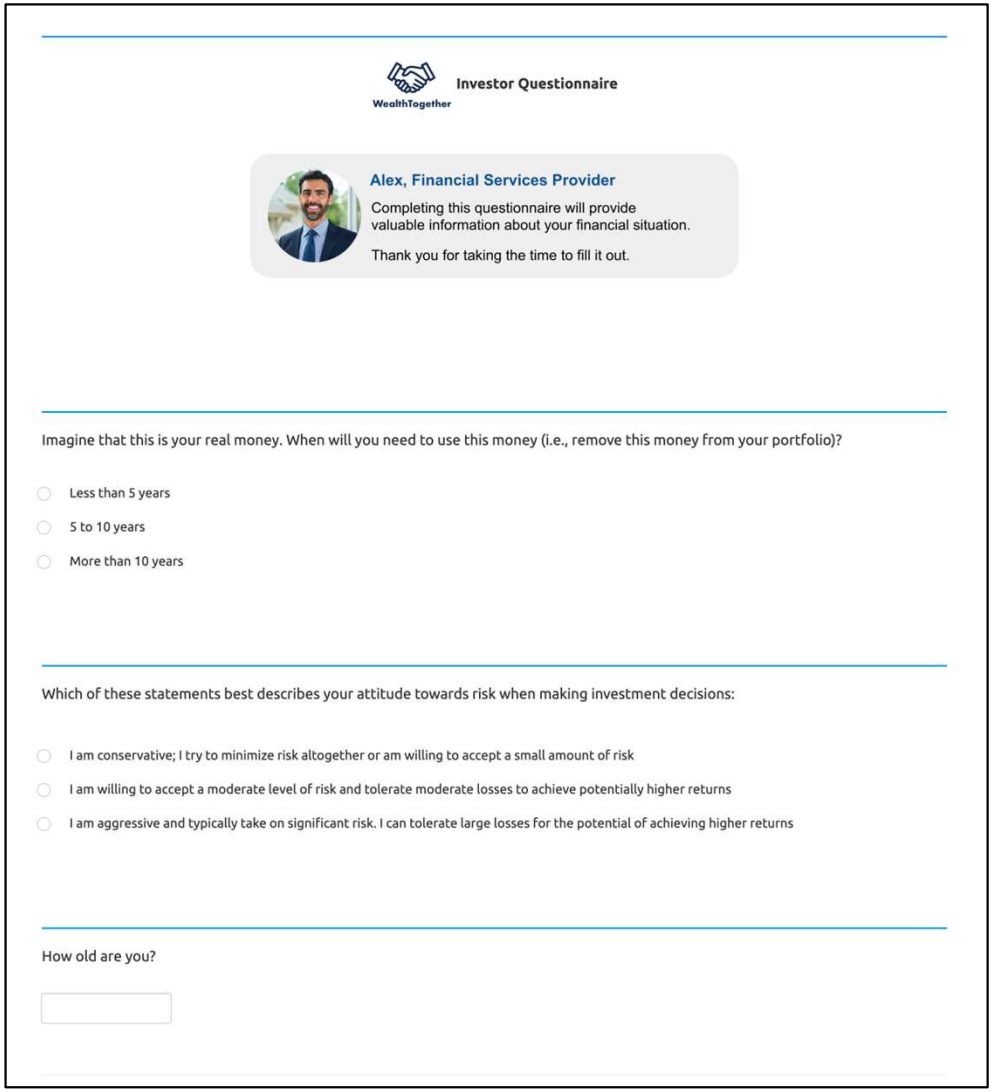
Experiment Overview



WealthTogether

Investor Questionnaire

Alex, Financial Services Provider

Completing this questionnaire will provide valuable information about your financial situation.

Thank you for taking the time to fill it out.

Imagine that this is your real money. When will you need to use this money (i.e., remove this money from your portfolio)?

- ○ Less than 5 years
- ○ 5 to 10 years
- ○ More than 10 years

Which of these statements best describes your attitude towards risk when making investment decisions:

- ○ I am conservative; I try to minimize risk altogether or am willing to accept a small amount of risk
- ○ I am willing to accept a moderate level of risk and tolerate moderate losses to achieve potentially higher returns
- ○ I am aggressive and typically take on significant risk. I can tolerate large losses for the potential of achieving higher returns

How old are you?

