Two Essays on the Impact of Affect on Users' Perception of Fake News on Social Media Platforms

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Abstract

Two Essays on the Impact of Affect on Users' Perception of Fake News on Social Media Platforms

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This dissertation comprises two interrelated essays that examine how affect influences fake news discernment and sharing intentions on social media platforms. The first essay systematically reviews existing literature to identify theoretical foundations, research themes, and gaps. It emphasizes the absence of affect in theoretical models of misinformation and the design of social media interventions. This provided motivation for the second essay, which presents three online studies that investigate the impact of three affective constructs: mood arousal, affective cues, and emotion, alongside the cognitive disposition of actively open-minded thinking (AOT) on fake news discernment and sharing intentions in a social media context. Study 1 demonstrated that mood arousal impaired fake news discernment at low AOT levels, had no impact at moderate AOT levels, and improved discernment at high AOT levels, demonstrating a continuum of mood arousal regulation ranging from dysregulation to adaptive optimization. It also demonstrated that mood arousal increased fake news sharing intentions only at low AOT levels. Study 2 found that affective cues impaired fake news discernment and increased sharing intentions regardless of AOT levels, suggesting such cues bypass affective regulation. Study 3 revealed that while emotional experiences diminished the influence of mood arousal, emotion itself had no direct effect on either fake news discernment or sharing intent, nor was it moderated by AOT. Overall, this work underscores key differences between the affective constructs and the need for fake news interventions that account for both cognitive and affective dimensions in emotionally charged online environments.

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To my family, "thank you" will never feel like enough. Thank you, baba, for insisting I pursue my education in Canada. Your catchphrase "*Education is very important*" has stuck with me to this day. Mama, I have drawn strength from you every step of the way. It is your endless love and countless sacrifices that I never take for granted that have made this possible. Lana, thank you for being there through it all and for helping me see this journey through to the end.

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Contribution of Authors

Chapter 1:

This chapter was published in an article authored by Dr. Mahdi Mirhoseini and I titled: “The Impact of Affect on the Perception of Fake News on Social Media: A Systematic Review”

Both authors reviewed the final manuscript and approved of the contents.

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Thesis Introduction

Although fabricated news has circulated in the media since the early 20th century (Lazer et al., 2018), the advent of social media platforms has dramatically amplified its scale and reach (Lewandowsky et al., 2017). These platforms are saturated with emotional content that users frequently encounter while scrolling through their feeds (Preston et al., 2021; Vosoughi et al., 2018), often eliciting affective responses that influence how they engage with news headlines (Kim & Yang, 2017). Yet, efforts to curb the dissemination of fake news on social media platforms have traditionally emphasized cognitive factors such as analytical thinking (Pennycook & Rand, 2019b, 2019a), fact-checkers (Lazer et al., 2018), and nudge-based interventions (Butler et al., 2024), among others, to reduce users' belief in fake news.

In doing so, this body of work has largely strayed away from understanding the impact of affect on the perception of fake news on social media platforms. This is surprising given that the impact of affect on judgment and decision making is well documented in the Psychology literature (Ajzen, 1996). The limited effectiveness of current technological interventions such as fact checkers and flagging systems (that assume users to be purely cognitive) may, in part, stem from their failure to account for users' affective states (Lazer et al., 2018).

Core affect, a foundational component in most psychological processes (Russell, 1980, 2003, 2009; Russell & Barrett, 1999) refers to a broad category of affective phenomena that are neither entirely distinct nor uniform (Russell, 2003). We believe that neglecting the multifaceted concept of affect in both theoretical models of misinformation and the design of social media interventions overlooks a key mechanism through which users engage with news online. To address this research gap, we sought out to answer our main research question: *How does affect impact users' belief in and intent to share fake news headlines on social media platforms?*

Our first step was to perform a systematic literature review (chapter 1 of this dissertation) investigating the impact of affect on the perception of fake news on social media platforms. The review confirmed a lack of consideration of affective-based mechanisms in misinformation research and highlighted it as a key gap in existing research on combatting misinformation on social media platforms. Our next step was to investigate the impact of various affective constructs on belief in and intent to share fake news on social media. To that effect, we drew on the affective response model (ARM) (P. Zhang, 2013) as a framework to unpack three affective constructs. The first construct was mood intensity or arousal, "a prolonged affective state that has an unclear or unknown stimulus" (P. Zhang, 2013, p. 250). The second construct was affective cues, which refer to observable attributes of a stimulus that are intrinsically capable of eliciting and shaping emotional responses (Valdez & Mehrabian, 1994; P. Zhang, 2013). The final construct was emotion, a short-lasting induced affective state triggered by specific stimuli (Scherer, 2005; P. Zhang, 2013). Through this work, we examined the research question: *What is the impact of mood arousal, affective cues, and emotion on users' belief in and intent to share fake news headlines on social media platforms?*

The role of cognitive factors in the perception of fake news should nonetheless not be discounted, as individuals who engage in reflective and analytical thinking are more likely to accurately distinguish fake news from real news than those who rely primarily on intuitive judgments (Pennycook & Rand, 2019b). This distinction between an intuitive and a reasoning system is captured within the Cognitive Experiential Self-Theory (CEST) (Epstein, 1998), a dual-process theory that emphasizes two parallel and independent information-processing systems governed by different rules: a preconscious, intuitive, and experiential system that is driven by emotions, and a conscious, rational, and analytical system that is deliberate and rule-based.

The CEST posits that while the intuitive system often drives initial judgments, the analytical system can intervene to adjust or override these judgments. Thus, a general cognitive disposition should help explain individuals' ability to discern fake news from real news. One such disposition is actively open-minded thinking (AOT), which reflects a willingness to engage with new evidence, reconsider preexisting beliefs, and integrate diverse perspectives (Baron, 2005). Individuals with reduced AOT struggle to actively seek evidence (Stanovich & West, 1997) or consider alternative perspectives (Campitelli & Gerrans, 2014). We believe that AOT may help counteract the influence of affect on the perception of fake news given that it encourages deliberation and reduces reliance on intuition. As such, we asked a second research question: *How does AOT interact with mood arousal, affective cues, and emotion to influence users' belief in and intent to share fake news headlines on social media platforms?*

Chapter 2 of this dissertation attempts to answer the aforementioned research questions through three studies: **Study 1**: Investigating the impact of mood arousal and AOT on belief in and intent to share fake news headlines on social media; **Study 2**: Investigating the impact of affective cues and AOT on belief in and intent to share fake news headlines on social media; and **Study 3**: Investigating the impact of emotion and AOT on belief in and intent to share fake news headlines on social media. These studies serve to (i) examine the impact of different affective constructs on belief and behavior, and (ii) propose that AOT provides a mindset that strengthens the rational system within the CEST, enabling individuals to make more accurate decisions, even when faced with emotionally charged judgments.

This dissertation extends existing fake news research by incorporating affective constructs, namely mood arousal, affective cues, and emotion, into models of fake news perception, addressing a gap in the literature that has predominantly focused on cognitive factors. It introduces

a multi-construct framework that offers a more holistic understanding of how affect and the cognitive disposition of AOT jointly shape users' belief in and sharing of fake news. Practically, the findings inform the design of more psychologically attuned interventions, beyond traditional fact-checking or cognitive nudges, by highlighting how affective experiences and dispositions like AOT modulate susceptibility to misinformation. Collectively, this work sheds light on the mechanisms that facilitate the entrenchment of fake news and lays a foundation for more affect-sensitive approaches to mitigate the fight against misinformation on social media platforms.

Chapter 1 The Impact of Affect on the Perception of Fake News on Social Media: A Systematic Review

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

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 PontSorribes 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.

Background

"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 deliberatively 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.

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).

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 (Gradon´ 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 (Gradon´ 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.

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.

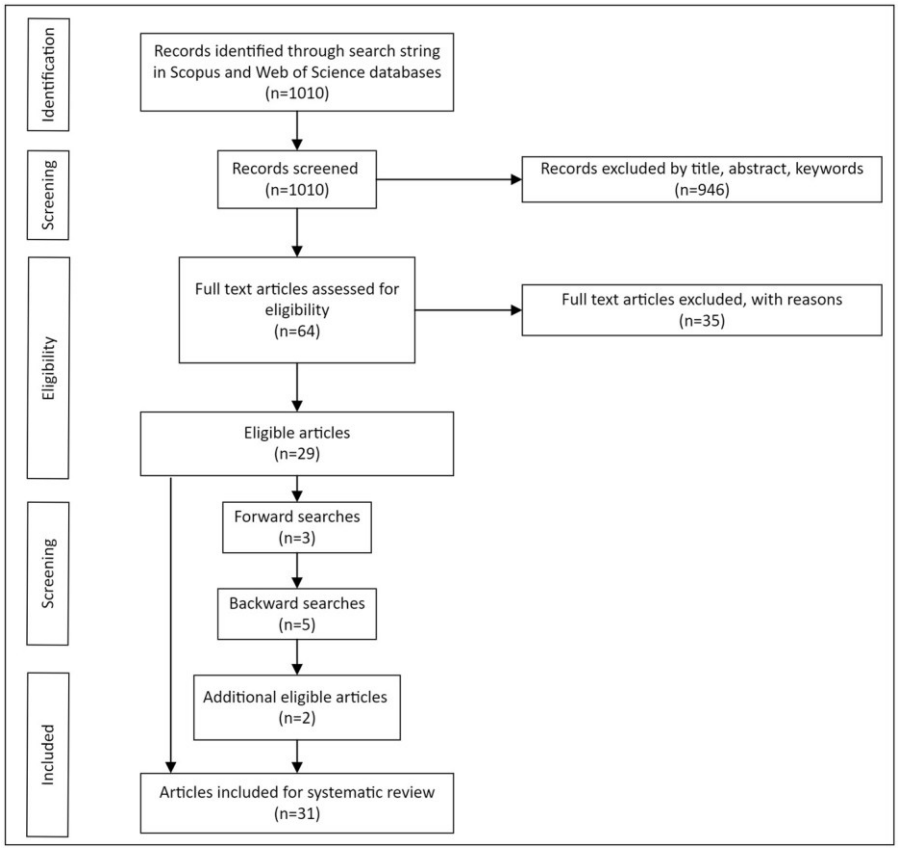

Figure 1. The literature review process.

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.

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.

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).

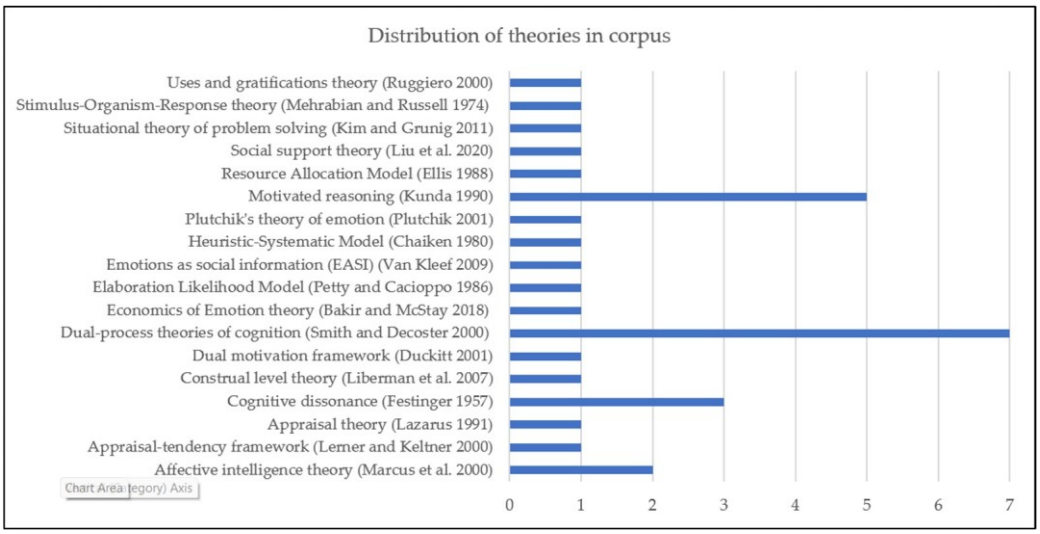

Figure 2. Distribution of 18 theories cited in 21 studies in the corpus (Ruggiero 2000; Mehrabian and Russell 1974; Kim and Grunig 2011; Liu et al. 2020; Ellis 1988; Kunda 1990; Plutchik 2001; Chaiken 1980; Van Kleef 2009; Petty and Cacioppo 1986; Bakir and McStay 2018; Smith and DeCoster 2000; Duckitt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

Research Themes and Research Gaps

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

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, CheungBlunden 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.

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.

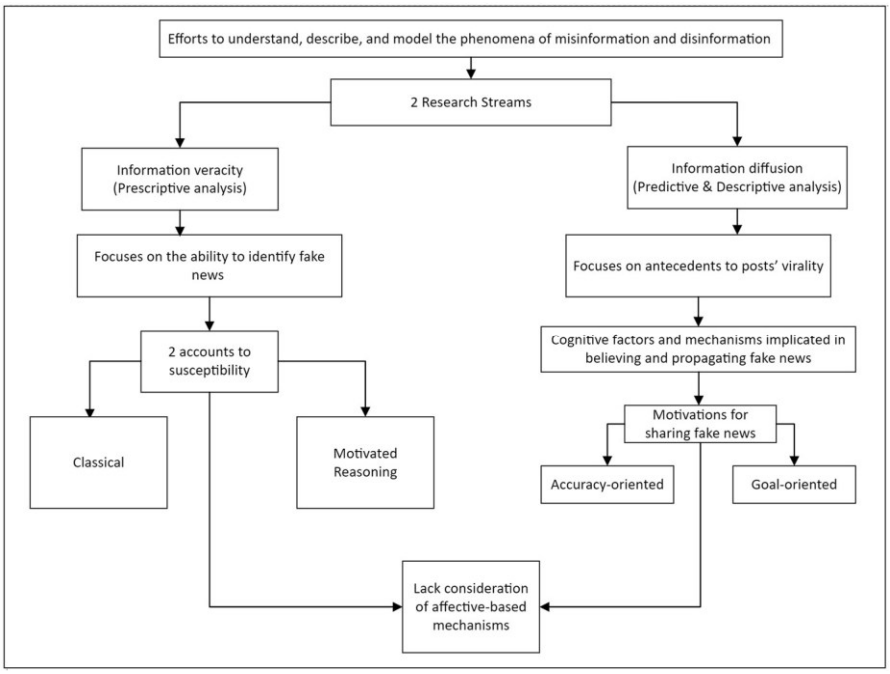

Figure 3. Attempts to model misinformation and disinformation lack consideration of the notion of emotion.

