



The Impact of Affect on the Perception of Fake News on Social Media: A Systematic Review

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Abstract: Social media platforms, which are ripe with emotionally charged pieces of information, are vulnerable to the dissemination of vast amounts of misinformation. Little is known about the affective processing that underlies peoples' belief in and dissemination of fake news on social media, with the research on fake news predominantly focusing on cognitive processing aspects. This study presents a systematic review of the impact of affective constructs on the perception of fake news on social media platforms. A comprehensive literature search was conducted in the SCOPUS and Web of Science databases to identify relevant articles on the topics of affect, misinformation, disinformation, and fake news. A total of 31 empirical articles were obtained and analyzed. Seven research themes and four research gaps emerged from this review. The findings of this review complement the existing literature on the cognitive mechanisms behind how people perceive fake news on social media. This can have implications for technology platforms, governments, and citizens interested in combating infodemics.

Keywords: fake news; misinformation; affect; emotion; social media; belief; intent to share



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1. Introduction

While the practice of fabricating news has a history dating back to the early twentieth century (Lazer et al. 2018), every iteration of technological progression has provided new opportunities for news fabrication (Gelfert 2018). A case in point is the advent of social media platforms, which have introduced new methods for generating, spreading, and consuming problematic information on an unprecedented scale (Lewandowsky et al. 2012). Notably, these platforms are characterized by an abundance of emotionally charged content that users encounter during their browsing activities (Effron and Raj 2020). This exposure can elicit various emotional reactions, potentially shaping how users engage with news-related posts and leading to various behaviors including sharing, commenting, messaging, and liking (Kim and Yang 2017). Despite this, research on fake news in the context of social media has largely neglected the influence of affect on how users perceive fake news (Kim and Yang 2017; Bakir and McStay 2018; Vosoughi et al. 2018) and has focused instead on the impact of cognitive factors on one's ability to identify fake news (Lazer et al. 2018; Vafeiadis and Xiao 2021; Bronstein et al. 2019; Pennycook and Rand 2019a). Indeed, the absence of affect in the research on fake news neglects one of the main mechanisms by which users interact with news on social media. Consequently, intervention methods that assume users to be purely cognitive may not effectively improve users' ability to discern fake news from real news. This is of importance seeing that significant investments from media organizations, governments, and academics alike have been dedicated to implementing methods and technologies aimed at combatting the flow and influence of fake news on social media (Osmundsen et al. 2021).

Scientific research on fake news contributes to an improved understanding of its spread, impact, and underlying cognitive and affective mechanisms, enabling the development of

effective strategies to counter its negative effects on society (Lewandowsky et al. 2012). This is especially important from a social media standpoint, where the unfettered access afforded by social media platforms has enabled greater exposure of the masses to a plethora of information from a multitude of sources at practically no cost (Ghenai and Mejova 2018). Indeed, with the onus for quality control of social media content on regular users who are generally neither trained nor accustomed to validating the news before reading or sharing it (Bode and Vraga 2018; Solovev and Pröllochs 2022), social media users fall victim to the phenomenon of fake news daily (Horner et al. 2021; Shao et al. 2018), contributing to its rapid spread (Lazer et al. 2018; Vosoughi et al. 2018; Langing 2018; Moravec et al. 2018; Wang et al. 2019). One example of the negative impact of fake news on social media platforms is the hostility towards health workers that was created by social media rumors circulating during the Ebola outbreak in 2014. This resulted in challenges to efforts to control the epidemic (Chou et al. 2018). According to Fahmy et al. (2023), fake social media accounts play a significant role in accelerating the spread of false information, as they can reach a large number of users in a short amount of time. This effect is further amplified by the vast volume of data circulating through social media platforms and the increasing number of users who rely on these platforms as their primary source of news, often from unverified sources (Gottfried and Shearer 2016; Besalú and Pont-Sorribes 2021). To that effect, research has indicated that 9 out of 10 Twitter users primarily turn to Twitter for their news (Rosenstiel et al. 2015). Consequently, it comes as no surprise that multiple studies have emphasized the importance of investigating the mechanisms behind information dissemination and the various factors contributing to the viral propagation of fake news on social media (Vosoughi et al. 2018; Osmundsen et al. 2021; Horner et al. 2021; Ali et al. 2022; Allcott and Gentzkow 2017; Apuke and Omar 2021; Chadwick et al. 2022; Freiling et al. 2023; Pennycook et al. 2018; Pennycook et al. 2020; Pennycook and Rand 2018; Pröllochs et al. 2021; Shin et al. 2018; Talwar et al. 2019).

The circulation of fake news on social media has therefore emerged as a major concern (Khan and Idris 2019; Baptista and Gradim 2020, 2022). Added to that is our observation that scientific investigations concerning fake news on social media have predominantly deviated from understanding the influence of affect on the perception of fake news among users of these platforms. In light of these findings, we set out to perform a systematic literature review of peer-reviewed articles to identify, analyze, and synthesize existing research on the impact of affect on the perception of fake news on social media platforms. We focus on the psychological impact of affect, which is one of the most immediate impacts and which could potentially lead to other societal level impacts such as polarization. We refer to the term “affect” because this terminology is consistent with the literature in the field of psychology and information systems. Specifically, this review attempts to answer the following questions:

- RQ1: Which theories have been employed to investigate how affect influences (i) belief in fake news on social media platforms and (ii) the inclination to share fake news on social media platforms?
- RQ2: What research themes have been discerned in the literature concerning the impact of affect on how fake news on social media platforms is perceived?
- RQ3: What areas of research deficiency have been revealed in the existing literature pertaining to the influence of affect on the perception of fake news on social media platforms?

By systematically collecting, summarizing, analyzing, and synthesizing findings from multiple studies across two databases, this review will help researchers and readers gain a better understanding of the current state of knowledge regarding the impact of affect on the perception of fake news from a social media standpoint. Core affect is an umbrella concept that includes all affective variables and can be defined as “a simple non-reflective feeling that is an integral blend of hedonic (pleasure-displeasure) and arousal (sleepy-activated) values” (Russell 2003), (p. 147). To that effect, we referred to the affective response model (ARM), a theoretically bound conceptual framework that provides a reference map for information and communication technology (ICT) studies that consider

affect (Zhang 2013). Developed from the psychology and social sciences literature, the ARM model provides a foundation for technology-specific affective concepts and has been used to study emotion (Cai et al. 2020). Specifically, we used ARM as our framework to categorize different affective variables: (1) Mood: “a prolonged affective state that has an unclear or unknown stimulus” (Zhang 2013) (p. 250); (2) Emotion: “an affective state induced by or attributed to a specific stimulus” (Zhang 2013) (p. 251); and (3) Affective Cues: technology features that manifest the affective quality of the technology and represent properties of the stimulus (such as the social media platform and news headline characteristics) that contain affective information independent of the perceiver (Zhang 2013). Affective cues can trigger spontaneous affective reactions among social media users and a corresponding behavioral approach reaction toward these cues, resulting in behavior including liking, commenting, or sharing (van Koningsbruggen et al. 2017). Through this review, we aim to obtain a more holistic view on the impact of affect on the perception of fake news on social media by identifying themes of this topic and uncovering gaps in current knowledge and areas where the research is lacking. The findings of this review can therefore provide insights on methods to improve users’ ability to discern fake news from real news on social media. They can also inform social media design such that it can counter the flow and influence of fake news that we are witnessing today.

1.1. Background

1.1.1. “Misinformation”, “Disinformation”, and “Fake News”

The umbrella of ‘problematic information’ includes diverse information modalities comprising misinformation, disinformation, and fake news, with the latter term being the most popular (Serrano-Puche 2021). Egelhofer and Lecheler (2019) argue that these terms are often used interchangeably, rendering the literature on false information plagued with terminological vagueness. While these terms are used to describe inaccurate or misleading information, they differ in important ways. In addition, the literature is not aligned regarding the definition of misinformation. For instance, misinformation is generally defined as information that is unintentionally inaccurate and misleading (Lewandowsky et al. 2012). Yet, according to Martel et al. (2020), misinformation is considered by many as false information that is spread, regardless of whether there is intent to mislead. Disinformation, on the other hand, refers to deliberately false or misleading information that is disseminated with the intent of causing harm or influencing public opinion (Lazer et al. 2018; Bakir and McStay 2018). Finally, the phenomenon of fake news is defined as online content that is fabricated, misleading, provided in a false context, or implying a false connection (Allcott and Gentzkow 2017; Wardle and Derakhshan 2018). In this work, we use the term “fake news” to refer to all types of misinformation and disinformation and adopt Lazer et al.’s definition of fake news as “fabricated information that mimics news media content in form but not in organizational process or intent” (Lazer et al. 2018, p. 1094), as it is the most prevalent and has been repeatedly cited in the fake-news literature.