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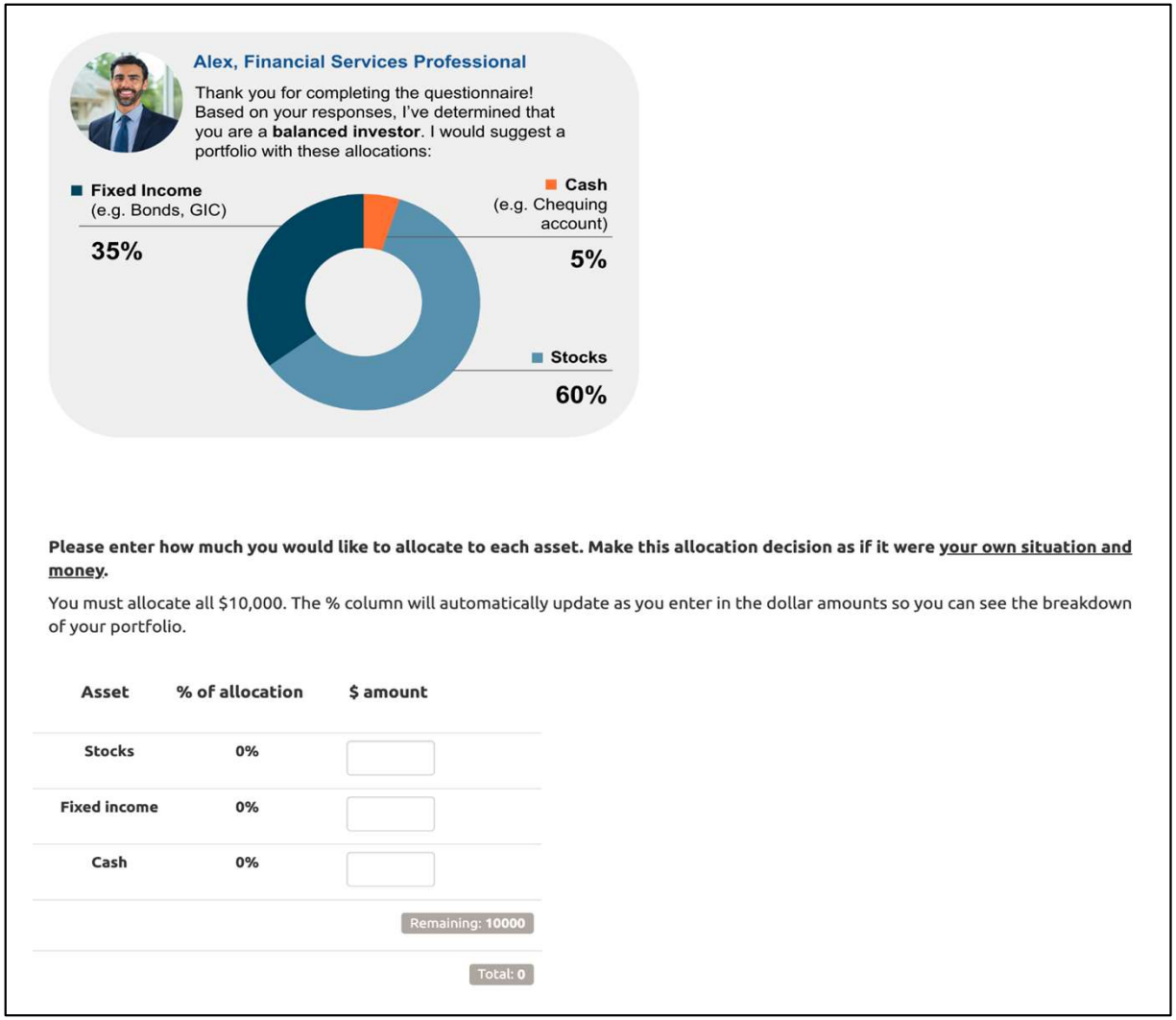
Experiment Overview



