# The spread and impact of fake news on social media: A systematic literature review and future research agenda

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# The spread and impact of fake news on social media: A systematic literature review and future research agenda

**Abstract**
In this post-truth era, fake news on social media has emerged as a societal problem, where objective facts have increasingly become less influential. Although there is a recent spike in fake news research, it has progressed without a proper agenda or a theoretical framework and has been fragmented. This systematic literature review (SLR) aims to organize the fragmented literature on fake news, focusing on the psychosocial antecedents of its spread on social media and the impact due to such spread. Accordingly, we systematically analyzed fifty-six empirical studies using standard protocols to delineate the current research profile and future research areas. The research themes emerging from the SLR are (i) the need for a theoretical and methodological grounding for understanding the fake news problem on social media, (ii) the person, behavior, and environmental factors for the fake news spread on social media, and (iii) social, economic, and psychological impacts due to fake news on social media. This study also argues for expanding the current research horizon by relying on new research methods and focusing on under-investigated psychosocial factors. The study may help policymakers plan and execute human-centric policy measures for combating fake news on social media by focusing on an individual's psychosocial factors.
**Keywords:** Fake news; Disinformation; Spread; Impact; Social media, Systematic review

## Introduction

The proliferation of fake news as a vitiating element in the social media environment has become a significant concern in society. The easy access to new media and social media technologies has left the ground open for all. No rules bind them, except for some technologically driven solutions that have proved too inadequate to check the surge of fake news on social media, resulting in dangerous consequences. For instance, a claim that there is a spiritual reason behind the spread of the Corona Virus was wrongly attributed to Bill Gates and was widely shared on social media platforms, such as Facebook and WhatsApp (BBC, 2020). Again, the spread of fake news on social media is the key reason for vaccine hesitancy (reluctance or refusal to vaccinate despite vaccines' availability), which has become a significant threat to global health (WHO, 2019). Fake news, defined as "fabricated information that mimics news media content in form but not in organizational process or intent" (Lazer et al., 2018, p. 1094), on social media has emerged as an unseen but omnipresent menace affecting our lives (Ireton & Posetti, 2018).

Despite the recent surge in research on ways to curb fake news, there is no apparent reduction in its spread through social media platforms. In India, for instance, there was almost a 20-50% increase in fake news in 2019 compared to the previous year (Chaturvedi, 2019). Similarly, there is a global increase in the circulation of fake news (Lee, 2019). Such an increase points to the deficiencies in the existing approach to combating fake news, which majorly focuses on providing technical solutions (techno-centric approach) based on software algorithms by overlooking the non-technical elements (human-centric approach), such as psychosocial aspects. While the techno-centric approach is one of the many ways to check fake news, measures relying majorly on the approach may not be effective because fake news creators use new technologies to bypass such technological interventions (e.g., social bots) (Stieglitz et al., 2017). Therefore, putting the individual, in addition to technology, at the center of combating fake news is crucial. Corroborating this view, Vosoughi et al. (2018) have also stressed individuals' roles and behaviors in fake news spread on social media. However, the current understanding of human factors is

scattered, and there is a need for structuring, organizing, and consolidating the present literature around these factors to have a holistic understanding of the spread of fake news on social media.

Further, while there is a consensus that fake news on social media is dangerous, there is still only a limited understanding of its impact, which demands more inquiries (Bovet & Makse, 2019). With social media emerging as a hyperconnected social networking platform, the chances of fake news entering and detrimentally influencing our lives are higher than before. For instance, when societal violence like the Capitol riots (Dastagir, 2021) is reported, the role of fake news spread through social media in fuelling it has become apparent. In the light of such catastrophic consequences, understanding the reasons for the spread of fake news is not sufficient and identifying the areas that are impacted by fake news becomes essential. Such an accurate understanding of the various impacts of fake news will help frame policies to minimize the damage. To this end, this research aims to identify the psychosocial antecedents of fake news spread on social media and the impact due to such spread from the prior literature and suggest the future research direction. Accordingly, our study is driven by three research questions (RQ):

*RQ1: What is the current status and profile of research on fake news spread on social media and its impact?*

*RQ2: What are the focal themes on psychosocial antecedents of fake news spread on social media and its impact that have been discussed in the prior literature?*

*RQ3: What are the gaps in the prior fake news research, and what are the future research avenues?*

In this work, to answer the above RQs, we collect and review material on fake news that has been published so far by undertaking a systematic literature review (SLR). We explain the psychosocial causes of fake news on social media and the impact of its spread based on our examination of the literature. We summarize the available research and suggest a framework for future studies on the spread and impact of fake news on social media. Our theoretical framework outlines the causes, effects, and interrelationships of the spread of fake news on social media. We have also highlighted several open research issues that can help us better understand how fake news spreads on social media and the effects of this spread.

To the best of our knowledge, only a few attempts to synthesize fake news knowledge are present (e.g., Tandoc et al., 2018; Wang et al., 2019). However, previous reviews have been very narrow in scope and paid less attention to psychosocial reasons for spreading fake news and its impacts. To elaborate, while the study by Tandoc et al. (2018) focused on creating a typology of fake news, the study by Wang et al. (2019) was more specific in providing an overview of research related to health misinformation. The review by Zhou and Zafarani (2020) aimed to classify literature on fake news detection methods to design better detection systems. Another review by Di Domenico et al. (2021) focused on the implications of fake news on marketing and consumers. Further, a review by Tsfati et al. (2020) focused on the causes and consequences of fake news dissemination by mainstream media instead of social media, which is the focus of our study. Lastly, while an SLR by review by Abu Arqoub et al. (2020) described studies related to fake news in all types of media (i.e., not limited to social media alone), it fell short of providing specific theme-related future research agenda. While we acknowledge the valuable contributions of these studies, none of these reviews focused on psychosocial antecedents of fake news on social media, which, we believe, is vital for a human-centric approach in combating fake news spread. Further, these reviews did not focus much on the impact of fake news at the societal level. In contrast, our study overcomes these shortcomings and adds crucial insights to the prior research by (1) linking the fake news spread on social media to its psychosocial antecedents, and (2) identifying three areas of fake news' impact— psychological, social, and economical. Thus, this study is different from the earlier reviews in terms of its focus (human-centric approach) and scope (psychosocial antecedents and impacts). In particular, this study makes the following key contributions. First, it presents an organized and thorough view of the literature with a discussion of the state-of-the-art research profile, thematic classifications, and limitations. Second, this study offers future research agendas for each research theme. And third, this study provides a theoretical framework, which, we believe, will be instrumental in guiding researchers and practitioners

in advancing our understanding of fake news. We believe that our SLR is well-timed due to the reports that fake news on social media has increased during the COVID-19 lockdown (UN, 2020).

## Background literature

### Definition

Although the phenomenon of fake news has recently gained research scholars' attention, the literature is already replete with competing definitions of it. While Allcott and Gentzkow (2017) define fake news as "news articles that are intentionally and verifiably false and could mislead readers" (p. 213), Johnson and Kelling (2018) define it as "content that is deliberately false and published on websites that mimic traditional news websites." (p. 819). What is clear from these definitions is that intentional or deliberate deception is an integral characteristic of fake news (Rini, 2017). Such deliberate deception is achieved by making fake news mimic the look and feel of real news, thus making it hide "under a veneer of legitimacy." (Tandoc et al., 2018, p. 147). Further, the intended target of fake news is a larger audience rather than the immediate recipient of it and is meant to be "shared and shared again." (Rini, 2017, p. 44)

Considering the two characteristics of fake news, i.e., intention and reach, a comprehensive definition of fake news is given by Reni (2017), who defined it as the "one that purports to describe events in the real world, typically by mimicking the conventions of traditional media reportage, yet is known by its creators to be significantly false, and is transmitted with the two goals of being widely re-transmitted and of deceiving at least some of its audience." (p. 45) Further, it is worthy to note that fake news comes under the broad category of information disorder, which are of three types: disinformation, malinformation, and misinformation (Wardle & Derakhshan, 2018). While disinformation is "intentionally false or inaccurate information that is spread deliberately" (Born & Edgington, 2017, p. 4), malinformation is "information, that is based on reality, but used to inflict harm on a person, organisation or country" (Wardle & Derakhshan, 2018, p. 44), and misinformation is false information but differs from disinformation in that it is not deliberate (Born & Edgington, 2017, p. 4). As intention is a necessary characteristic of fake news, it falls under the category of disinformation.

### Fake news, traditional media, and social media

Fake news is hardly a new phenomenon, and human history is replete with numerous instances that go hand in hand with the evolution of media. Examples of this menace can be found right from the times of the early Roman Empire (Posetti & Matthews, 2018) to the times of one-to-many communication channels such as radio and television (Gorbach, 2018). While fake news has entered traditional media, such as television outlets, generally, these organizations follow stringent journalistic standards, which act as a first-level filter before the fake contents reach the public (Tandoc et al., 2018). However, the emergence of the Internet and the advent of social media have exacerbated the fake news spread. Social media have become a fertile ground for fake news to be transmitted faster and to a broader audience by facilitating many-to-many communication rather than one-to-many as in traditional media. The issue has become more critical as evidence suggests that the number of individuals who rely on social media as the primary source for news is very high. For instance, with nearly 2.5 billion users (Statista, 2020), Facebook has become the primary news source for many (Gottfried & Shearer 2016), increasing the risk of spreading fake news. With massive information circulating on social media, it becomes challenging for users to separate truth from fiction (Moravec et al., 2018). The profuse of online news (Karlsson, 2011) and the hedonic nature of social media usage have accelerated peoples' gullibility to fake news (Peterson, 2019). In this post-truth era, where individuals consume information based on emotions rather than facts, social media has emerged as the foremost purveyor and hotbed of fake news with grave societal consequences. To effectively tackle this problem, there is an urgent need to take stock of the existing research in the area and pave a clear path for future researchers.

## Methodology

In this study, we adopted a formal SLR procedure suggested by Rowe (2014) for finding the relevant articles to take stock of the current research, unearth research gaps, and offer future directions. The primary purpose of following these procedures was to ensure objectivity and reproducibility in the SLR process. The current SLR aims to curate empirical studies on psychosocial reasons for fake news spread on social media and its impact.

### Review boundaries

This review focuses on the psychosocial causes of fake news spread on social media and the overall impact due to such spread. We are particularly interested in the empirical studies on fake news on social media. Therefore, we have deliberately excluded articles that discussed fake news but were not in the social media context. Also, we did not include studies that focused on fake news detection, and that was technical. Further, only articles that were in peer-reviewed journals were included.

