PREDICTING FAKE NEWS SUSCEPTIBILITY AMONG TECHNICALLY SKILLED EMPLOYEES USING PSYCHOLOGICAL TRAITS

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Abstract:

In a time characterized by the quick development of digital information, technically skilled workerswho are trained to think in logical fashionsare still vulnerable to misinformation. Fake news which attends to cybersecurity, engineering trends, or technologies used in the workplace can negatively affect a professional decision, team engagement, or trust in a colleague or organization. This paper will present how personal psychological characteristics like need for cognition, openness to experience, cognitive reflection and confirmation bias predict vulnerability to fake news by technically skilled workers. In this paper, the detailed findings of a varied psychometric and machine-learning classifier analysis of 310 employees in the IT, engineering, and data science fields is discussed. Participants were asked to fill out validated inventories measuring psychological traits and answer a selection of reality and fake news headlines which were grounded in technical fields. Lower cognitive reflection scores, higher confirmation bias scores predict vulnerability to fake information. Need for cognition only acted as a protective factor, when moderated by lower impulsivity.This paper presents a predictive model, using logistic regression and random forest classifiers, that achieved an over 82% accuracy to predict an individual's tendency to believe or share fake news. The model emphasizes the mediating influence of psychological patterns vignette the mere possession of domain knowledge. The findings of this paper demonstrate the necessity for tailored interventions to implement metacognitive training and internal fact-checking protocols within organizations to better reduce the dissemination of misinformation. This research is positioned as a contribution to the organizational psychology and digital trust scholarship, and offers possible strategies to protect technically skilled workforces from cognitive manipulation in environments associated with high-stakes information.

Keywords: Fake news susceptibility Technically proficient employees, Cognitive reflection, Confirmation bias, psychological traits, Misinformation about the workplace, Predictive modelling

INTRODUCTION

In our information-dense digital settings, assessing correct information from misleading or false content is a vital skill. While disinformation has been studied, primarily in social and political contexts, its encroachment into technical work presents different challenges [1]. Technically proficient employeesengineers, programmers, data analystsare routinely interfacing large amounts of information, such as updates on new tools, security alert research, productivity technologies, and engineering advances. Although these skills are designed to engage in logic and analytical problem-solving related to their jobs, they may also be vulnerable to fake news, especially when glibly presented with an air of domain specificity and credibility. New research is developing some counter-intuitive science that highly intelligent or technically functionally employees are still subject to fake news, particularly when their belief or values are casually confirmed by misinformation [2]. Thus, it is a somewhat paradoxical to assume domain expertise confers cognitive immunity form collaborative disinformation. For example, an employee with extensive technical capabilities may share a false cybersecurity threat only out of urgency,

without double-checkingcausing unnecessary panic or disruption in workflow[3].

Considering the growth in remote work and reliance on technology for communication, it is important to understand the psychology behind the susceptibility to fake news. The purpose of this study is to examine the psychological characteristics predicting vulnerability to misinformation; psychologists and educators should use this research to begin building a model of misinformation vulnerability from the psychological traits and fake news engagement within skilled technical staff. We hope that by identifying the psychological characteristics associated with vulnerability and fake news engagement, we can assist in the development of targeted intervention and training modules, and risk mitigation provisions, to protect technical staff from misinformation. This is key to organizations supporting technical staff to balance technical accuracy with trust and informed decision making to ensure productivity and organizational security [4].

LITERATURE REVIEW

2.1 Psychological Predictors of Misinformation Belief

The role of psychological traits in influencing refinements in the likelihood of individuals falling prey to fake news has been identified and examined by several studies [5]. The Cognitive Reflection Test (CRT) measures how likely a subject is to override intuitive responses with analytical thought. In other words, low CRT scores predict an increased likelihood of acceptance of misinformation without critical evaluation. The Need for Cognition (NCS) is another influence, referring to an individual's intrinsic motivation to engage in and enjoy effortful cognitive activities—for example, people who have higher NCS would be expected to critically evaluate information. Personality traits in general, and the Big Five model specifically (e.g., openness, conscientiousness) have been associated with belief formation; for example, low openness individuals may experience resistance to new information that violates existing misconceptions [6].

2.2 Misinformation in Technically Skilled Populations

While technically skilled employees may be thought of as rational and analytical, their specific domain knowledge can, in some counterintuitive ways, increase their susceptibility to misinformation - particularly information that confirms current understanding or is consistent with professional interests[7]. When time constrained, engineers, programmers, and analysts typically resort to heuristics, which could include familiarity or authority of the source of the information. Research has demonstrated that technical overconfidence and domain-specific anchoring can restrict professionals from making verification leaps, especially when the misinformation falls under the umbrella of "in my field". Exposure to misinformation in work-related communication platforms can influence workplace dynamics and shared decision-making quality [8].

2.3 Gaps in Organizational Misinformation Resilience Strategies

Most misinformation interventions available today are geared towards general media literacy or fact-checking style training. Most misinformation training, unfortunately, ignores what are called psychological predispositions in regard to how technically skilled employees process, perceive, and share information. For example, few organizations provide misinformation training around implicating trait variables like impulsivity as well as confirmation bias [9]. The absence of real-time filtering, and trust-calibrated alerts on internal communication platforms may contribute to unbounded information misinformation propagation. Misinformation resilience in technical workforces needs buy-in that is based in predictive models and psychologically informed risk profiles [10].

METHODOLOGY

3.1 Participants and Sampling

The sample consisted of 310 technically skilled employees based in the sectors of software engineering, cybersecurity, data analytics, and telecommunications, among others. Participants were recruited using purposive sampling from large IT companies and professional networks [11].