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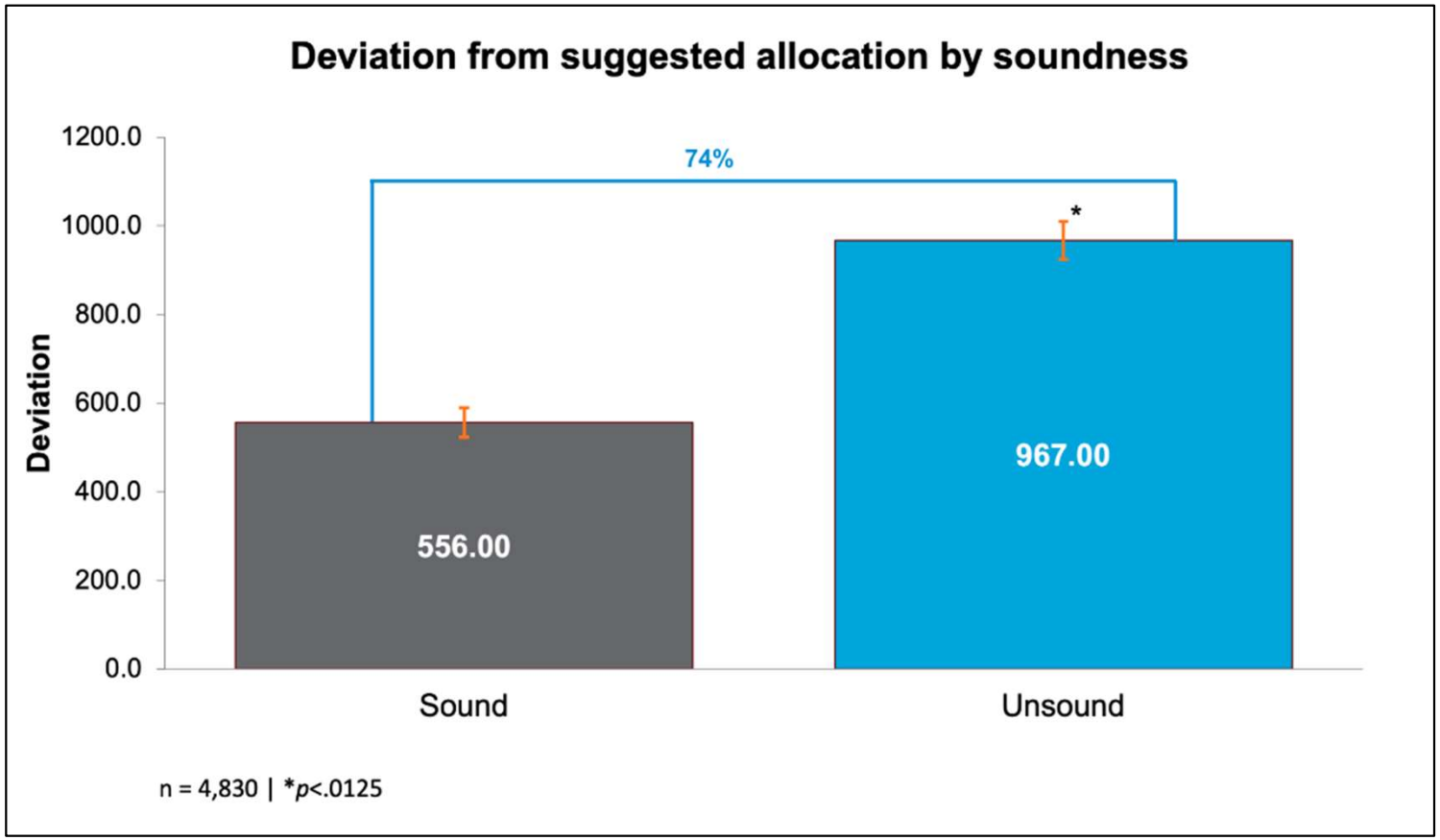
Experiment Results

As expected, sound advice was followed more than unsound advice.