### Literature search process

We adopted the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) framework for searching and shortlisting the relevant literature (Liberati et al., 2009). The SLR process started with the identification of appropriate search terms and databases. After removing duplicate and irrelevant articles from this search, we performed a backward-forward search on all the relevant articles. Whenever there was no clarity regarding article selection and categorizations, the research team reached a consensus after a thorough discussion. By reading the title and abstract of the articles, we removed many purely technical articles (e.g., Zhao & Sui, 2017) and if they were not related to psychosocial antecedents or impact. After this process, the remaining articles were read in full, and some were removed by iteratively applying the reviewer boundaries and quality checks (Table 1). Backward and forward citations were conducted for the remaining studies (Webster & Watson, 2002) and additional articles relevant to our study. Figure 1 depicts the PRISMA procedure that we followed to shortlist the articles.

**Table 1.** Criteria for quality check of articles

| S.No. | Criteria | Score |
|-------|----------|-------|
| QE1 | Explicit and adequate discussion of data analysis | "quantitative": (+2); "qualitative": (+1.5); "no evidence": (+0) |
| QE2 | Appropriate explanation of the relevance (contributions) of the study outcomes and challenges | "yes": (+2); "partially": (+1.5); "no": (+0) |
| QE3 | Outcomes aligned with the utilized methodology and topic of interest? | "yes": (+2); "partially": (+1.5); "no": (+0) |
| QE4 | Peer-recognition and source reliability (expressed as sum of citations and H Index) | "sum >= 100": (+2); "sum >= 50 and < 100": (+1.5); "sum >= 1 and < 50": (+1); "sum = 0": (+0) |
| QE5 | The method(s) commonly used in past studies? | "yes": (+1); "no": (+0) |

### Literature analysis process

Adopting the guidelines by Webster and Watson (2002), first, the articles were analyzed author-centric approach, where each paper was coded based on pre-defined units of analysis. Accordingly, based on these codes, a matrix of the analyzed studies was constructed (see Appendix A). Subsequently, using concept-centric analysis, we organized the studies based on themes from them.
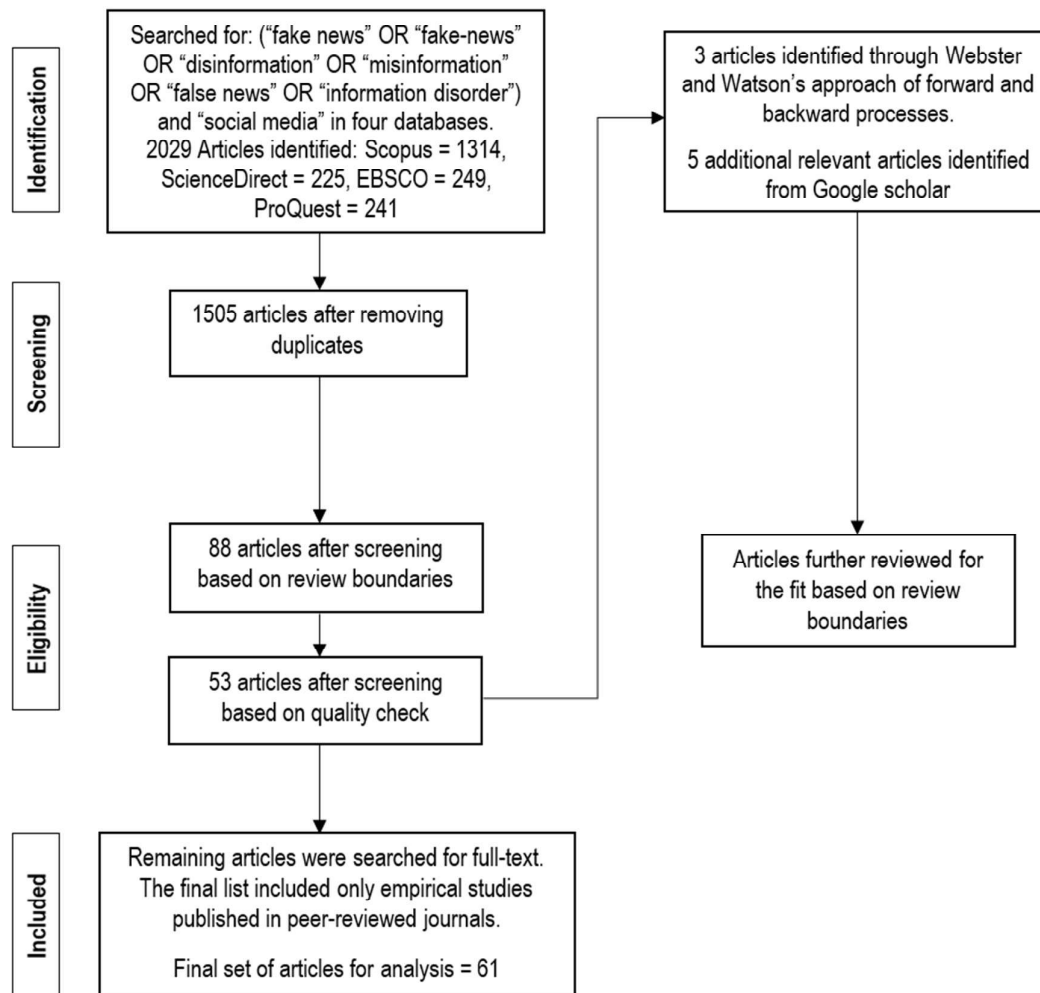
**Figure 1.** SLR process and protocols

**Findings of the review: Focal themes of prior research**

The 61 studies in our sample are analyzed and synthesized to understand the domain, geographical, theoretical, and methodological profiles of the studies. To end this, we created a concept matrix (Webster & Watson, 2002) and conducted iterative discussions between the researchers. Accordingly, many themes emerged which represent the research in this area. Further, to categorize the psychosocial factors of fake news spread on social media and its impact, we used the research framework shown in Figure 2. As psychosocial factors can include a variety of internal and external factors that can influence an individual's behavior, we first categorized the factors for fake news spread as internal or external based on whether these factors are internal to the individual or external. Further, the internal factors were categorized into psychological, behavioral, and biological because the internal drivers could be due to psychological processes, past behavioral patterns, and biological reasons. Categorization was done iteratively, and sub-categories were allowed to emerge throughout the analysis. For instance, psychological factors were further subdivided into attitudinal, cognitive, and affective, whereas environmental factors were further subdivided into socio-cultural, policy-related, and physical.
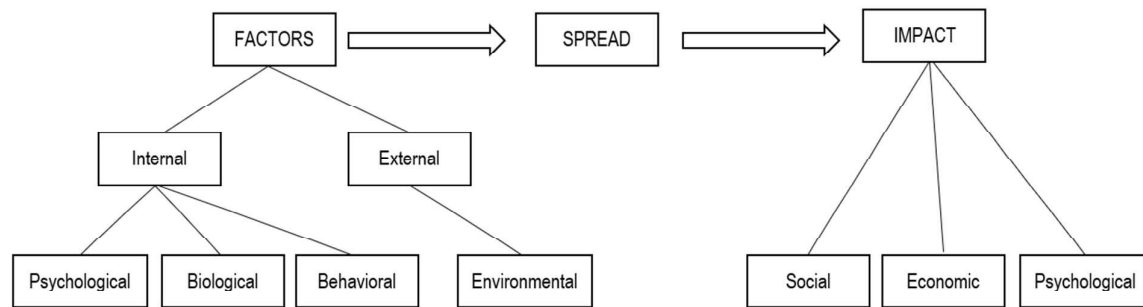
**Figure 2.** Research framework

**Domain profile**

The publication trend from our analysis indicates high scholarly attention (e.g., Apuke & Omar, 2021; Jang & Kim, 2018) being given to the political domain (21.31%) and health (26.22%). A few studies (e.g., Brigida & Pratt, 2017) were also conducted in other domains, such as business and finance, albeit less.

**Geographical profile**

As per our analysis, most of the studies (34.43%) were in the US context. Further, nearly 23% of the studies (Barfar, 2019; Brigida & Pratt, 2017; Vargo et al., 2018) did not mention the country where the study was conducted. It is worthy to note that the spectrum of countries analyzed in the studies has broadened in recent years. For instance, there were more studies in the context of other developed countries, such as Italy (Carrieri et al., 2019), the UK (Chadwick et al. (2018), and Denmark (Hansen & Schmidtblaicher, 2019). Further, recently, some studies happened in the context of developing countries, such as Bangladesh (Islam et al., 2020), India (e.g., Talwar et al., 2020), Indonesia (e.g., Rustan, 2020), and Nigeria (e.g., Apuke & Omar, 2020a), among others. This high imbalance of studies favoring developed countries may indicate that the current understanding of the phenomenon has not accounted for the cultural variations among countries.

**Theoretical profile**

The extant literature on the fake news spread and its impact has been chiefly atheoretical, with a few studies employing theoretical frameworks (45.90%) to understand the phenomenon. For instance, related to the spread of fake news, Barfar (2019) used dual-process theory to understand how cognitive and affective responses to political news to fake news vs. real news. Further, Islam et al. (2020) used cognitive load theory to understand the role of social media fatigue in influencing fake news spread. Related to impact, Arayankalam and Krishnan (2021) used the agenda-building theory to establish how enemy countries leverage fake news as a tool to fractionalize online media and foam social media-induced violence in a country. Other theories employed are the uses and gratification theory (Apuke & Omar, 2020a), persuasion knowledge model (Chen & Cheng, 2019), elaboration likelihood model (Chen et al., 2021), and protection-motivation theory (Laato et al., 2020).

**Methodological profile**

Concerning research design, our analysis showed that more than 85% of studies under review employed a quantitative methodology. In comparison, only 6% of studies employed a qualitative methodology, and 1.7% of articles used a mixed-method approach (see Appendix A). Regarding methodology, a few studies (e.g., Kim & Dennis, 2019; Pennycook et al., 2018) have used experimental design (see Table 2) as a form of investigation (26.22%), which may help in establishing the causal effect. However, most studies have employed a survey design (45.90%), which has an inherent limitation in establishing causality between the variables (Pierce & Haugh, 1977). Other data methods were focus interviews, case studies, Delphi, and netnography. It is worthy to note that survey data and test scores from experiments formed the large categories for the data types. Some less employed data types are photos and user comments from social media.