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.

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-asinformation 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/nonmoral) 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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References Available online: (accessed on 15 March 2012)

Ajzen, Icek. 1996. The Social Psychology of Decision Making. In Social Psychology: Handbook of Basic Principles. New York: Guilford Press, pp. 297–325.

Ali Adeeb, Rana, and Mahdi Mirhoseini. 2023. Investigating the Impact of Mood and Emotion on the Perception of Fake News on Social Media Platforms. NeuroIS Retreat, 150–58, unpublished.

Ali, Khudejah, Cong Li, Khawaja Zain-ul-abdin, and Syed Ali Muqtadir. 2022. The Effects of Emotions, Individual Attitudes towards

Vaccination, and Social Endorsements on Perceived Fake News Credibility and Sharing Motivations. Computers in Human Behavior 134: 107307. [CrossRef]

Allcott, Hunt, and Matthew Gentzkow. 2017. Social Media and Fake News in the 2016 Election. Journal of Economic Perspectives 31: 211–36. [CrossRef]

Apuke, Oberiri Destiny, and Bahiyah Omar. 2021. Fake News and COVID-19: Modelling the Predictors of Fake News Sharing among Social Media Users. Telematics and Informatics 56: 101475. [CrossRef]

Bago, Bence, David G. Rand, and Gordon Pennycook. 2020. Fake News, Fast and Slow: Deliberation Reduces Belief in False (but Not True) News Headlines. Journal of Experimental Psychology: General 149: 1608–13. [CrossRef]

Bago, Bence, Leah R. Rosenzweig, Adam J. Berinsky, and David G. Rand. 2022. Emotion May Predict Susceptibility to Fake News but Emotion Regulation Does Not Seem to Help. Cognition and Emotion 36: 1166–80. [CrossRef]

Bakir, Vian, and Andrew McStay. 2018. Fake News and The Economy of Emotions: Problems, Causes, Solutions. Digital Journalism 6: 154–75. [CrossRef]

Baptista, João Pedro, and Anabela Gradim. 2020. Understanding Fake News Consumption: A Review. Social Sciences 9: 185. [CrossRef]

Baptista, João Pedro, and Anabela Gradim. 2022. Who Believes in Fake News? Identification of Political (A)Symmetries. Social Sciences 11: 460. [CrossRef]

Besalú, Reinald, and Carles Pont-Sorribes. 2021. Credibility of Digital Political News in Spain: Comparison between Traditional Media and Social Media. Social Sciences 10: 170. [CrossRef]

Bless, Herbert, and Klaus Fiedler. 2006. Mood and the Regulation of Information Processing and Behavior. In Affect in Social Thinking and Behaviour. New York: Psychology Press, pp. 65–84.

Bode, Leticia, and Emily K. Vraga. 2018. See Something, Say Something: Correction of Global Health Misinformation on Social Media. Health Communication 33: 1131–40. [CrossRef] [PubMed]

Brady, William J., Julian A. Wills, John T. Jost, Joshua A. Tucker, and Jay J. Van Bavel. 2017. Emotion Shapes the Diffusion of Moralized Content in Social Networks. Proceedings of the National Academy of Sciences 114: 7313–18. [CrossRef]

Bronstein, Michael V., Gordon Pennycook, Adam Bear, David G. Rand, and Tyrone D. Cannon. 2019. Belief in Fake News Is Associated with Delusionality, Dogmatism, Religious Fundamentalism, and Reduced Analytic Thinking. Journal of Applied Research in Memory and Cognition 8: 108–17. [CrossRef]

Cai, Wenjie, Brad McKenna, and Lena Waizenegger. 2020. Turning It Off: Emotions in Digital-Free Travel. Journal of Travel Research 59: 909–27. [CrossRef]

Chadwick, Andrew, Cristian Vaccari, and Johannes Kaiser. 2022. The Amplification of Exaggerated and False News on Social Media: The Roles of Platform Use, Motivations, Affect, and Ideology. American Behavioral Scientist.. [CrossRef]

Chaiken, Shelly. 1980. Heuristic Versus Systematic Information Processing and the Use of Source Versus Message Cues in Persuasion. Journal of Personality and Social Psychology 39: 752. [CrossRef]

Charquero-Ballester, Marina, Jessica G. Walter, Ida A. Nissen, and Anja Bechmann. 2021. Different Types of COVID-19 Misinformation Have Different Emotional Valence on Twitter. Big Data & Society 8: 205395172110412. [CrossRef]

Cheung-Blunden, Violet, Kunal Uday Sonar, Emily Ann Zhou, and Caleb Tan. 2021. Foreign Disinformation Operation's Affective Engagement: Valence versus Discrete Emotions as Drivers of Tweet Popularity. Analyses of Social Issues and Public Policy 21: 980–97. [CrossRef]

Chin, Ying Shin, and Hasmah Zanuddin. 2022. Examining Fake News Comments on Facebook: An Application of Situational Theory of Problem Solving in Content Analysis. Media Asia 49: 353–73. [CrossRef]

Chou, Wen-Ying Sylvia, April Oh, and William M. P. Klein. 2018. Addressing Health-Related Misinformation on Social Media. JAMA 320: 2417–18. [CrossRef]

Conroy, Nadia K., Victoria L. Rubin, and Yimin Chen. 2015. Automatic Deception Detection: Methods for Finding Fake News. Proceedings of the Association for Information Science and Technology 52: 1–4. [CrossRef]

Corbu, Nicoleta, Alina Bârgăoanu, Flavia Durach, and Georgiana Udrea. 2021. Fake News Going Viral: The Mediating Effect of Negative Emotions. Media Literacy and Academic Research 4: 58–87.

Dabbous, Amal, Karine Aoun Barakat, and Beatriz De Quero Navarro. 2022. Fake News Detection and Social Media Trust: A Cross-Cultural Perspective. Behaviour & Information Technology 41: 2953–72. [CrossRef]

Deng, Bingjie, and Michael Chau. 2021. The Effect of the Expressed Anger and Sadness on Online News Believability. Journal of Management Information Systems 38: 959–88. [CrossRef]

Duckitt, John. 2001. A Dual-Process Cognitive-Motivational Theory of Ideology and Prejudice. Advances in Experimental Social Psychology 33: 41–113.

Effron, Daniel A., and Medha Raj. 2020. Misinformation and Morality: Encountering Fake-News Headlines Makes Them Seem Less Unethical to Publish and Share. Psychological Science 31: 75–87. [CrossRef]

Egelhofer, Jana Laura, and Sophie Lecheler. 2019. Fake News as a Two-Dimensional Phenomenon: A Framework and Research Agenda. Annals of the International Communication Association 43: 97–116. [CrossRef]

Ekman, Paul. 1992. An Argument for Basic Emotions. Cognition and Emotion 6: 169–200. [CrossRef]

Ellis, Henry C. 1988. Resource Allocation Model of the Effect of Depressed Mood States on Memory. In Affect, Cognition and Social Behavior. Edited by Klaus Fiedler and Joseph P. Forgas. Gottingen: Hogrefe, pp. 25–43.

Evans, Jonathan St. B. T., and Keith E. Stanovich. 2013. Dual-Process Theories of Higher Cognition: Advancing the Debate. Perspectives on Psychological Science 8: 223–41. [CrossRef]

Fahmy, Sara G., Khaled M. Abdelgaber, Omar H. Karam, and Doaa S. Elzanfaly. 2023. Modeling the Influence of Fake Accounts on User Behavior and Information Diffusion in Online Social Networks. Informatics 10: 27. [CrossRef]

Festinger, Leon. 1957. Cognitive Dissonance Theory. Primary Prevention of HIV/AIDS: Psychological Approaches. Newbury Park: SAGE Publications Ltd.

Filkuková, Petra, and Johannes Langguth. 2021. Blinded by Emotions: The Association between Emotional Reactivity and Trust in Fictitious News Stories on Crime. Studia Psychologica 63: 404–16. [CrossRef]

Flynn, Daniel J., Brendan Nyhan, and Jason Reifler. 2017. The Nature and Origins of Misperceptions: Understanding False and Unsupported Beliefs About Politics. Political Psychology 38: 127–50. [CrossRef]

Freiling, Isabelle, Nicole M. Krause, Dietram A. Scheufele, and Dominique Brossard. 2023. Believing and Sharing Misinformation, Fact-Checks, and Accurate Information on Social Media: The Role of Anxiety during COVID-19. New Media & Society 25: 141–62. [CrossRef]

Gelfert, Axel. 2018. Fake News: A Definition. Informal Logic 38: 84–117. [CrossRef]

Ghenai, Amira, and Yelena Mejova. 2018. Fake Cures: User-Centric Modeling of Health Misinformation in Social Media. arXiv arXiv:1809.00557. [CrossRef]

Gottfried, Jeffery, and Elisa Shearer. 2016. News Use across Social Media Platforms 2016. Washington, DC: PewResearchCenter.

Gradon´, Kacper T., Janusz A. Hołyst, Wesley R. Moy, Julian Sienkiewicz, and Krzysztof Suchecki. 2021. Countering Misinformation: A Multidisciplinary Approach. Big Data & Society 8: 205395172110138. [CrossRef]

Gwebu, Kholekile L., Jing Wang, and Ermira Zifla. 2022. Can Warnings Curb the Spread of Fake News? The Interplay between Warning, Trust and Confirmation Bias. Behaviour & Information Technology 41: 3552–73. [CrossRef]

Harmon-Jones, Cindy, Brock Bastian, and Eddie Harmon-Jones. 2016. The Discrete Emotions Questionnaire: A New Tool for Measuring State Self-Reported Emotions. Edited by André Aleman. PLoS ONE 11: e0159915. [CrossRef]

Hoang, Thi Bich Ngoc, and Josiane Mothe. 2018. Predicting Information Diffusion on Twitter—Analysis of Predictive Features. Journal of Computational Science 28: 257–64. [CrossRef]

Holland, Rob W., Marieke De Vries, Berlinda Hermsen, and Ad Van Knippenberg. 2012. Mood and the Attitude–Behavior Link: The Happy Act on Impulse, the Sad Think Twice. Social Psychological and Personality Science 3: 356–64. [CrossRef]

Horne, Benjamin, and Sibel Adali. 2017. This Just In: Fake News Packs A Lot In Title, Uses Simpler, Repetitive Content in Text Body, More Similar To Satire Than Real News. Proceedings of the International AAAI Conference on Web and Social Media 11: 759–66. [CrossRef]

Horner, Christy Galletta, Dennis Galletta, Jennifer Crawford, and Abhijeet Shirsat. 2021. Emotions: The Unexplored Fuel of Fake News on Social Media. Journal of Management Information Systems 38: 1039–66. [CrossRef]

Jiang, Shan, and Christo Wilson. 2018. Linguistic Signals under Misinformation and Fact-Checking: Evidence from User Comments on Social Media. Proceedings of the ACM on Human-Computer Interaction 2: 1–23. [CrossRef]

Khan, M. Laeeq, and Ika Karlina Idris. 2019. Recognise Misinformation and Verify before Sharing: A Reasoned Action and Information Literacy Perspective. Behaviour & Information Technology 38: 1194–1212. [CrossRef]

Kim, Antino, and Alan R. Dennis. 2019. Says Who? The Effects of Presentation Format and Source Rating on Fake News in Social Media. MIS Quarterly 43: 1025–39. [CrossRef]

Kim, Cheonsoo, and Sung-Un Yang. 2017. Like, Comment, and Share on Facebook: How Each Behavior Differs from the Other. Public Relations Review 43: 441–49. [CrossRef]

Kim, Jeong-Nam, and James E. Grunig. 2011. Problem Solving and Communicative Action: A Situational Theory of Problem Solving. Journal of Communication 61: 120–49. [CrossRef]

King, Kelvin K., and Bin Wang. 2023. Diffusion of Real versus Misinformation during a Crisis Event: A Big Data-Driven Approach. International Journal of Information Management 71: 102390. [CrossRef]

Kivela, Mikko, Alex Arenas, Marc Barthelemy, James P. Gleeson, Yamir Moreno, and Mason A. Porter. 2014. Multilayer Networks. Journal of Complex Networks 2: 203–71. [CrossRef]

Kramer, Adam D. I., Jamie E. Guillory, and Jeffrey T. Hancock. 2014. Experimental Evidence of Massive-Scale Emotional Contagion through Social Networks. Proceedings of the National Academy of Sciences 111: 8788–90. [CrossRef]

Kunda, Ziva. 1990. The Case for Motivated Reasoning. Psychological Bulletin 108: 480–98. [CrossRef]

Langing, Katie. 2018. Fake News Spreads Faster Than True News on Twitter—Thanks to People, Not Bots. Science.

Lazarus, Richard S. 1991. Progress on a Cognitive-Motivational-Relational Theory of Emotion. American Psychologist 46: 819. [CrossRef] Lazarus, Richard S. 1999. The Cognition-Emotion Debate: A Bit of History. Handbook of Cognition and Emotion 5: 3–19.