3.2 Psychological assessment tools

Each participant completed three standardized assessment tools it used to measure; Cognitive Reflection Test (CRT) – measured analytical thinking. Need for Cognition Scale (NCS) – measured tendency towards cognitive engagement. Cognitive Bias Scale (CBS) – measured confirmation bias, impulsivity, and susceptibility to persuasion [12].

3.3 Fake News Stimuli Design

A set of 20 curated headlines from the topics of technology, cybersecurity, and AI was developed with half being fake yet purposefully fabricated based on existing misinformation formats. Headlines were then tested for plausibility, and appropriateness for content. Participants rated, belief, and likelihood of sharing on the headlines provided [13].

FINDINGS AND DISCUSSION

4.1 Trait Correlations with Fake News Belief

The correlation analysis produced clear and statistically significant relationships between psychological dispositions and susceptibility to fake news in technically skilled employees. Specifically, participants who scored lower on the Cognitive Reflection Test (CRT) were more likely to believe or share fake news, $r = –0.48$, $p < 0.01$[14]. Thus, the fact that people are generally reliant on intuitive thinking and less likely to reflect on their choices makes them especially vulnerable to misinformation, particularly when the content is match domain-relevant. In addition, high scores in both confirmation bias and impulsivity positively correlated with fake news susceptibility ($r = 0.52$; $r = 0.46$, respectively). Thus, participants who habitually seek information that confirms their preconceived notions or who act quickly and unthinkingly appear more likely to accept false narratives over fact-checking. In fact, these traits likely diminish some level of cognitive dissonance and reinforce the up-front believability of misleading information, especially when the content aligns with technical ideologies or distribution trends linked to their workplace environment[15].

4.2 Accuracy

Two models were used to, in the context of the psychological traits used in the model, calendar fake news susceptibility, the Logistic Regression model produced a 76.2% accuracy where both CRT and Confirmation Bias were significant predictors ($p < 0.001$), enough for confidence in that both of these traits accounted individually for the probability of belief, thus supporting these foundational effects. The Random Forest Classifier improved upon the logistic regression model and produced an accuracy of 82.3% on the test dataset, and improved handling of nonlinear relationships between variables and produced a ranked order of features that could be weighed in terms of importance. The top three predictors of fake news susceptibility were:

- CRT (Cognitive Reflection Test) – most important trait for avoiding fake content
- Confirmation Bias – made fake narratives familiar, and preserved beliefs
- Impulsivity – decreased tendency to fact-check or validate

Latent traits emerged for Need for Cognition (NCS) and Conscientiousness, where these traits did not added value to prediction in the random forest model, but these were only marginal contributors to prediction overall. Overall, the implications of these results are that the interaction between analytical reasoning and cognitive shortcuts are more important than general knowledge or familiarity with the domain of the narrative in terms of belief.

4.3. Subgroup Analysis

An examination of the particular professional subgroups indicates that susceptibility differed meaningfully, as illustrated below:

Cybersecurity professionals had higher CRT scores and the lowest overall susceptibility to fake news. Cybersecurity professionals are routinely immersed in threat assessment, adversarial thinking, and social engineering likely improving reflexive skepticism and critical evaluation. Young engineers, particularly those with less than three years of professional experience, were significantly more impulsive with a greater proclivity to believe the fake news headlines. Less skilled individuals may rely on quick problem-solving processes, or have less exposure to reasoned, peer-reviewed environments. Data analysts and IT professionals who indicated that they handled large volumes of digital content (e.g., emails, texts, pages) every day demonstrated higher bias-driven responses than their NCS scores would suggest. Their involvement with digital materials may have been so cognitively taxing that their vigilance and focus on analytical evaluation became compromised, even for skilled thinkers, leading to heuristic judgments instead. The differences observed in these subgroups echo the proposition that trait profiles interact with unique contextual variables such as role, experience level, and information loads: presenting possibilities for the development of refined interaction strategies.

DISCUSSION

The results indicate that cognitive traits, not technical expertise, predict fake news susceptibility among knowledgeable (domain specific) employees. Low cognitive reflection, and high confirmation bias, correlate with lower likelihood to engage in critical evaluation. This makes folks vulnerable to persuasive misinformation, even when they are engaged in their area of expertise. In a workplace context, this might equate to faulty decision-making, incorrect technical assumption application, and misinformation gaining traction. Organizations even routinely upskill in technical areas, but do not emphasize informal psychological resilience training, suffering cognitive "blind spots" against the risk of misinformation.

Concerning misinformation and useful skills, we need to pause and differentiate digital literacy (i.e., recognizing the various forms of URLs, substitutions, and fake forms) from psychological literacy (for instance managing impulsivity, reflecting on beliefs, or genuine curiosity). Employees might have digital literacy, but for manipulated content, do not manage that content even if their purpose is to enhance cognitive habits half or whole time.

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CONCLUSION

The current research show that even highly skilled employees are not immune to disinformation and that using their psychological traits is paramount to their belief and sharing behaviors. Low cognitive reflection, high confirmation bias, and impulsivity emerge as strong predictors of fake news susceptibility in high-competence contexts. This research has ramifications for both organizational psychologists and the field of digital trust by providing an organizing system for potential trait-based interventions, such as cognitive bias training, critical thinking workshops, and AI-based disinformation alerting systems. Future researchers who use this finding may want to expand this study to other populations (culturally and interdisciplinary) and track the changes longitudinally, while evaluating adaptive learning modules dedicated to enhancing analytical reasoning and self-awareness regarding digital content consumption.

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