**Table 2.** Data gathering methods used in reviewed studies (N = 61)

| Data gathering method | Frequency | Data type used | Frequency |
|---|---|---|---|
| Survey | 28* | Survey data | 28 |
| Experiment | 16 | Test scores | 16 |
| Secondary data | 7 | Log data | 6 |
| Focus group interviews | 2 | News content from websites | 2 |
| Data from social media platforms | 3 | Focus group data | 2 |
| Case study | 1 | Delphi method data | 1 |
| Data from websites | 2 | Observation data | 1 |
| Delphi | 1 | Photos | 1 |
| Netnography | 1 | User comments from Facebook, Twitter | 2 |
| | | Textual data | 1 |
| | | EEG | 1 |
| | | Case data | 1 |
| *One study used both the survey and experiment. | | | |

### Antecedents of fake news spread

### Internal factors for the spread of fake news

As mentioned above, internal factors include the antecedents that originate within the individual. For instance, these factors may be due to the individuals' subjective perceptions originating from their thinking and emotions. Or it may be due to the experiences, habits, and learning from past behaviors. Or it may be due to inherent genetic and dispositional factors they cannot control. Based on this reasoning, we categorized these factors into psychological, behavioral, and biological.

#### *Psychological factors*

Psychological factors are defined as variables related to feelings (affective), thoughts (cognitive), and attitudes of an individual (Matcham et al., 2015). As shown in Table 3, we classified the psychological factors identified in the studies using the categories mentioned above.

**Table 3.** Psychological factors for the spread of fake news

| Factors | Studies |
|---|---|
| **Attitudinal** | |
| Political orientation | Faragó et al. (2019) |
| Perceived information quality | Koohikamali and Sidorova (2017) |
| Truthfulness and plausibility for news events | Polage (2012) |
| Trustworthiness of source | Koohikamali and Sidorova (2017); Buchanan and Benson (2019) |
| Trust on the sender | Duffy et al. (2019) |
| Trust in the government and media | Humprecht (2019); Pickles et al. (2021) |
| Trust in online information | Laato et al. (2020);Talwar et al. (2019) |
| Trust in the message | Di Domenico et al. (2021) |
| Altruism | Apuke and Omar (2020a, 2021) |
| Perceived herd | Apuke and Omar (2020b) |

| Factors | Studies |
|---|---|
| Perceived severity | Laato et al. (2020) |
| Perceived susceptibility | Laato et al. (2020) |
| Perceived control | Zheng et al. (2022) |
| Partisanship | Neyazi and Muhtadi (2021) |
| Trust in scientific institutions | Pickles et al. (2021) |
| Attitudes toward news verification | Pundir et al. (2021) |
| Discussion heterogeneity preference | Su (2021) |
| **Cognitive** | |
| False memories | Polage (2012) |
| Conspiracist mentality | Faragó et al. (2019) |
| Third person effect | Mena (2019); Lee et al. (2022) |
| Motivation to entertain/troll | Chadwick et al. (2018) |
| Risk-taking propensity | Duffy et al. (2019); Koohikamali and Sidorova (2017); Buchanan and Benson (2019) |
| Confirmation bias | Duffy et al. (2019); Kim et al. (2019); Moravec et al. (2019) |
| Overclaiming level of knowledge | Pennycook and Rand (2019) |
| Analytical thinking | Pennycook and Rand (2019) |
| Prior exposure | Pennycook et al. (2018); Wasserman and Madrid-Morales (2019); Buchanan (2020) |
| Information seeking | Apuke and Omar (2020b, 2021) |
| SNS dependency | Apuke and Omar (2020b) |
| Fake news knowledge | Apuke and Omar (2020b); Pundir et al. (2021) |
| Education | Buchanan (2020); Pickles et al. (2021) |
| Belief that stories are true | Buchanan (2020) |
| Topical relevance | Chen et al. (2021); Madrid-Morales et al. (2021) |
| Information literacy | Chen et al. (2021); Pickles et al. (2021) |
| Motivational drivers (Self-promotion, entertainment) | Islam et al. (2020) |
| Social media fatigue | Islam et al. (2020); Talwar et al. (2019) |
| Religiosity | Islam et al. (2020) |
| Deficient self-regulation | Islam et al. (2020) |
| Information overload | Laato et al. (2020) |
| Civic duty | Madrid-Morales et al. (2021) |
| Pre-existing misinformation beliefs | Pan et al. (2021) |
| Inattention to accuracy | Pennycook et al. (2021) |
| Spoken language | Pickles et al. (2021) |
| Faith in scientists | Su (2021) |
| **Affective** | |
| Fear of missing out (FoMO) | Talwar et al. (2019); Pundir et al. (2021) |
| Humor | Madrid-Morales et al. (2021) |
| Anger | Ali et al. (2022); Featherstone and Zhang (2020) |
| Health-related anxiety | Pan et al. (2021) |
| Threat of COVID-19 | Pickles et al. (2021); Su (2021) |
| Emotional support | Zhou et al. (2021) |
| Fear | Ali et al. (2022); Tan and Hsu (2022) |
| Surprise | Tan and Hsu (2022) |

Attitude is a favorable or unfavorable evaluation by an individual of anything, and such evaluations color our preferences, orientations, and trust. These evaluations are essential in determining how a person reacts to fake news on social media. For instance, a person may share fake news if it aligns with his/her political orientation and partisan views (Faragó et al., 2019; Neyazi & Muhtadi, 2021). Such attitudes increase the perceived severity, truthfulness, and plausibility of fake news events, increasing the chances of spreading them (Laato et al., 2020; Polage, 2012). Similarly, trust, being an attitude (John, 1996), predisposes an individual to believe or not to believe in a piece of fake news and eventually share it or not. For instance, the trustworthiness of news sources is a critical factor in determining the sharing of fake news (Buchanan & Benson, 2019; Koohikamali & Sidorova, 2017). Similarly, a person's trust in the sender, government, and media has been found to influence the sharing of fake news on social media (Duffy et al., 2019; Humprecht, 2019; Pickles et al., 2021).

Next to the attitudinal type, most of the psychological factors identified in the analysis are cognitive. Cognitive factors include aspects of thinking and reasoning, such as knowledge, consciousness, memory, and motivation (Matlin, 2008). Research shows that the propensity to spread fake news increases when an individual's knowledge base is limited to discern truth from fiction (Pennycook & Rand, 2019). Corroborating this finding, level of education (Pickles et al., 2021) and knowledge about fake news (Apuke & Omar, 2020b; Pundir et al., 2021) are observed to limit its spread. However, with the ubiquitous availability of information gadgets, we are frequently bombarded with digital content from social media, resulting in an information overload. Such information deluge causes social media fatigue and negatively affects our cognitive ability to think before sharing fake news (Islam et al., 2020; Laato et al., 2020; Talwar et al., 2019). In addition, humans are prone to various errors in the thinking process, which unconsciously drive them to share fake news on social media. For instance, studies have observed that confirmation bias, the tendency to confirm pre-existing beliefs, is a primary reason for spreading fake news (Duffy et al., 2019; Kim et al., 2019; Moravec et al., 2019). Further, false memories created due to frequent exposure to false information drive a person to believe in its content and spread it further (Polage, 2012). The issue is compounded when people overclaim their level of knowledge and think wrongly that others rather than themselves are susceptible to fake news (third-person effect) (Pennycook & Rand, 2019).

Affective factors include elements that are based on emotions and moods (Baumeister et al., 2007). Sharing fake news on social media is also sometimes driven by various affective factors. For instance, fear of missing out from a person's social circle is one reason people share fake news on social media (Pundir et al., 2021; Talwar et al., 2019). Similarly, during the COVID pandemic, health-related anxiety and the threat of the disease are the primary reasons for the spread of fake news related to COVID on social media (Pan et al., 2021; Pickles et al., 2021; Su, 2021). Anger (Featherstone & Zhang, 2020), emotional support (Zhou et al., 2021), and humor (Madrid-Morales et al., 2021) are the other affective factors that influence the sharing of fake news on social media.

### *Biological factors*

Human behavior manifests in various ways, although within biological limits (Bandura, 2002) set by factors such as age, sex, and personality traits (Briem et al., 2004; Mongini et al., 2009). Recent evidence indicates that these factors influence the fake news sharing behavior on social media. For instance, in their study, Duffy et al. (2019) found that older people were less circumspect of the content they received and, thus, were more likely to spread fake news. Similarly, an individual's personality is observed to affect the sharing of fake news (Buchanan, 2020; Buchanan & Benson, 2019; Islam et al., 2020; Koohikamali & Sidorova, 2017). Corroborating such effects, a study by Buchanan (2020) observed that agreeableness, conscientiousness, extraversion, and neuroticism influenced fake news sharing behavior. Sex is another biological factor that influences the spread of fake news, and studies indicate that females are less involved in spreading it than males (Pickles et al., 2021; Rampersad & Althiyabi, 2020). Table 4 depicts the biological factors identified from the studies we analyzed.

**Table 4.** Biological factors for the spread of fake news

| Factors | Studies |
|---|---|
| Personality | Koohikamali and Sidorova (2017); Buchanan and Benson (2019); Buchanan (2020); Islam et al. (2020) |
| Age | Duffy et al. (2019); Pickles et al. (2021); Wasserman and Madrid-Morales (2019); Buchanan (2020) |
| Gender | Pickles et al. (2021); Rampersad and Althiyabi (2020); Buchanan (2020) |

### *Behavioral factors for the spread of fake news*

Behavioral factors include skills, existing behavior patterns, symbolic modeling, and self-efficacy (Bandura, 1989; Bandura, 2001; Saleme et al., 2020). As identified from the analysis, these factors are shown in Table 5.

**Table 5.** Behavioral factors for the spread of fake news

| Factors | Studies |
|---|---|
| The skill of media truth discernment | Pennycook and Rand (2019) |
| Self-disclosure | Talwar et al. (2019) |
| Social comparison | Talwar et al. (2019) |
| TV news consumption | Wasserman and Madrid-Morales (2019) |
| Instant news sharing | Apuke and Omar (2020a) |
| Socialisation | Apuke and Omar (2020a, 2021) |
| Self-promotion | Apuke and Omar (2020a) |
| Information sharing | Apuke and Omar (2021) |
| Active Corrective Actions on Fake News | Talwar et al. (2020) |
| Passing time | Apuke and Omar (2021) |
| Political engagement | Madrid-Morales et al. (2021) |
| Perceived behavioral control | Pundir et al. (2021) |
| Instantaneous Sharing of News for Creating Awareness | Talwar et al. (2020) |
| Passive Corrective Actions on Fake News | Talwar et al. (2020) |

The more extensive the skills people possess, the easier it is to integrate them into the existing behavioral patterns to produce new ones (Bandura, 2001). A deficit in such skills restricts a person from performing appropriate behaviors. For instance, when the skill of discerning truth from media is high, people are better positioned to stop the spread of fake news on social media (Pennycook & Rand, 2019). Further, people are more likely to engage in a behavior if it results in rewarding effects than unrewarding

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outcomes (Bandura, 2001). For instance, as the social comparison is associated with projecting a positive image before others and sharing fake news can have a damaging effect on the sender's image, people who engage more in social comparison is less likely to share fake news on social media (Talwar et al., 2019). Similarly, self-promotion, a practice of presenting oneself with an overly positivistic image as compared to others, increases fake news sharing by individuals as they are more likely to seek more likes, shares, and retweets on their postings, prompting them to share false information (Apuke et al., 2020a). Further, existing behavioral patterns, such as instant news sharing for creating awareness (Talwar et al., 2020), socialization (Apuke & Omar, 2020a, 2020b), and information sharing (Apuke & Omar, 2021), also affect fake news sharing on social media. Some of the other behavioral factors are political engagement with news (Madrid-Morales et al., 2021), existing TV news consumption behavior (Wasserman & Madrid-Morales, 2019), perceived behavioral control (Pundir et al., 2021), passing time (Apuke & Omar, 2021), self-disclosure of personal information with others (Talwar et al., 2019) and corrective actions on fake news (Talwar et al., 2020).