Lazer, David, Matthew A. Baum, Yochai Benkler, Adam Berinsky, Kelly M. Greenhill, Filippo Menczer, Miriam J. Metzger, Brendan Nyhan, Gordon Pennycook, David Rothschild, and et al. 2018. The Science of Fake News. Science 359: 1094–96. [CrossRef]

[PubMed]

Lee, Jiyoung, Shaheen Kanthawala, Brian C. Britt, Danielle F. Deavours, and Tanya Ott-Fulmore. 2022. Prevalence of Anger, Engaged in Sadness: Engagement in Misinformation, Correction, and Emotional Tweets during Mass Shootings. Online Information Review

46: 422–40. [CrossRef]

Lerner, Jennifer S., and Dacher Keltner. 2000. Beyond Valence: Toward a Model of Emotion-Specific Influences on Judgement and Choice. Cognition & Emotion 14: 473–93. [CrossRef]

Lewandowsky, Stephan, Ullrich K. H. Ecker, Colleen M. Seifert, Norbert Schwarz, and John Cook. 2012. Misinformation and Its Correction: Continued Influence and Successful Debiasing. Psychological Science in the Public Interest 13: 106–31. [CrossRef]

[PubMed]

Li, Ming-Hui, Zhiqin Chen, and Li-Lin Rao. 2022. Emotion, Analytic Thinking and Susceptibility to Misinformation during the COVID-19 Outbreak. Computers in Human Behavior 133: 107295. [CrossRef]

Liberman, Nira, Yaacov Trope, and Cheryl Wakslak. 2007. Construal Level Theory and Consumer Behavior. Journal of Consumer Psychology 17: 113–17. [CrossRef]

Liu, Yixuan, Changchang Ren, Dingyu Shi, Kai Li, and Xiaofei Zhang. 2020. Evaluating the Social Value of Online Health Information for Third-Party Patients: Is Uncertainty Always Bad? Information Processing & Management 57: 102259. [CrossRef]

Lutz, Bernhard, Marc T. P. Adam, Stefan Feuerriegel, Nicolas Pröllochs, and Dirk Neumann. 2023. Affective Information Processing of Fake News: Evidence from NeuroIS. In Information Systems and Neuroscience: NeuroIS Retreat 2019 LNISO. Edited by Fred D. Davis, Rene Riedl, Jan vom Brocke, Pierre-Majorique Léger, Adriane B. Randolph and Thomas Fischer. Cham: Springer, vol. 32, pp. 121–28.

Mahdi, Ali, Maya F. Farah, and Zahy Ramadan. 2022. What to Believe, Whom to Blame, and When to Share: Exploring the Fake News Experience in the Marketing Context. Journal of Consumer Marketing 39: 306–16. [CrossRef]

Marcus, George E., W. Russell Neuman, and Michael MacKuen. 2000. Affective Intelligence and Political Judgment. Chicago: University of Chicago Press.

Martel, Cameron, Gordon Pennycook, and David G. Rand. 2020. Reliance on Emotion Promotes Belief in Fake News. Cognitive Research: Principles and Implications 5: 47. [CrossRef] [PubMed]

Mehrabian, Albert, and James A. Russell. 1974. An Approach to Environmental Psychology. Cambridge, MA: The MIT Press.

Mirhoseini, Mahdi, Spencer Early, Nour El Shamy, and Khaled Hassanein. 2023. Actively Open-Minded Thinking Is Key to Combating Fake News: A Multimethod Study. Information & Management 60: 103761. [CrossRef]

Moravec, Patricia, Randall Minas, and Alan R. Dennis. 2018. Fake News on Social Media: People Believe What They Want to Believe When It Makes No Sense at All. MIS Quarterly 43: 1343–60. [CrossRef]

Mortillaro, Marcello, and Marc Mehu. 2015. Emotions: Methods of Assessment. In International Encyclopedia of the Social & Behavioral Sciences. Amsterdam: Elsevier, pp. 519–25. [CrossRef]

Muis, Krista R., Marianne Chevrier, and Cara A. Singh. 2018. The Role of Epistemic Emotions in Personal Epistemology and

Self-Regulated Learning. Educational Psychologist 53: 165–84. [CrossRef]

Osatuyi, Babajide, and Jerald Hughes. 2018. A Tale of Two Internet News Platforms-Real vs. Fake: An Elaboration Likelihood Model Perspective. Paper presented at the 51st Hawaii International Conference on System Sciences (HICSS), Waikoloa Village, HI, USA, January 3–6; pp. 3986–94.

Osmundsen, Mathias, Alexander Bor, Peter Bjerregaard Vahlstrup, Anja Bechmann, and Michael Bang Petersen. 2021. Partisan

Polarization Is the Primary Psychological Motivation behind Political Fake News Sharing on Twitter. American Political Science Review 115: 999–1015. [CrossRef]

Pare, Guy, Mirou Jaana, and Claude Sicotte. 2007. Systematic Review of Home Telemonitoring for Chronic Diseases: The Evidence Base. Journal of the American Medical Informatics Association 14: 269–77. [CrossRef] [PubMed]

Pehlivanoglu, Didem, Nichole R. Lighthall, Tian Lin, Kevin J. Chi, Rebecca Polk, Eliany Perez, Brian S. Cahill, and Natalie C. Ebner. 2022. Aging in an 'Infodemic': The Role of Analytical Reasoning, Affect, and News Consumption Frequency on News Veracity Detection. Journal of Experimental Psychology: Applied 28: 468–85. [CrossRef]

Pekrun, Reinhard, and Elizabeth J. Stephens. 2012. Academic Emotions. APA Educational Psychology Handbook 2: 3–31. [CrossRef]

Pennycook, Gordon, and David G. Rand. 2018. Susceptibility to Partisan Fake News Is Explained More by a Lack of Deliberation than by Willful Ignorance. SSRN Working Paper. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3165567 (accessed on 1 November 2023).

Pennycook, Gordon, and David G. Rand. 2019a. Fighting Misinformation on Social Media Using Crowdsourced Judgments of News Source Quality. Proceedings of the National Academy of Sciences 116: 2521–26. [CrossRef]

Pennycook, Gordon, and David G. Rand. 2019b. Lazy, Not Biased: Susceptibility to Partisan Fake News Is Better Explained by Lack of Reasoning than by Motivated Reasoning. Cognition 188: 39–50. [CrossRef]

Pennycook, Gordon, Jonathon McPhetres, Yunhao Zhang, Jackson G. Lu, and David G. Rand. 2020. Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy-Nudge Intervention. Psychological Science 31: 770–80. [CrossRef]

Pennycook, Gordon, Tyrone D. Cannon, and David G. Rand. 2018. Prior Exposure Increases Perceived Accuracy of Fake News. Journal of Experimental Psychology: General 147: 1865–80. [CrossRef]

Petty, Richard E., and John T. Cacioppo. 1986. The Elaboration Likelihood Model of Persuasion. New York: Springer, pp. 1–24.

Plutchik, Robert. 2001. The Nature of Emotions: Human Emotions Have Deep Evolutionary Roots, a Fact That May Explain Their Complexity and Provide Tools for Clinical Practice. American Scientist 89: 344–50. [CrossRef]

Pröllochs, Nicolas, Dominik Bär, and Stefan Feuerriegel. 2021. Emotions Explain Differences in the Diffusion of True vs. False Social Media Rumors. Scientific Reports 11: 22721. [CrossRef]

Rijo, Angela, and Sven Waldzus. 2023. That's Interesting! The Role of Epistemic Emotions and Perceived Credibility in the Relation between Prior Beliefs and Susceptibility to Fake-News. Computers in Human Behavior 141: 107619. [CrossRef]

Rosenstiel, Tom, Jeff Sonderman, Kevin Loker, Maria Ivancin, and Nina Kjarval. 2015. Twitter and the News: How People Use the Social Network to Learn About the World, AmericanPress Institute. Available online: http://www.americanpressinstitute.org/ wp-content/uploads/2015/09/Twitter-and-News-How-people-use-Twitter-to-get-news-American-Press-Institute.pdf (accessed on 1 November 2023).

Rosenzweig, Leah R., Bence Bago, Adam J. Berinsky, and David G. Rand. 2021. Happiness and Surprise Are Associated with Worse Truth Discernment of COVID-19 Headlines among Social Media Users in Nigeria. Harvard Kennedy School Misinformation Review 2: 1–37. [CrossRef]

Rubin, Victoria L., Yimin Chen, and Nadia K. Conroy. 2015. Deception Detection for News: Three Types of Fakes. Proceedings of the Association for Information Science and Technology 52: 1–4. [CrossRef]

Ruggiero, Thomas E. 2000. Uses and Gratifications Theory in the 21st Century. Mass Communication & Society 3: 3–37.

Russell, James A. 2003. Core Affect and the Psychological Construction of Emotion. Psychological Review 110: 145–72. [CrossRef] [PubMed]

Scheibenzuber, Christian, Laurentiu-Marian Neagu, Stefan Ruseti, Benedikt Artmann, Carolin Bartsch, Montgomery Kubik, Mihai Dascalu, Stefan Trausan-Matu, and Nicolae Nistor. 2022. Fake News Framing, Emotion, Argumentation, and Dialogic Social

Knowledge Building in Online Discussions: An Exploration Including Natural Language Processing Data. Paper presented at the

15th International Conference on Computer-Supported Collaborative Learning-CSCL 2022, CSCL2022 Proceedings, International Conference Center Hiroshima, The International Society for the Learning Science, Hiroshima, Japan, June 6–10; pp. 415–18.

Scheibenzuber, Christian, Laurentiu-Marian Neagu, Stefan Ruseti, Benedikt Artmann, Carolin Bartsch, Montgomery Kubik, Mihai

Dascalu, Stefan Trausan-Matu, and Nicolae Nistor. 2023. Dialog in the Echo Chamber: Fake News Framing Predicts Emotion, Argumentation and Dialogic Social Knowledge Building in Subsequent Online Discussions. Computers in Human Behavior 140: 107587. [CrossRef]

Schwarz, Norbert. 2012. Feelings-as-Information Theory. In Handbook of Theories of Social Psychology: Volume 1. Edited by Paul Van Lange, Arie Kruglanski and E. Higgins. London: SAGE Publications Ltd., pp. 289–308. [CrossRef]

Serrano-Puche, Javier. 2021. Digital Disinformation and Emotions: Exploring the Social Risks of Affective Polarization. International Review of Sociology 31: 231–45. [CrossRef]

Settle, Jaime E. 2020. Moving Beyond Sentiment Analysis: Social Media and Emotions in Political Communication. In The Oxford Handbook of Networked Communication. Oxford: Oxford University Press.

Shao, Chengcheng, Giovanni Luca Ciampaglia, Onur Varol, Kai-Cheng Yang, Alessandro Flammini, and Filippo Menczer. 2018. The

Spread of Low-Credibility Content by Social Bots. Nature Communications 9: 4787. [CrossRef] [PubMed]

Shin, Jieun, Lian Jian, Kevin Driscoll, and François Bar. 2018. The Diffusion of Misinformation on Social Media: Temporal Pattern, Message, and Source. Computers in Human Behavior 83: 278–87. [CrossRef]

Skaza, Jonathan, and Brian Blais. 2017. Modeling the Infectiousness of Twitter Hashtags. Physica A: Statistical Mechanics and Its Applications 465: 289–96. [CrossRef]

Slovic, Paul, Melissa L. Finucane, Ellen Peters, and Donald G. MacGregor. 2007. The Affect Heuristic. European Journal of Operational Research 177: 1333–52. [CrossRef]

Smith, Eliot R., and Jamie DeCoster. 2000. Dual-Process Models in Social and Cognitive Psychology: Conceptual Integration and Links to Underlying Memory Systems. Personality and Social Psychology Review 4: 108–31. [CrossRef]

Solovev, Kirill, and Nicolas Pröllochs. 2022. Moral Emotions Shape the Virality of COVID-19 Misinformation on Social Media. Paper presented at the ACM Web Conference 2022, Virtual Event, April 25–29; Lyon: ACM, pp. 3706–17. [CrossRef] Spielberger, Charles. 1983. State-Trait Anxiety Inventory for Adults. Palo Alto: Consulting Psychologists.

Swami, Viren, Adrian Furnham, Nina Smyth, Laura Weis, Alixe Lay, and Angela Clow. 2016. Putting the Stress on Conspiracy Theories: Examining Associations between Psychological Stress, Anxiety, and Belief in Conspiracy Theories. Personality and Individual

Differences 99: 72–76. [CrossRef]

Talwar, Shalini, Amandeep Dhir, Puneet Kaur, Nida Zafar, and Melfi Alrasheedy. 2019. Why Do People Share Fake News? Associations between the Dark Side of Social Media Use and Fake News Sharing Behavior. Journal of Retailing and Consumer Services 51: 72–82. [CrossRef]

Tan, Wee-Kheng, and Chun Yu Hsu. 2023. The Application of Emotions, Sharing Motivations, and Psychological Distance in Examining the Intention to Share COVID-19-Related Fake News. Online Information Review 47: 59–80. [CrossRef]

Tandoc, Edson C. 2019. The Facts of Fake News: A Research Review. Sociology Compass 13: e12724. [CrossRef]

Tomljenovic, Helena, Andreja Bubic, and Nikola Erceg. 2020. It Just Doesn’t Feel Right—The Relevance of Emotions and Intuition for Parental Vaccine Conspiracy Beliefs and Vaccination Uptake. Psychology & Health 35: 538–54. [CrossRef]

Torre, Jared B., and Matthew D. Lieberman. 2018. Putting Feelings Into Words: Affect Labeling as Implicit Emotion Regulation. Emotion Review 10: 116–24. [CrossRef]

Tracy, Jessica L., and Richard W. Robins. 2008. The Nonverbal Expression of Pride: Evidence for Cross-Cultural Recognition. Journal of Personality and Social Psychology 94: 516–30. [CrossRef] [PubMed]

Vafeiadis, Michail, and Anli Xiao. 2021. Fake News: How Emotions, Involvement, Need for Cognition and Rebuttal Evidence (Story vs. Informational) Influence Consumer Reactions toward a Targeted Organization. Public Relations Review 47: 102088. [CrossRef] Valencia-Arias, Alejandro, Diana María Arango-Botero, Sebastián Cardona-Acevedo, Sharon Soledad Paredes Delgado, and Ada Gallegos. 2023. Understanding the Spread of Fake News: An Approach from the Perspective of Young People. Informatics 10: 38. [CrossRef]

Van Kleef, Gerben A. 2009. How Emotions Regulate Social Life: The Emotions as Social Information (EASI) Model. Current Directions in

Psychological Science 18: 184–88. [CrossRef] van Koningsbruggen, Guido M., Tilo Hartmann, Allison Eden, and Harm Veling. 2017. Spontaneous Hedonic Reactions to Social Media Cues. Cyberpsychology, Behavior, and Social Networking 20: 334–40. [CrossRef]

Vosoughi, Soroush, Deb Roy, and Sinan Aral. 2018. The Spread of True and False News Online. Science 359: 1146–51. [CrossRef] Wahl-Jorgensen, Karin. 2019. Emotions, Media and Politics. Hoboken: John Wiley & Sons.

