Center for Adaptive Rationality

A Systematic Meta-Analysis of Demographic and Psychological Factors Underlying Online Misinformation Veracity Judgments

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Introduction

There is growing public and scholarly concern regarding the belief in, and spread of, misinformation, especially as internet-based news dissemination and consumption increases[1]. Scholars broadly agree that misinformation poses a threat to democracy, although the exact ways it impacts the democratic process are still largely unknown[2,3]. Significant efforts are underway to uncover the factors that make individuals susceptible to misinformation, but the literature is currently fragmented and contradictory, and lacks a systematic summarization and aggregation of findings. Our objective is to address this gap, focusing on the impact of key demographic and psychological factors on judgments of misinformation veracity (i.e., their truthfulness).

We examined four demographic factors—age, gender, education, and political identity—and four psychological factors—analytical thinking[4], ideological congruency (partisan bias)[5], motivated reflection[6], and familiarity[7] (illusory truth effect).

We conducted a systematic meta-analysis using individual participant data (raw trial-level data). Our focus was on news headlines (Figure 1), the predominant method for studying susceptibility to misinformation.

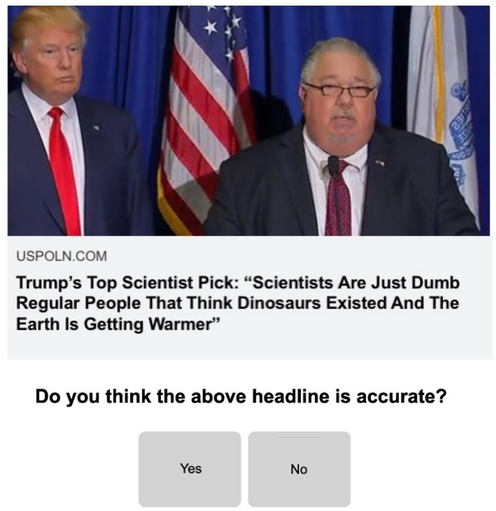

Figure 1. A typical setup in a news veracity judgment task. Participants are presented with a news item (here with an image, source, and headline) and have to judge its veracity.

Research Questions

1. How do **demographic factors** (i.e., age, gender, education, and political identity) influence participants' misinformation veracity judgments?

2. How do **psychological factors** (i.e., analytical thinking, ideological congruency, motivated reflection, and familiarity) influence participants' misinformation veracity judgments?

Methods

To collect relevant studies, we used two general databases (Web of Science and Scopus) and one subject-specific database (PsychInfo). The search string, inclusion criteria, and full preregistration are available on OSF (https://osf.io/yvbaz). The initial search yielded 3,038 unique articles, of which 1,196 remained after a title-only screening. Two coders independently screened the abstracts of these articles, resulting in 238 articles that underwent a comprehensive assessment for eligibility. A total of 24 articles met the inclusion criteria. Data from 19 articles (containing 28 studies; N = 10,250) are presented here.

For the analysis, we applied a Bayesian mixed-effects signal detection theory (SDT) model to the raw participants' choice data (N = 346,225 unique choices). This allows us to distinguish between people's ability to discriminate true news from false news (i.e., *d'*) and their tendency to classify news as true (i.e., response bias; Figure 2).

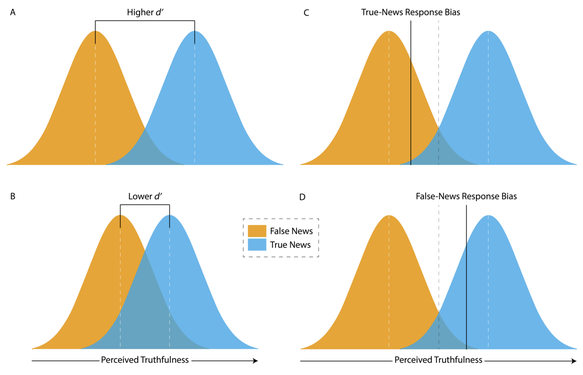

Figure 2. SDT discrimination ability (*d'*; panels A, B) and response bias (panels C, D). Participants with higher *d'* (panel A) are better able to distinguish between true and false news than those with lower *d'* (panel B). SDT also allows us to infer whether participants have a response bias toward treating news as "true" (panel C) or "false" (panel D). This can result in, for example, incorrectly treating false news as true (panel C) or true news as false (panel D).