## External factors
### *Environmental factors for the spread of fake news*
Environmental factors include the physical and sociostructural environment thrust upon people, where they have limited control over these factors and are external to them (Bandura, 1999). As identified in the studies, these factors are indicated in Table 6. As per Bhuiyan et al. (2009), three types of environmental factors: physical, socio-cultural, and policy-related environments, influence a person's behavior. In addition to these, as social media use is highly dependent on other technologies, such as the Internet and smartphones, it is also important to consider its technology-related environment. The physical environmental factors constitute the tangible aspects such as the characteristics of the source and message external to an individual that can affect sharing of fake news on social media. For instance, when the fake news article is presented in a source-primacy format, the chances of sharing or forwarding that article further are less as it reduces users' trust making them more skeptical (Di Domenico et al., 2021; Kim & Dennis, 2019). A similar effect is observed when the source credibility is displayed in the message (Chen et al., 2021; Kim et al., 2019). In addition, an individual's social and cultural environments influence the spread of fake news. For instance, an individual's social tie strength with the sender of fake news increases the trust in the message, prompting the former to share it further (Apuke & Omar, 2020b). Similarly, parasocial interaction, which is the emotional connection of an individual to the sender, and homophily of the individual's network, increases the believability of fake news, increasing its sharing on social media (Apuke & Omar, 2020b). Further, culture influences the spread of fake news on social media by affecting the comprehensibility of the news item (Rampersad & Althiyabi, 2020). Some of the other environmental factors are shown in Table 6. It is worthy to note that there were no policy-related or technology-related environmental factors in the analyzed studies.

**Table 6.** Environmental factors for the spread of fake news

| Factors | Studies |
|---|---|
| **Physical** | |
| The presentation format of the article | Di Domenico et al. (2021); Kim and Dennis (2019); |
| Displaying source credibility | Chen et al. (2021); Kim et al. (2019) |
| Level of ambiguity and richness of the message | Zhou et al. (2021) |
| **Socio-cultural** | |

| Factors | Studies |
|---|---|
| Critical comments by others | Colliander (2019); Lobato et al. (2020); Rustan (2020) |
| Repeated exposure | Effron and Raj (2020); Polage (2012); Pan et al. (2021) |
| Social tie strength | Apuke and Omar (2020b) |
| Culture | Rampersad and Althiyabi (2020) |
| Argument quality | Chen et al. (2021) |
| Parasocial interaction | Apuke and Omar (2020b) |
| Homophily | Chen et al. (2021) |
| Repetition effect | Corneille et al. (2020) |
| Interpersonal relationship between sender and receiver | Di Domenico et al. (2021) |
| Deceptive intent of the source | Di Domenico et al. (2021) |
| Two-sided refutational messages | Featherstone and Zhang (2020) |
| Comments exposing the fake news | Lobato et al. (2020); Rustan (2020) |
| Comments critically attacking both the fake news and its poster for promoting it | Lobato et al. (2020) |
| Health caution and advice in the message | Zhou et al. (2021) |
| Help-seeking misinformation | Zhou et al. (2021) |
| Pandemic severity | Zheng et al. (2022) |

**Impact of fake news**

To organize the impact of fake news, we categorized them into three, namely, social, economic, and psychological, and then organized various impacts identified using these codes. Impact refers to the consequences on society, which can be at social, economic, or psychological levels. As identified from the studies, these impacts are indicated in Table 7. When fake news becomes common on social media, it lowers the credibility of facts (Baxter et al., 2019). At the social level, such noncredible information enters the media domain, setting its agenda (Vargo et al., 2018) and fractionalizing it (Arayankalam & Krishnan, 2021). Consequently, peoples' trust in media gets negatively affected (Chen & Cheng, 2019), reducing the influence of media on society. In such situations, traditional and online media awareness programs in debunking various myths and hoaxes may be ineffective. For instance, despite media awareness campaigns, false stories about the vaccine risks are significant reasons for vaccine hesitancy (Hansen & Schmidtblaicher, 2019) and a decrease in child immunization rates (Carrieri et al., 2019). In addition to these health-related impacts, fake news derails the democratic process by ideologically polarizing society and delegitimizing the electoral processes (Ncube, 2019; Spohr, 2017). Recent evidence indicates that enemy nations leverage such dark powers of fake news on social media to weaken a country by inducing violence (Arayankalam & Krishnan, 2021). The economic impact of fake

news on social media, although not clear yet, is witnessed in stocks and brand trust of businesses. For instance, as per Brigida and Pratt (2017), fake news negatively impacts stock prices by changing the perception of a business among shareholders. Further, such wrong perceptions also negatively affect businesses' brand trust and attitude (Chen & Cheng, 2019; Flostrand et al., 2019; Visentin et al., 2019). Lastly, the psychological impacts of fake news manifest in various ways. For instance, users are less analytical due to cognitive dissonance when exposed to fake political news than when exposed to real news (Barfar, 2019). In such a state, users show more anger and incivility (Barfar, 2019). Further, increased exposure to fake news is associated with an increase in alienation and cynicism (Balmas, 2014) and the third-person effect (Jang and Kim, 2018).

**Table 7.** Impact of fake news

| Impact | Studies |
|---|---|
| **Social** | |
| Vaccine hesitancy | Hansen and Schmidtblaicher (2019) |
| Ideological polarization | Spohr (2017) |
| Lowers credibility of facts | Baxter et al. (2019) |
| Sets agenda of partisan media | Vargo et al. (2018) |
| The decrease in child immunization rates | Carrieri et al. (2019) |
| Delegitimise the electoral process | Ncube (2019) |
| Trust in media | Chen and Cheng (2019) |
| Social media-induced offline violence | Arayankalam and Krishnan (2021) |
| Domestic online media fractionalization | Arayankalam and Krishnan (2021) |
| **Economic** | |
| Affects stock prices | Brigida and Pratt (2017) |
| Negatively affects brand trust and attitude of businesses | Chen and Cheng (2019); Flostrand et al. (2019); Visentin et al. (2019) |
| Equity value of social media platform | Velichety and Shrivastava (2022) |
| **Psychological** | |
| Greater anger | Barfar (2019) |
| Incivility | Barfar (2019) |
| Low levels of cognitive thinking | Barfar (2019) |
| Self-efficacy | Chen and Cheng (2019) |
| Manipulate people's will | Ncube (2019) |
| The credibility of news and its sources | Visentin et al. (2019) |
| Third-person effect | Jang and Kim (2018) |
| Feelings of inefficacy | Balmas (2014) |
| Alienation | Balmas (2014) |
| Cynicism | Balmas (2014) |
| Modify behavior | Bastick (2021) |

| Impact | Studies |
|---|---|
| Reduced motivation to vaccinate | Calo et al. (2021) |

### Gaps and avenues for future research

Having explored the current state of research on the spread and impact of fake news on social media, in the ensuing sections, we highlight the existing research gap and present an agenda for future research. In addition, we present a research framework that can guide to taking the fake news research forward.

## Research gaps

### Domain diversity

This review indicates that most empirical research investigating the psychosocial antecedents of fake news spread and its impact was in the political and health domain. Such a concentration of studies in a few domains poses concerns about generalizability. As our review indicated, several psychological factors play a role in influencing a person to spread fake news on social media, while the influence of these factors may potentially vary depending on the domain. For instance, while anxiety is a crucial affective factor that influences fake news spread in the health domain (Pan et al., 2021), it may not be the case in other domains, such as politics, where one dominant emotion could is humor (Madrid-Morales et al., 2020). Therefore, there is a need for research that understands the fake news phenomenon by considering such variations across various domains.

### Geographical and cultural diversity

As indicated by our analysis, the studies investigating the psychosocial antecedents of fake news spread on social media and its impact are majorly focused on the USA. However, recent research points to the cultural variation in how people respond to fake news. For instance, as per Rampersad and Althiyabi (2020), culture plays the most significant role in accepting fake news. Therefore, it may be argued that the role of geographic and cultural variations cannot be discounted while understanding the spread and impact of fake news on social media. To this end, future fake news research must undertake more culturally and geographically diverse inquiries for a holistic understanding of the phenomenon.

### Theoretical foundations

Regarding theoretical groundings, we posit that most fake news research has drawn from psychology and journalism, and there is a scope for inquiring about the phenomenon using the perspectives of other allied areas, such as communication studies and disaster management. For instance, scholars may benefit from understanding why some people do not react to fake news while peoples' active participation is vital to contain its spread. Researchers may adopt theories such as the spiral of silence theory (Noelle-Neumann, 1974) and the situational theory of problem-solving (Kim & Grunig, 2011). Further, we argue that the theorization of fake news may benefit from conceptualizing it as an 'information disaster' and drawing from disaster management literature. Disaster management literature suggests four phases in dealing with a disaster: mitigation, preparedness, response, and recovery (Shaluf, 2008). While mitigation includes any activities that prevent a disaster or reduce its damaging effects, preparedness relates to planning how to respond when a disaster happens, and the response comprises actions taken immediately before, during, and just after a disaster. Recovery includes activities that guide long-term actions designed to bring the situation to be normal or improved levels after a disaster (Shaluf, 2008). We argue that borrowing such a structured view from disaster management and adapting to the fake news context by considering it as an "information disaster" will help scholars develop a holistic theoretical understanding of the phenomenon.

### Methodological foundations

Regarding methodological foundations, most studies we analyzed have employed survey design, which has an inherent limitation in establishing causality between the variables. Therefore, future studies may adopt methods such as field experiments and longitudinal research designs for establishing the causality

among the variables. In addition, as the understanding of fake news is still nascent, future studies may rely on qualitative methods, such as case studies, to drive theory development.