1.1.2. Classifications of Emotion in Misinformation Studies

As will be discussed in detail in the results section, studies on misinformation have distinguished between dimensional, discrete, epistemic, non-epistemic, self-conscious, and other-condemning views of emotions. The dimensional view focuses solely on the emotional valence conveyed by a piece of information, i.e., whether it is positive, negative, or neutral (Vosoughi et al. 2018). The discrete view of emotion, on the other hand, contends that different emotions have unique causes as well as behavioral or physiological consequences (Ekman 1992; Lazarus 1999). Epistemic emotions are related to the perceived quality of knowledge and the processing of information (Pekrun and Stephens 2012) and arise from cognitive evaluations of how new information aligns or misaligns with existing knowledge or beliefs (Muis et al. 2018). Finally, research on misinformation distinguishes between two clusters of moral emotions: “self-conscious” emotions, comprising shame,

pride, and guilt and “other-condemning” emotions, comprising contempt, anger, and disgust (Tracy and Robins 2008).

1.1.3. Two Research Streams Model Misinformation and Disinformation

The widespread misinformation on social media platforms has inspired scholars across disciplines to attempt to understand, describe, and model the phenomena of misinformation and disinformation (Gradoñ et al. 2021; Gwebu et al. 2022). These efforts aim to identify important features that help assess the veracity of information and influence its diffusion on social media, including machine learning methods (Gradoñ et al. 2021; Solovev and Pröllochs 2022), data- and text-mining techniques in misinformation detection (Zhou et al. 2021), sentiment analysis (Charquero-Ballester et al. 2021; King and Wang 2023), structural equation modeling (Dabbous et al. 2022), regression analysis (Khan and Idris 2019), feature extraction (Solovev and Pröllochs 2022), data science and complex networks (Kivela et al. 2014), and agent-based models of misinformation spreading (Skaza and Blais 2017). Two broad research streams have emerged this work: information veracity and information diffusion (Hoang and Mothe 2018). Information veracity research involves the use of prescriptive analysis (Shin et al. 2018; Hoang and Mothe 2018) and focuses on proactive measures such as detection. It utilizes cues related to linguistic properties and social network characteristics to identify false information (Conroy et al. 2015; Rubin et al. 2015). Information diffusion research, on the other hand, focuses on antecedents to posts’ virality for predictive and descriptive analysis. This research stream has identified three types of features, including user-based, time-based, and content-based features (Hoang and Mothe 2018), which are used to predict or describe the spread of information.

2. Materials and Methods

A systematic literature review was conducted following the procedure undertaken in the review performed by Pare et al. (2007). The study followed the PRISMA guidelines, and the registration number is CRD42023477823. Inclusion and exclusion criteria were established. The inclusion criteria required that the studies (1) be empirical, i.e., have an experimental design involving direct data collection from participants, (2) be published in the English language and appear in peer-reviewed journals, and (3) refer to affect in the context of fake news and/or misinformation and/or disinformation. The exclusion criteria comprised studies on fake news and/or misinformation and/or disinformation that (1) did not refer to affect, (2) investigated the impact of affect only on attitude towards fake news, (3) investigated the impact of the exposure to fake news on affect, but did not investigate the subsequent impact of affect on the perception of fake news, (4) referred to emotionality as a personality trait and not as an emotion, and (5) focused on features such as sentiment of individuals on social media that are posting misinformation.

Once the review questions were finalized, keywords were identified based on the review questions and a high-level overview of the literature on the topic of fake news. When choosing keywords related to emotion, we referred to the basic affective concepts of the affective response model (ARM) (Zhang 2013). As a result, we used the following string: (“fake news” OR “misinformation” OR “disinformation” OR “fals* news”) AND (“emotion*” OR “sentiment” OR “core affect” OR “mood” OR “affective quality” OR “temperament” OR “attitude”) to search the SCOPUS and Web of Science databases. This identified 1010 peer-reviewed articles. A screening of the titles, abstracts and keywords of these articles excluded 946 records, leaving 64 articles to be assessed for eligibility. A full text review of these 64 articles led to the exclusion of 35 articles from the review process. A forward and backward search on Google Scholar of the remaining 29 eligible articles added 8 articles to the list (3 articles from the forward search and 5 articles from the backward search). Full text screening of these 8 articles led to the exclusion of 6 articles, leaving a total of 31 articles that were included for systematic review. Figure 1 outlines the literature review process undertaken. The full list of excluded articles along with the reasons for exclusion is included in Appendix A.

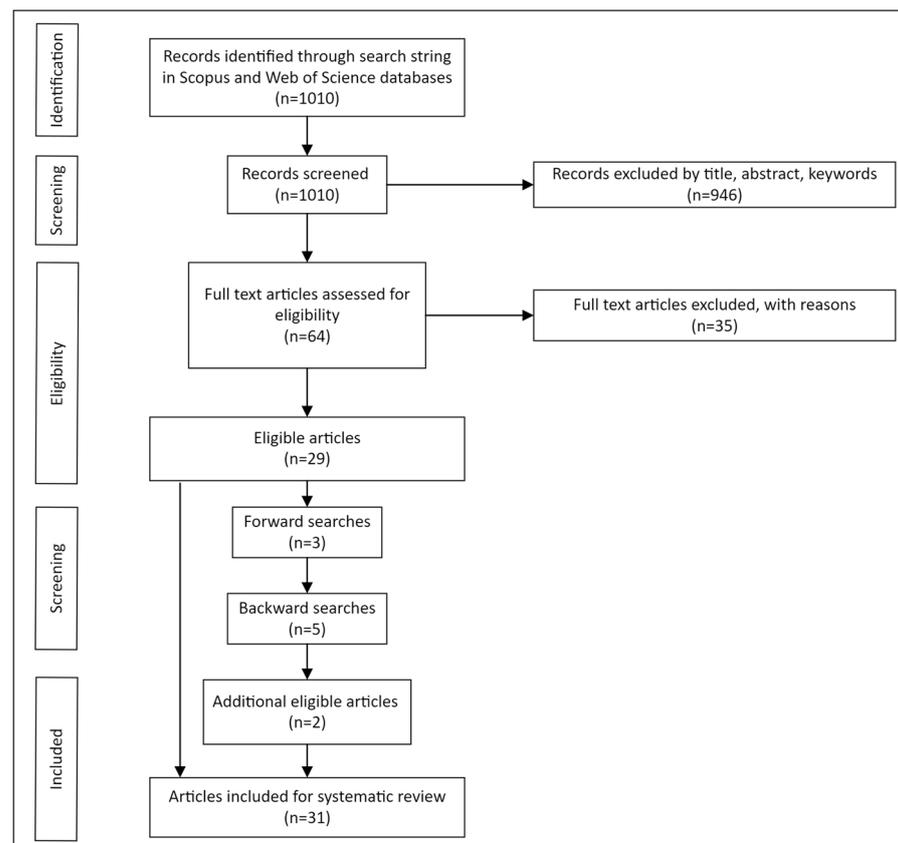


Figure 1. The literature review process.

3. Results

Seven research themes and four research gaps regarding the impact of affect on the perception of fake news were identified upon analyzing the corpus.

3.1. Descriptive Statistics

Among the 31 studies that were analyzed in this review, 20 were online experiments, 1 was a lab experiment, and 10 were studies that performed content analysis which included text mining, sentiment analysis, readability, textual analysis, and natural language processing (NLP). The articles discussed four main disciplines, with 29% of the articles from the health discipline, 13% from politics, 10% from psychology, and 48% from sociology. In total, 28 studies focused on either the dimensional or the discrete view of emotion. Two studies investigated the relationship between emotion—from both a dimensional and a discrete view—and the spread of fake news. One study distinguished between moral and non-moral emotions in social media content. Two studies distinguished between epistemic and non-epistemic emotions. In total, 14 articles in the corpus delved into how affective cues influence the way fake news is perceived, while 17 articles explored how peoples' emotions affect their perception of fake news; 16 of the 17 articles examining the influence of affect on the perception of fake news utilized questionnaires and self-report measures to measure affect, and 1 article measured emotion through neurophysiological measures.

3.2. Theories in Misinformation Studies That Include Affect

Appendix B displays a comprehensive list of the 18 theories that were cited in 21 of the examined articles. Each study is accompanied by its corresponding finding(s). As demonstrated in Figure 2, the most common theory cited in the examined literature was the dual-process theory of cognition (Smith and DeCoster 2000), which was informed by 30% of the corpus (7 of 21 articles). The second most prevalent theory in the corpus was the theory of motivated reasoning (Kunda 1990), which was informed by approximately 24%

(5 of 21 articles) of the corpus. Finally, approximately 15% (3 of 21 articles) of the corpus cited the theory of cognitive dissonance (Festinger 1957).

