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CHALLENGING THE ROLE OF ANALYTICAL THINKING IN FAKE NEWS DETECTION: EVIDENCE FROM GENDER-RELATED MYSIDE BIAS

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Abstract

This study examined the effect of myside bias on fake news identification and its moderating role in the association between analytical thinking and success in fake news identification using an experimental paradigm. A sample of 128 adults rated their belief in news items that differed both in veracity (true vs. fake) and in congruency (congruent- favoring their gender vs. incongruent- opposing their gender). They also responded to the Verbal Cognitive Reflection Test as a measure of analytical thinking. A mixed-design ANCOVA revealed statistically significant main effects of both- myside bias and analytical thinking, while the interaction between the two was not found to be significant. The present findings demonstrate that myside bias significantly affects belief judgments in fake news evaluation, independent of individual differences in analytical thinking. Additionally, vCRT scores significantly predicted mean belief ratings, but not signal detection sensitivity, as indexed by discriminability (d′). It implies that analytical thinking may influence decision thresholds or response bias, rather than the quality of evidence integration required for accurate discrimination. Overall, this study highlights the role of myside bias in the identification of fake news while challenging the assumption that analytical reasoning is directly correlated with improved fake news detection.

Keywords: *Fake news identification, myside bias, analytical reasoning, motivated reasoning.*

1. Introduction

Scholarly literature focused on identifying factors that can make an individual more susceptible to believing in fake news has rendered the analytical thinking ability to be one of the most influential factors in predicting success in fake news identification (for example, Pennycook & Rand, 2020; Gaillard, et al., 2021). When decision conditions favour more calculated, analytical modes of cognitive processing, they are more likely to result in higher success in fake news discernment (Bryanov & Vziatysheva, 2021). However, empirical evidence supporting the *motivated reasoning approach* suggests that having cognitive abilities such as analytical thinking skills is not enough for accurate truth discernment. Rather, motivational factors such as belief bias are central to the process of truth discernment. People with higher ability do not necessarily engage more in analytical thinking, rather they may simply be more successful when they do so (Evans, 2008). If motivational factors do not encourage them to engage analytical thinking, higher cognitive abilities can in fact assist them in explaining away inconvenient data (Kahan, 2017). Studies concerning this debate have shown a more profound effect of analytical thinking ability than motivational factors. However, they have heavily relied on *belief bias*, which is a type of bias that is remediable. It is sensitive to analytical thinking ability as it emerges from testable beliefs which are easily verifiable and can be updated by personal observations, expert opinions, and even sophisticated methods of science (Stanovich & Toplak, 2023). It would be interesting to see whether analytical reasoning ability will help individuals overcome more rigid biases. One such bias is *myside bias*, which emerges from distal beliefs that are difficult to verify directly through experience or even expert opinion. These beliefs are accompanied with high conviction and emotional commitment, making them more resistant to change. Thus, we suspect that although analytical thinking ability has been found to aid in overcoming belief bias in processing fake news, it will have little impact on myside bias in the context of fake news identification. We hypothesize that, firstly, participants will be more likely to believe the news that favours their gender identity (referred as *congruent),* regardless of its actual veracity and reject that does not favour their gender identity (referred as *incongruent),* regardless of its actual veracity. Secondly, analytical thinking ability will have little influence on the believability ratings in the presence of myside bias.

2. Method

Our target sample for the study was 128 young adults (mean age= 21.5 years; 83 females, 45 males). Participants were presented with the *Fake News Identification Task* containing 12 news items, of which six reported true incidents and six were fabricated. Among the true items, two described incidents favouring women (female-congruent), two favoured men (male-congruent), and two were unrelated to gender (neutral). The fabricated items were structured in the same manner. For each item, participants rated the perceived probability that the news was true on a scale ranging from 0% to 100%. The vCRT was used to measure analytical thinking skills (Sirota et al., 2021). This test comprises 10 items in the form of questions that elicit an obvious but wrong answer and a less obvious but incorrect answer.

3. Analysis

We employed a mixed-design analysis of covariance (ANCOVA), with myside bias (operationally defined in terms of congruency with two levels- congruent vs. incongruent) as the within-subjects factor and vCRT scores entered as a continuous between-subjects covariate. This allowed us to test for within-subject differences in believability ratings across conditions while accounting for individual variation in vCRT scores. We also conducted the analysis of discriminability (d′), a signal detection-based index that reflects the ability to separate signal from noise, in this case fake news from true news. This index was computed by calculating the difference between mean believability ratings on fake items and those on true items.