## Internal factors

### *Attitudinal factors*

While attitudes play a critical role in spreading fake news on social media, and many extant studies have sought to unravel their roles, many areas of this psychological construct need further focus. To elaborate, there are four broader aspects of attitudes: attitude strength, depth of information processing, attitudinal ambivalence, and attitude function (Bassili, 2008). However, there is a limited understanding of the specific roles of these aspects in spreading fake news on social media. For instance, according to Bassili (2008), extreme attitudes are difficult to change through "counter-attitudinal persuasive messages," whereas it is easy to do that using "pro-attitudinal ones." (p. 239). Thus, when fake news is in sync with the existing extreme attitudes of a person, there is a high possibility of resharing the fake news.

Similarly, when the motive to process the information is high, information processing will happen at a deeper level (Petty & Cacioppo, 1986), increasing the chance of believing a piece of fake news and making the person a potential spreader. For example, a person interested in politics may engage more deeply with fake news related to elections than someone who is not, resulting in its spread. Research shows that attitudinal ambivalence has a vital role in the information processing of an individual (Conner & Armitage, 2008; Hanze, 2001). Given that ambivalent attitudes are based on conflicting evaluations and inconsistent information, they are weakly anchored and more susceptible to a message's influence (Conner & Armitage, 2008). Thus, in the context of fake news, people with an ambivalent attitude may unconsciously become primary spreaders as they are more prone to believe the false content.

Further, attitudes have three essential functions in satisfying a person's psychological needs: object appraisal, social adjustment, and externalization (Smith et al.,1956). When a person is exposed to fake news, he/she may appraise the contents based on various criteria before deciding to share it or not. While Tandoc et al. (2019) have investigated the role of one such criterion, that is, the relevance of news to the person, there can be many other criteria that need investigation. For instance, a person may share information that is not so relevant to him/her but relevant to somebody close to him/her. *Social adjustment* helps maintain relationships with others and can be a strong reason for people not to react to fake news they do not approve of, or in the worst case, even spread it when there is a danger of social rejection from their peers. *Externalization, similar to the ego-defensive function (Katz, 1960),* is an unconscious function that protects a person's self-esteem from unresolved inner problems. A person's internal problems can manifest in terms of a negative attitude towards an object or an event in fake news and manifest in the form of sharing it.

In sum, we contend that by accounting for the four aspects of attitudes, future investigations will shed more light on its role in spreading fake news.

### *Cognitive factors*

As our review indicated, cognitive factors play a critical role in influencing the spread of fake news. However, many areas still demand attention to enhance our understanding of fake news spread on social media. The three major aspects of cognition are acquisition, storage, and transformation of knowledge (Matlin, 2008). While extant studies (e.g., Buchanan, 2020; Polage, 2012; Pennycook & Rand, 2019) have inquired into each of these aspects, we point to two areas from storage and transformation that can enhance our understanding of the fake news spread, namely, memory schema and errors in thinking, respectively.

A schema is generalized knowledge about situations and events from a person's past experiences (Davis & Loftus, 2007). Studies have shown that individuals tend to reshare and forward fake news consistent with their beliefs. While one reason for such a tendency is confirmation bias (Duffy et al., 20191; Marcella et al., 2019), the other reason could be the presence of a schema that supports their views. Past research shows that schemas can mislead us into remembering information that is not stated to make them consistent with our current viewpoint (Schacter, 2001). Exposure to fake news can likely

lead to forming a new schema, which may prepare an individual psychologically to reshare and forward similar fake news in the future.

Thinking constitutes reasoning, decision-making, and problem-solving (Matlin, 2008), and errors in any of these (i.e., transformation errors) will affect an individual's thinking process and influence the spread of fake news. Some prominent transformation errors are confirmation bias, belief bias, small-sample fallacy, framing effect, and overconfidence effect. However, our analysis shows that the existing research has only investigated the role of confirmation bias in spreading fake news (e.g., Duffy et al., 2019; Marcella et al., 2019), while other errors remain less investigated. For instance, a person can also make wrong judgments about resharing or forwarding fake news by relying only on prior beliefs rather than logic due to belief bias. Therefore, exploring the roles of other knowledge transformation errors in fake news spread on social media is important.

### Affective factors

As our review indicated, affective factors also play an influential role in the spread of fake news on social media. However, many areas of this construct require a renewed focus from researchers. To elaborate, affect is classified into five categories: dispositional affect, mood, acute emotions, emotional intelligence, and sentiments (Kelly & Barsade, 2001). While dispositional affect refers to the inherent emotions in an individual that influence his/her perception of the world, moods refer to a low-intensity emotion that does not have a clear cause. Individuals may not realize that moods are affecting their behavior. Further, while acute emotions refer to intense feelings of shorter duration that are more focused than dispositional affect and moods (Frijda, 1994), emotional intelligence is the ability to understand and regulate one's emotions and those of others (Mayer & Salovey, 1997). And sentiments are valanced appraisals of anything resulting in liking or disliking (Frijda, 1994). We argue that the factors related to each of the five categories of affect can influence an individual's resharing and forwarding of fake news. For instance, when individuals are in a negative mood and receive fake news about a political opponent, they may reshare it as research shows that moods strongly influence our thinking (Isen & Reeve, 2005). Although a few studies (e.g., Anthony & Moulding, 2019; Talwar et al., 2019) have studied some affective factors (e.g., Fear of Missing Out, benevolence), a systematic investigation into the role of each of the different types of affect is still lacking.

### Biological factors

While extant studies have investigated the effect of three biological factors, namely, sex, age, and personality, the role of one of the critical physiological factors, sleep, demands scholarly focus. Sleep has a critical role in the proper functioning of our affective and cognitive processes. Thus, any disruption in our circadian patterns can derail the homeostasis necessary for optimal psychological functioning (Harvey, 2008). For instance, sleep deprivation is increasingly related to maladaptive emotional and mood regulation (Gujar et al., 2011) and reduced cognitive abilities (Killgore et al., 2008). Thus, by influencing cognition and affect, both known to influence fake news sharing, the quality of sleep also likely impacts the spread of fake news on social media.

### Behavioral factors for the spread of fake news

While the extant studies have investigated various behavioral factors that influence the fake news spread, studies on the role of alters' behavior in influencing an individual's propensity to spread fake news on social media are scarce. One key process through which this behavior manifest is the majority effect, which refers to the behavior of an individual brought about by the majority's actions in the group that person is a part of (Asch, 1951). A recent study by Wei et al. (2019) found that individuals tend to change their behavior against their individual preferences to align with the opinions of their peers. As major social media platforms, such as Facebook and WhatsApp, offer affordances such as groups, the majority effect can play a key role in spreading fake news in such groups. To elaborate, as the deviations from group opinions lead to tension and uncertainty (Yaniv et al., 2009), an individual in a social media group also likely gets influenced by the majority's views and further spread the content.

Further, collective action from the public is necessary to solve any societal problem, such as fake news (Kim & Grunig, 2011). However, most studies on fake news focused on how individuals behave

upon receiving fake news while ignoring why they sometimes don't react (Kim & Yang, 2017). Evidence indicates that nearly 70% will ignore a social media post even when they know it is fake (Tandoc et al., 2020). According to the situational theory of problem-solving, active publics, the people who proactively solve a problem, are critical in solving a societal problem (Kim & Grunig, 2011). In other words, by encouraging voice behavior (a.k.a, voicing), which is the proactive expression of constructive opinions, concerns, or ideas about issues (Liu et al., 2010), among social media users, passive people can be changed into active public to stop the fake news spread. Understanding the role of voicing in checking the spread of fake news requires a deeper investigation.

### *External* factors

### *Environmental factors for the spread of fake news*

While the extant studies have investigated various environmental factors that influence the fake news spread on social media, there were no studies in policy-related and technology-related environment subcategories. This is a glaring gap as the government's ICT-related policies, and availability of various technologies can impact how people send news (or fake news) on social media. For instance, Khan et al. (2020) have found that the maturity of ICT laws in a country influences ICT diffusion. As fake news spread on social media is also contingent on social media use, various government/firm policies and measures, such as the maturity of ICT laws and regulations, may affect fake news spread. Similarly, because the use of social media, which is the platform on which fake news spread, is dependent on the availability of supporting technological infrastructures, such as the Internet, computers, and smartphones, a technological environment (e.g., technology to track fake news) that decides the availability/non-availability of such technologies may also influence the fake news spread on social media. However, more scholarly attention is warranted to understand such influence.

Further, within the socio-cultural environment, an area that demands more attention is social interactions. Social interactions are classified into three types based on the utilities obtained from such interactions: focus-related, consumption, and approval (Balasubramanian & Mahajan, 2001). While the focus-related interaction stresses the utility an individual receives when adding value to the community through their interactions, the consumption-based social interaction focuses on the value obtained by individuals through "direct consumption of the contributions of other community constituents" (p. 125), and the approval social interaction focuses on individual's satisfaction that comes "when other constituents consume and approve of the constituent's own contributions" (Balasubramanian & Mahajan, 2001, p. 126). We believe that the type of social interactions can potentially impact the spread of fake news. For instance, when individuals receive fake news that proclaims societal good, and if the social interaction is focus-related, they may tend to believe it and reshare it with others. Similarly, when individuals engage in approval-based social interactions, they may reshare or forward content that is appealing to others. Supporting our view, a study by Taylor et al. (2012) has found that by sharing online advertisements, which are "entertaining, informative, titillating, or shocking" (p. 13) with others, individuals tend to achieve self-enhancement. More research is warranted to unravel the roles of each type of interaction on fake news spread on social media.

### Impact of fake news

As shown in our analysis, the impact of fake news can be at three levels, namely, social, economic, and psychological. According to Norris et al. (2014), social impact can be categorized into five, namely, (1) labor rights and decent work; (2) health and safety; (3) human rights; (4) governance; and (5) community impacts. While there were studies on the community and health impacts of fake news (e.g., Arayankalam & Krishnan, 2021; Hansen & Schmidtblaicher, 2019; Carrieri et al., 2019), there was only one study that looked into the impact on governance (e.g., Ncube, 2019) and no studies investigated how fake news can affect labor rights and decent work, and human rights. However, there are indications that the impact of fake news on human and labor rights can be significant. To elaborate, fake news spread through WhatsApp and Facebook was a key trigger for some riots and violence in India, resulting in human rights

violations (McLaughlin, 2018). Further, fake news spread on social media has caused many human rights violations, such as the lynching of lower castes (Wire, 2019). Furthermore, during the COVID outbreak in India, fake news triggered laborers' mass migration from various states, jeopardizing their rights (Mahapatra & Choudhary, 2020). However, more empirical studies are needed to understand the more profound social impact of fake news, and thus, future studies should focus on investigating the social impacts in each of the five categories mentioned above.