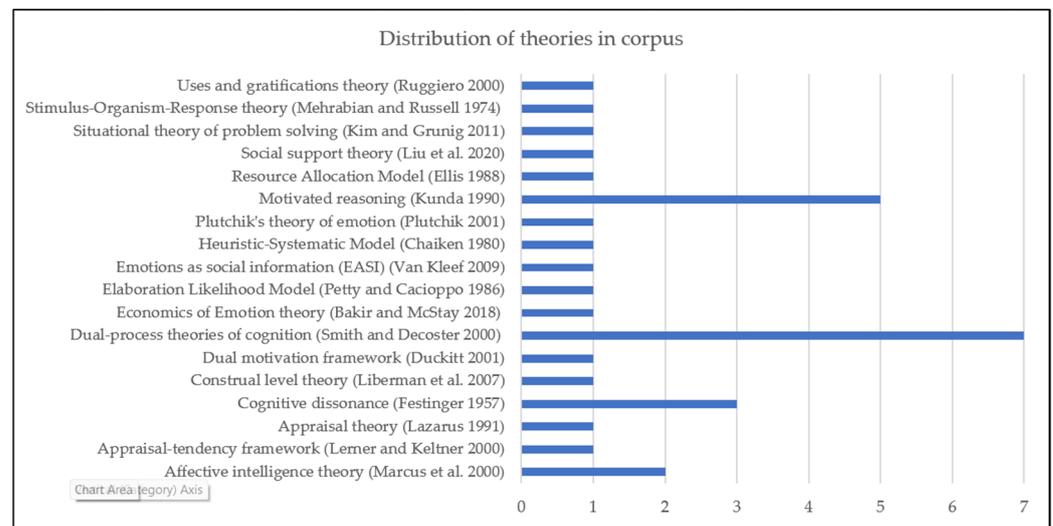


Figure 2. Distribution of 18 theories cited in 21 studies in the corpus (Ruggiero 2000; Mehrabian and Russell 1974; Kim and Grunig 2011; Liu et al. 2020; Ellis 1988; Kunda 1990; Plutchik 2001; Chaiken 1980; Van Kleef 2009; Petty and Cacioppo 1986; Bakir and McStay 2018; Smith and DeCoster 2000; Duckitt 2001; Liberman et al. 2007; Festinger 1957; Lazarus 1991; Lerner and Keltner 2000; Marcus et al. 2000).

3.3. Research Themes and Research Gaps

The following sections describe the research themes and gaps uncovered in this systematic review.

3.3.1. Research Themes

1. The relevance of affect in fake-news research.

Understanding the belief in and sharing of fake news can be intricate and can entail cognitive or emotional implications (Scheibenzuber et al. 2022). Consequently, the realm of fake-news research covers a wide range of studies, some of which are designed to prompt users to exercise a greater level of critical scrutiny when engaging with social media content (Kim and Dennis 2019; Moravec et al. 2018), others that use warning messages (Gwebu et al. 2022), and studies that redesign the warnings and train the users (Moravec et al. 2018). According to Horner et al. (2021), there is evidence in these studies that emotion is a powerful antecedent to some of the actions taken by users. The importance of affect in fake-news research was also highlighted by Kramer et al. (2014), who argued that the presence of “emotional contagions” (i.e., emotional states that are transferable from one person to another) in social media allows creators of fake news to manipulate readers into consuming and propagating fake news. In the same vein, studies by Horner et al. (2021) and Rijo and Waldzus (2023) argued that information systems research has demonstrated that emotions can better predict problematic social media use than conventional factors such as usefulness and satisfaction. To that end, viral misinformation was found to be associated with emotionally charged words and decreased objectivity (Jiang and Wilson 2018). Given that sentiment data are obtainable in the early stages of fake news propagation, a time when insights into the dynamics of dissemination are scant, Pröllochs et al. (2021) proposed that regulating the emotional content in social media posts could serve as a potential strategy for platforms to devise an effective approach to mitigating the spread of false rumors. Finally, several studies have demonstrated that fake news is often aimed at eliciting high emotionality (Bakir and

McStay 2018; Brady et al. 2017; Horne and Adali 2017). This notion stems from studies that have recognized emotions as a possible cause of inaccurate intuitive reactions and people's lack of deliberation (Holland et al. 2012; Slovic et al. 2007). This is in line with findings by Pennycook and Rand (2019b), who found that when people engage in deliberate thinking, they are more likely to accurately distinguish fake news from real, compared with when they rely on their intuitions. Consequently, affect seems to be a relevant yet understudied topic when investigating peoples' perception of fake news on social media.

2. Classification of misinformation studies that investigate the impact of affect. The literature examined in this review can be classified into two broad groups: (i) literature investigating the impact of affective cues on the perception of fake news and (ii) literature investigating the impact of peoples' emotions on the perception of fake news. Within the latter group, there is an additional specification that further divides the literature into two groups: studies investigating the impact of peoples' emotions prior to their exposure to fake news content, and studies focusing on the impact of peoples' emotions as an outcome of their exposure to misinformation (i.e., after participants in the studies have been exposed to fake news). One exception is the study by Swami et al. (2016), in which participants completed measures of belief in conspiracy theories, trait anxiety, and state anxiety, which were presented to them in a random order. As such, while that study examined the relationship between emotion (anxiety) and belief in conspiracy theories, it is not possible to classify it solely into one group. According to Chadwick et al. (2022), most prior research on misinformation focuses on specific emotions triggered by the information content itself, rather than on general affective orientations that different users have toward news and the environments through which they acquire it. We observed this to be the case—as demonstrated in Table 1 where the list of studies focusing on the impact of emotion as a result of exposure to misinformation is longer than the list of studies investigating the impact of emotion prior to presentation of stimuli.

Table 1. Classification of misinformation studies that investigate the impact of emotion on the perception of fake news.

Literature Investigating the Impact of Affective Cues on the Perception of Fake News	Literature Investigating the Impact of Peoples' Emotions on the Perception of Fake News	
	Prior to Participants' Exposure to Fake News Content	After Participants' Exposure to Fake News Content
Ali et al. (2022)	Freiling et al. (2023)	Bago et al. (2022)
Charquero-Ballester et al. (2021)	Martel et al. (2020)	Chadwick et al. (2022)
Cheung-Blunden et al. (2021)	Filkuková and Langguth (2021)	Corbu et al. (2021)
Chin and Zanuddin (2022)	Swami et al. (2016)	Horner et al. (2021)
Deng and Chau (2021)	Tomljenovic et al. (2020)	Li et al. (2022)
King and Wang (2023)	Weeks (2015)	Lutz et al. (2023)
Lee et al. (2022)		Pehlivanoglu et al. (2022)
Osmundsen et al. (2021)		Rijo and Waldzus (2023)
Osatuyi and Hughes (2018)		Rosenzweig et al. (2021)
Pröllochs et al. (2021)		Swami et al. (2016)
Scheibenzuber et al. (2022)		Tan and Hsu (2023)
Solovev and Pröllochs (2022)		Wang et al. (2020)
Vosoughi et al. (2018)		
Zhou et al. (2021)		

3. Classifications of emotion in misinformation studies. *Dimensional vs. discrete emotion*—28 of the 31 studies examined in this review focused on either the dimensional or the discrete view of emotion. The majority of the articles (23 of 31) used a discrete model of emotion, while 9 studies used a dimensional model of emotion. Two studies (Pröllochs et al. 2021; Cheung-Blunden et al. 2021) investigated the relationship between emotion—from both a dimensional and a discrete view—and the spread of fake news. Specifically, the study by Pröllochs et al. (2021) examined rumor cascades on Twitter by categorizing the language into sentiment

(distinguishing between positive and negative) and the eight basic emotions (namely anger, anticipation, joy, trust, fear, surprise, sadness, and disgust) (Plutchik 2001). By doing so, the authors analyzed whether sentiment words (i.e., conveying sentiment), as well as different emotional words (i.e., basic emotions), in social media content explained differences in the spread of true vs. false rumors. In a similar vein, Cheung-Blunden et al. (2021) demonstrated how the detailed and specific discrete emotion viewpoint outperforms the broad and generalized dimensional view of emotion in uncovering the emotional factors that drive the popularity of tweets. These two studies highlighted the importance of incorporating both sentiment (dimensional view of emotion) and basic emotions (discrete view of emotion) when investigating the structural properties of fake news. It was not possible to classify the model of emotion used in Lutz et al. (2023), since emotion in that study was measured using neurophysiological measures (electrocardiography and eye-tracking). *Epistemic vs. non epistemic emotion*—two studies in the corpus distinguished between epistemic and non-epistemic emotions. For starters, the findings by Martel et al. (2020) of (i) a positive correlation between increased emotional intensity and an increased belief in fake news and (ii) a negative correlation between increased emotionality and the ability to differentiate between true and fake headlines, applied to several emotional states as measured on the PANAS scale (Watson et al. 1998). However, this pattern did not hold for emotions associated with analytical thinking, such as “interest”, “alert”, “determined”, and “attentive”. This suggested that these “epistemic” emotions may elicit different processes in peoples’ perceptions of fake news. The second work on epistemic emotions is a recent study by Rijo and Waldzus (2023) that investigated whether the relation between participants’ existing political beliefs and their (i) accuracy judgements and (ii) inclination to share both fake and real news is mediated by epistemic emotional reactions, namely surprise and interest, and perceived credibility, namely, trustworthiness, rigorosity, and impartiality. The results of the study indicated that the inclination to share fake news was not entirely accounted for by emotional reactions and credibility perceptions, suggesting once again that emotions tied to epistemic experiences may trigger distinct cognitive processes in how individuals perceive fake news. Again, this classification of emotions highlighted the importance of distinguishing between epistemic vs. non epistemic emotions when investigating their impact on the perception of fake news. *Self-conscious vs. other-condemning moral emotion*—research by Brady et al. (2017) distinguished between moral and non-moral emotional expressions in social media content. To that effect, another classification of emotions in the context of misinformation was evident in the work of Solovev and Pröllochs (2022), who provided evidence concerning the distinctive impacts of two moral emotion categories, self-conscious emotions and other-condemning emotions, within the context of spreading both true and false rumors on social media. The authors found that when the source tweets predominantly featured other-condemning moral emotions, false rumors received more engagement in the form of retweets compared with true ones. Conversely, a higher occurrence of self-conscious moral emotion words was associated with a more limited dissemination of information. This emphasized the importance of categorizing emotions into moral and non-moral, as well as distinguishing between these categories when examining how emotions affect people’s beliefs and their inclination to share false news.