4. Results

4.1. Main effects and moderation analysis

A mixed-design analysis of covariance (ANCOVA) revealed a statistically significant main effect of congruency, $F(1, 126) = 7.20$, $p = .008$, $\omega^2 = .022$, indicating that participants' responses differed reliably between congruent and incongruent conditions after controlling for individual differences in verbal Cognitive Reflection Test (vCRT) scores. The magnitude of the effect was small but meaningful, with congruency accounting for approximately 2.2% of the variance in responses. The significant main effect of congruency reflects higher adjusted responses in the congruent condition ($M = 61.34$, $SE = 1.72$, 95% CI [57.93, 64.74]) relative to the incongruent condition ($M = 48.91$, $SE = 1.65$, 95% CI [45.64, 52.17]), as indicated by the estimated marginal means computed at the mean level of vCRT. Similarly, a statistically significant main effect of CRT was observed, $F(1, 126) = 5.198$, $p = 0.24$), indicating that believability ratings on fake news identification task varied as a function of participants' vCRT scores.

In contrast, the interaction between congruency and vCRT scores was not statistically significant, $F(1, 126) = 0.05$, $p = .824$, $\omega^2 \approx 0$ (Table 1), indicating that the effect of congruency did not vary as a function of participants' level of analytical thinking. Taken together, these findings suggest that congruency exerted a robust and uniform influence on performance across participants, independent of variation in analytical thinking ability, and that cognitive reflection did not moderate sensitivity to congruency in the present task.

4.2. Analysis of discriminability

Linear regression analyses were conducted to compare the relationship of analytical reasoning ability with believability ratings and that with discriminability index. First, vCRT scores significantly predicted mean belief ratings, $R^2 = .042$, $F(1, 126) = 5.48$, $p = .021$, indicating that higher levels of analytical thinking were associated with lower news believability ratings. In contrast, vCRT scores did not significantly predict signal detection sensitivity, as indexed by discriminability (d′), $R^2 = .003$, $F(1, 126) = 0.38$, $p = .537$. These findings indicate that individual differences in analytical thinking were not meaningfully associated with participants' ability to discriminate between true and false items at the level of signal detection sensitivity.

5. Discussion

The present findings demonstrate that both myside bias and analytical thinking independently influenced believability judgments in the fake news identification task. The mixed-design ANCOVA revealed a statistically significant main effect of myside bias, with higher adjusted belief ratings for items congruent with participants' gender identity. This finding is consistent with prior research on myside bias and motivated reasoning, which demonstrates that individuals tend to evaluate information more favourably when it aligns with their existing beliefs, values, or identity-relevant attitudes (Roozenbeek, et al., 2022).

Importantly, this effect remained significant after controlling for vCRT scores, suggesting that unlike belief bias, myside bias operates as a robust cognitive bias that is not reducible to individual differences in analytical reasoning alone.

Similarly, a significant main effect of vCRT was observed, indicating that believability ratings varied as a function of participants' analytical thinking ability. This finding suggests that analytical thinking does play a role in shaping belief judgments in the context of fake news, likely by influencing overall response tendencies. However, the presence of a vCRT main effect alongside a strong effect of myside bias suggests that analytical thinking operates independently of myside bias, rather than moderating it. That is, individuals higher in analytical thinking ability may adopt a generally more cautious evaluative stance, but this does not eliminate the advantage afforded to congruent information.

The non-significant interaction between congruency and vCRT indicates that participants with higher and lower levels of analytical thinking ability showed comparable differences between congruent and incongruent conditions. In other words, analytical thinking did not attenuate sensitivity to myside bias in the present task. This finding aligns with emerging evidence that analytical reasoning does not uniformly reduce motivated cognition, and in some cases may coexist with, or even facilitate, biased evaluation when information is belief-consistent (for example, Cavojova et al., 2024; Greene et al., 2021). From this perspective, analytical thinking may be selectively engaged to justify preferred conclusions, known as *rationalization*, rather than to impartially evaluate evidence. The absence of moderation therefore supports theoretical frameworks proposing that motivated and analytical processes are not mutually exclusive but can operate in parallel.

The discriminability analyses further clarify the role of analytical thinking in the process of fake news identification. While vCRT scores significantly predicted mean belief ratings, they did not predict discriminability (d′). This dissociation suggests that individuals higher in analytical thinking differed in their overall response tendencies—that is, how skeptical or believing they were on average—but not in their ability to distinguish true from false information. This pattern implies that analytical thinking may influence decision thresholds or response bias, rather than the quality of evidence integration required for accurate discrimination. Participants with higher vCRT scores may adopt a more cautious or skeptical evaluative stance, but this does not necessarily translate into improved sensitivity to veracity cues.

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