Wang, Rui, Yuan He, Jing Xu, and Hongzhong Zhang. 2020. Fake News or Bad News? Toward an Emotion-Driven Cognitive Dissonance Model of Misinformation Diffusion. Asian Journal of Communication 30: 317–42. [CrossRef]

Wang, Yuxi, Martin McKee, Aleksandra Torbica, and David Stuckler. 2019. Systematic Literature Review on the Spread of HealthRelated Misinformation on Social Media. Social Science & Medicine 240: 112552. [CrossRef]

Wardle, Claire, and Hossein Derakhshan. 2018. Thinking about 'Information Disorder': Formats of Misinformation, Disinformation, and Mal-Information. In Journalism, 'Fake News' & Disinformation. Edited by Cherilyn Ireton and Julie Posetti. Paris: UNESCO, pp. 43–54.

Watson, David, Lee Anna Clark, and Auke Tellegen. 1998. Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. Journal of Personality and Social Psychology 54: 1063–70. [CrossRef]

Weeks, Brian E. 2015. Emotions, Partisanship, and Misperceptions: How Anger and Anxiety Moderate the Effect of Partisan Bias on Susceptibility to Political Misinformation: Emotions and Misperceptions. Journal of Communication 65: 699–719. [CrossRef]

Zhang, Ping. 2013. The Affective Response Model: A Theoretical Framework of Affective Concepts and Their Relationships in the ICT Context. MIS Quarterly 37: 247–74. [CrossRef]

Zhou, Cheng, Haoxin Xiu, Yuqiu Wang, and Xinyao Yu. 2021. Characterizing the Dissemination of Misinformation on Social Media in Health Emergencies: An Empirical Study Based on COVID-19. Information Processing & Management 58: 102554. [CrossRef]

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," *Online Information Review*, 2022.	Review paper.
P. C. Bauer and B. Clemm von Hohenberg, "Believing and sharing information by fake sources: An experiment," *Political Communication*, 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," *Computational Brain & Behavior*, 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," *Linguistic and Philosophical Investigations*, 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," *Personality and Individual Differences*, 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," *Brazilian Journalism Research*, 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," *Proceedings of the ACM on Human-Computer Interaction*, 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," *Online Social Networks and Media*, 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," *Journal of Health Communication*, 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," *Journal of Computational Social Science*, 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," *Journal of Experimental Social Psychology*, 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," *Social Influence*, 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," *Proceedings of the ACM on Human-Computer Interaction*, 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," *Journal of the Association for Information Science and Technology*, vol. 72, no. 9, pp. 1117–1132, 2021.	Focuses only on the detection of fake news.
K. T. Gradon´, J. A. Hołyst, W. R. Moy, J. Sienkiewicz, and K. Suchecki, "Countering misinformation: A multidisciplinary approach," *Big Data & Society*, 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," *Politics in Central Europe*, 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," *Jurnal Ilmiah Peuradeun*, 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," *Behaviour & Information Technology*, 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," *Psychological Reports*, 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," *Political Behavior*, pp. 1–60, 2023.	Only refers to affective polarization.
L. A. Juez and J. L. Mackenzie, "Emotion, lies, and "bullshit" in journalistic discourse," *Ibérica*, 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 *2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 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," *Online Social Networks and Media*, 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," *Health Communication*, 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," *Cyberpsychology, Behavior, and Social Networking*, 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," *Historia y comunicación social*, 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," *Psychology of Popular Media*, 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," *IEEE Transactions on Computational Social Systems*, 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," *Journal of Police and Criminal Psychology*, 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," *Healthcare Informatics Research*, 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?," *Emotion*, 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," *Social Media+ Society*, 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," *International Review of Sociology*, 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," *Health Communication*, 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," *Memory & Cognition*, 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," *Personality and Social Psychology Bulletin*, 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," *Media and Communication*, 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," *Public Relations Review*, 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 *Proceedings of the 2021 IEEE/ACM international conference on advances in social networks analysis and mining*, 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," *Communication Studies*, 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," *Data Analysis and Knowledge Discovery*, 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.
Dual-process theories of cognition (Smith and DeCoster 2000)	Ali et al. (2022).	- 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).	- 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.
	Martel et al. (2020).	- 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).	- 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).	- 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).	- 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.
Motivated reasoning (Kunda 1990)	Freiling et al. (2023).	See above.
	Martel et al. (2020).	See above.
	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.

Chapter 2: Investigating the impact of affective constructs and Actively Open-Minded Thinking (AOT) on the perception of fake news on social media

Abstract

Social media has amplified the spread of fake news, yet research largely overlooks the impact of affective influences on fake news perception. We examine the impact of mood arousal (study 1), affective cues (study 2), and emotion (study 3), alongside Actively Open-Minded Thinking (AOT) on fake news discernment and sharing intentions in a social media context. Study 1 demonstrated that mood arousal reduced discernment at low AOT, had no effect at moderate AOT, and improved discernment at high AOT levels, suggesting a continuum of mood arousal regulation from dysregulation to adaptive optimization. Additionally, mood arousal increased fake news sharing intentions only at low AOT levels. Study 2 found that affective cues impaired truth discernment and increased sharing intentions regardless of AOT levels, suggesting such cues bypass regulation. Study 3 revealed that while emotional experiences diminished the influence of mood arousal, emotion itself had no direct effect on either of fake news discernment or sharing intent, nor was it moderated by AOT. These findings emphasize key differences between affective constructs and the need for misinformation interventions that account for both cognitive and affective dimensions in emotionally charged online environments.

Introduction

Although fake news has circulated in the media since the early 20th century (Lazer et al., 2018), the rise of social media platforms, enabled by new technologies, has allowed producers of fake news to create and spread false information at an unprecedented scale (Lewandowsky et al., 2017). One hallmark of these platforms is their abundant emotional content, which users regularly encounter as they scroll through their feeds (Preston et al., 2021; Vosoughi et al., 2018). This

emotional stimulation can influence how users subsequently engage with news headlines, prompting behaviors such as liking, sharing, commenting or messaging (Kim & Yang, 2017). Despite this, much of the research on combatting the spread of fake news on social media platforms has concentrated on cognitive factors such as analytical thinking (Pennycook & Rand, 2019b, 2019a), dogmatism (Bronstein et al., 2019), fact-checkers (Lazer et al., 2018), passive and active inoculation (Kozyreva et al., 2020; Lewandowsky & and van der Linden, 2021, Maertens et al., 2021; Roozenbeek & Van Der Linden, 2019), intellectual humility (Bowes & Fazio, 2024), source credibility reasoning (Dias et al., 2020), and nudge-based interventions (Butler et al., 2024) on reducing belief in misinformation.

As a result, little attention has been given to the role of affect in shaping users' belief in and intent to share fake news on social media platforms. This research gap is noteworthy given that the impact of affect on judgment and decision making is well documented in the Psychology literature (Ajzen, 1996) by the dual-process theories of cognition (Smith & DeCoster, 2000), the resource allocation model (Ellis, 1988), the assimilative vs. accommodative model of emotion (Bless & Fiedler, 2006), the notion of the affect heuristic (Slovic et al., 2007), and feelings as information theory (Schwarz, 2012). Despite this extensive body of work, research on misinformation continues to prioritize cognitive interventions, overlooking the substantial impact of affective processes.

The scant studies on combating fake news that have implicated the notion of affect have disregarded its multifaceted nature. This complexity is evident in the concept of core affect, which is a neurophysiological state consciously accessible as a non-reflective feeling and comprises two independent dimensions: the pleasure (valence) dimension, ranging from misery to ecstasy, and the arousal (activation) dimension, ranging from sleepiness to activation (Russell, 2003). Indeed,

although there has been a predominant focus on affective feelings within the Information and Communication Technology (ICT) context, this narrow lens overlooks the broader nature of affect which, as highlighted by Zhang (2013), encompasses several and different affective concepts.

To gain a better understanding of the different affective concepts in the context of perceiving fake news on social media (i.e., in the context of an ICT interaction episode), we refer to the Affective Response Model (ARM), a theoretically bound conceptual framework that provides a systematic reference map for ICT studies that consider affect (P. Zhang, 2013). The ARM framework proposes that affective concepts can be examined by where their meanings exist and groups them into three categories accordingly: (i) concepts that reside within a person, (ii) concepts that reside within a stimulus, and concepts that reside between a person and a stimulus (P. Zhang, 2013). Thus, in using ARM, we account for the multifaceted nature of core affect by distinguishing between different affective concepts that extend beyond affective feelings, which Zhang (2013) writes is just one of the four facets of emotions. This is especially relevant in an ICT context, where it is important to differentiate between affective responses tied to the object itself (e.g., an ICT tool) and those linked to its use (P. Zhang, 2008; P. Zhang & Sun, 2009).

Additionally, ARM provides a theoretically grounded structure for exploring the causal or co-occurring relationships among different affective elements during ICT interactions. It draws from established models such as the Affect Infusion Model (AIM) (Forgas, 1995), which posits that affective states can systematically influence cognitive processes; the Stimulus–Organism–Response (S-O-R) paradigm (Mehrabian & Russell, 1974), which explains how environmental cues trigger affective and cognitive reactions that influence behavior; and the Feelings-as-information theory (Schwarz, 2012), which proposes that the feelings one has toward a stimulus can influence their evaluation of that stimulus. Taken together, ARM addresses an existing gap in

the ICT literature and answers a core question in our work, namely: *What impacts do affective responses have on human interaction with ICTs in a fake news context?*

Three of the affective constructs identified by the ARM framework are included in this work. The first construct is mood arousal (residing within a person). This is the intensity of mood, "a prolonged affective state that has an unclear or unknown stimulus (P. Zhang, 2013, p. 250). It is a transient state that waxes and wanes, often modulating our conscious awareness and shaping the way other emotions and feelings are experienced (Russell, 2003). The second construct is affective cues (residing within a stimulus), which represent properties of the stimulus that contain affective information independent of the perceiver (P. Zhang, 2013). For instance, certain design attributes of an ICT, like its size, color or interface layout, serve as affective cues (Soldat et al., 1997; Valdez & Mehrabian, 1994). These were found to influence both emotional responses (Valdez & Mehrabian, 1994) and cognitive processing strategies (Soldat et al., 1997). These findings are aligned with the stimulus-organism-response (S-O-R) model, which posits that environmental cues serve as stimuli that impact individuals' cognitive and affective reactions, which in turn shapes their behavior (Mehrabian & Russell, 1974). In digital contexts, affective cues operate at a perceptual level to capture attention and trigger affective reactions even before the semantic content of the message is fully processed (P. Zhang, 2013). The final construct is emotion (residing between a person and a stimulus), which is positioned within the ARM framework as an ephemeral affective state that is induced as a result of an interaction between users and a stimulus (P. Zhang, 2013). It is characterized by a comprehensive and interlinked cascade of physiological and psychological responses, triggered by specific stimuli (Scherer, 2005).

Carretié et al. (2003) posit a strong interdependence of cognitive and affective neural processes. As such, we do not discount the role of cognitive factors in the perception of fake news and include one such trait, Actively Open-Minded Thinking (AOT) in this work. AOT refers to the disposition to consider alternative viewpoints, seek out evidence that challenges one's beliefs, and revise opinions based on new information, rather than relying on intuition or pre-existing biases (Stanovich & West, 1997). Specifically, we investigate the impact of AOT as well as its interaction with the aforementioned affective constructs on belief in and intent to share fake news in a social media context.

Having established the affective constructs and the cognitive disposition central to this work, the next section reviews theoretical frameworks and studies that elucidate the mechanisms through which the affective constructs and AOT shape individuals' judgments and behavior.

Literature review

Affective-cognitive integration theories

In investigating the relationship between affect and individuals' propensity to believe information, two competing theories exist. The assimilative vs. accommodative model (Bless & Fiedler, 2006) states that positive and negative emotions influence peoples' perceived accuracy of information by regulating their information processing strategies differently. Thus, individuals experiencing positive emotion tend to employ more heuristic and less effortful strategies while those in negative emotional states tend to use more analytic, detail oriented, and effortful processing strategies that increase sensitivity to false or misleading information (Bless & Fiedler, 2006). The fake news literature in support of this theory is scarce.

The resource allocation model (Ellis, 1988), which can be classified under the dual process models of cognition (Smith & DeCoster, 2000), on the other hand states that both positive and negative emotions facilitate heuristic information processing strategies because they increase irrelevant thoughts that occupy attentional resources in the brain and reduce the processing effort invested in ongoing cognitive tasks. This theory has greater support in the fake news literature as it was informed by Martel et al. (2020), who investigated the role of emotion on the likelihood of believing fake news. In one study, they found that as individuals increasingly relied on emotions over reason, their perception of fake stories as being accurate also grew. In a separate study, Martel et al. (2020) demonstrated that an increased reliance on momentary emotion, regardless of its type or valence, increased individuals' susceptibility to fake news on social media beyond the effects of a lack of reasoning and decreased discernment between real and fake news. A similar finding was demonstrated by Rosenzweig et al. (2021), who found that experiencing any emotional reaction after reading a headline was associated with worse truth discernment and that participants were better at discerning true from false news when they experienced no emotion after reading a headline. Finally, a study by Bago et al. (2020) provided partial support of the resource allocation model through its finding that with the exception of anger, the majority of emotions are associated with diminished truth discernment.

Incidental vs integral affect

In the context of users scrolling through social media, mood arousal is akin to the affective climate that users bring to these platforms whereas emotion is what each post evokes in the moment. A similar distinction was made by Blanchette and Richards (2010) between incidental and integral affect. In the former, the affective feeling state is free floating and independent from the content that participants are processing (similar to Zhang, (2013)'s conceptualization of mood). Integral

affect on the other hand occurs when the affective state is induced by the content that participants are processing during the task (similar to Zhang, (2013)'s conceptualization of emotion). It should however be noted that when referring to incidental affect, although Blanchette and Richards (2010) mention that it may be induced by "moods", they describe moods to be "induced affective states that are transient in nature" p. 562. As such, there is no consensus in the literature regarding the definition of affective concepts, yet agreement does exist about affective concepts differing across the task relevance dimension.

Classical reasoning theory

Although this work advocates for incorporating affect in misinformation research, it does not do so at the expense of cognitive factors. The impact of cognitive reasoning in the context of fake news perception should not be underestimated because one theory in the fake news literature on why individuals fall for fake news is the classical reasoning theory (Kohlberg, 1994; Piaget, 2013). This account of reasoning argues that individuals' vulnerability to fake news primarily stems from their unwillingness or inability to engage in sufficient analytical thinking. According to the classical reasoning account, the extent to which individuals apply their cognitive resources for reasoning is linked to their ability to discern between true and false information, regardless of whether the content aligns with their political beliefs (Pennycook & Rand, 2019b).