4. Measurement of emotion.

In 16 of the 17 articles investigating the impact of peoples’ emotions on the perception of fake news, emotion was measured through questionnaires and self-report measures. To that end, four of the studies (Chadwick et al. 2022; Martel et al. 2020; Pehlivanoglu et al. 2022; Li et al. 2022) used the PANAS scale (Watson et al. 1998). Two of the studies (Bago et al. 2022; Rosenzweig et al. 2021) measured the six distinct basic emotions (Ekman 1992) using icons. One study by Tomljenovic et al. (2020) developed its own scale (emotions towards vaccination—ETV scale). Swami

et al. (2016) used the State–Trait Anxiety Inventory (STAI) (Spielberger 1983) to measure anxiety. Horner et al. (2021) used the Discrete Emotions Questionnaire (DEQ) (Harmon-Jones et al. 2016). Epistemic emotion (interest and surprise) was measured by Rijo and Waldzus (2023) using a seven-point scale (1 = very little, 7 = very much). Corbu et al. (2021) measured anger, fear, contentment, and enthusiasm using a scale adjusted from Harmon-Jones et al. (2016). Finally, several studies assessed emotional responses using different five-point Likert scales (Tan and Hsu 2023; Wang et al. 2020; Weeks 2015) and seven-point Likert scales (Freiling et al. 2023; Filkuková and Langguth 2021). The study by Lutz et al. (2023) is the only study in this review that measured emotion strictly using neurophysiological processes, namely eye tracking and heart-rate measurements. Among the studies that investigated the impact of affective cues on the perception of fake news, emotion was assessed using different techniques including text analysis, manual content analysis, coding, sentiment analysis, text mining, and readability analysis.

5. Emotion as a mediator in the processing of fake news.
Emotional framing, a technique used to insidiously convey misinformation, occurs when negative emotions are activated in context, and has been shown to be a frequent instrument of fake-news dissemination (Scheibenzuber et al. 2022, 2023). To that end, in his conceptual framework for understanding the role played by emotions in ‘information disorder’, Serrano-Puche (2021) referred to the role of emotions in mediating the framing effect process. Some of the empirical studies reviewed in this work have suggested a mediating role of emotion on misinformation processing. For starters, Wang et al. (2020) introduced a model implicating cognitive dissonance as a factor in the spread of misinformation, with negative emotions playing a mediating role. In this model, misinformation triggers negative emotions, which contribute to its dissemination. In a similar vein, Rijo and Waldzus (2023) identified that participants’ negative views of the political system intensified their emotional reactions to both true and false news, ultimately shaping their perceptions of credibility. As a result, there was an increase in accuracy attributions of news and a greater willingness to share it, regardless of its truthfulness. Corbu et al. (2021) also identified a mediating effect of negative emotions and found that provoking anger and fear (but not enthusiasm and contentment) was an important explanatory factor that predicted peoples’ willingness to share fake news. Finally, a nationwide survey conducted by Li et al. (2022) observed that elevated levels of negative emotions were correlated with a diminished ability to discern false headlines from true ones, implying that negative emotions could mediate accurate discernment.
6. Emotion as a moderator in the processing of fake news.
Amongst the articles examined in this review, two articles provided evidence for the moderating role of emotion in the perception of fake news. To begin with, in the context of COVID-19 fake news on Twitter, work by Solovev and Pröllochs (2022) found false rumors to be more viral than the truth if the source tweets contained a high number of other-condemning emotion words. Conversely, the prevalence of self-conscious emotion words in a source tweet was linked to less viral spread. These findings suggested that moral emotions may moderate the veracity effect. The second study was by Weeks (2015), who provided evidence that the independent experience of anger and anxiety moderated (heightened or dampened) partisanship bias when participants considered the veracity of misinformation.
7. Mixed findings on the impact of emotion on the perception of fake news.
When exploring how emotions relate to individuals’ inclination to believe information, there are two contrasting theories. The assimilative–accommodative model (Bless and Fiedler 2006) contends that positive and negative emotions have varying effects on individuals’ perception of the accuracy of information because they differentially influence their processing strategies. According to this theory (which has limited support in the fake-news literature), people experiencing positive emotions tend to lean

toward heuristic processing strategies, while those in negative emotional states tend to favor more deliberate and effortful processing strategies (Bless and Fiedler 2006). On the other hand, the resource allocation model (Ellis 1988), which can be classified under the dual-process models of cognition (Smith and DeCoster 2000), posits that both positive and negative emotions promote heuristic information processing strategies because they increase irrelevant thoughts that occupy cognitive resources and reduce the effort that would otherwise be allocated to cognitive tasks (Ellis 1988). As shown in Appendix B, the dual-process models of cognition have been informed by seven studies that investigated the role of emotion on susceptibility to misinformation. The following section of this review suggests an additional layer of complexity, in which the corpus provided mixed findings regarding the impact of emotional valence as well as the impact of discrete emotions on belief in and the spread of misinformation. From a dimensional view of emotion, findings regarding the impact of emotional valence on belief in misinformation are mixed. For instance, work by Filkuková and Langguth (2021) provided evidence that both positive and negative emotional reactivity are associated with increased susceptibility to misinformation. Meanwhile, Chin and Zanuddin (2022) demonstrated that individuals who are skeptical of fake news often exhibit negative emotions while consuming information on Facebook. Additionally, those who comment with negative emotions are more likely to assert that the news is fake. In contrast, Pehlivanoglu et al. (2022) demonstrated that lower positive and higher negative affect in participants were not associated with more accurate detection of fake news. The examined corpus investigating the impact of emotional valence on the spread of misinformation was also divided in terms of findings. To begin with, work by Wang et al. (2020) provided evidence for the mediating effect of negative emotion on misinformation processing and diffusion, whereby misinformation triggers negative emotions leading to its diffusion. In a similar vein, Scheibenzuber et al. (2023) employed natural language processing (NLP) to analyze the content of online discussions and demonstrated that emotional framing, which activates mostly negative emotions, was a frequent instrument of fake news dissemination. In the context of politics, Chadwick et al. (2022) provided evidence that provoking negative affective orientation toward news on social media was an important explanatory factor that predicted the amplification of false news. Similarly, King and Wang (2023) found that negative sentiment propelled diffusion of misinformation by demonstrating that individuals are more prone to retweet misinformation with a negative tone (such as tweets expressing sadness) in comparison to misinformation with a positive or neutral tone. This finding aligns with the findings of Osatuyi and Hughes (2018), who revealed that creators of false information often favor negative sentiments to attract sharing. Contrary to these findings, Pröllochs et al. (2021) found that false rumors had a higher likelihood of becoming viral if they contained a greater share of terms linked to a positive sentiment. Additionally, work by Li et al. (2022) did not find a mediating effect of emotion (positive or negative) on the spread of misinformation. Finally, Charquero-Ballester et al. (2021), who performed sentiment analysis of COVID-19 misinformation on Twitter, demonstrated that misinformation does not generally lean towards a certain emotional valence. From a discrete view of emotion, research on the impact of discrete emotions on belief in misinformation suggests that heightened emotionality can affect the accuracy of peoples' belief in fake news. For starters, Martel et al. (2020), who assessed the role of momentary mood states on belief in fake news, found that heightened non-epistemic emotions predicted a greater belief in fake (but not real) news posts on social media and a diminished truth discernment. In a similar vein, Rosenzweig et al. (2021) demonstrated that experiencing any emotional reaction (as opposed to no emotion) was associated with worse truth discernment. When exploring the relationship between experiencing specific emotions and susceptibility to fake news, Bago et al. (2022) observed that with the exception of anger, overall emotional response to the headlines was associated with decreased truth discernment.