The economic impacts can be classified into three levels: micro, meso, and macro (Rose & Krausmann, 2013). While the micro-level constitutes individual businesses, individuals, and households, the meso-level constitutes individual industries or markets, and the macro-level comprises the combination of all economic actors at a country level (Rose & Krausmann, 2013). As can be seen from the studies analyzed, while most of the impacts identified were at the micro-level (e.g., Flostrand et al., 2019; Visentin et al., 2019), there was only one study each at the meso-level (e.g., Chen & Cheng, 2019) and macro-level (e.g., Brigida & Pratt, 2017). The limited number of studies on the economic impact of fake news is particularly glaring as in this post-truth era, the menace of fake news has become a part of our lives and thus, needs to be accounted for in all economic transactions. For instance, a meso-level study is required to understand which types of industries or markets are more affected by fake news. Similarly, macro-level research is needed to understand the economic costs of fake news to a country regarding crucial parameters, such as GDP. Thus, more empirical studies are needed to comprehensively understand the economic impact of fake news by focusing on each of the levels mentioned above.

While some of the psychological impacts have been studied in the existing studies, some areas that need more investigation are related to affect. While a few studies (e.g., Balmas, 2014; Barfar, 2019) have investigated the impact on emotions, a systematic investigation is still lacking. Per Russell's circumplex framework (Russell, 2003), there are four categories of emotions based on valence and arousal. For instance, stress is an emotion with high arousal and high valence, whereas disappointment is an emotion with low arousal and high valence. The other major emotions are hate, fear, shame, despair, empathy, pride, and happiness (Russell, 2003). These emotions drive different behavior in an individual, making it vital to understand the effect of fake news on each of these emotions. Accordingly, future research should investigate the impact of fake news on emotions based on Russell's framework (Russell, 2003).

Based on the gaps discussed, we present the RQs for future investigation in Table 8.

**Table 8.** Summary of proposed future agendas

| Research themes and sub-themes | RQ | Future research agenda |
|---|---|---|
| **DOMAIN** | | |
| | **RQ1.1** | How are the psychological processes involved in the fake news spread on social media different in different domains? |
| **COUNTRY-LEVEL DIVERSITY** | | |
| | **RQ2.1** | What role doe culture play in the spread and impact of fake news on social media? |
| | **RQ2.2** | Do country-level variations, such as being developed or developing, change the current understanding of fake news spread and impact? |
| **THEORETICAL FOUNDATIONS** | | |
| | **RQ3.1** | Why do some people not proactively react to fake news while people's active participation is vital to contain its spread on social media? |

| Research themes and sub-themes | RQ | Future research agenda |
|---|---|---|
|  | RQ3.2 | By conceptualizing fake news as an 'information disaster,' how can we apply the four stages of disaster management: mitigation, preparedness, response, and recovery to understand fake news spread on social media? |
| **METHODOLOGICAL FOUNDATIONS** |  |  |
|  | RQ4.1 | Does adopting experimental, longitudinal, and qualitative methodological approaches improve our understanding of the fake news phenomenon? |
| **PERSON FACTORS** |  |  |
| **Attitudinal** |  |  |
| Strength | RQ5.1 | How do the four properties of attitude strength: extremity, importance, accessibility, and ambivalence, affect fake news spread on social media? |
| Processing | RQ5.2 | How does a person's depth of processing information presented in fake news affect its spread on social media? |
| Function | RQ5.3 | What is the role of three different functions of attitudes, namely, object appraisal, social adjustment, and externalization, in the fake news spread on social media? |
| Perspective | RQ5.4 | How does an individual's attitudinal ambivalence towards a topic influence the fake news spread on social media? |
| **Cognitive** |  |  |
| Storage | RQ6.1 | What is the role of memory schemas in the fake news spread on social media? |
| Transformation errors | RQ6.2.1 | What is the role of the small-sample fallacy in the fake news spread on social media? |
|  | RQ6.2.2 | What is the role of the conjunction fallacy in the fake news spread on social media? |
|  | RQ6.2.3 | What is the role of the framing effect in the fake news spread on social media? |
|  | RQ6.2.4 | What is the role of overconfidence in the fake news spread on social media? |
| **Affective** |  |  |
|  | RQ7.1 | What is the role of an individual's dispositional affect in the fake news spread on social media? |
|  | RQ7.2 | What is the role of an individual's mood in the fake news spread on social media? |
|  | RQ7.3 | What is the role of an individual's acute emotions in the fake news spread on social media? |
|  | RQ7.4 | What is the role of an individual's emotional intelligence in the fake news spread on social media? |
|  | RQ7.5 | What is the role of an individual's sentiments in the fake news spread on social media? |
| **Biological** |  |  |
|  | RQ8.1 | What is the role of sleep in the fake news spread on social media? |
| **BEHAVIORAL FACTORS** |  |  |

| Research themes and sub-themes | RQ | Future research agenda |
|---|---|---|
| | RQ9.1 | What is the role of the majority effect in the fake news spread on social media? |
| | RQ9.2 | What is the role of voicing in controlling the spread of fake news on social media? |
| **ENVIRONMENTAL FACTORS** | | |
| **Policy-related** | RQ10.1 | What is the role of policy-related environmental factors, such as ICT law maturity and government regulations, in the fake news spread on social media? |
| **Technology-related** | RQ10.2 | What is the role of the technological environment, such as the availability of technology, in influencing fake news spread on social media? |
| **Social interactions** | RQ10.2 | What are the roles of different social interaction motives, namely, focus-related, consumption, and approval, in the fake news spread on social media? |
| **IMPACT** | | |
| **Social** | RQ11.1 | What is the impact of fake news on labor rights and decent work? |
| | RQ11.2 | What is the impact of fake news on the health and safety of people in a country? |
| | RQ11.3 | What is the impact of fake news on human rights? |
| | RQ11.4 | What is the impact of fake news on governance in a country? |
| | RQ11.5 | What is the impact of fake news on a particular community in a society? |
| **Economic** | RQ12.1 | What is the economic impact of fake news at three levels, namely, (1) micro; (2) meso; and (3) macro? |
| **Psychological** | RQ13.1 | What is fake news' effect on triggering different emotions based on arousal and valence? |

### A theoretical framework for fake news spread and impact on social media

We now present a comprehensive theoretical framework (see Figure 3) based on the analysis and gaps identified in the reviewed studies. The framework synthesizes the antecedents of fake news spread on social media and its impacts due to the spread. We discuss the theoretical underpinnings of this framework and then elaborate on the key aspects of the framework.

Fake news sharing is a behavior that is the result of many factors that are both internal and external to an individual. To explain the relationships among them and increase the generalizability, drawing on a theoretical foundation that is well-established and broad becomes critical. To this end, the social cognitive theory (SCT) (Bandura, 1989) is an apt theoretical foundation as it theorizes the relationships among three broad factors: person, behavioral, and environmental, to explain human behavior.

According to SCT, one of the most widely used psychosocial theories for behavioral change, human behavior is an outcome of triadic reciprocal causation among three factors, namely, (1) person; (2) environmental; and (3) behavioral (Bandura, 2012). While the person factors include the psychological aspects (e.g., cognitive and affective) and biological aspects (Bandura, 2012), the environmental factors constitute an individual's external surroundings, which influence the strength and frequency of a particular behavior. And behavioral factors include skills, existing behavior patterns, symbolic modeling, and self-efficacy (Bandura, 1989; Bandura, 2001; Saleme et al., 2020). The behavior gets reinforced or diminished based on the skills and learning from past behaviors. In addition, individuals learn desirable and undesirable behaviors by observing others and reproducing learned behaviors to maximize benefits

(Bandura, 2012). Thus, a comprehensive understanding of human behavior requires an integrated causal system in which social influences operate through psychological mechanisms to produce behavioral effects.

Using this theoretical grounding and our analysis, we present a comprehensive theoretical framework for the spread and impact of fake news on social media in Figure 3. As can be seen, three broad psychosocial factors affect the spread of fake news on social media. As per SCT, each of these factors may interact with each other in influencing the spreading behavior of an individual. While we used SCT as the base, we modified the framework based on the findings from our analysis. For example, although behavioral factors were considered internal, external behavioral factors can also influence fake news spread on social media. As mentioned previously, the majority effect may affect the spreading behavior on social media. Further, we also expand each of the components into detailed sub-categories drawing on the current literature.
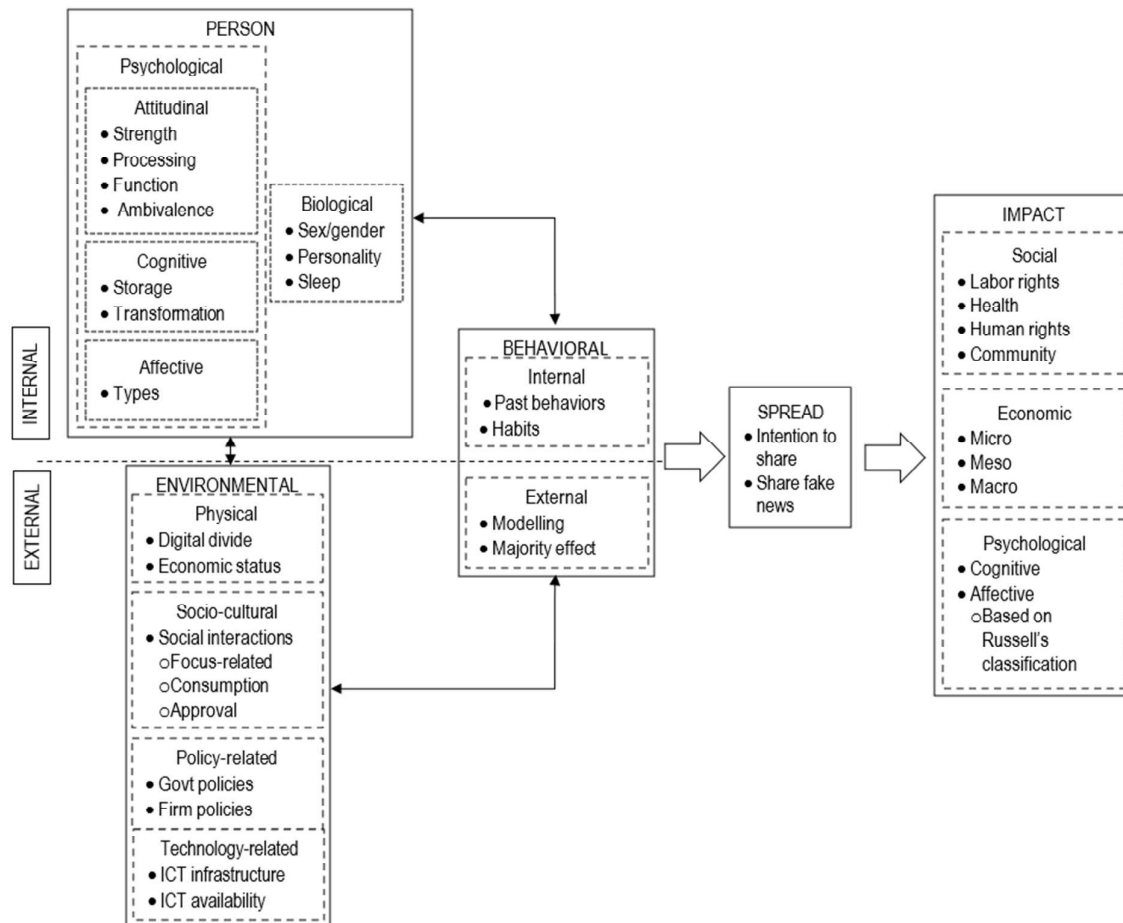