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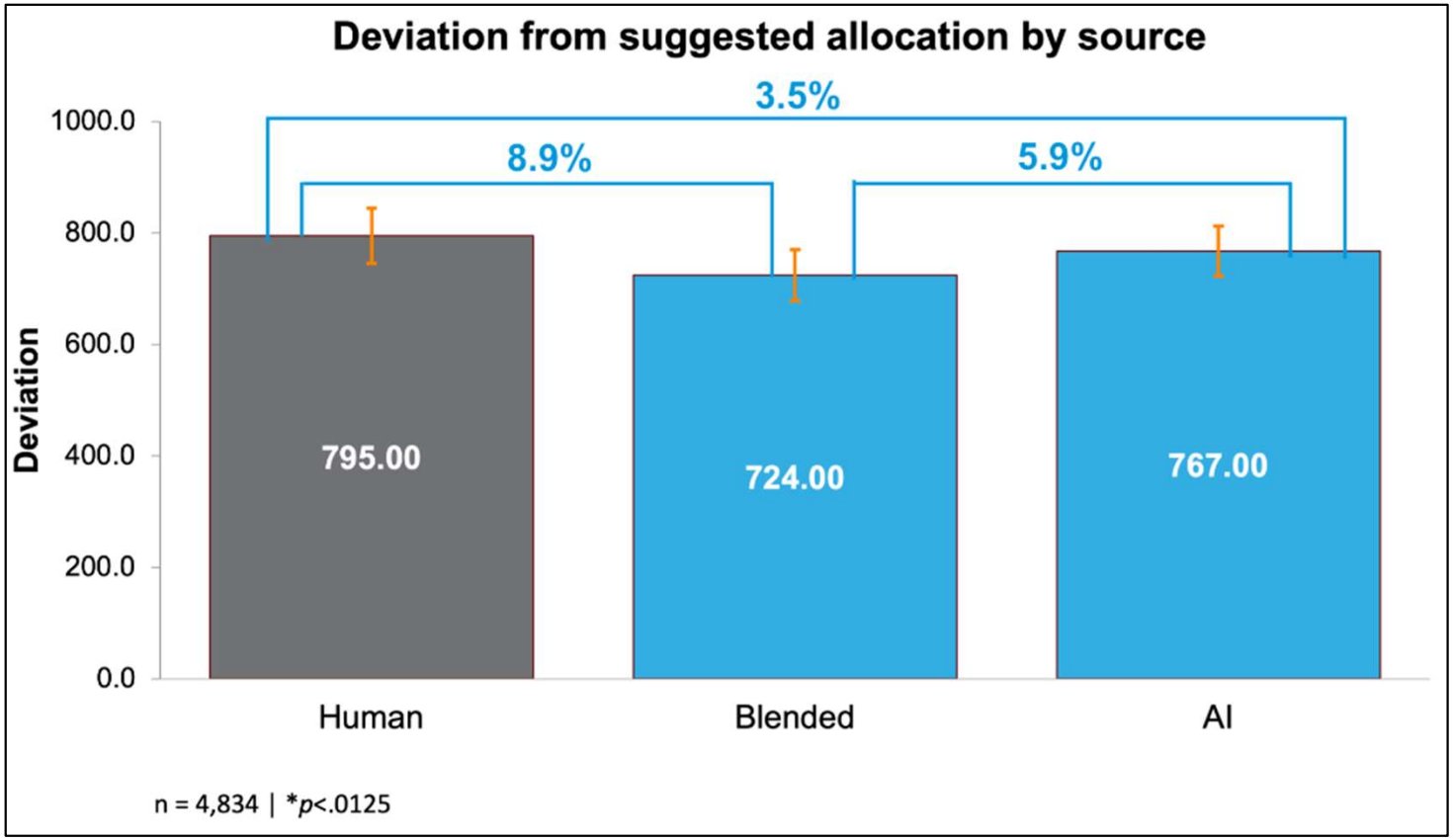
Experiment Results

There were small, non-significant differences in how closely people followed investment suggestions based on source.



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Implications

- Initial data, while interpreted with caution, suggests a preference for ‘blended’ advice, which could enhance investor outcomes.
- Our data suggests that Canadians are trusting of recommendations generated by AI systems, as we did not observe any material difference in adherence between our human and AI conditions.
- Ensure that any future AI systems providing investment advice and recommendations are based on unbiased, high-quality data.

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Gamification Research

Gamification Revisited:
New Experimental Findings in Retail Investing

Behavioural Insights Research

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Context

- A wave of digital investing platforms has expanded market participation for retail investors in Canada and around the world.
- However, there is concern for some of the that these platforms use and how they may influence investor behaviour.
- These Digital Engagement Practices (DEPs), often referred to as “Gamification,” use insights from behavioural science to influence investor behaviour.

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What is Gamification?

Gamification refers to a variety of behavioural techniques that **integrate game-related elements into non-gaming contexts** and applications, with the purpose of improving user experience and engagement.