In the study by [Li et al. \(2022\)](#), only heightened negative emotionality was associated with diminished truth discernment. Meanwhile, a study by [Ali et al. \(2022\)](#) identified contrasting two-way interaction effects between individuals' attitudes and the emotions of anger and fear on individuals' perceptions of the credibility of fake news in the context of vaccination. More precisely, anger caused individuals who held a neutral stance on vaccination to view the fake news as less credible, while fear led individuals who were against vaccination to perceive the fake news as more credible. In a similar vein, [Deng and Chau \(2021\)](#)¹, who examined the impact of angry and sad expressions in online news on how readers perceived the news, discovered that expressions of anger (but not sadness) diminished the believability of the news. The study by [Swami et al. \(2016\)](#) demonstrated a significant correlation between trait anxiety and belief in conspiracy theories, and work by [Freiling et al. \(2023\)](#) determined that anxiety played a pivotal role in belief in various types of claims. Lastly, [Tomljenovic et al. \(2020\)](#) found that stronger beliefs in vaccine conspiracy theories were linked to heightened negative emotions towards vaccination, including anger, fear, disgust, anxiety, repulsion, and worry. When considering research on the impact of discrete emotions on the spread of misinformation, [Horner et al. \(2021\)](#) synthesized a process model explaining how discrete emotional reactions impact sharing behaviors and lead to the dissemination of fake news. This study revealed that individuals reporting elevated levels of negative emotions, including anger, disgust, fear, anxiety, and sadness, and lower levels of positive emotions, including desire, relaxation, and happiness, were more inclined to suppress the propagation of fake news and less likely to contribute to its dissemination. On the other hand, a seminal study by [Vosoughi et al. \(2018\)](#) delved into the analysis of over 12,000 news stories on Twitter and revealed that false information propagated significantly farther, more rapidly, more extensively, and to a larger audience than the truth, because it led to emotional responses including fear, disgust, and surprise. Utilizing the same Twitter dataset employed by [Vosoughi et al. \(2018\)](#), [Pröllochs et al. \(2021\)](#) measured emotions conveyed in the responses to the news stories and ascertained that a higher prevalence of anger in the responses was linked to a greater number of viral cascades for false rumors. Additionally, they observed that the virality of false rumors was heightened when these rumors incorporated emotional language linked to feelings of trust, anticipation, or anger. These rumors were less likely to go viral if they contained language connected to surprise, fear, and disgust. In another study, [Lee et al. \(2022\)](#) determined that tweets conveying sadness were more prone to be retweeted and liked by users, whereas tweets expressing anger, anxiety, and joy were less likely to garner such engagement. In a political context, [Corbu et al. \(2021\)](#) demonstrated that provoking anger and fear (but not enthusiasm and contentment) was an important explanatory factor that predicted peoples' willingness to share fake news. Finally, [Tan and Hsu \(2023\)](#) found that worry plays a prominent role in driving the sharing motivation of fake news.

3.3.2. Research Gaps

1. There is a lack of consideration of affective-based mechanisms in information veracity research.

From a fake-news perspective, studies on information veracity focus on the impact of cognitive factors such as analytical thinking ([Pennycook and Rand 2019a, 2019b](#)), dogmatism ([Bronstein et al. 2019](#)), and fact checkers ([Lazer et al. 2018](#)) on one's ability to identify fake news. To that effect, researchers have proposed two primary accounts of susceptibility to fake news ([Pehlivanoglu et al. 2022](#)). The first is the classical account of reasoning, which contends that people's vulnerability to fake news is due to a lack of analytical thinking ([Tandoc 2019](#); [Bago et al. 2020](#); [Mirhoseini et al. 2023](#)). This account proposes that the ability to identify fake news is predicted by analytical reasoning, irrespective of whether the news aligns with one's ideology ([Pennycook and Rand 2019a](#)). The classical reasoning account aligns with the dual-process theories

of judgment, which posit that analytic thinking, as opposed to intuition, can often lead to sound judgment (Evans and Stanovich 2013). The second account is the motivated reasoning account (Kunda 1990), which proposes that people tend to use reasoning to justify their pre-existing beliefs and self-serving conclusions, driven by various motivations (Mirhoseini et al. 2023). According to Pehlivanoglu et al. (2022), the motivated reasoning account suggests that individuals are more inclined to apply analytical reasoning to issues that correspond to their pre-existing beliefs. As a result, there is an increased probability that people believe fake news that aligns with their ideology. Research thus far has been supportive of the classical account. Consequently, regardless of which of the accounts of susceptibility to fake news is supported in a given study (the classical account or the motivated reasoning account), it is clear that research investigating peoples' ability to identify fake news has refrained from considering the notion of emotion.

2. There is a lack of consideration of affective-based mechanisms in information-diffusion research.

Studies on information diffusion focus on the prevalence, persistence, consequence, and correction of misinformation (Lewandowsky et al. 2012; Flynn et al. 2017). This research stream includes psychological research that has endeavored to identify the cognitive factors and mechanisms implicated in believing and propagating fake news, drawing on diverse theoretical frameworks (Rijo and Waldzus 2023). These include explanations such as "confirmation bias, selective exposure, desirability bias, bandwagon effect, third-person perception, and echo chambers" (Tan and Hsu 2023) (p. 62). Researchers have also investigated peoples' motivations for sharing fake news on social media, including factors such as "social media fatigue, social comparison, self-disclosure, fear of missing out, and online trust" (Tan and Hsu 2023) (p. 62). In the context of fake news on COVID-19, Apuke and Omar (2021) proposed six factors including altruism, entertainment, socialization, the passage of time, information sharing, and information seeking as contributing to the sharing of fake news on social media. Osmundsen et al. (2021) tested accuracy-oriented and goal-oriented motivations in a comprehensive study on competing psychological theories of sharing fake news and found partisan polarization, i.e., a goal-oriented motivation, to be a primary motivation behind the sharing of political news on Twitter. Valencia-Arias et al. (2023) found that the rapid dissemination of fake news is associated with individuals' inclination to inform their close contacts, especially when the shared content aligns with their preconceived notions and convictions. Finally, in a conceptual framework of consumers' experiences of fake news, Mahdi et al. (2022) referred to several theories on fake-news sharing motives including social identity theory, rational choice theory, social comparison theory, and self-determination theory, none of which implicate affect. Thus, whether a given study considers the factors involved in the propagation of fake news and/or peoples' motivations to share fake news, we conclude once again that research investigating why individuals spread fake news has strayed away from considering the notion of affect. Figure 3 provides an overview of efforts undertaken to understand, describe, and model misinformation and disinformation and demonstrates the finding that these efforts lack consideration of affective-based mechanisms.

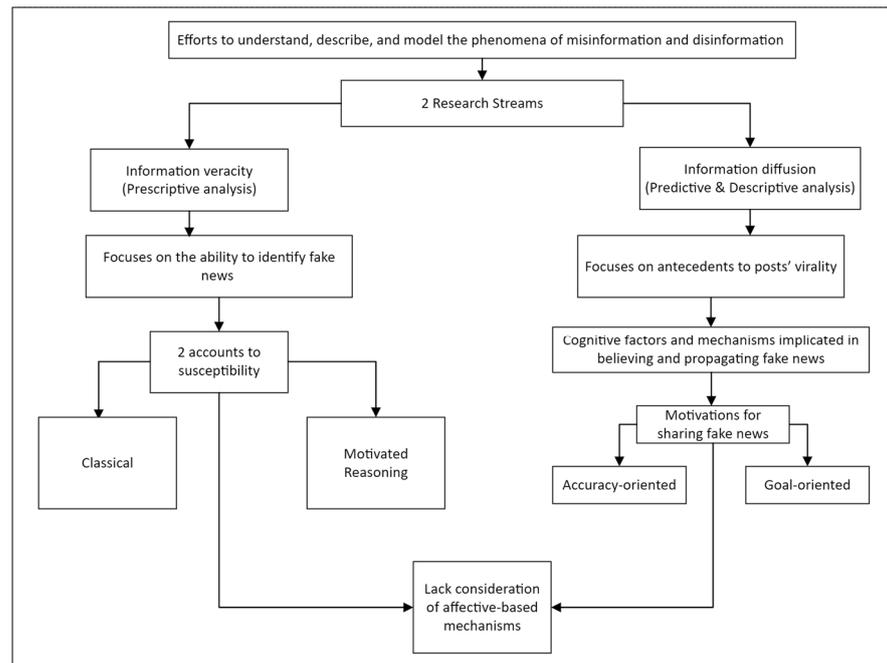


Figure 3. Attempts to model misinformation and disinformation lack consideration of the notion of emotion.