Cognitive-Experiential Self-Theory (CEST)

Support for the relevance of cognitive factors in the perception of fake news comes from research showing that individuals who perform better on the Cognitive Reflection Test (CRT) (Frederick, 2005), which measures the propensity to engage in analytical reasoning, are better able to distinguish between real and fake news headlines than those who primarily rely on intuitive judgments (Pennycook et al., 2020; Pennycook & Rand, 2019b). On the sharing of fake news,

research shows that prompting individuals to engage in deliberate reasoning, rather than relying on intuition, can reduce their self-reported likelihood of sharing fake news on social media. For instance, asking participants to pause and consider why a given headline is true or false before deciding to share it (Fazio, 2020) or prompting one accuracy judgment at the beginning of a study (Pennycook et al., 2020, 2021) was shown to decrease the dissemination of misinformation.

The act of distinguishing between a reasoning and an intuitive system is aligned with the Cognitive-Experiential Self-Theory (CEST) (Epstein, 1998), a dual-process framework that posits two parallel and independent information-processing systems. The first is the experiential system that operates intuitively and preconsciously and is guided by emotions, while the second is the rational system that functions consciously and analytically, and adheres to rule-based reasoning. CEST aligns conceptually with the dual-process framework for cognition (Smith & DeCoster, 2000) as its experiential system resembles the automatic system (system 1), and its rational system resembles the controlled system (system 2). In the experiential system of CEST, emotions are fundamental in influencing behavior and guiding judgments (Epstein, 1998). Importantly, according to CEST, initial judgments are often driven by the intuitive system, however the analytical system can intervene to reassess or override these judgments when necessary. This highlights the role of cognitive dispositions in determining one's ability to differentiate between fake and real news.

Actively open-minded thinking (AOT)

One example of a cognitive disposition that can intervene in the experiential system of CEST is actively open-minded thinking (AOT), defined as "the disposition to weigh new evidence against a favored belief heavily (or lightly), the disposition to spend a great deal of time (or very little) on a problem before giving up, or the disposition to weigh heavily the opinions of others in forming

one's own" (Baron, 2005), p. 15). Reduced AOT is associated with several constructs stemming from diminished system 2 thinking, including religious fundamentalism (Pennycook et al., 2014), dogmatism (Bronstein et al., 2019), and reduced analytical thinking (Bronstein et al., 2019). Indeed, AOT has been shown to facilitate system 2 thinking, which can suppress and override incorrect intuitive responses driven by system 1 (Newton & Pennycook, 2020). In a fake news context, the importance of AOT was highlighted by Mirhoseini et al. (2023), who demonstrated through behavioral and neurophysiological evidence that reduced AOT is the primary factor that renders users vulnerable to fake news.

AOT and Emotion Regulation

The CEST theory (Epstein, 1998) posits that individuals' initial judgments are typically influenced by their intuitive, affect-laden experiential system. However, this initial reaction is not always final. The analytical, rational system has the capacity to step in, critically evaluate the initial judgment, and, if necessary, modify or override it. This more deliberate process allows for adjustments based on new information, ensuring that decisions are not solely dictated by intuition but can also be refined through conscious reflection. Empirical evidence supports this notion, demonstrating that reflective individuals display heightened sensitivity to conflicts between intuition and logic (conflict detection) (Šrol & De Neys, 2021). In a similar vein, Strudwicke et al. (2024) found that AOT predicted conflict detection sensitivity and meta-reasoning discrimination (an index of the ability to discern correct from incorrect answers). Given that AOT is linked to enhanced System 2 functioning (Newton & Pennycook, 2020), this framework can be extended to argue that, in the context of fake news, AOT may promote System 2 thinking by improving emotion regulation.

Emotion regulation refers to "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998), p.275). It involves the initiation of new emotional responses or the modification of existing ones through regulatory processes (Ochsner & Gross, 2005) and may be particularly important when individuals encounter emotionally evocative stimuli, a hallmark of fake news headlines (Preston et al., 2021; Vosoughi et al., 2018). Such stimuli can trigger strong affective reactions that, if left unchecked, may impair cognitive processing and lead to impulsive decision-making (Martel et al., 2020). Because AOT is associated with enhanced system 2 functioning (Newton & Pennycook, 2020), individuals with higher levels of AOT may be better equipped to regulate their emotional responses. In turn, improved emotion regulation could help mitigate the disruptive influence of mood on cognition (such as when discerning between real and fake news headlines) by preventing a premature reliance on intuitive reactions when a more rational and reflective analytical approach is warranted.

The impact of affect on the sharing of fake news

On the sharing of social media content, Horner et al. (2021) found that individuals who reacted to fake news with intense emotions were the most likely to say they would share or suppress those stories. This effect was influenced by whether the headlines were aligned with their existing beliefs. By contrast, those who felt relatively unmoved were less inclined to share any content. Notably, Horner et al. (2021)'s findings make a distinction regarding the valence of the emotions experienced. Specifically, participants who reported experiencing high levels of negative emotions and low levels of positive emotions were more inclined to refrain from spreading fake news and less likely to engage in its dissemination.

Accuracy sharing dissociation

Research has shown that the veracity of headlines has minimal impact on individuals' intentions to share them on social media, even though it significantly affects their accuracy judgments (Pennycook et al., 2020, 2021). In fact, Pennycook et al. (2021) argue that believing in the accuracy of a given headline and deciding to share it are largely independent processes. Similarly, Chen (2016) found that the sharing of misinformation is driven more by individuals' personalities and specific motivations than by how accurate they perceive the content to be. This disconnect between accuracy and sharing, referred to as the accuracy-sharing dissociation phenomenon (Pennycook et al., 2020, 2021), has been attributed to three competing theories: (1) the confusion-based account, which suggests that people mistakenly think the false content they share is true; (2) the preference-based account, which posits that individuals prioritize aligning with their political identity over truthfulness; and (3) the inattention-based account, which argues that the distracting nature of social media leads people to overlook their general preference for sharing accurate information.

Study 1 Investigating the impact of mood arousal and AOT on belief in and intent to share fake news headlines on social media

We investigate the association between state-based emotionality (users' mood arousal) and a cognitive disposition (users' AOT) with users' accuracy judgments and sharing intentions of real and fake news headlines. According to the circumplex model of affect (Russell, 1980), arousal, a fundamental component of mood, reflects the physiological and psychological activation dimension of mood. AOT is a willingness to engage with new evidence, reconsider preexisting beliefs, and integrate diverse perspectives (Baron, 2005; Stanovich & West, 1997). Our goal is to understand the impact of mood arousal on (i) performance (the ability to discern between real and fake news headlines) and (ii) behavior (the intent to share fake news headlines) and to assess if and how mood arousal prior to viewing news headlines interacts with AOT to impact these variables.

Hypotheses

In line with the Resource Allocation Model (Ellis, 1988) and findings by Martel et al. (2020) and Rosenzweig et al. (2021), we predict that heightened mood arousal increases the extent to which people believe fake news on social media and decreases their performance (ability to discern between real and fake news headlines).

H1: Mood arousal is associated with a decreased ability to discern between real and fake news headlines on social media platforms.

Consistent with the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021), we predict that heightened mood arousal increases the extent to which people intend to share fake news headlines.

H2: Mood arousal is associated with an increased intent to share fake news headlines on social media platforms.

Drawing from the classical reasoning account (Kohlberg, 1994; Piaget, 2013) and findings by Mirhoseini et al. (2023), we predict that AOT reduces the extent to which people believe fake news on social media and increases their performance (ability to discern between real and fake news headlines).

H3: AOT is associated with an increased ability to discern between real and fake news headlines on social media platforms.

In accordance with the classical reasoning account (Kohlberg, 1994; Piaget, 2013), we predict that AOT reduces the extent to which people intend to share fake news headlines.

H4: AOT is associated with a decreased intent to share fake news headlines on social media platforms.

Building on the Cognitive Experiential Self Theory (CEST) (Epstein, 1998), we predict that increased levels of AOT lead to enhanced regulation of mood arousal. This enhanced regulatory capacity, in turn, renders individuals with high AOT levels less susceptible to the negative effect of mood arousal when evaluating the authenticity of news headlines.

H5: The impact of mood arousal on the ability to discern between real and fake news headlines is reduced in people with high AOT levels.

In line with the Cognitive Experiential Self Theory (CEST) (Epstein, 1998) and the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021), we hypothesize that increased levels of AOT lead to improved regulation of mood arousal. This enhanced regulatory capacity, in turn, should render individuals with high AOT levels less susceptible to the impact of mood intensity on their intent to share fake news headlines.

H6: The impact of mood arousal on the intent to share fake news headlines is reduced in people with high AOT levels.

Method

We created a survey using the online platform Qualtrics and collected data using the online platform Prolific. To test our hypotheses, we crafted 12 news headlines in a format that mimics Facebook posts. These were chosen according to the bipartisan factchecker website snopes.com, adjusted for their length in terms of the number of words, and balanced in terms of truthfulness (true/false), and political stance (neutral/liberal favorableness/conservative favorableness). A control headline: "The capital city of Canada is Ottawa", the assessment of which is very easy was also created. To focus attention on the headline and to remove any confounds, we added a grey rectangle (where there usually is an image) accompanying the headline. Figure 1 shows an example of one of the headlines. Appendix C displays all headline posts used in this study.

Figure 1. Example of a headline (false, neutral) used in study 1.

Procedure

We began the study by asking participants a series of demographics questions. Then, we deployed a measure of arousal to measure participants' mood arousal. Next, we presented participants with the task during which the 13 headlines (12 headlines from snopes.com + the control headline) were randomly presented to participants. After being presented with each headline, participants were asked to (in the following order): (1) assess the veracity of each headline, and (3) report on their intent to share each headline. After completion of the task, participants' AOT was measured. Figure 2 demonstrates the experimental design.

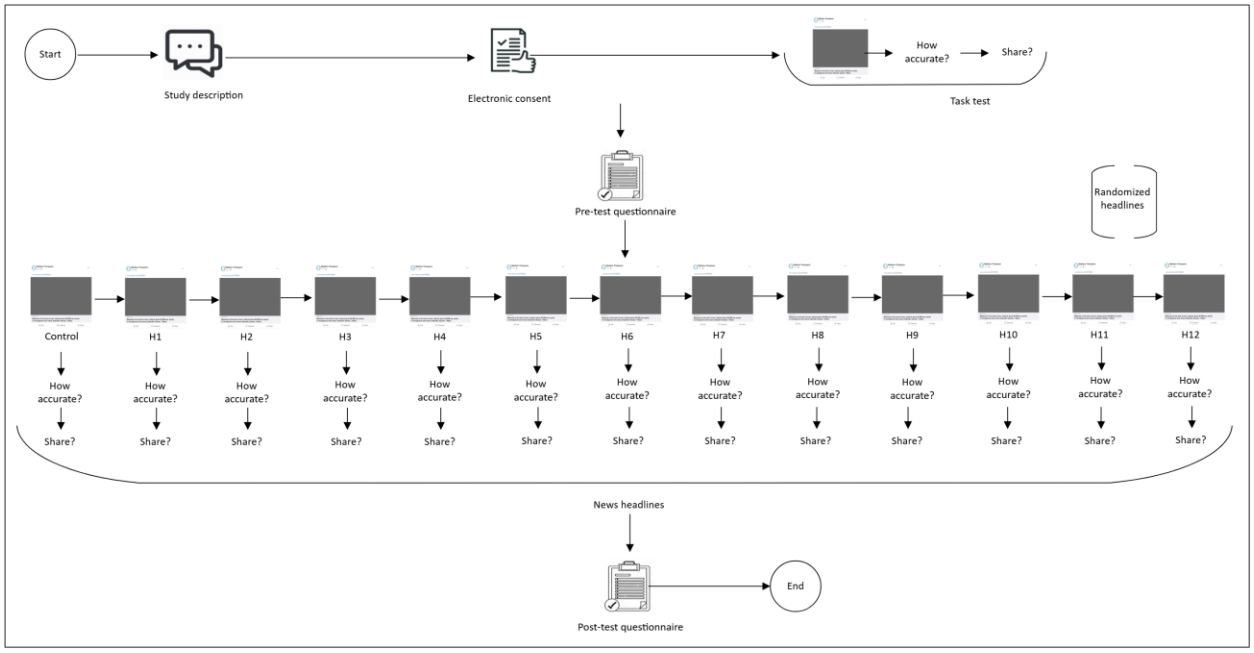


Figure 2. Study 1 experimental design.

Measures

We measured participants' mood arousal using the circumplex model by Mehrabian and Russell (1974), which is among the most extensively researched models of affect (Remington et al., 2000; Russell & Barrett, 1999). Participants were asked to rate their feelings on a scale related to how activated or calm they feel. To measure participants' belief of the headlines they were presented with, we asked the question "To the best of your knowledge, how accurate is the claim in the above

headline?" which was evaluated on a 4-point scale ranging from "not at all accurate" to "very accurate". To measure participants' intent to share the headlines they were presented with, we asked "Would you share the information you just read?", which was answered with a yes/no response. Participants' ability to think in an actively open-minded fashion was measured using the well-established AOT scale by Stanovich and West (1997).

Results

We collected data from 253 participants. Because this was an online study in which we had little control over the participants while they were answering our surveys, it was important to exclude participants (n=48) who failed the attention check and/or spent too long or very little time performing the task. Our final sample after cleaning the data was 205 participants.

Participants

Our final sample was 38% male, 60% female. 1% classified as "other" and 1% opted not to specify their gender. 21% of the participants were between 18-24 years of age, 27% were between 25-34 years of age, 21% were between 35-44 years of age, 18% were between 45-54 years of age, and 13% were over 55 years old. The ethnicities distribution of our sample was as follows: 13% Asian/Pacific Islander, 19% Black or African American, 11% Hispanic or Latino, 0.5% Native American or American Indian, 56 % White, and 0.5% Other. 33% had a high school or high school equivalent degree, 45% had a Bachelor's degree, 19% had a Master's degree, and 3% had a Doctorate.