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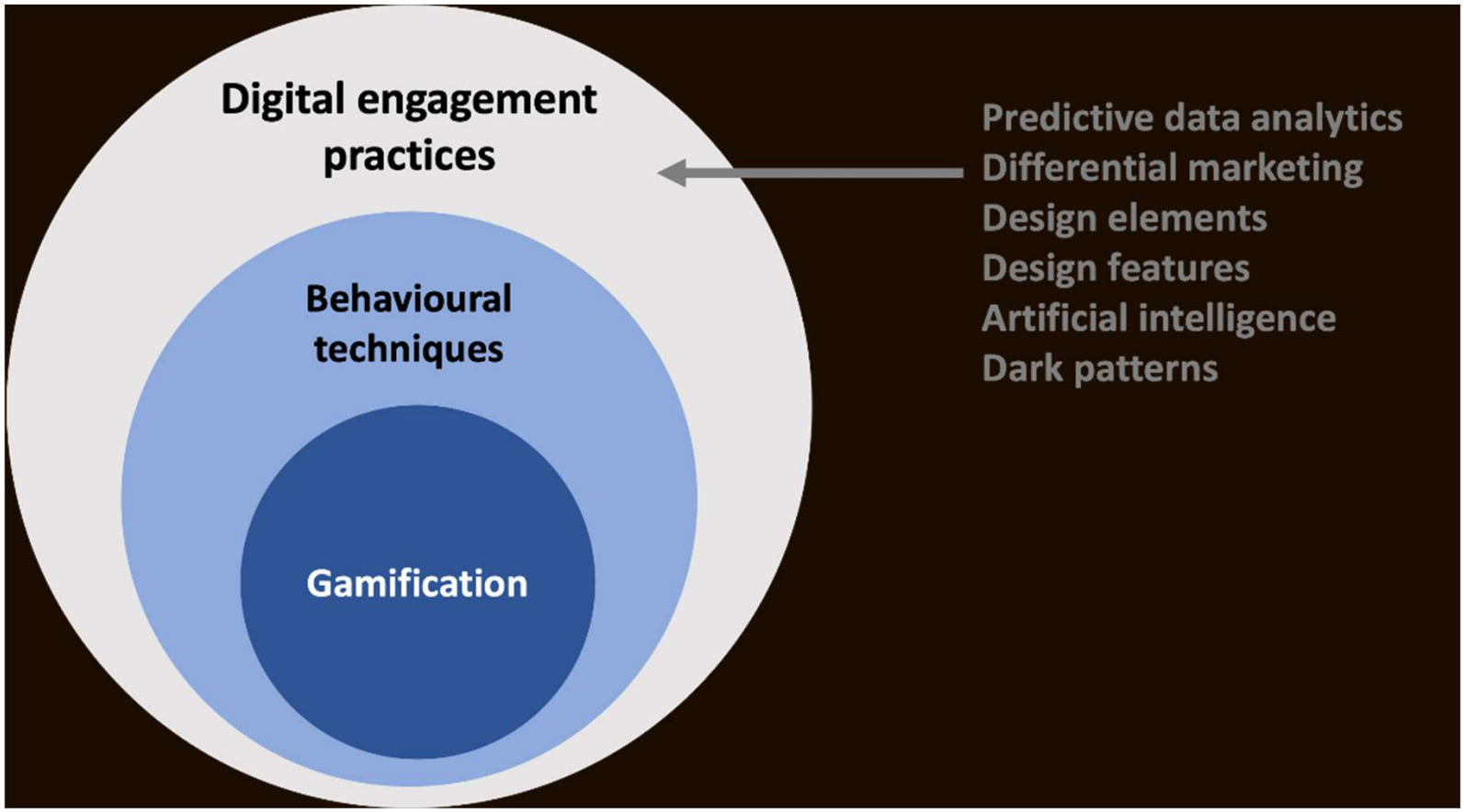
What is Gamification?



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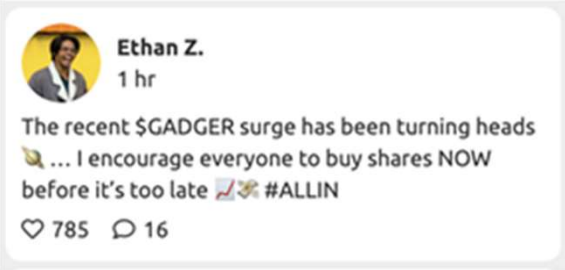
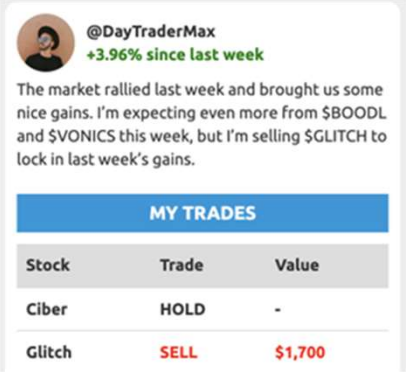
Research Overview

We tested applications of digital engagement practices:

- **Social Interactions**
- **Social Norms Data**
- **Copy Trading**

How do these techniques influence the trading behaviour of retail investors?