3. The literature on the impact of emotion on perception of fake news generally refrains from making causal claims. Research investigating the impact of emotion (be it through the discrete and/or the dimensional view) on the perception of fake news is almost entirely correlational. Indeed, although the research suggests that the emotionality of headlines may be a cause for people preferentially believing in and sharing false headlines, there is generally no evidence supporting this claim. One exception to this finding is the second experiment performed by [Martel et al. \(2020\)](#), who explored the psychology underlying belief in blatantly false news stories. Using a dual-process framework, the authors included an emotion induction, a reason induction, and a control induction, to experimentally manipulate participants' reliance on emotion versus reason when they assessed the truthfulness of news headlines. Their findings demonstrated a 10% increase in belief, when comparing the control condition with the emotion-induction condition. This suggested that as participants increasingly depended on their emotions rather than reason, they were more likely to perceive the fake news as real. The more participants relied on their emotions over reason, the more they regarded fake news to be real. Thus, the authors were able to suggest that emotion actively contributes to an amplified belief in fake news. Additionally, this article demonstrated that an increased reliance on emotion seems to be a susceptibility factor for fake news, independent of reduced analytical thinking. [Bago et al. \(2022\)](#) also attempted to address the issue of correlational work by inducing subjects to control their emotions using two well-documented emotion regulation techniques: emotion suppression and cognitive reappraisal. The study provided some evidence that the suppression of emotions can be effective in countering belief in fake news; however, this result should be interpreted with caution as attempts to replicate the findings within the same study were unsuccessful. Consequently, with the exception of the study by [Martel et al. \(2020\)](#), the literature on the impact of emotion on perception of fake news refrains from making any causal claims.
4. Studies on misinformation have largely strayed away from incorporating neurophysiological measures of emotion.

With the exception of the recent study by [Lutz et al. \(2023\)](#), which measured emotion using eye tracking and heart-rate measures, emotion was assessed subjectively in the corpus through the use of questionnaires and self-report measures. This is not surprising, since 20 of the 31 studies analyzed in this work consisted of online experiments. This is an important gap in the literature on fake news, because obtaining reliable self-reports about emotional states hinges on participants' ability to precisely comprehend and convey their emotional responses through self-reporting ([Settle 2020](#)), which does not always occur. Additionally, labeling emotions through self-assessment reports prior to assessing belief can act as emotional regulation ([Torre and Lieberman 2018](#)), reducing felt emotions. The importance of deploying neurophysiological measures of emotion in misinformation studies was suggested by [Ali Adeeb and Mirhoseini \(2023\)](#), who proposed a NeuroIS approach that includes electrodermal activity and FaceReader technology measures of emotion to investigate the effects of experiencing different emotions on peoples' belief in and intent to share fake news on social media. The importance of measuring emotion using neurophysiological measures was also suggested by [Pröllochs et al. \(2021\)](#) who used a dictionary approach to quantify the use of language in Twitter rumor cascades. In this study, the authors stipulated that rumors containing words linked to positive language might trigger negative emotions in readers. Therefore, a drawback of their method was the inability to deduce the neurophysiological condition of users and whether specific emotions were evoked. This would be circumvented if a biological measure of emotions were deployed, as was demonstrated by [Lutz et al. \(2023\)](#), since the biological measure would provide insights into the interplay between the expression and the elicitation of emotions in the context of fake news.

4. Discussion

[Lewandowsky et al. \(2012\)](#), in an extensive survey of the literature on misinformation, highlighted the role of emotion as a topic deserving of future research attention. Almost ten years later, this call for research was answered by [Serrano-Puche \(2021\)](#), who performed a review of the influence of emotions on misinformation, disinformation, and fake news. This review classified social networks as "a means of communication that privileges the transmission and dissemination of emotional content and the consequent formation of affective audiences" (p. 232). To that end, several studies have stipulated that the "emotional architectures" of social media not only encourage emotional signaling but also evolve in response to it, resulting in emotions being transmitted on social media on a massive scale ([Brady et al. 2017](#); [Wahl-Jorgensen 2019](#)). Despite this, our review found that, by and large, affect, which plays a pivotal role in how individuals respond to the stimuli they encounter, seems to be a relevant yet understudied topic when attempting to understand, describe, and model the phenomena of misinformation and disinformation. Indeed, the absence of the notion of affect from the primary accounts of susceptibility to fake news (i.e., information-veracity research) and the psychological factors investigated in relation to the spreading of fake news (i.e., information-diffusion research) is surprising. This is because the influence of emotions on human judgement and decision making has been thoroughly substantiated in the field of psychology ([Ajzen 1996](#)) and has been informed through various theories including the dual-process theories of cognition ([Evans and Stanovich 2013](#)), the assimilative accommodative model of emotion ([Bless and Fiedler 2006](#)), and feelings-as-information theory ([Schwarz 2012](#)). One reason for the limited literature on the influence of affect on perception of fake news is that studying emotions can be challenging as they stem from implicit bodily processes that occur beyond one's conscious awareness ([Mortillaro and Mehu 2015](#)) and evolve rapidly as users engage with the emotionally charged content on social media platforms.

This review collected and synthesized information from empirical studies to pool the literature pertaining to the impact of affect on the perception of fake news on social media platforms. We analyzed 31 articles, identified seven relevant research themes, and

uncovered for research gaps to guide future research. Our analysis was inspired by the following research questions: (1) Which theories have been employed to investigate how affect influences (i) belief in fake news on social media platforms and (ii) the inclination to share fake news on social media platforms? (2) What research themes have been discerned in the literature concerning the impact of affect on how fake news on social media platforms is perceived? and (3) What areas of research deficiency have been revealed in the existing literature pertaining to the influence of affect on the perception of fake news on social media platforms?

Our review classified our corpus in the contexts of (1) the impact of affective cues and (2) the impact of peoples' emotions on the perception of fake news. A classification of the types of emotions examined in the corpus was also performed. As uncovered in one of the research gaps, studies on the impact of affect on perception of fake news are for the most part correlational and therefore refrain from making any causal claims. Added to that is the emergent theme that the findings of these studies are mixed according to both a dimensional as well as a discrete view of emotion. Finally, the corpus revealed some evidence for emotion at times playing a mediating role and at other times playing a moderating role in individuals' belief in fake news and their intent to share fake news on social media platforms. As a consequence, it is difficult to have a clear answer to the question: What is the impact of affect on the perception of fake news on social media?

Based on our uncovered themes and gaps, we identified several avenues for future research. First, we recommend that researchers test the causal influence of affect on perception of fake news as well as the causal influence of exposure to fake news on affect and the subsequent impact of affect on behavior. Second, efforts should be made to investigate the relationship between emotion—from both a dimensional and a discrete point of view—and belief in and the intent to share fake news. Third, future studies in this realm should distinguish between different types of emotion (epistemic/non epistemic and moral/non-moral) in the context of their impact on both belief in and the intent to share fake news on social media. Fourth, work by [Mortillaro and Mehu \(2015\)](#), which reviewed the methods of assessment of emotions, demonstrated that emotions can be assessed through measures of physiological activation (autonomic measures of emotion) and through measures of nonverbal behavior (such as facial behavior). Thus, neurophysiological measures of emotion should be incorporated in future studies on misinformation complementarily to questionnaires and self-report measures so as to improve the quality of the assessment of emotion and accurately understand emotional reactions to fake news content.

Gaining a deeper understanding of how affective variables influence the way fake news on social media is perceived can offer valuable insights into the processes that lead to the entrenchment of fake news, as well as the strategies that can be employed to mitigate its dissemination and impact. Such insights hold significant implications for technology platforms, governments, and individuals seeking to combat the spread of misinformation and its harmful consequences. We hope that these initial findings can serve as a guide to advancing this line of research.

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Appendix A

List of articles excluded from corpus along with reason for exclusion.