**Figure 3.** Theoretical framework

## Conclusion

This study has provided a comprehensive assessment of how extant research has focused on the fake news spread on social media and its impact. By analyzing empirical studies in the area, this study provided a comprehensive research profile of the literature. Then, this study proposed future agendas by delineating the gaps in the prior research. Finally, using SCT, we presented a theoretical framework that may be used in future explorations of fake news spread on social media and its impact. The study findings have significant implications for researchers and policymakers.

**Theoretical implications**

This study offers several significant contributions to fake news research. Firstly, despite a recent surge in research on fake news on social media, the field is still developing, making it critical to lay a clear and focused path for future research. By employing an SLR approach, this study outlines a structured research profile of the literature on the psychosocial antecedents of fake news spread and its impact and identifies the emergent research gaps. Based on the gaps identified, we also provide specific research questions to advance the literature related to fake news on social media to guide the researchers.

Secondly, this study proposes a theoretical framework that provides an extensive overview of the key elements defining the literature on fake news spread and impact. In particular, our framework summarizes the existing relationships between various antecedents of fake news spread on social media and the impact of such spread, bringing out new research possibilities. In doing so, this study also adds to the prior literature reviews that were focused on areas such as the typology of fake news (Tandoc et al., 2018), detection methods (Zhou & Zafarani, 2020), and implications on marketing and consumers (Di Domenico et al., 2021) and consequently neglected to specifically consider the psychosocial antecedents of fake news spread on social media, and its impact.

**Practical implications**

From a practical standpoint, our study makes three key contributions. First, a clear understanding of the factors that lead to the spread of fake news on social media and the impact is critical to effectively dealing with the menace of fake news. By comprehensively organizing the factors and the areas of impact, this study becomes a ready-to-go reference for policymakers. Second, an important finding for policymakers is that both internal and external factors cause fake news to spread. While the internal factors are psychosocial, biological, and behavioral, external factors are environmental. This understanding shows that fake news mitigation efforts need a holistic approach from policymakers by considering all these categorizations. Further, policymakers can plan mitigation efforts against fake news focusing on three kinds of impact: social, economic, and psychological. It may also aid them in designing user guidelines for combating fake news spread on social media. Third, we contend that the overarching framework will serve as a useful reference frame for policymakers in planning their mitigation actions against fake news.

**Limitations and future work**

The review process has been explained in detail to ensure possible replication. However, we acknowledge some of the limitations of this review. First, we focused solely on assimilating empirical knowledge and therefore excluded articles published as conceptual and narrative reviews. Second, to keep the scope of the review manageable, we excluded any conference publications and theses, which may have limited the themes identified during the analysis. Third, while we have tried our best to ensure the comprehensiveness of the article search, some relevant studies may have been omitted due to indexing errors within the databases. Despite this possibility, we firmly believe that the possible number of such omitted studies is likely to be less and would not have affected the results considerably. Despite these limitations, the study takes an essential step in enhancing the theoretical understanding of fake news spread on social media and the impact due to such spread.

In conclusion, the existing approach to combating fake news spread on social media is centered on providing technological solutions by overlooking the non-technical elements (human-centric approach), such as psychosocial aspects. Further, there is still a lack of clarity on the impact of fake news. However, the literature on these two areas is disorganized and scattered, which prevents a systematic understanding of the fake news phenomenon and potential research areas. As a solution to this glaring concern, this study, using an SLR, seeks to organize various findings and identify avenues to comprehensively and systematically steer future research in this area.

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**Appendix**

**A. Comprehensive information on reviewed articles**

| S. No. | Authors | Country | Domain | Type | Data gathering | Data type | Theory | Themes | Broad area | Sample characteristics |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Ali et al. (2022) | USA | Health | Quantitative | Experiment | Test score | Heuristic-Systematic model | Fear affects anti-vaccine individuals; Anger affects neutral individuals; Emotions, attitudes, and social endorsement jointly affect status-seeking motivation to share fake news | Spread | N = 656 individuals above 18 years, 54.7% female, mean age = 38.21 (SD = 12.98) |
| 2 | Apuke and Omar (2020a) | Nigeria | Health | Quantitative | Online survey | Survey data | Uses and gratification theory | Altruism, instant news sharing, socialization and self-promotion | Spread | N = 152 individuals, 53.2% female |
| 3 | Apuke and Omar (2020b) | Nigeria | Health | Quantitative | Online survey | Survey data | Uses and gratification theory, social networking sites dependency theory and social impact theory | Information seeking, status seeking, social tie strength, perceived herd, parasocial interaction, SNS dependency, fake news knowledge | Spread | N = 650 individuals, 49.2% female |
| 4 | Apuke and Omar (2021) | Nigeria | Health | Quantitative | Online survey | Survey data | Uses and Gratification framework | Altruism, information sharing, socialization, information seeking and pass time | Spread | N = 385 individuals, 46.8% female |

| 5 | Arayankalam and Krishnan (2021) | Cross-country | Politics | Quantitative | Secondary | Log data | Agenda building theory | Social media-induced offline violence and domestic online media fractionalization | Impact | N = 179 countries |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Balmas (2014) | Israel | Politics | Quantitative | Telephonic survey | Survey data | - | Feelings of inefficacy, alienation, and cynicism | Impact | N = 509 individuals, 50% female, mean age = 44 years (SD = 17.28) |
| 7 | Barfar (2019) | Others | Politics | Quantitative | Facebook | User comments from Facebook | Dual-process theories | Greater anger and incivility, levels of cognitive thinking | Impact | 2100 user posts |
| 8 | Bastick (2021) | France | Others | Quantitative | Randomized controlled experiment | Test score | - | Modify behavior | Impact | N = 233 students, 71.7% female, mean age = 18.45 (SD = 0.65) |
| 9 | Baxter et al. (2019) | Scotland | Journalism | Quantitative | Survey | Survey data | - | Lowers credibility of facts | Impact | N = 538 individuals, 64.2% female, 45.3% between 25 and 44 years |
| 10 | Brigida and Pratt (2017) | Others | Finance | Quantitative | Secondary | Log data | - | Stock price reacts to the fake news | Impact | Not mentioned |
| 11 | Buchanan (2020) | UK | Others | Quantitative | Online survey | Survey data | - | Belief stories true, prior familiarity, agreeableness, conscientiousness, extraversion, neuroticism, gender, education, age | Spread | (1) N= 672 individuals, 52.5% female; (2) N = 312 individuals, 53.3% female; (3) N = 225 individuals, 64.9% female; (4) N = 283 individuals, 55.5% female. |
| 12 | Buchanan and | Cross-country | Others | Quantitative | Survey | Survey data | - | Trustworthiness of source and the recipient's risk | Spread | 409 individuals, gender and age not mentioned |

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|---|---|---|---|---|---|---|---|---|---|---|
| | Benson (2019) | | | | | | | propensity and personality | | |
| 13 | Calo et al. (2021) | USA | Health | Quantitative | National panel | Test score | | Reduced motivation to vaccinate | Impact | N = 1206 individuals, 54% female, mean age = 42.8. |
| 14 | Carrieri et al. (2019) | Italy | Health | Quantitative | Secondary | Log data | - | Decrease in child immunization rates | Impact | Not mentioned |
| 15 | Chadwick et al. (2018) | UK | Journalism | Quantitative | Twitter, survey | Tweets/Survey data | - | Motivation to entertain/troll | Spread | Tweets, survey |
| 16 | Chen and Cheng (2019) | USA | Business | Quantitative | Survey | Survey data | The persuasion knowledge model | Self-efficacy, media trust, brand trust | Impact | N = 468 individuals, 47.4% female, mean age = 47 years (SD = 18.57) |
| 17 | Chen et al. (2021) | Taiwan | Others | Quantitative | Online survey | Survey data | Elaboration likelihood model | Argument quality, topical relevance, source credibility, homophily, Information literacy | Spread | (1) N= 227 students, female 60.4%, mean age = 38.99 years; (2) N = 236 students, female 54.7%, mean age = 40.06 years; (3) N= 221 students, female 49.8%, mean age = 36.95 years; (4) N= 247 students, female 56.7%, mean age = 36.48 years |
| 18 | Colliander (2019) | USA | Others | Quantitative | Experiment | Test scores | - | Critical comments by others | Spread | 1201 individuals, 60% female, mean age = 37 years; 800 individuals, 50% female, mean age = 36 years |
| 19 | Corneille et al. (2020) | Not given | Others | Quantitative | Experiment | Test score | - | Repetition effect | Spread | (1) N= 49 individuals, 40.8% female, mean age= 35.74 (SD = 12.44); (2) N= 152 individuals,50.6% female, mean age= 34.20 (SD = 11.42); (3) N= 200 individuals, 50% female, |

