

# Fooling with facts: studying cognitive biases through a large-scale “wisdom of the crowd” experiment

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Humans' cognitive abilities are subject to various biases both at the individual and societal levels. Such biases can have dramatic effects on our decision making. The rise of social media, crowd-sourced information repositories, and user-based information channels have raised the concern that “fake [or biased] information” along with “filter bubbles” will further distort the perception of reality that online users gain through online media leading to ill-informed decisions in political events and beyond.

The proposed research aims to study two main processes in which such biases can be induced and affect our judgments, through a series of large scale field experiments. a) Projection bias<sup>1</sup>, that is the tendency to falsely project current preferences onto a future event combined with recency effects<sup>2</sup> that put more emphasis on the more recent events and evidence. b) Herding effects (also known as Bandwagon effect<sup>3</sup>), through which the rate of uptake of beliefs, ideas, fads and trends increases the more that they have already been adopted by others, where social information of how many have already adopted is crucial.

This research will be carried out in collaboration with *Play the Future*<sup>4</sup> (PTF), a Canada-based company that runs the PTF mobile application. PTF users can play prediction games in which they predict a numerical answer to a question about the future and will collect points proportional to the accuracy of their prediction upon the occurrence of the event. Examples of such questions are “which of the NBA teams will score the most in tonight's playoff games?” or “how much will the Fate of the Furious earn at the domestic box office this weekend?”. The users are also provided with “hints” to improve their guesses, such as: “Team with the fewest points scored in the last game: BULLS (95 points)” or “The opening weekend Box Office total of FoF: \$98,766,705” respectively.

PTF currently has 53,000 monthly active users (April) with a total of 101,000 registered users in the system.

In a series of experiments (4000-5000 users per “tournament”), we will ask the PTF users to predict the outcome of certain, political, economical, and cultural events. However, in the framework of a randomized controlled trial experiment, different facts with positive/negative spin will be provided to different groups of users as hints. The main outcome measure is the distribution of the predictions by each of the groups and the bias introduced by providing different hints including opposing facts.

In a second series of experiments, the hints will contain social information on other users' predictions. Previous research has shown such information may lead to both a constructive increase in the wisdom of the crowd or destructive herding effect, increasing the biases in the common beliefs. In this project, we are seeking to systematically quantify and study these effects and find out the exact conditions under which each of the two scenarios will occur.

Since the PTF users have signed up through their Facebook accounts, and agreed to share their demographic information with the app, we will be able to measure the size of the effect on individual users depending on different criteria, including age, gender, location, and other attributes.

With the increasing importance of how public and social media disseminate news and how information and misinformation shape public opinions, our proposed research will help the policy makers, media outlets, and social media platforms to make informed decisions on how to regulate, balance, and legitimize the information-space that we are currently live in.

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<sup>1</sup> Loewenstein, G., O'Donoghue, T., & Rabin, M. (2003). Projection bias in predicting future utility. *The Quarterly Journal of Economics*, 118(4), 1209-1248.

<sup>2</sup> Bjork, R. A., & Whitten, W. B. (1974). Recency-sensitive retrieval processes in long-term free recall. *Cognitive Psychology*, 6(2), 173-189.

<sup>3</sup> Colman, A. M. (2015). *A dictionary of psychology*. Oxford University Press, USA.

<sup>4</sup> <http://www.playthefuture.com/>