Articles Excluded from Corpus	Reason for Exclusion
V. Balakrishnan, L. H. Abdul Rahman, J. K. Tan, and Y. S. Lee, "COVID-19 fake news among the general population: motives, socio-demographic, attitude/behavior, and impacts—a systematic review," <i>Online Information Review</i> , 2022.	Review paper.
P. C. Bauer and B. Clemm von Hohenberg, "Believing and sharing information by fake sources: An experiment," <i>Political Communication</i> , vol. 38, no. 6, pp. 647–671, 2021.	Does not refer to emotion, but looks at congruence with attitudes.
D. Borukhson, P. Lorenz-Spreen, and M. Ragni, "When does an individual accept misinformation? An extended investigation through cognitive modeling," <i>Computational Brain & Behavior</i> , vol. 5, no. 2, pp. 244–260, 2022.	Comparatively assesses the predictive accuracy (on an individual level) of models to accept fake news. Implicates emotion only through sentiment analysis.
S. Bratu, "The fake news sociology of COVID-19 pandemic fear: Dangerously inaccurate beliefs, emotional contagion, and conspiracy ideation," <i>Linguistic and Philosophical Investigations</i> , no. 19, pp. 128–134, 2020.	Examines how exposure to misinformation impacted attitude through affective routes.
D. P. Calvillo, R. J. Garcia, K. Bertrand, and T. A. Mayers, "Personality factors and self-reported political news consumption predict susceptibility to political fake news," <i>Personality and Individual Differences</i> , vol. 174, p. 110666, 2021.	Emotionality is a personality trait here and not emotion based on ARM.
J. C. Correia, P. Jerónimo, and A. Gradim, "Fake news: emotion, belief and reason in selective sharing in contexts of proximity," <i>Brazilian Journalism Research</i> , vol. 15, no. 3, pp. 590–613, 2019.	Does not refer to emotion.
U. Dutta, R. Hanscom, J. S. Zhang, R. Han, T. Lehman, Q. Lv, and S. Mishra, "Analyzing Twitter users' behavior before and after contact by the Russia's Internet Research Agency," <i>Proceedings of the ACM on Human-Computer Interaction</i> , vol. 5, no. CSCW1, pp. 1–24, 2021.	Does not look at impact of sentiment.
J. D. Featherstone, G. A. Barnett, J. B. Ruiz, Y. Zhuang, and B. J. Millam, "Exploring childhood anti-vaccine and pro-vaccine communities on Twitter—a perspective from influential users," <i>Online Social Networks and Media</i> , vol. 20, p. 100105, 2020.	Performs sentiment analysis but does not look at impact of sentiment on perception of fake news.
J. D. Featherstone and J. Zhang, "Feeling angry: the effects of vaccine misinformation and refutational messages on negative emotions and vaccination attitude," <i>Journal of Health Communication</i> , vol. 25, no. 9, pp. 692–702, 2020.	Looks only at the impact of misinformation on affect
E. Ferrara, S. Cresci, and L. Luceri, "Misinformation, manipulation, and abuse on social media in the era of COVID-19," <i>Journal of Computational Social Science</i> , vol. 3, pp. 271–277, 2020.	Examines diffusion patterns of COVID-19 misinformation but does not focus on emotion.
J. P. Forgas, S. M. Laham, and P. T. Vargas, "Mood effects on eyewitness memory: Affective influences on susceptibility to misinformation," <i>Journal of Experimental Social Psychology</i> , vol. 41, no. 6, pp. 574–588, 2005.	Examines the impact of affect on the incorporation of misleading information into eyewitness memories only.
L. Frischlich, J. H. Hellmann, F. Brinkschulte, M. Becker, and M. D. Back, "Right-wing authoritarianism, conspiracy mentality, and susceptibility to distorted alternative news," <i>Social Influence</i> , vol. 16, no. 1, pp. 24–64, 2021.	Investigates the impact of the exposure to fake news on affect, not on belief.
A. Ghenai and Y. Mejova, "Fake cures: user-centric modeling of health misinformation in social media," <i>Proceedings of the ACM on Human-Computer Interaction</i> , vol. 2, no. CSCW, pp. 1–20, 2018.	Focuses on features such as sentiment of individuals on social media that are posting misinformation.
A. Giachanou, P. Rosso, and F. Crestani, "The impact of emotional signals on credibility assessment," <i>Journal of the Association for Information Science and Technology</i> , vol. 72, no. 9, pp. 1117–1132, 2021.	Focuses only on the detection of fake news.
K. T. Gradoń, J. A. Holyst, W. R. Moy, J. Sienkiewicz, and K. Suchecki, "Countering misinformation: A multidisciplinary approach," <i>Big Data & Society</i> , vol. 8, no. 1, p. 20539517211013848, 2021.	Briefly refers to sentiment analysis but does not discuss how it can be used to counter misinformation.
M. Gregor and P. Mlejnková, "Facing Disinformation: Narratives and Manipulative Techniques Deployed in the Czech Republic," <i>Politics in Central Europe</i> , vol. 17, no. 3, pp. 541–564, 2021.	Refers to emotion only in the context of manipulative techniques.

G. Gumelar, E. Erik, and H. Maulana, "The Effect of Need for Cognition and Need for Affection on the Intention of Spreading Fake News," <i>Jurnal Ilmiah Peuradeun</i> , vol. 8, no. 1, pp. 99–108, 2020.	Refers to need for affection, not to affect.
K. L. Gwebu, J. Wang, and E. Zifla, "Can warnings curb the spread of fake news? The interplay between warning, trust and confirmation bias," <i>Behaviour & Information Technology</i> , vol. 41, no. 16, pp. 3552–3573, 2022.	Briefly refers to emotional trust—concentrates on the impact of warnings on belief in and intent to share fake news.
M. Hartmann and P. Müller, "Acceptance and adherence to COVID-19 preventive measures are shaped predominantly by conspiracy beliefs, mistrust in science and fear—A comparison of more than 20 psychological variables," <i>Psychological Reports</i> , p. 00332941211073656, 2022.	Examines the relationship between (i) belief in conspiracies and paranormal beliefs and (ii) emotion on acceptance and adherence to COVID-19 preventative measures, not on belief in nor intent to share fake news.
L. Jenke, "Affective polarization and misinformation belief," <i>Political Behavior</i> , pp. 1–60, 2023.	Only refers to affective polarization.
L. A. Juez and J. L. Mackenzie, "Emotion, lies, and "bullshit" in journalistic discourse," <i>Iberica</i> , no. 38, pp. 17–50, 2019.	Demonstrates how political and scientific fake news manipulates readers' emotion but does not investigate the impact of emotion on belief in nor intent to share fake news.
P. Kostakos, M. Nykanen, M. Martinviita, A. Pandya, and M. Oussalah, "Meta-terrorism: identifying linguistic patterns in public discourse after an attack," in <i>2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)</i> , pp. 1079–1083, 2018.	Performs sentiment analysis but does not look at impact of sentiment on perception of fake news.
E. Kušen and M. Strembeck, "Politics, sentiments, and misinformation: An analysis of the Twitter discussion on the 2016 Austrian Presidential Elections," <i>Online Social Networks and Media</i> , vol. 5, pp. 37–50, 2018.	Examines negative information about both candidates, not emotion per se.
J. Lee, J. W. Kim, and H. Yun Lee, "Unlocking conspiracy belief systems: how fact-checking label on twitter counters conspiratorial MMR vaccine misinformation," <i>Health Communication</i> , pp. 1–13, 2023.	Does not focus on impact of emotion. Looks at prior attitudes toward the vaccine when assessing susceptibility to misinformation.
P. L. Liu and L. V. Huang, "Digital disinformation about COVID-19 and the third-person effect: examining the channel differences and negative emotional outcomes," <i>Cyberpsychology, Behavior, and Social Networking</i> , vol. 23, no. 11, pp. 789–793, 2020.	Is not about fake news.
M. A. Maldonado, "Understanding fake news: Technology, affects, and the politics of the untruth," <i>Historia y comunicación social</i> , vol. 24, no. 2, p. 533, 2019.	Refers only to confirmation bias.
J. G. Myrick and S. Erlichman, "How audience involvement and social norms foster vulnerability to celebrity-based dietary misinformation," <i>Psychology of Popular Media</i> , vol. 9, no. 3, pp. 367, 2020.	Uses appraisal theory of emotions to test a proposed conceptual model whereby audience involvement processes shape emotions, which influence openness to misinformation—does not refer to belief in nor intent to share misinformation.
U. Naseem, I. Razzak, M. Khushi, P. W. Eklund, and J. Kim, "COVIDSenti: A large-scale benchmark Twitter data set for COVID-19 sentiment analysis," <i>IEEE Transactions on Computational Social Systems</i> , vol. 8, no. 4, pp. 1003–1015, 2021.	Describes COVIDSenti but not in the context of misinformation.
K. A. Peace and K. M. Constantin, "Misremembering events: Emotional valence, psychopathic traits, and the misinformation effect," <i>Journal of Police and Criminal Psychology</i> , vol. 31, pp. 189–199, 2016.	Focuses on memory recall, not on misinformation and/or fake news.
H. L. Quach, T. Q. Pham, N. A. Hoang, D. C. Phung, V. C. Nguyen, S. H. Le, . . . & C. K. Nguyen, "Understanding the COVID-19 Infodemic: Analyzing User-Generated Online Information During a COVID-19 Outbreak in Vietnam," <i>Healthcare Informatics Research</i> , vol. 28, no. 4, pp. 307–318, 2022.	Analyzes sentiment dynamics of misinformation but does not look at dissemination.
C. Sanchez and D. Dunning, "Cognitive and emotional correlates of belief in political misinformation: Who endorses partisan misbeliefs?," <i>Emotion</i> , vol. 21, no. 5, pp. 1091, 2021.	Does not look at belief, only mentions endorsement.
L. Savolainen, D. Trilling, and D. Liotsiou, "Delighting and detesting engagement: Emotional politics of junk news," <i>Social Media+ Society</i> , vol. 6, no. 4, p. 2056305120972037, 2020.	Does not look at belief in fake news nor intent to share fake news.
J. Serrano-Puche, "Digital disinformation and emotions: exploring the social risks of affective polarization," <i>International Review of Sociology</i> , vol. 31, no. 2, pp. 231–245, 2021.	Review paper.
Y. Sun, S. C. Chia, F. Lu, and J. Oktavianus, "The battle is on: Factors that motivate people to combat anti-vaccine misinformation," <i>Health Communication</i> , vol. 37, no. 3, pp. 327–336, 2022.	Focuses only on methods to combat erroneous information—does not look at belief nor intent to share