Behavioral Results

Participants had a mean accuracy of 66.30% (Figure 3), reflected in *d'* being credibly higher than 0 (β = .73, 95% CI = [.68, .78]; Figure 4). They were also slightly better at judging the veracity of false news headlines (69.71%) than of true news headlines (68.58%), indicated by a false-news response bias (β = -.51 [-.59, -.44]). For *d'*, we found that older adults (β = .35 [.30, .40]), Democrats (compared to Republicans; β = -1.02 [-1.07, -.98]), people with higher analytical thinking skills (β = .87 [.80, .94]), and people familiar with the news headline (β = .20 [.13, .27]) tended to exhibit higher discrimination ability. Older age (β = -.49 [-.54, -.44]) and higher analytical thinking skills (β = -.20 [-.27, -.13]) were associated with a more pronounced false-news response bias, indicating a higher tendency to respond "false" as compared to true. Conversely, education (β = .21 [.13, .28]), congruency (β = .77 [.72, .81]), and familiarity (β = 2.00 = [1.97, 2.05]) were associated with a more pronounced true-news response bias (responding "true" more often).

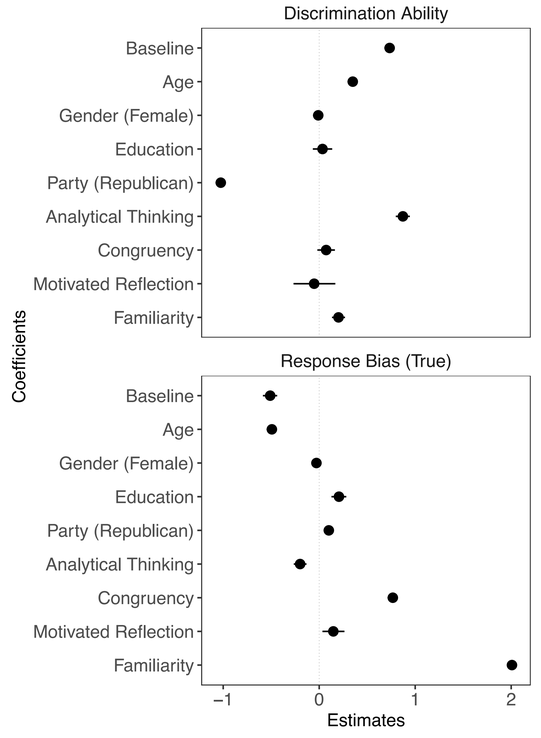

Figure 4. SDT results—*d'* (top panel) and response bias (bottom panel)—for demographic and psychological factors. Positive (negative) values for *d'* suggest higher (lower) discrimination; positive (negative) values for response bias suggest a true-news (false-news) response bias (tendency to reply "true" ["false"] more often than "false" ["true"]).

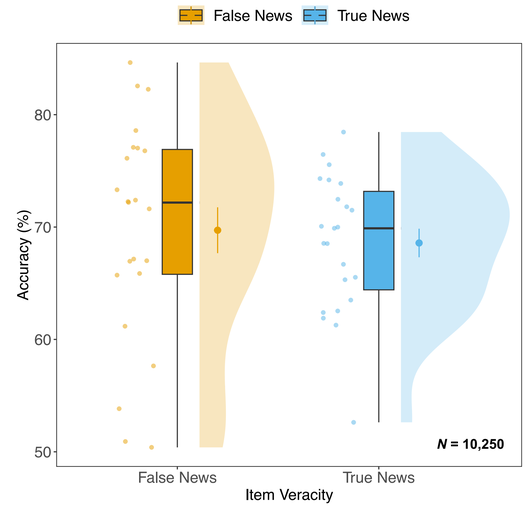

Figure 3. Accuracy (in percentages) for true and false news items. Small colored dots represent the mean accuracy across each study. Boxplots show the median value and IQR. Whiskers indicate an additional 1.5 IQR. Large colored dots represent the aggregate mean with standard errors. Density plots describe the distribution of the data.

Conclusion

This systematic meta-analysis provides valuable insight into the previously fragmented understanding of demographic factors. For instance, our finding of a higher *d'* among older adults confirms the existence of a paradox that requires further examination: Despite higher discernment, older adults share the most misinformation[9]. Our findings also bring clarity to psychological factors (e.g., analytical thinking and congruency) that have yielded conflicting results. Evidently, a confluence of factors are at play when judging the veracity of news, suggesting the need for a multifaceted approach to intervention building. Furthermore, the application of SDT, which distinguishes between *d'* and response bias, sheds light on the specific effects of demographic and psychological factors. This paves the way for targeted strategies to detect and combat the spread of misinformation.

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