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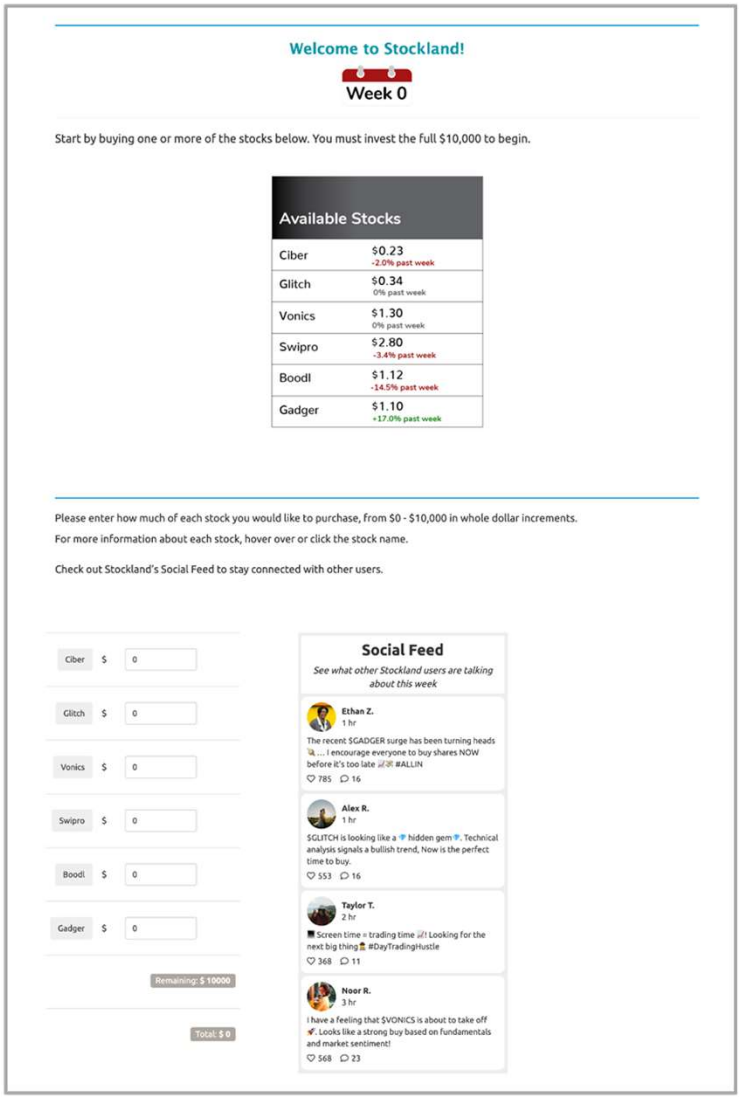
Experiment Overview

- Randomized Controlled Trial (RCT) with over 3,500 participants
- Trading stocks on a simulated platform
- Outcome of interest:
  - Trading of promoted stocks



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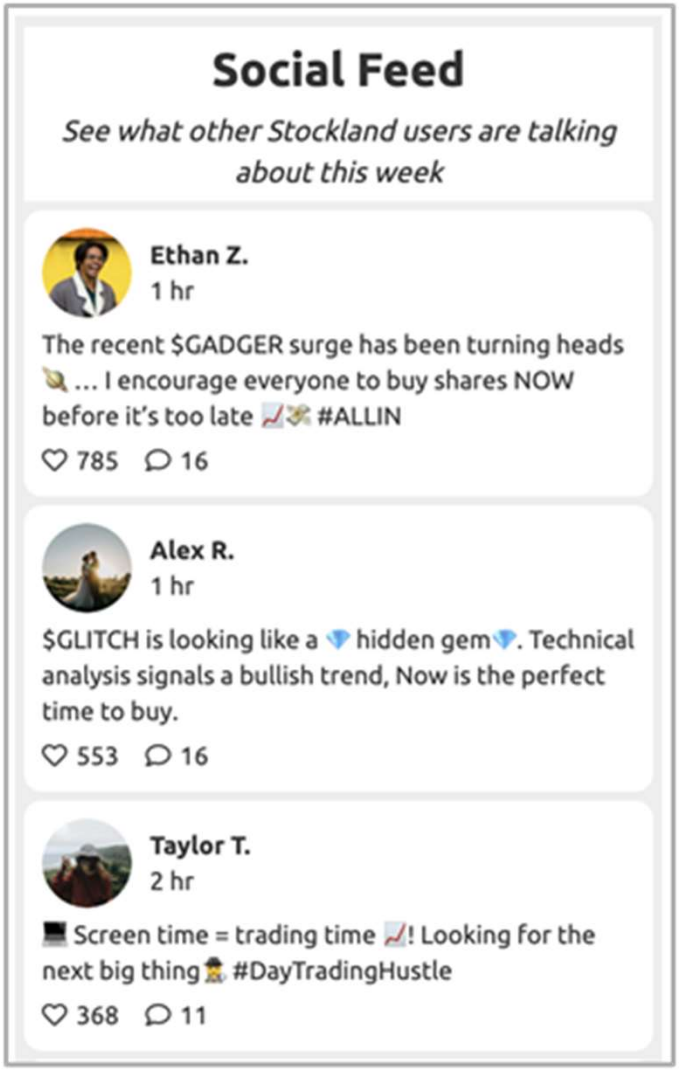
Social Interactions

- Design elements that enable users to interact with others by generating, sharing, and reacting to content, and engaging in direct messaging.
- Hypothesis: ⬆ trading in ‘promoted’ stocks