M. W. Susmann and D. T. Wegener, "The role of discomfort in the continued influence effect of misinformation," <i>Memory & Cognition</i> , pp. 1–14, 2022.	Investigates role of discomfort on misinformation endorsement, which predicted continued belief in and use of misinformation. However, did not refer to emotions being elicited as a result of discomfort.
M. W. Susmann and D. T. Wegener, "How attitudes impact the continued influence effect of misinformation: The mediating role of discomfort," <i>Personality and Social Psychology Bulletin</i> , vol. 49, no. 5, pp. 744–757, 2023.	Investigates impact of attitude on belief in misinformation.
M. Taddicken and L. Wolff, "'Fake News' in science communication: emotions and strategies of coping with dissonance online," <i>Media and Communication</i> , vol. 8, no. 1, pp. 206–217, 2020.	Analyses emotions that are aroused when users are confronted with opinion-challenging disinformation—does not refer to belief in or intent to share disinformation
M. Vafeiadis and A. Xiao, "Fake news: How emotions, involvement, need for cognition and rebuttal evidence (story vs. informational) influence consumer reactions toward a targeted organization," <i>Public Relations Review</i> , vol. 47, no. 4, p. 102088, 2021.	Focuses on rebuttal evidence, involvement, and need for cognition in relation to positive and negative emotions.
Y. Wang, R. Han, T. Lehman, Q. Lv, and S. Mishra, "Analyzing behavioral changes of twitter users after exposure to misinformation," in <i>Proceedings of the 2021 IEEE/ACM international conference on advances in social networks analysis and mining</i> , pp. 591–598, 2021.	Focuses on misinformation's impact on specific user behavior.
Z. Xu and H. Guo, "Using text mining to compare online pro-and anti-vaccine headlines: Word usage, sentiments, and online popularity," <i>Communication Studies</i> , vol. 69, no. 1, pp. 103–122, 2018.	Does not clearly delineate between misinformation and true news—refers only to pro- and anti-vaccine headlines (PVHs and AVHs).
Y. Z. Yipeng and M. J. Jingdong, "Analyzing Sentiments and Dissemination of Misinformation on Public Health Emergency," <i>Data Analysis and Knowledge Discovery</i> , vol. 4, no. 12, pp. 45–54, 2020.	Paper written in Chinese.

Appendix B

Theories cited in 21 studies in the corpus along with the finding(s) of each study.

Theory	Study Referencing Theory	Findings
Affective intelligence theory (Marcus et al. 2000)	Lee et al. (2022).	Tweets expressing sadness had a higher likelihood of being retweeted and liked by users, whereas tweets containing emotions such as anger, anxiety, and joy had lower engagement.
	Weeks (2015).	- Experiencing anger and anxiety independently leads to different outcomes in terms of political misperceptions, either intensifying or mitigating the influence of partisanship. - Anxiety, in comparison to a neutral emotional state, reduces belief accuracy when evaluating uncorrected misinformation from the out-party, while anger reduces belief accuracy when assessing uncorrected misinformation consistent with one's party.
Appraisal-tendency framework (ATF) (Lerner and Keltner 2000)	Deng and Chau (2021).	When readers detect expressions of anger in headlines, they often perceive it as a sign of the author's minimal cognitive effort and interpret it as a signal of heuristic information processing. This reduces the credibility of news, impacting subsequent social media behaviors including reading, liking, commenting, and sharing.
Appraisal theory (Lazarus 1991)	Tan and Hsu (2023).	- The relevance of an emotion to the context of fake news is crucial to how it manifests. - Feelings of worry prompt altruistic sharing motivations and, ultimately, intentions to share.
Cognitive dissonance (Festinger 1957)	Freiling et al. (2023).	- Anxiety is a significant factor in both belief and behavior (i.e., the willingness to share claims of any type). - Heightened anxiety can help mitigate partisan motivated reasoning.
	Lutz et al. (2023).	Users may unknowingly fall victim to fake news.
	Wang et al. (2020).	An emotion-driven cognitive dissonance model of misinformation diffusion is proposed, where negative emotions, triggered by misinformation, mediate the processing and spread of misinformation.
Construal level theory (Liberman et al. 2007)	Tan and Hsu (2023).	See above.

Dual motivation framework (Duckitt 2001)	Osmundsen et al. (2021).	The strongest predictor of news sharing is negative feelings toward political opponents and not positive feelings toward one's own party.
	Ali et al. (2022).	<ul style="list-style-type: none"> - Two-way interaction effects between emotion and attitude play a role in shaping how fake news is perceived in terms of credibility. - Anger caused individuals who had a neutral attitude towards the vaccine to find fake anti-vax news less credible than those in the neutral emotion condition. - Fear caused individuals holding an anti-vax attitude to find fake news more credible than those in the anger condition.
	Bago et al. (2022).	<ul style="list-style-type: none"> - Except for anger, an overall emotional response at the headline level was linked to increased belief in both true and false headlines and a reduced ability to discern the truth. - Emotion decreases sharing discernment in headlines that are discordant while it increases sharing discernment in headlines that are concordant.
Dual-process theories of cognition (Smith and DeCoster 2000)	Martel et al. (2020).	<ul style="list-style-type: none"> - Increased emotionality, regardless of its type or valence, predicts a higher likelihood of believing in fake news and a decreased ability to distinguish between fake and real news. - An increased reliance on emotion represents an underlying susceptibility to fake news beyond mere reasoning deficits.
	Pehlivanoglu et al. (2022).	Lower positive affect and higher negative affect were not linked to improved detection of fake news.
	Rijo and Waldzus (2023).	<ul style="list-style-type: none"> - Negative beliefs about the political system amplified emotional responses to true and false news, increasing perceptions of credibility, which, in turn, led to higher accuracy attributions and a greater willingness to share news, whether true or false. - The inclination of participants to share fake news cannot be fully accounted for by their emotional reactions and perceptions of credibility.
	Tomljenovic et al. (2020).	Belief in vaccine conspiracies is predicted by specific unfavorable emotions toward vaccination and, to a lesser extent, peoples' intuitive thinking style.
	Weeks (2015).	See above.
Economics of Emotion theory (Bakir and McStay 2018)	Horner et al. (2021).	<ul style="list-style-type: none"> - Participants with higher levels of emotion were more inclined to take actions that either spread or suppressed fake news. - Participants with lower emotion levels were more likely to disregard or withdraw from the propagation of false news. - Participants with high negative emotions and low positive emotions were more inclined to suppress the spread of fake news and less likely to contribute to its propagation.
Elaboration Likelihood Model (Petty and Cacioppo 1986)	Osatuyi and Hughes (2018).	Fake news with a significant impact on business tends to have a more negative tone compared with real news.
Emotions as social information (EASI) (Van Kleef 2009)	Deng and Chau (2021).	See above.
Heuristic-Systematic Model (Chaiken 1980)	Ali et al. (2022).	See above.
Plutchik's theory of emotion (Plutchik 2001)	Pröllochs et al. (2021).	<ul style="list-style-type: none"> - When compared with true rumors, false rumors are more likely to go viral if they consist of a greater share of words associated with a positive sentiment. This is particularly true for emotional words related to trust, anticipation, or anger. - Opposite effects, although smaller in magnitude, apply to emotional words related to surprise, fear, and disgust.
	Freiling et al. (2023).	See above.
	Martel et al. (2020).	See above.
Motivated reasoning (Kunda 1990)	Pehlivanoglu et al. (2022).	See above.
	Rijo and Waldzus (2023).	See above.
	Weeks (2015).	The inclination for partisan motivated reasoning might be more amplified by anger than by anxiety or general negative emotions.

Resource Allocation Model (Ellis 1988)	Li et al. (2022).	- Elevated emotionality, whether positive or negative, is associated with increased belief in and intention to share information, regardless of its veracity. - One's ability to discern false headlines from true headlines is inversely linked to having stronger negative emotions.
Social support theory (Liu et al. 2020)	Zhou et al. (2021).	Emotional support has a significant impact on enhancing individuals' sharing behavior on social media.
Situational theory of problem solving (STOPS) (Kim and Grunig 2011)	Chin and Zanuddin (2022).	- Non-believers in fake news often express negative emotions when reading fake news, and commenters with negative emotions are more prone to assert that the news is fabricated compared with those with different emotional states. - More negative comments, such as anger, worry, and fear, are often found in discussions related to fake news.
Stimulus-Organism-Response (SOR) theory (Mehrabian and Russell 1974)	Li et al. (2022).	See above.
Uses and gratifications theory (Ruggiero 2000)	Tan and Hsu (2023).	See above.

Note

¹ In this study, news headlines from credible news websites were used. The authors nevertheless acknowledge the possibility that these news headlines might be fake.

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