# Chapter 11
# Combating Misinformation in the Open Access Era

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## ABSTRACT

*Since the early 21st century, the scholarly community has struggled with the rising cost of scientific publications and issues related to the accessibility and dissemination of scientific work and research results to the wider community. Maintaining a high quality of scientific publications and lowering the cost led to the emergence of the open access (OA) movement. OA has appeared as an essential resource to make scholarly publications available to a broader audience in the last two decades, aiming to improve access to scientific knowledge. However, the onset of the internet and social media has given rise to a tide of misinformation, resulting in diminishing trust in science. This chapter discusses the importance of OA as a trusted source in combating misinformation and adopting strategies for sustaining the OA business models. Additionally, this chapter draws on the social psychology literature and the "inoculation theory" to reason why OA as a credible source of information can protect us against misinformation.*

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## THE AIM OF THE CHAPTER

*Man is a historical animal with a deep sense of his own past, and if he cannot integrate the past by a history explicit and true, he will integrate it by a history implicit and false.(Geoffrey Barraclough,1956).*

This book chapter explains the role open access (OA) can play in combating *misinformation*. Misinformation refers to false information created accidentally or designed deliberately to be false and poses inevitable cognition and social interaction challenges due to its misleading nature (DePaulo et al., 1996; Scheufele & Krausea, 2018). A recent Reuters survey shows that concerns regarding misinformation are growing, ranging from politics to science (Newman et al., 2019; Scheufele & Krause, 2019). Therefore, as a research topic, misinformation has recently attracted considerable attention. Recent studies highlight the role of misinformation in shaping resistant-to-change misconceptions and conspiracy theories and giving rise to numerous environmental, societal, and global problems (e.g., Cook et al., 2017; 2018, Hopf et al., 2019; Iammarino & O'Rourke, 2018). For example, misconceptions regarding vaccines, also known as the anti-vaccine movement, have prolonged the COVID-19 pandemic, increased mortality and morbidity, and exacerbated health inequalities and disparities, such as increasing rates of mental health issues in the poorer and marginalized communities (Ransing et al., 2021). In addition, Silverman (2016) reports that fake news outperformed real news on Facebook, favoring a candidate during the last three months preceding the 2016 United States election. Conspiracy thinking has also caused the politicization of climate science and consequently the increasing polarization of the public concerning critical environmental issues, such as global warming. These examples indicate that misinformation can damage our critical thinking abilities, thus incurring tremendous unnecessary costs on individuals and society and threatening democracy (Cook et al., 2017; Lewandowsky et al., 2013a; Lewandowsky et al., 2013b; Oreskes, 2014).

As humans, we intuitively use our heuristics, which are mental rules of thumb, when evaluating information (Cook et al., 2017; Richter et al., 2009). This intuitive thinking, operated by "system 1," is effortless and fast with no sense of voluntary control. However, we use "system 2" for critical thinking, which is slow, more effortful, and analytical and is responsible for generating thoughts and new beliefs and making deliberate decisions and choices (Kahneman, 2011, p. 21; Norman, 2021, p. 33; Scheufele & Krause, 2019). The system-2 thinking, activated by conscious mental exertion, would enable us to judge the validity and accuracy of the information we acquire, including considering short-term benefits and long-term cost and impact of our decisions on other individuals. Recent studies suggest that more exposure to objective information increases open-mindedness and activates analytical thinking, leading to more clarity and better decision-making (Bronstein et al., 2019; Lazer et al., 2018). In other words, exposure to scientific information allows individuals to recognize their mental ability to become critical thinkers and lifelong learners and eventually re-examine their dysfunctional beliefs. As critical thinkers, we can better judge the differences between assumptions and facts by evaluating methods and instruments to arrive at the truth. Furthermore, critical thinking minimizes the risk of confirmation biases, which is unconsciously favoring information that aligns with our belief system. By contrast, exposure to counterfactual information weakens our analytical thinking. A lack of critical thinking is linked to inaccurate beliefs, delusionality, dogmatism, and religious fundamentalism (Bronstein et al., 2019; Pennycook et al., 2012).

Exposure to "scientific consensus" is known as "prebunking." Prebunking seeks to help people recognize and resist subsequently encountered misinformation (Van der Linden et al., 2017). Several experimental