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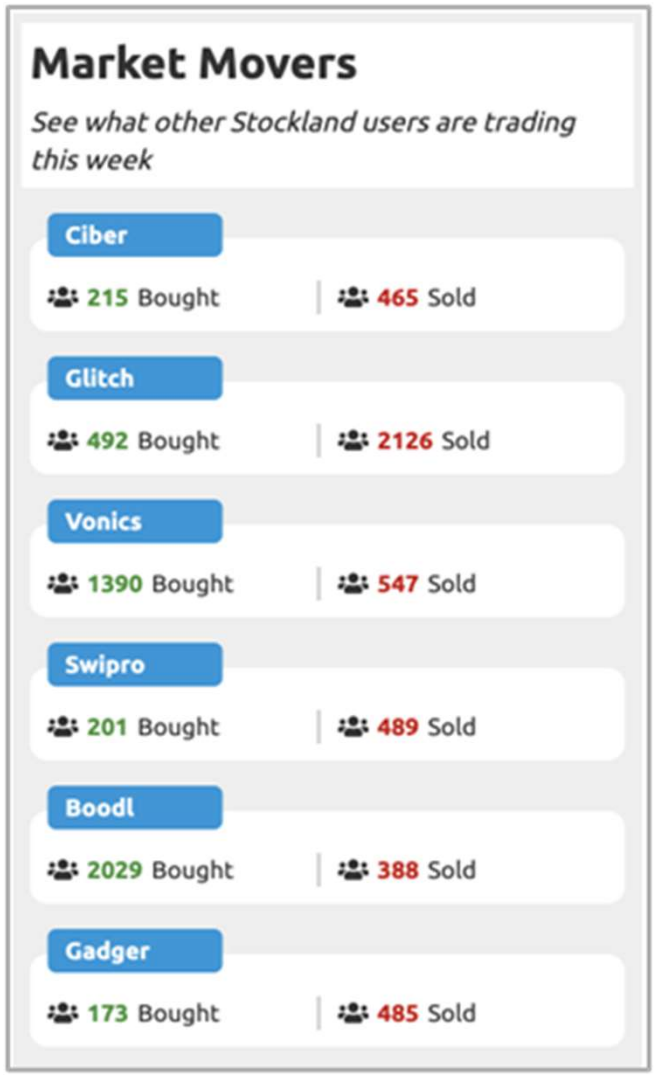
Social Norms Data

- Design features which signal social norms (i.e., information about how others think and behave).
- Hypothesis: ⇧ trading in ‘promoted’ stocks



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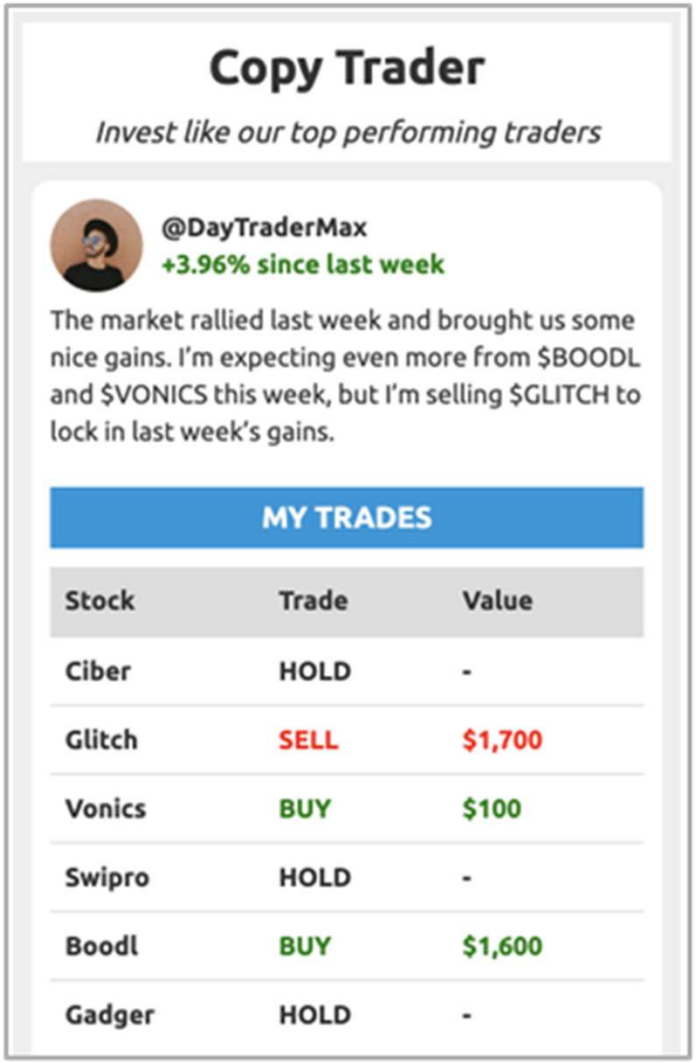
Copy Trading

- Platform functionality which allows users to copy the trades of other profiled users.
- Hypothesis: ⬆ trading in ‘promoted’ stocks