Descriptive statistics

Tables 1a and 1b display the descriptive statistics for the variables of interest. These include demographic variables (age, gender, ethnicity, and education) and our independent variables

(mood arousal and AOT) respectively. For our dependent variables, the average performance was 3.370 (SD=1.271) and the average intent to share was 1.180 (SD=1.563). For analysis purposes, participants who indicated "Other" or "I prefer not to say" for gender were pooled into a separate category "Other" (n=4). Similarly, participants who indicated "Asian/Pacific Islander", "Hispanic or Latino", "Native American or American Indian", or "Other" were pooled into a separate category "Other" (n=52). Finally, participants with a Master's or Doctorate level of education were pooled into a separate category "Graduate" (n=45).

Variable	Category	N
Age	18-24 years	43
	25-34 years	56
	35-44 years	42
	45-54 years	38
	Over 55 years	26
Gender	Male	78
	Female	123
	Other	4
Ethnicity	White	115
	Black or African American	38
	Other	52
Education	High School	67
	Bachelor's	93
	Graduate	45

Table 1a. Descriptive statistics for the demographic variables in study 1.

Variable	N	Min	Max
Mood arousal	205	-2.325	3.255
AOT	205	-2.491	1.875

Table 1b. Descriptive statistics for the independent variables in study 1. Values for mood arousal and AOT are standardized.

Correlation Analysis

Our first step was to explore the relationship between our independent variables (mood arousal and AOT) and our dependent variables (performance and share). We performed a bivariate correlation analysis to determine if a statistically significant association exists between these variables. The Pearson correlation coefficient, r, was calculated to assess the strength and direction of the relationship between the variables. As shown in Table 1 in Appendix A, all correlation coefficients were in the expected directions. Both dependent variables (performance and share)

had statistically significant relationships at the 0.01 level with mood arousal and with AOT. The magnitudes of the correlation coefficients were relatively small, with a Pearson correlation coefficient of $|r| < 0.292$. Based on the results, we can conclude that there is a significant association between mood arousal, AOT, performance, and sharing intent.

Impact of mood arousal, AOT, and their interaction on performance

We examined how mood arousal, AOT, and the interaction between mood arousal and AOT are associated with performance, i.e., the ability to discern real from fake news headlines, and whether these relationships are statistically significant. We used the univariate ANOVA procedure in SPSS to examine the effects of mood arousal (independent variable), AOT (independent variable), and their interaction on performance (dependent variable) while controlling for age, gender, ethnicity, and education. As shown in table 2, the overall model was statistically significant, $F(13, 191) = 2.896$, $p < 0.001$, explaining 16.5% of the variance in performance ($R^2=0.165$, Adjusted $R^2=0.108$). Appendix B (tables 1 and 2) contain the reliability analysis results for the mood arousal and AOT constructs.

Predictor	**SS**	**df**	**MS**	**F**	**p**
Corrected Model	54.268	13	4.174	2.896	<0.001
Intercept	367.419	1	367.419	254.92	<0.001
Age	1.893	4	0.473	0.328	0.859
Gender	1.832	2	0.916	0.635	0.531
Ethnicity	0.046	2	0.023	0.016	0.984
Education	9.384	2	4.692	3.255	0.041
Mood arousal	4.009	1	4.009	2.781	0.097*
AOT	21.158	1	21.158	14.680	<0.001
Mood arousal x AOT	16.421	1	16.421	11.393	<0.001
Error	275.293	191	1.441		

Table 2. Tests of Between-Subject Effects for the impact on performance. $R^2 = 0.165$ (Adjusted $R^2= 0.108$). *value considered significant at the 0.05 level due to the two-tailed nature of the p value reported in the table.

Main Effects

Among the demographics variables, only education had a statistically significant effect on performance $F(2,191)=3.255$, $p=0.041$. Bonferroni-adjusted pairwise comparisons for the

education categories revealed that participants with a bachelor's degree performed significantly worse than those with a graduate degree (p=0.036) with a mean difference of 0.570. There were no significant differences in performance between participants with a high school education and those with either a bachelor's or graduate degree (table 3). This suggests that graduate education may provide a significant advantage over a bachelor's degree but not necessarily over a high school education, perhaps due to other confounding factors.

Regarding the independent variables, table 3 shows that mood arousal had a negative effect on performance (B=-0.151, p=0.097). Since our hypothesis is directional (we expect that mood arousal negatively impacts performance), we considered this result to be statistically significant at the 0.05 level (p=0.097/2=0.049). Thus, we have sufficient evidence to claim a significant impact of mood arousal on performance, and we reject the null hypothesis for H1. Results for the impact of AOT demonstrate a significant positive effect on performance (B=0.339, p<0.001), indicating that higher AOT levels are associated with improved performance. Thus, we have sufficient evidence to claim a significant impact of AOT on performance, and we reject the null hypothesis for H3.

Parameter	**B (SE)**	**p**
Intercept	4.518 (0.729)	<0.001
Age = 18-24 years	-0.034 (0.316)	0.914
Age = 25-34 years	-0.064 (0.296)	0.829
Age = 35-44 years	0.085 (0.310)	0.784
Age = 45-54 years	-0.224 (0.315)	0.476
Age = Over 55 years	Reference category	-
Gender = Male	-0.719 (0.638)	0.261
Gender = Female	-0.694 (0.633)	0.274
Gender = Other	Reference category	-
Ethnicity = White	-0.037 (0.213)	0.862
Ethnicity = Black or African American	-0.016 (0.271)	0.952
Ethnicity = Other	Reference category	-
Education = High School	-0.339 (0.248)	0.172
Education = Bachelor's	-0.570 (0.225)	0.012
Education = Graduate	Reference category	-
Mood arousal	-0.151 (0.091)	0.097*
AOT	0.339 (0.088)	<0.001
Mood arousal x AOT	0.298 (0.088)	<0.001

Table 3. Parameter estimates for the impact on performance. Values for mood arousal and AOT are standardized. *value considered significant at the 0.05 level due to the two-tailed nature of the p value reported in the table.

Interaction Effect

As shown in tables 2 and 3, the impact of the interaction between mood arousal and AOT on performance was statistically significant $F(1,191)=11.393$, $B=0.298$, $p<0.001$, indicating that the relationship between mood arousal and performance depends on AOT levels. Specifically, the negative impact of mood arousal on performance is reduced and may even disappear in individuals with high AOT. Thus, we have sufficient evidence to claim moderating impact of AOT on performance, and we reject the null hypothesis for H5.

To further explore this moderation effect, we used the Hayes' PROCESS macro in SPSS (Hayes, 2017) to probe the interaction between mood arousal and AOT. We examined the conditional effects of mood arousal (our focal predictor) on performance (our outcome variable) at representative levels of AOT, focusing on low (mean–1 SD), moderate (mean), and high (mean+1 SD) levels. These results are presented in table 4 and demonstrate that AOT moderates the relationship as follows: at a low level of AOT (-0.9313), mood arousal has a significant negative effect ($B=-0.4007$, $p=0.0005$), meaning it significantly decreases performance. At a moderate AOT level (0.0853), the effect is negative (-0.1162), but not statistically significant ($p=0.1902$). When AOT is high (1.1018), the effect turns positive (0.1682) but remains non-significant ($p=0.2137$).

AOT level	**AOT value**	**Effect (SE)**	**p**
Low (-1 SD)	-0.9313	-0.4007 (0.1133)	0.0005
Moderate (Mean)	0.0853	-0.1162 (0.0884)	0.1902
High (+1 SD)	1.1018	0.1682 (0.1349)	0.2137

Table 4. Conditional effects of the focal predictor (mood arousal) on the outcome variable (performance) at low, moderate, and high values of the moderator (AOT). Values for arousal and AOT are standardized.

Next, we employed the Johnson-Neyman technique and identified two critical thresholds of AOT that define when mood arousal significantly affects performance. The analysis identified two

critical values of AOT at -0.1133 and 1.8090 (see table 5a). Specifically, below AOT=-0.1133, approximately 44.88% of the sample, and above AOT=1.8090, approximately 3.90% of the sample, the effect of mood arousal on performance was statistically significant ($p<0.05$) (see table 5b). This highlighted the role of AOT in mood arousal regulation: individuals with low AOT (≤-0.1133) struggle to regulate mood arousal effectively, leading to impaired performance. As AOT increases beyond -0.1133 to just under 1.8090, the negative effect of mood arousal weakens and is no longer significant, suggesting that individuals with moderate AOT levels develop some regulatory capacity that prevents mood arousal from significantly impairing their performance. In this range, AOT appears to function primarily as a buffer, mitigating the negative impact of mood arousal on performance, likely through the regulation of mood arousal. At high AOT levels (≥1.809), mood arousal has a significant positive effect on performance, indicating that individuals with high AOT not only buffer against the negative effects of mood arousal but actively regulate and channel it in a way that enhances cognitive functioning. This suggests that AOT does not strictly reduce mood arousal but can also optimize its effects, allowing individuals to harness physiological activation to improve their performance.

AOT value	**% Below**	**% Above**
-0.1133	44.8780	55.1220
1.8090	96.0976	3.9024

Table 5a. AOT values defining Johnson-Neyman significance regions.

AOT value	**Effect (SE)**	**p**
-2.4470	-0.8248 (0.2211)	0.0002
-1.0455	-0.4327 (0.1198)	0.0004
-0.1133	-0.1718 (0.0871)	0.0500
1.0566	0.1556 (0.1319)	0.2396
1.5238	0.2863 (0.1643)	0.0830
1.8090	0.3661 (0.1857)	0.0500
1.9909	0.4170 (0.1997)	0.0380

Table 5b. Conditional effect of focal predictor (mood arousal) on the outcome variable (performance) at select values of the moderator (AOT).

The interaction plot in figure 3 illustrates that the impact of mood arousal on performance is contingent upon an individual's level of AOT. At low AOT levels, there is a negative relationship between mood arousal and performance (blue line), suggesting that individuals with lower AOT experience decreased performance as mood arousal increases. In contrast, at high AOT levels, there is a positive relationship (cyan line), indicating that individuals with higher AOT benefit from increased mood arousal, leading to improved performance. At moderate AOT levels, the relationship between mood arousal and performance is relatively flat (red line), suggesting that mood arousal does not significantly impact performance in individuals with moderate AOT levels. This crossover interaction suggests that AOT plays a crucial role in determining whether mood arousal enhances or hinders performance, with lower AOT individuals being more susceptible to the negative effects of high mood arousal, whereas higher AOT individuals can leverage mood arousal to improve their performance.

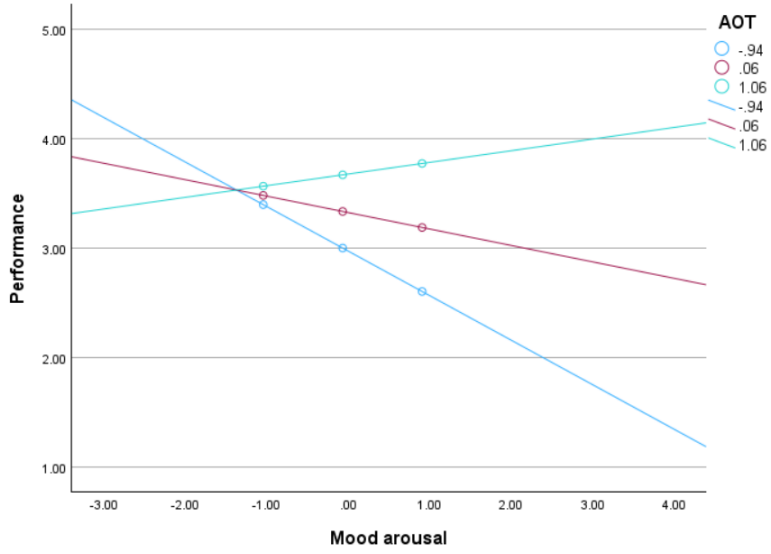


Figure 3. Interaction plot showing the conditional effect of mood arousal (independent variable) on performance (perf, dependent variable), at low, moderate, and high values of AOT (moderator).

Impact of mood arousal, AOT, and their interaction on behavior

Our next step was to investigate how mood arousal, AOT, and the interaction between mood arousal and AOT are associated with behavior, i.e., the sharing of false headlines, and whether these relationships are statistically significant. We used the univariate ANOVA procedure in SPSS to examine the effects of mood arousal (independent variable), AOT (independent variable), and their interaction on share (dependent variable) while controlling for age, gender, ethnicity, and education. As shown in Table 6, the overall model was statistically significant, $F(13, 191) = 4.764$, $p<0.001$, explaining 24.5% of the variance in sharing behavior ($R^2=0.245$, Adjusted $R^2=0.193$).

Predictor	**SS**	**df**	**MS**	**F**	**p**
Corrected Model	122.017	13	9.386	4.764	<0.001
Intercept	49.067	1	49.067	24.905	<0.001
Age	7.308	4	1.827	0.927	0.449
Gender	14.490	2	7.245	3.677	0.027
Ethnicity	23.248	2	11.624	5.900	0.003
Education	7.328	2	3.664	1.860	0.159
Mood arousal	1.966	1	1.966	0.998	0.319
AOT	22.998	1	22.998	11.673	<0.001
Mood arousal x AOT	11.123	1	11.123	5.645	0.018
Error	376.305	191	1.970		

Table 6. Tests of Between-Subject Effects for the impact on behavior (intent to share fake news headlines). $R^2= 0.245$ (Adjusted $R^2= 0.193$).

Main Effects

Among the demographic variables, gender and ethnicity are significantly associated with sharing behavior. Gender had a significant main effect, $F(2,191)=3.677$, $p=0.027$. Bonferroni-corrected post hoc tests showed that male participants were significantly more likely to share information than female participants, $p=0.024$, with a mean difference of 0.558. No significant differences were found between either of these groups and those identifying as "other."

Ethnicity was also a significant predictor $F(2,191)=5.900$, $p=0.003$. Post hoc tests indicated that participants identifying as Black or African American were significantly more likely to share information than White participants, $p=0.003$, with a mean difference of 0.942. No significant differences were found between either group and participants identifying as "other" (table 7).

Regarding the independent variables, mood arousal had a statistically nonsignificant effect on share (B=0.106, p=0.319). This suggests that the intensity of mood alone does not reliably predict an increased tendency to share fake news, and we do not have sufficient evidence to reject the null hypothesis for H2. Results for the impact of AOT demonstrate a significant negative effect on share (B=-0.353 p<0.001), indicating that higher AOT levels are associated with a decreased intent to share fake news headlines. Thus, we have sufficient evidence to claim a significant impact of AOT on the intent to share fake news headlines and we reject the null hypothesis for H4.

