

Determinants of the Belief in (Fake) News

Pre-Analysis Plan

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Abstract

The scale of fake news and misinformation is constantly growing in our hyper-connected world, which may have grave economic and societal consequences. For example, fake news and rumors can manipulate elections, threaten public health, and hype up (or down) investors leading to artificial market disturbances and instability. Designing appropriate social and economic policies in order to combat fake news and to improve the resilience of individuals, institutions, and markets to misinformation calls for a systematic investigation into the underlying cognitive, psychological, and institutional determinants of the belief in falsehoods and resistance to factual information. In this project, we aim to investigate the role of cognitive ability, overconfidence, and motivated reasoning (due to partisanship, prior issue opinions, and ideology) in the processing of (mis)information in several countries. In addition, we will analyze their role in updating from new information and the evolution of opinions.

Keywords: fake news, misinformation, cognitive ability, motivated reasoning, overconfidence, online survey experiment

JEL Classification:

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1 Introduction

The recent developments around the world have brought misinformation and fake news to the center stage of public discourse because they may influence public opinion, behavior, and governance in every important aspect of life.

Our project is a large-scale study investigating how the processing of (mis)information and the ability to discern correct and false news depends on cognitive and psychological factors. It is important to improve this understanding in order to promote resilience to misinformation because the wide reach of misinformation combined with declining trust in policy makers, experts, and institutions can have drastic economic and societal consequences.

Mass misinformation is not a new concept. However, the unprecedented pace of scientific progress and the rise of social media have transformed misinformation in the 21st century, earning it a new name, “fake news.” In particular, the internet and social media have transformed the dissemination of (mis)information by allowing individuals and third parties to spread their own news. Therefore, there is a nascent literature investigating misinformation and fake news (see, e.g., Berinsky, 2017; Allcott and Gentzkow, 2017; Lazer et al., 2018; and Vosoughi, Roy, and Aral, 2018).

Still, not enough is known about the mechanisms behind the processing of information and the ability to discern correct and fake news. These mechanisms are the building blocks of opinion formation and warrant a comprehensive analysis, which is the aim of our project. More precisely, our project investigates the role of cognitive ability, overconfidence, and motivated reasoning (due to partisanship, prior issue opinions, and ideology) in the processing of (fake) news. In addition, we will analyze their role in updating from new information and the evolution of opinions. To that aim, we combine theoretical modeling with a large-scale survey and experimental study. In our study, participants take a news quiz, which provides a measure of their ability to discern correct and false news. Guided by our theoretical model, we use survey and experimental data to understand (i) how an individual’s ability to discern correct and fake news relates to cognitive ability, motivated reasoning, and overconfidence; and (ii) how these factors affect updating from new information.

We conduct the study in three different countries: Austria, Germany, and UK. This will allow us to investigate the importance of the country context in our results. We will recruit subjects using Marketagent, which is a leading international online survey company. We will recruit 1100 subjects in each country that will be representative of the respective country population.

2 Study Design

Our study combines surveys, measures of cognitive ability and overconfidence, and an experiment. Below we explain the components of the study design in the same order as participants see them during the study.

2.1 Demographics

First, we ask subjects to complete a short questionnaire on demographics, which includes questions on gender, age, education, and place of birth. We ask demographic questions at the beginning of the study to set quotas to ensure a sample that is representative of the general population in Austria, Germany, and the UK.

2.2 News Quiz

The news quiz has 16 questions and is designed in a way that correct answers are based less on knowledge and more on thinking and reasoning. Each news item in the quiz has two answer options and participants are asked to choose the correct answer. The quiz is incentivized as every correct answer is rewarded with strictly positive probability. In particular, it is explained to participants that two items will be randomly selected to determine their payoff from the quiz. The quiz mainly covers global or Europe-specific news concerning important economic, social, and political issues (e.g., climate change, inequality, and immigration). News items are balanced within each topic; e.g., if there are two questions whose correct answers are consistent with pro-migrant attitudes, then there are two questions whose correct answers are consistent with anti-migrant attitudes. We also include two neutral news items in the quiz.

2.3 Confidence

After participants complete the news quiz, we elicit their beliefs about their own performance in the quiz to measure their (over)confidence. The performance measure in the news quiz is the total number of correct answers; i.e., the news quiz score. We elicit confidence in both relative and absolute terms: we ask subjects to guess their quiz score as well as their ranking among 100 typical participants in their respective country.

2.4 Experimental treatment: Updating from information

Our treatment focuses on the influence of cognitive and psychological factors on updating from “new information” and the evolution of opinions. Treatment is within-subject.