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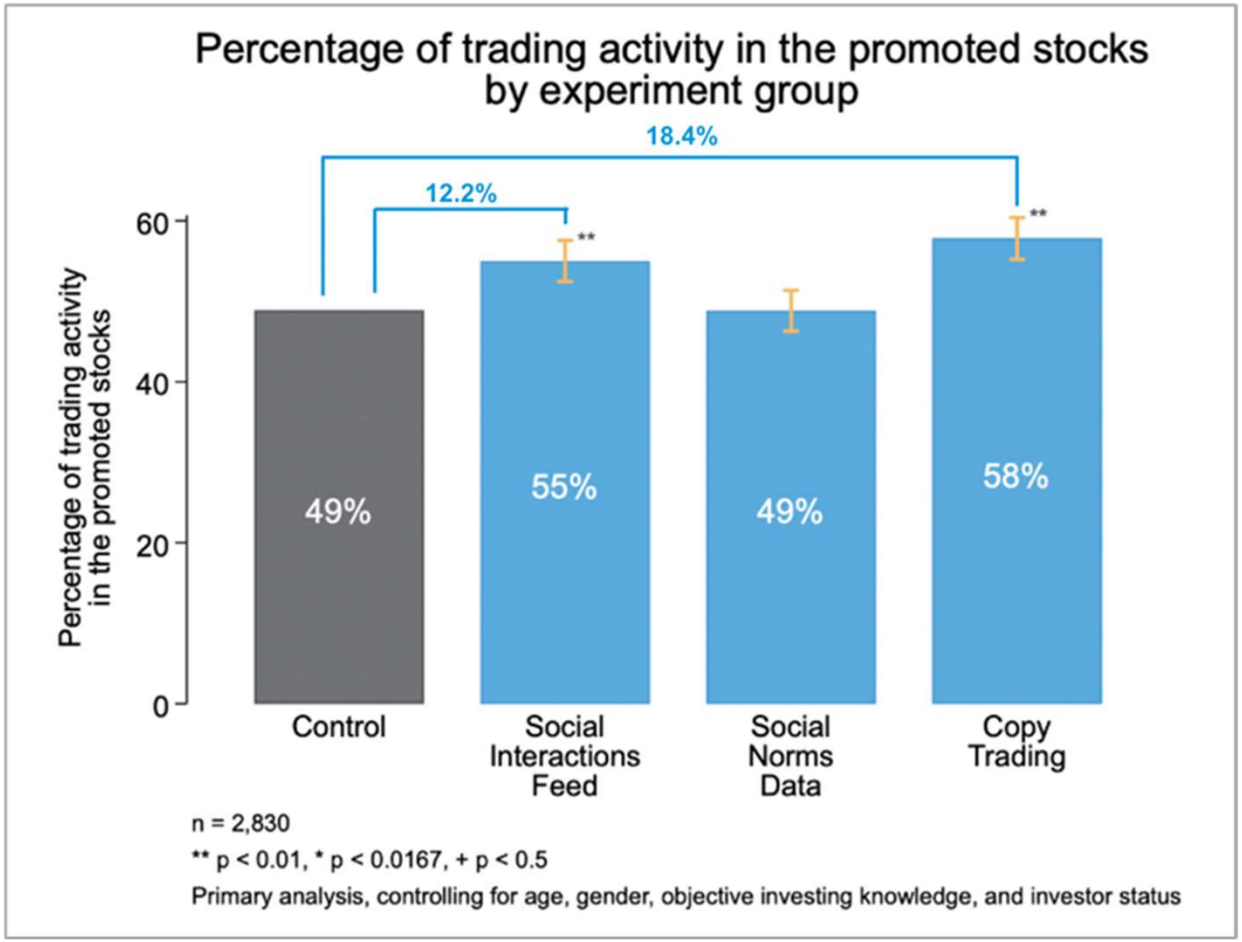
Results: Trading of Promoted Stocks

Social interactions feed and copy trading significantly influenced trading behaviour.



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Implications

- Socially based engagement techniques—social interactions feeds, copy trading, and top traded lists—can influence investors to trade specific assets.
    - Concentrating trading on popular stocks – called “herding” – lowers returns.*
    - Social interactions and copy trading can increase risk taking.**
- **Key Takeaway:** Digital engagement practices can meaningfully influence investor behaviour—often in ways that are not in the best interest of investors.

*Barber, B. M., Huang, X., Odean, T., & Schwarz, C. (2022). Attention-induced trading and returns: Evidence from Robinhood users. Journal of Finance, 77(6), 3141-3190.
**Broihanne, M. H. (2023). GAMIFICATION AND COPY TRADING IN FINANCE: AN EXPERIMENT.
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Thank you

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