Interaction Effect

The impact of the interaction between mood arousal and AOT on share was statistically significant (B=-0.245, p=0.018), indicating that AOT regulates the extent to which mood arousal influences sharing behavior. Specifically, since the interaction coefficient is negative, the effect of mood arousal on share becomes more negative as AOT increases. Thus, we have sufficient evidence to claim a moderating impact of AOT on share, and we reject the null hypothesis for H6. This finding implies that at lower levels of AOT, the effect of mood arousal on share might be positive. To confirm whether low AOT individuals actually share more under high mood intensity and to further explore this moderation effect, we used the PROCESS macro (Hayes, 2017) to probe the interaction between mood arousal and AOT.

Parameter	**B (SE)**	**p**
Intercept	1.392 (0.852)	0.104
Age = 18-24 years	0.312 (0.369)	0.398
Age = 25-34 years	-0.056 (0.346)	0.871
Age = 35-44 years	-0.308 (0.362)	0.397
Age = 45-54 years	-0.037 (0.368)	0.920
Age = Over 55 years	Reference category	-
Gender = Male	0.655 (0.746)	0.381
Gender = Female	0.097 (0.740)	0.896
Gender = Other	Reference category	-
Ethnicity = White	-0.427 (0.249)	0.088
Ethnicity = Black or African American	0.514 (0.317)	0.107
Ethnicity = Other	Reference category	-

Education = High School	-0.430 (0.289)	0.139
Education = Bachelor's	-0.497 (0.263)	0.060
Education = Graduate	Reference category	-
Mood arousal	0.106 (0.106)	0.319
AOT	-0.353 (0.103)	<0.001
Mood arousal x AOT	-0.245 (0.103)	0.018

Table 7. Parameter estimates for the impact on behavior (intent to share fake news headlines).

We examined the conditional effects of mood arousal (our focal predictor) on sharing intent (our outcome variable) at the same representative levels of AOT, focusing on low (mean–1 SD), moderate (mean), and high (mean+1 SD) levels. The results, presented in table 8, demonstrate that AOT moderates the relationship as follows: at low AOT (-0.9313), mood arousal has a significant positive effect on share (B=0.4379, p=0.0018), suggesting that individuals with lower AOT are more likely to share when experiencing heightened mood intensities. This finding aligns with the idea that low AOT individuals may be more impulsive, leading to increased engagement with content under conditions of heightened mood arousal. At moderate AOT (0.0853), the effect of mood arousal on share is still positive but no longer significant (B=0.1558, p=0.1515). This suggests that for individuals with moderate AOT, mood arousal does not reliably predict sharing behavior, indicating that AOT begins to dampen the influence of mood arousal. As AOT increases further, the relationship between mood arousal and share continues to weaken; at high AOT (1.1018), mood arousal has a small negative effect on share, but this effect is not statistically significant (B=-0.1263, p=0.4448). This implies that high AOT individuals regulate affective influences on sharing behavior to the extent that mood arousal no longer plays a meaningful role in their decision-making process.

AOT level	**AOT value**	**Effect (SE)**	**p**
Low (-1 SD)	-0.9313	0.4379 (0.1386)	0.0018
Moderate (Mean)	0.0853	0.1558 (0.1082)	0.1515
High (+1 SD)	1.1018	-0.1263 (0.1650)	0.4448

Table 8. Conditional effects of the focal predictor (mood arousal) on the outcome variable (intent to share fake news headlines) at low, moderate, and high values of the moderator (AOT). Values for mood arousal and AOT are standardized.

Next, we employed the Johnson-Neyman technique and identified a critical threshold of AOT that defines when mood arousal significantly affects share (AOT=-0.1107, comprising 44.88% of the sample) (see table 9a). Table 9b provides further insight, namely that mood arousal significantly increases sharing behavior only at low levels of AOT (≤-0.1107). This suggests that low AOT individuals struggled to regulate mood arousal effectively, rendering them more susceptible to arousal-driven sharing. Conversely, for individuals with moderate and high AOT levels (AOT>-0.1107), the effect of mood arousal on sharing intent was not significant, suggesting that these individuals do not rely on heightened arousal states when deciding whether to share information.

AOT value	**% Below**	**% Above**
-0.1107	44.88	55.12

Table 9a. AOT value defining Johnson-Neyman significance region for the impact on behavior (intent to share fake news headlines).

AOT	**Effect (SE)**	**p**
-2.4470	0.8586 (0.2705)	0.0017
-1.1156	0.4891 (0.1518)	0.0015
-0.1107	0.2102 (0.1066)	0.0500
0.6596	-0.0036 (0.1328)	0.9784
1.1033	-0.1268 (0.1651)	0.4436
1.5471	-0.2499 (0.2032)	0.2201
1.7690	-0.3115 (0.2234)	0.1648
1.9909	-0.3731 (0.2443)	0.1283

Table 9b. Conditional effect of focal predictor (mood arousal) on behavior (intent to share fake news headlines) at select values of the moderator (AOT).

The Johnson-Neyman analysis revealed that mood arousal significantly increases sharing only at low levels of AOT, with the effect becoming non-significant as AOT increases. This suggests that AOT moderates the influence of mood arousal, not by reversing its direction, but by gradually diminishing its impact. This indicates a pattern of attenuation of the effect of mood arousal on the intent to share fake news. Figure 4 demonstrates that individuals low in AOT (blue

line) show an increase in sharing intent, reflecting an arousal-driven response. At moderate AOT levels (red line), the slope flattens, indicating a reduced effect consistent with regulation, where mood arousal is no longer a dominant influence on behavior. At high AOT levels (cyan line), the slope turns slightly negative, suggesting a dampening effect of mood arousal on the intent to share fake news.

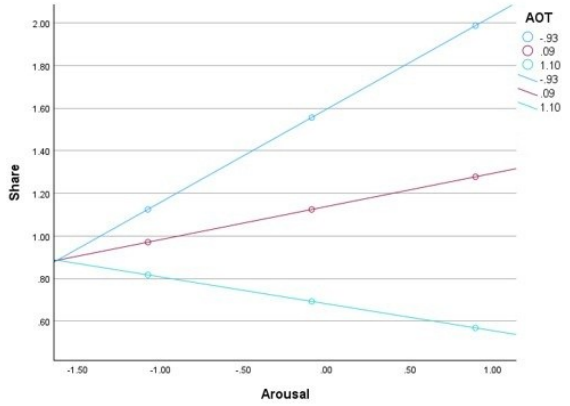


Figure 4. Moderation plot showing the conditional effect of mood arousal (independent variable) on intent to share (dependent variable), at low, moderate, and high values of AOT (moderator).

Discussion

The majority of our hypotheses were supported. First, consistent with findings by Martel et al. (2020), participants with higher levels of mood arousal were less successful in discerning fake news headlines, thereby supporting H1. Second, our findings demonstrated that mood arousal did not have an impact on the intent to share fake news headlines. Thus, H2 was not supported. Third, consistent with findings by Mirhoseini et al. (2023), we found that participants with higher AOT levels were better able to discern real from fake news headlines than participants with lower levels of AOT, supporting H3. Fourth, our finding that participants with higher AOT levels had a decreased intent to share fake news provided support for H4.

The moderating role of AOT was confirmed in this work. ANOVA results demonstrated no effect on the negative impact of mood arousal on performance in individuals with low AOT levels. Moderate AOT levels mitigated the negative effect of mood arousal on participants' ability to discern between real and fake news headlines, while high AOT levels reversed the negative effect of mood arousal, leading to improved performance as mood arousal increased in these individuals. This was evident in the interaction plot (figure 3), which portrayed (i) little to no impact of AOT on the negative relationship between mood arousal and performance for participants with low AOT levels, (ii) a diminished influence of mood arousal on performance for participants with moderate AOT levels, and (iii) a reversal of the negative relationship between mood arousal and performance for participants with high AOT levels. These findings combined provided support for H5. Finally, the positive influence of mood arousal on the intent to share fake news headlines was unaffected in participants with low AOT levels and gradually diminished as AOT levels increased, providing support for H6. This was evident in the moderation plot (figure 4), which portrayed (i) little to no impact of AOT on the positive relationship between mood arousal and sharing intent for individuals with low AOT levels, and (ii) a diminished influence of mood arousal on sharing intent for individuals with moderate and high AOT levels. Table 10 displays a summary of the hypotheses and whether they were supported.

Hypothesis	**Prediction**	**Supported?**
H1	Mood arousal decreases the ability to discern between real and fake news headlines.	✅
H2	Mood arousal increases the intent to share fake news headlines.	❌ ✅
H3	AOT increases the ability to discern between real and fake news headlines.	✅
H4	AOT decreases the intent to share fake news headlines.	✅
H5	High AOT reduces the negative impact of mood arousal on news discernment.	✅
H6	High AOT reduces the impact of mood arousal on the intent to share fake news.	✅

Table 10 Summary of study 1 hypotheses and whether they were supported.

We argue that mood arousal regulation through AOT plays a critical role in resisting the persuasive nature of fake news headlines. This, in turn, improves individuals' performance (i.e., their ability

to discern between real and fake news headlines) and decreases their intent to share fake news headlines.

Impact of mood arousal on performance at different levels of AOT

Our findings demonstrate that the impact of mood arousal on individuals' performance (the ability to discern fake news headlines) was not uniform across individuals. Those with low AOT were vulnerable to arousal interference, exhibiting an impaired discerning ability. However, this effect diminished among individuals with moderate AOT, and was reversed in those with high AOT, who benefited from increased mood intensities. We propose that this differential impact of mood arousal on performance across AOT levels can be understood through the lens of mood arousal regulation that shifts along a continuum; from dysregulation at low AOT levels to regulation at moderate AOT levels to adaptive optimization at high AOT levels.

To begin with, the Johnson-Neyman analysis identified two critical AOT thresholds where the effect of mood arousal on fake news discernment shifts. At low AOT levels (below -0.133), mood arousal significantly disrupted cognitive processing, leading to greater susceptibility to misinformation. We propose that individuals in this AOT range struggled to regulate their emotional responses effectively, allowing heightened mood arousal to interfere with the rational system in the Cognitive Experiential Self-Theory (CEST) (Epstein, 1998) and increasing reliance on impulsive, intuitive judgments (Ochsner & Gross, 2005; Pennycook & Rand, 2019b). This suggests that at low AOT levels, mood arousal regulation is either absent or ineffective, preventing individuals from mitigating the intensity of mood to interfere with reasoning. This aligns with research by Martel et al. (2020) showing that heightened emotional states can disrupt analytical reasoning.

As AOT increased above -0.133 and just under 1.809 (representing moderate AOT levels and the majority of the sample), the statistically significant negative effect of mood arousal disappeared. This suggests that individuals in this range developed sufficient regulatory capacity to buffer against arousal-driven susceptibility to misinformation. We propose that individuals in this AOT range tend to pause and reflect on their emotional states and consider how these feelings might influence their judgement. In doing so, they engage in a form of inherent 'affect cooling' allowing them to recognize and attenuate emotional reactions, preventing mood arousal from dictating their decisions. This, in turn, promotes a more deliberate and reflective evaluation of information. Consistent with this view, Stanovich and West (1997) argue that AOT items capture a willingness to consider evidence against one's beliefs, implying a resistance to the emotional comfort of confirmation bias. This interpretation suggests that cognitive flexibility, supported by open-minded thinking, can counteract the effect of heightened emotional states on analytical reasoning and aligns with the CEST (Epstein, 1998), which posits that the analytical system can intervene to refine or override initial intuitive judgments.

Our findings highlight an important nuance in understanding the mechanism of mood arousal regulation in the context of performance. Specifically, at moderate AOT levels, mood arousal regulation appears to be non-instrumental rather than strategic. That is, while individuals in this AOT range were able to prevent the intensity of their mood from impairing their fake news discernment, they were unable to leverage it to enhance their performance. This pattern aligns with traditional models of emotion regulation, which emphasize controlling or suppressing affective intensity to prevent it from interfering with cognitive functioning (Gross, 1998). It is also consistent with research by Richards and Gross (2000), who demonstrated that suppressing emotion does not enhance cognitive engagement or reasoning ability. In fact, the authors make a

case that expressive suppression, an emotion regulation strategy that entails suppressing facial expressions of emotion (Richards & Gross, 1999, 2000) requires continuous self-monitoring and control, which consumes cognitive resources that could otherwise be allocated to processing and encoding information.

In contrast to the patterns observed at moderate levels of AOT, a distinct shift emerges at high AOT levels (≥1.809) where mood arousal no longer merely loses its negative influence but instead significantly improves performance. Individuals in this range appear to move beyond containing the intensity of their mood to actively leveraging it to support cognitive engagement with the task at hand. While this may seem at odds with traditional views of emotion regulation, it is important to recognize that mood arousal regulation does not strictly entail suppressing arousal. Rather, effective mood arousal regulation involves aligning emotional states with task demands (Tamir, 2009, 2016). This perspective aligns with contemporary models of goal-directed emotion regulation, which emphasize that emotional responses are not regulated solely to minimize discomfort but to optimize cognitive performance (Tamir, 2009, 2016; Tamir et al., 2020). Regulation, in this context, involves modulating emotional states to support goal pursuit, such as maintaining focus or enhancing evaluative reasoning.

A central mechanism in this process is cognitive reappraisal, a strategy that involves reinterpreting a stimulus to alter its affective impact (Gross, 2001, 2002; McRae et al., 2012). It is often applied flexibly to facilitate engagement with challenging tasks (Sheppes & Gross, 2012). This shift in the functional role of mood arousal points to a qualitatively different form of its regulation at high AOT levels; one that is flexible, adaptive, and aligned with task demands. Rather than viewing mood arousal as a distraction from their goal of evaluating a fake news headline, high AOT individuals may be more inclined to reframe (reappraise) it as a cue to scrutinize

misinformation more carefully. In this context, mood arousal functions not as a hindrance, but as a motivational resource, sustaining cognitive focus and analytical effort. Thus, instead of merely suppressing emotional responses, individuals with high AOT levels appear to engage in strategic, goal-directed regulation of the intensity of their mood that transforms mood arousal from a potential liability into a cognitive asset thereby improving their performance.