| | | | | | | | | | | | mean age = 32.70 (SD - 10.47) |
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| 20 | Di Domenico et. (2021) | Not given | Others | Quantitative | Experiment | Test score | - | | Presentation format of fake news, interpersonal relationship between sender and receiver, trust in the message, deceptive intent of the source | Spread | (1) N = 214 individuals, 51.2% female, mean age = 40.58 (SD = 12.86); (2) N = 277 individuals, 49.9% female, mean age = 40.66 (SD = 12.84) |
| 21 | Duffy et al. (2019) | Singapore | Social relationship | Qualitative | Focus group interview | Focus group data | - | | Trust of sender, confirmation bias, risk to protect friends from harm, age | Spread | N = 88 individuals, age and gender not mentioned |
| 22 | Effron and Raj (2020) | USA | Others | Quantitative | Experiment | Test scores | - | | Repetition, less unethical | Spread | (1) N = 138 individuals, 45.65% female, mean age = 34 years (SD = 13); (2) N = 796 individuals, 58.67% female, mean age = 34 years (SD = 12) |
| 23 | Faragó et al. (2019) | Hungary | Politics | Quantitative | Survey | Survey data | - | | Partisanship, conspiracy mentality | Spread | (1) N = 1,012 individuals, gender not mentioned, mean age = 45.99 years: (2) N = 382 individuals, 74.6% female, mean age = 22.10 years |
| 24 | Featherstone and Zhang (2020) | USA | Health | Quantitative | Experiment | Test scores | - | | Two-sided refutational messages, anger emotion | Spread | N = 69 individuals, mean age and gender not mentioned |
| 25 | Flostrand et al. (2019) | Not given | Business | Qualitative | Delphi | Delphi method data | - | | Affects brand management of businesses | Impact | N =42 academics, 43% female |

| 26 | Hansen and Schmidtbl aicher (2019) | Denmark | Health | Quantitative | Secondary | Log data | - | Vaccine hesitancy | Impact | Not mentioned |
|----|------|------|------|------|------|------|------|------|------|------|
| 27 | Humprech t (2019) | USA, UK, Germany, and Austria | Public engagement | Qualitative | Websites | News content | - | Trust in the government and in news media | Spread | 100 false news stories |
| 28 | Islam et al. (2020) | Banglades h | Others | Quantitative | Online survey | Survey data | Affordance lens and cognitive load theory | Motivational drivers (Self-promotion, entertainment), personal attributes (exploration, religiosity, deficient self-regulation), social media fatigue | Spread | N = 433 individuals, 37% female |
| 29 | Jang and Kim (2018) | USA | Politics | Quantitative | Survey | Survey data | Third-person perception | Third person effect | Impact | N = 1299 individuals, 51.2% female, mean age = 47.4 years |
| 30 | Kim and Dennis (2019) | USA | Politics | Quantitative | Experiment | Test scores | Cognitive dissonance theory | Presentation of article | Spread | N = 445 individuals, 50% female, 83% between 25 and 64 years |
| 31 | Kim et al. (2019) | USA | Others | Quantitative | Experiment | Test scores | - | Confirmation bias, source ratings (expert rating, user article rating, user source rating) | Spread | N = 590 individuals, 51% female |
| 32 | Koohikam ali and Sidorova (2017) | USA | Others | Quantitative | Survey | Survey data | Theory of planned behavior | Perceived information quality (enjoyment, relevance, and reliability), risk-taking propensity | Spread | N =379 students, 48% female, age between 18 and 25 years |

| 33 | Laato et al. (2020) | Bangladesh | Health | Quantitative | Online survey | Survey data | Health belief model (HBM), protection-motivation theory (PMT), cognitive load theory (CLT) | Trust in online information, information overload, perceived severity, perceived susceptibility. | Spread | N = 294 individuals, 40% female |
| 34 | Lee et al. (2022) | USA | Others | Quantitative | Survey | Survey data | the Gamson hypothesis | Third-person perception | Spread | N = 1026 individuals, 53% female, mean age = 44.41 |
| 35 | Lobato et al. (2020) | Not given | Health | Quantitative | Online survey | Survey data | - | Positive comments from other users, comments exposing the fake news, comments critically attacking both the fake news and its poster for promoting it. | Spread | N = 296 individuals, 39% female, mean age = 36.23 |
| 36 | Madrid-Morales et al. (2021) | Sub-Saharan Africa | Politics | Qualitative | Focus group | Focus group data | - | Civic duty, humor, political engagement, topic of fake news. | Spread | N = 94 students, 48% female |
| 37 | Mena (2019) | Not given | Politics | Quantitative | Experiment | Test scores | Third person effect | Third party effect | Spread | N = 501 individuals, 51.1% female, mean age = 36.31 years (SD = 11.18) |
| 38 | Moravec et al. (2019) | USA | Others | Quantitative | Experiment | Behavioral and electroencephalography (EEG) data | - | Confirmation bias (political opinion) | Spread | N = 83 individuals, 39% female |
| 39 | Ncube (2019) | Zimbabwe | Politics | Qualitative | Netnography | Observation data | - | Manipulating the people's will, | Impact | Not mentioned |

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| | | | | | | | | delegitimize the electoral process | | |
| 40 | Neyazi and Muhtadi (2021) | Indonesia | Politics | Quantitative | National survey | Survey data | Selective belief | Partisanship | Spread | N = 1,820 individuals |
| 41 | Pan et al. (2021) | China | Health | Quantitative | Online survey | Survey data | | Health-related anxiety, pre-existing misinformation beliefs, and repeated exposure | Spread | N= 22,706 individuals, 69.7% female, and 30.3% male, mean age = 31.13 years (SD = 9.51) |
| 42 | Pennycook and Rand (2018) | USA | Others | Quantitative | Survey | Survey data | Dual-process theory | Skill of media truth discernment, overclaiming level of knowledge, analytic thinking | Spread | N = 402 individuals, 48.75% female, mean age = 37.7 years; N = 402 individuals, 47.51% female, mean age = 36.4 years |
| 43 | Pennycook and Rand (2019) | USA | Politics | Quantitative | Experiment | Test scores | Dual process theory | Reasoning ability | Spread | N = 802 individuals, 51.62% female, mean age = 37.2 years; N = 1463 individuals, 54.7% female |
| 44 | Pennycook et al. (2018) | Not given | Politics | Quantitative | Experiment | Test scores | The Illusory Truth Effect | Exposure | Spread | (1) N = 409 individuals, 57.46% female, mean age = 35.8 years; (2) N = 949 individuals, 51.52% female, mean age = 37.1 years |
| 45 | Pennycook et al. (2021) | USA | Others | Quantitative | Survey, Experiment | Survey data, Test scores | - | Inattention to accuracy | Spread | (1) N = 1005 American individuals, 51.34% female, mean-age = 36.7 years; (2) N = 401 American individuals, 45.89% female; (3) N = 747 individuals from MTurk, 60.34% female, mean-age = 34.5 years; (4) N = 780 individuals from |

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| | | | | | | | | | | MTurk, 63.72% female, mean-age = 33.3 years; (5) N = 671 individuals from MTurk, 50.07% female, mean-age = 45.5 years; (6) 394 individuals from MTurk, 52.96% female, mean-age = 54.06 years |
| 46 | Pickles et al. (2021) | Australia | Health | Quantitative | Longitudinal survey | Survey data | - | | digital health literacy, perceived threat of COVID-19, confidence in government, trust in scientific institutions, age, gender, education level and spoken language. | Spread | (T1) N= 4362 individuals, (T2) N= 1882 individuals, (T3) = 1369 individuals |
| 47 | Polage (2012) | USA | Others | Quantitative | Experiment | Test scores | - | | Familiarity with false news stories, truthfulness and plausibility for these events, false memory | Spread | N = 38 students, age and gender not reported |
| 48 | Pundir et al. (2021) | India | Others | Quantitative | Online survey | Survey data | Theory of planned behavior | Awareness and knowledge, perceived behavioral control, attitudes toward news verification and fear of missing out | Spread | N= 400 individuals, 43.25% females, age between 18–30 years |
| 49 | Rampersa d and | Saudi Arabia | Others | Quantitative | Survey | Survey data | Technology acceptance model | Age, gender, education, culture, comprehensibility | Spread | N = 107 students, majority male, 58% between 21 and 30 years |

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|---|---|---|---|---|---|---|---|---|---|---|
| | Althiyabi (2020) | | | | | | | | | |
| 50 | Rustan (2020) | Indonesia | Others | Quantitative | Experiment | Test scores | - | Positive comments from other users, comments exposing the fake news, comments critically attacking both the fake news and its poster for promoting it. | Spread | N = 60 students, age and gender not mentioned |
| 51 | Spohr (2017) | USA and UK | Politics | Qualitative | Case | Case data | - | Ideological polarization | Impact | Not mentioned |
| 52 | Su (2021) | USA | Health | Quantitative | Online survey | Survey data | - | Discussion heterogeneity preference, worry about COVID-19, faith in scientists | Spread | N = 482 individuals, 44.4% female, mean age = 40.62(SD = 13.95) |
| 53 | Talwar et al. (2019) | India | Others | Quantitative | Survey | Survey data | Social comparison theory, Self-determination theory, Rational choice theory | Online trust, self-disclosure, fear of missing out (FoMO), social media fatigue, social comparison | Spread | N = 1022 WhatsApp users, 73.7% female, mean age = 22.19 years (SD = 3.05) |
| 54 | Talwar et al. (2020) | India | Others | Quantitative and qualitative | Survey | Open ended essays; survey data | Third-person effect hypothesis and honeycomb framework of social media | Active Corrective Actions on Fake News, instantaneous Sharing of News for Creating Awareness, passive Corrective Actions on Fake News | Spread | (1) N= 58 individuals, 53.4% female. (2)N= 471, 58% female, mean age = 21 years; N = 374, 55% female, mean age = 20 years. |

| 55 | Tan and Hsu (2022) | Taiwan | Health | Quantitative | Survey | Survey data | Psychological distance, Construal level theory | Worry, Surprise | Spread | (1) N = 299 individuals |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | Vargo et al. (2018) | Others | Journalism | Quantitative | Secondary | News content | Agenda-setting theory; Network Agenda-Setting (NAS) model | Sets agenda of partisan media | Impact | Not mentioned |
| 57 | Velichety and Shrivastava (2022) | Others | Business | Quantitative | Secondary | Twitter data, company reports | Negative bias | Equity value of social media platform | Impact | Tweets, reports |
| 58 | Visentin et al. (2019) | USA | Business | Quantitative | Experiment | Test scores | Source credibility theory | Perceptions of the news 'credibility, perceived credibility of the sources, brand trust, brand attitudes. | Impact | N = 400 individuals, 47% female, age not mentioned |
| 59 | Wasserman and Madrid-Morales (2019) | Kenya, Nigeria and South Africa | Journalism | Quantitative | Survey | Survey data | - | Age, TV news consumption, perceived exposure to fake news | Spread | N = 1847 individuals |
| 60 | Zheng et al. (2022) | US and China | Health | Quantitative | Secondary | National surveys, reports | Protective action decision model (PADM) | Pandemic severity, perceived control | Spread | NA |
| 61 | Zhou et al. (2021) | China | Health | Quantitative | Social media platform | Textual data | Social support theory | Health caution and advice, help seeking misinformation, emotional support, level of ambiguity and richness | Spread | NA |