After participants report their beliefs about own performance, they take the same news quiz again. In particular, in each news item participants see their initial answer and a noisy but informative binary signal about the correct answer. The signal shows the correct answer with probability 0.75 and the wrong answer with probability 0.25, which participants know. After receiving the signal, they can change their initial answer. The experiment is incentivized as every correct answer is rewarded with strictly positive probability. In particular, one item will be randomly selected to determine their payoff from this part.

2.5 Measure of Cognitive Ability

Following the treatment, subjects take a short 12-item version of the Raven’s advanced progressive matrices test. This will provide us with a measure of cognitive ability.

2.6 Survey on issue opinions

In this part, we use tested items from established sources to elicit participants’ issue positions relevant to the items in the news quiz, as well as their ideology, trust in institutions such as the government, media, and scientists.

As outcome variables, we are interested in not only the overall performance of participants in the news quiz but also their performance in those news items whose correct answers are inconsistent with the prior issue opinions of participants, as measured by this survey on issue opinions. Put differently, one important outcome variable concerns “motivated errors” of participants, which we define as answers in the news quiz that are wrong but consistent with the prior issue opinions of participants, as measured by this survey. See Section 6 for the construction of the measure of the prior issue opinion.

2.7 Background

At the end of the study, we ask subjects some additional background questions on employment status, household income, voting choices, party sympathy, and media consumption.

3 Outcome Variables

Key outcomes of interest are:

- (i) news quiz performance (i.e., quiz score);
- (ii) news quiz performance in items whose correct answers are inconsistent with the

prior issue opinions (i.e., motivated errors, as defined in Section 2.6); and
(iii) updating from information signals that are inconsistent with the initial answers in the news quiz.

4 Hypotheses

We have three main hypotheses on outcome variables derived from our theoretical model.

Hypothesis 1 (Effect of cognitive ability on news quiz score) *The news quiz performance increases in cognitive ability.*

The next hypothesis concerns the “rate of motivated errors” of a participant, which we define as the share of wrong answers in news quiz items whose correct answers are inconsistent with the prior issue opinions of participants, as measured by the survey described in Section 2.6.

Hypothesis 2 (Effect of cognitive ability on motivated errors) *The rate of motivated errors in the news quiz decreases in cognitive ability.*

Hypothesis 3 (Effect of overconfidence on updating) *Overconfident individuals are less likely to update and change their answers after a signal that conflicts with their initial assessment.*

5 Analysis

Below we detail the main regressions we intend to run, however it is likely that additional analysis will be conducted in order to further test our theory and explore mechanisms.

5.1 Hypothesis 1

To address our first hypothesis, we study the relationship between the news quiz score and cognitive ability as measured by the Raven’s test. The main specification for this regresses each participant’s quiz score on the cognitive ability measure and control variables including standard demographic controls, such as gender and age. We will also report the results of this regression without any controls.

5.2 Hypothesis 2

To address our second hypothesis, we study the relationship between motivated errors and cognitive ability as measured by the Raven’s test. The main specification for this regresses the share of motivated errors on the cognitive ability measure and control variables including standard demographic controls, such as gender and age. We will also report the results of this regression without any controls.

5.3 Hypothesis 3

To address our third hypothesis, we study the relationship between overconfidence and updating. Overconfidence is a variable based on the difference between the participant’s elicited score and actual score. Updating is measured by the share of changed answers among those news items whose information signal is inconsistent with initial answers of participants.

The main specification regresses updating by each participant on overconfidence and control variables including standard demographic controls, such as gender and age. We will also report the results of this regression without any controls.

5.4 Additional Analyses

We will perform a number of exploratory analyses. In particular, we will examine heterogeneity in outcomes of interest by several variables, such as the country of citizenship, participant position on the left-right scale, and party identification. construction of v

6 Measuring Prior Issue Opinions

The construction of the prior issue opinion of each participant on a theme is based on self-reported measures, e.g., reporting (strong) agreement or (strong) disagreement with (or neutrality toward) certain statements in a specific theme included in our news quiz.

For each theme, we have several such self-reported measures, which we will aggregate to obtain a single value indicating the prior issue opinion of a participant in that theme. In particular, this measure will indicate the “direction” of the opinion, e.g., whether a participant is pro-migrant, anti-migrant or neutral in the theme of migration.

7 Observations to drop

We will drop the data of participants who are either very fast (indicating speeding through the questions without paying attention) and those who are very slow suggesting that they may have searched for the answers of the incentivized questions or they may have been distracted by other activities. Given that the survey company we work with provides high quality online panels, we expect the dropped data to amount to (at most) 4-7% of the total number of observations.