Impact of mood intensity (arousal) on behavior at different levels of AOT

Our findings demonstrate that the impact of mood arousal on individuals' behavior (i.e., the sharing of fake news headlines) was not uniform across individuals. Those with low AOT were vulnerable to mood arousal interference, exhibiting an increased intent to share fake news headlines. In contrast, the effect of mood arousal diminished among individuals with moderate and high AOT levels, rendering individuals within this AOT range less inclined to share fake news. We propose that this differential impact of mood arousal on intent to share across AOT levels can be understood through the lens of mood arousal regulation that shifts along a continuum; from dysregulation at low AOT levels to regulation at moderate and high AOT levels.

The Johnson-Neyman analysis revealed that mood arousal significantly increases sharing behavior only among individuals with low AOT (≤ -0.1107). We propose that at these levels, mood arousal regulation is either absent or ineffective, making individuals more likely to believe and by extension share fake news headlines. This unregulated mood arousal disrupts cognitive processing by impairing the rational system described in the Cognitive Experiential Self-Theory (CEST) (Epstein, 1998). As a consequence, low AOT individuals lacking the cognitive resources to mitigate mood arousal's influence become increasingly reliant on impulsive judgments and share more fake news than do individuals with higher AOT levels. This interpretation is consistent with the confusion-based account of the accuracy-sharing dissociation phenomenon (Pennycook et al.,

2020, 2021) in that individuals in this AOT range share fake news headlines because they mistakenly believe them to be true.

As AOT increased beyond -0.1107 (encompassing moderate and high AOT levels), the previously statistically significant positive effect of mood arousal on the intent to share disappeared, turning negative and non-significant. We propose that individuals in this AOT range possess a capacity to buffer against arousal-driven impulsive behavior because they tend to reflect on their emotional states and how their feelings may influence their behavior. Within this AOT range, mood arousal is no longer a dominant influence on behavior because of the 'affect cooling' (discussed in the previous section) which allows individuals to recognize and attenuate emotional reactions, preventing the intensity of mood from dictating their decisions. Therefore, when mood arousal tempts individuals to share false information, those with moderate and high AOT levels may resist this impulse by regulating their own feelings. This interpretation aligns with the CEST (Epstein, 1998), which posits that the analytical system can intervene to refine or override initial intuitive judgments.

It is worth noting that while the attenuation of the effect of mood arousal on the intent to share fake news emerges at moderate AOT levels, at very high AOT levels, the p-values begin to decline further, approaching but not reaching statistical significance (see table 9b). This may suggest a strengthening of AOT's moderating influence, where individuals become even more resistant to mood arousal-driven sharing tendencies. However, this trend should be interpreted cautiously, as the effect of arousal on the intent to share fake news headlines remains statistically non-significant across the high AOT range.

Our findings highlight the interdependent roles of both affect (mood arousal) and cognition (AOT) in determining belief in and the intent to share fake news on social media platforms. As

mentioned, much of the misinformation literature has strictly emphasized cognitive factors such as analytical reasoning and critical thinking (Pennycook & Rand, 2019a). Our results underscore that these cognitive faculties do not function in isolation; rather, they are closely intertwined with affective processes, particularly the regulation of mood arousal , which shapes how individuals engage with, and process emotionally charged content. The ability to critically evaluate news headlines is not merely a function of rational thought; rather, it also depends on the capacity to regulate one's emotional responses in different contexts and prevent affect-driven biases from distorting judgment.

Effective interventions against fake news must therefore consider the affective as well as the cognitive aspects of thought processes. For starters, social media platforms should consider implementing features that reduce mood arousal-inducing content, such as reflection prompts to encourage users to (i) be mindful of the activation of their mood, and (ii) verify content before sharing. Educational initiatives that promote critical thinking, analytical reasoning, and open-mindedness should be complemented by strategies that enhance mood arousal regulation skills, such as mindfulness training (Farb et al., 2014) and/or affective inoculation techniques (Roozenbeek & Van Der Linden, 2019; Lewandowsky & and van der Linden, 2021, Maertens et al., 2021). Additionally, media literacy and cognitive training programs could be designed to help people identify when the intensity of their mood might be skewing their evaluation of news content online. Addressing only one aspect may be insufficient; instead, an intervention approach that recognizes the synergistic interplay of affective and cognitive factors in shaping belief formation and behavior is likely to be more effective in building resilience against misinformation.

As shown in figure 1, the stimuli used in this study lack images and color and generally differ from typical news headlines that users encounter on social media platforms. Given the

pervasive presence of visual and interactive elements on social media, study 2 investigates the impact of affective cues, specific stimulus features such as color, size, and interface layout features that evoke emotional responses (P. Zhang, 2013), on the perception of fake news on social media platforms. Incorporating affective cues is in line with P. Zhang (2013)'s assertion that object-based evaluations are essential in research on human-ICT interaction. We also investigate if and how affective cues interact with AOT to shape belief in and intent to share fake news headlines. Understanding how affective cues influence user perception and if and how this interplay is moderated by AOT improves the ecological validity of our research and is crucial for elucidating the mechanisms underlying the dissemination of fake news on social media platforms.

Study 2 Investigating the impact of affective cues and AOT on belief in and intent to share fake news headlines on social media

We investigate the impact of the presence of affective cues and a cognitive disposition (users' AOT) on users' accuracy judgements and sharing intentions of real and fake news headlines. Affective cues refer to the objective, sensory features of a stimulus that can naturally evoke and influence emotional responses (Valdez & Mehrabian, 1994) and can be directly perceived by a user (P. Zhang, 2013). AOT is a willingness to engage with new evidence, reconsider preexisting beliefs, and integrate diverse perspectives (Baron, 2005; Stanovich & West, 1997). Our goal is to investigate the impact of affective cues on (i) performance (ability to discern between real and fake news headlines) and (ii) behavior (the intent to share fake news headlines) and to assess if and how affective cues in social media posts interact with AOT to impact these variables.

Hypotheses

In line with the Affective Response Model (ARM) (P. Zhang, 2013) and findings by Valdez and Mehrabian (1994), we predict that the presence of affective cues in social media posts elicits emotional responses, which increases the extent to which people believe fake news and decreases their performance (ability to discern between real and fake news headlines).

H1: Affective cues decrease the ability to discern fake news headlines on social media platforms.

Drawing from the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021) and findings by Valdez and Mehrabian (1994), we predict that the presence of affective cues in social media leads to an increase in the extent to which people intend to share fake news headlines.

H2: Affective cues increase the intent to share fake news headlines on social media platforms.

Building on the Cognitive Experience Self Theory (CEST) (Epstein, 1998), we predict that higher levels of AOT renders individuals less susceptible to the negative effect of affective cues when evaluating the authenticity of news headlines.

H3: The impact of affective cues on the ability to discern fake news headlines is reduced in people with high AOT.

In accordance with the Cognitive Experience Self Theory (Epstein, 1998) and the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021), we predict that higher levels of AOT render individuals less susceptible to the impact of affective cues on their intent to share fake news headlines.

H4: The impact of affective cues on the intent to share fake news headlines is reduced in people with high AOT.

Method

We created an experiment using the online platform Qualtrics and collected data using the online platform Prolific. To test our hypotheses, we created a condition, "Affective cues", that utilizes the 13 headlines (12 headlines + control) from study 1 but presents them with affective cues embedded in a typical Facebook post format. Specifically, in this condition, each news headline is accompanied by an image, a thumbnail of the user posting the headline, a link to the news article, and engagement metrics (the number of likes, comments, and shares). Moreover, these news headlines appear within the context of a standard Facebook newsfeed, surrounded by familiar elements such as friends' stories, birthday notifications, and navigation links to various sections of the platform. The other condition "No Affective Cues" comprises the 13 headlines used in study 1. Thus, we treated the two experiments as separate conditions within a single between-subject

study, allowing for a direct comparison between the presence and absence of affective cues. Figure 5 shows an example of one of the posts used in the affective cues condition. The affective cues, which mirror the naturalistic way users encounter news on social media put participants in a real-world online mindset, thereby enhancing ecological validity. Appendix D displays all headline posts used in the affective cues condition.

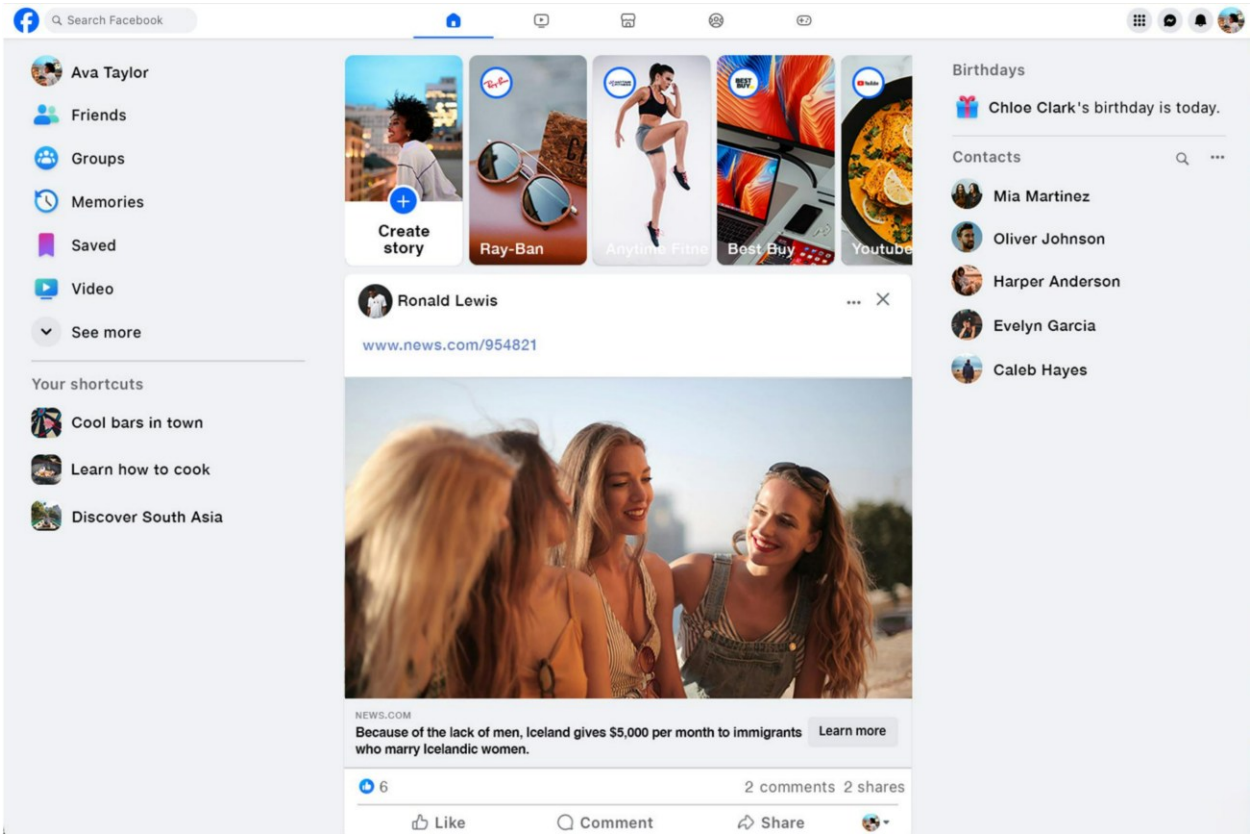


Figure 5. Example of a post (false, neutral) used in study 2.

Procedure

We followed the same procedure outlined in study 1.

Measures

We measured participants' belief of the headlines, participants' intent to share the headlines, and participants' ability to think in an actively open-minded fashion using the same measures used in study 1.

Results

We collected data from 246 participants in the "Affective Cues" condition. We added this sample to the sample collected in study 1, which served as the "No Affective Cues" condition. Thus, our total sample for analysis was n=246+253=499 participants. Because this was an online experiment in which we had little control over the participants while they were answering our surveys, it was important to exclude participants (n=153) who failed the attention check and/or spent too long or very little time performing the experimental task. Our final sample after cleaning the data was 346 participants.

Participants

Our final sample was 40% male, 59% female. Four people classified as "other", and one person opted not to specify their gender. 15% of the participants were between 18-24 years of age, 26% were between 25-34 years of age, 24% were between 35-44 years of age, 19% were between 45-54 years of age, and 16% were over 55 years old. The ethnicities distribution of our sample was as follows: 8% Asian/Pacific Islander, 25% Black or African American, 9% Hispanic or Latino, ≈1% Native American or American Indian, 54 % White, and ≈3% Other. 35% had a high school or high school equivalent degree, approximately 41% had a Bachelor's degree, 20% had a Master's degree, and approximately 4% had a Doctorate.

Descriptive statistics

Table 11 shows the descriptive statistics for the variables of interest stratified by condition. These include demographic variables (age, gender, ethnicity, and education) and our independent

variable AOT. For our dependent variables, in the "no affective cues" condition, the average performance was 3.370 (SD=1.271) and the average intent to share was 1.180 (SD=1.563). In the "affective cues" condition, the average performance was 3.20 (SD=1.512) and the average intent to share was 1.510 (SD=1.890). For analysis purposes, participants who indicated "Other" or "I prefer not to say" for gender were pooled into a separate category "Other" (n=5). Similarly, participants who indicated "Asian/Pacific Islander", "Hispanic or Latino", "Native American or American Indian", or "Other" were pooled into a separate category "Other" (n=73). Finally, participants with a Master's or Doctorate level of education were pooled into a separate category "Graduate" (n=83).

		Condition	
Variable	Category	No Affective Cues (n=176)	Affective Cues (n=170)
Age	18-24 years	37	17
	25-34 years	45	44
	35-44 years	35	48
	45-54 years	32	33
	Over 55 years	27	28
Gender	Male	63	75
	Female	111	92
	Other	2	3
Ethnicity	White	96	90
	Black or African American	37	50
	Other	43	30
Education	High School	59	63
	Bachelor's	79	62
	Graduate	38	45
AOT	N	176	170
	Min-Max	-2.206 – 2.043	-2.331 – 2.043

Table 11. Descriptive statistics for the variables of interest in study 2, stratified by condition. Value for AOT is standardized.

Inferential analyses

We performed an independent samples t-test to compare the means of performance and share across the two conditions (see Appendix A, Table 2a). Participants in the no affective cues condition correctly discerned more fake news headlines than those in the affective cues condition, though the effect was small (p=0.049, d=0.21). Conversely, participants in the affective cues condition were more likely to share fake news headlines compared to the no affective cues

condition, also with a small effect (p=0.044, d=-0.22). To explore the relationship between AOT and our dependent variables (performance and share), we performed a bivariate correlation analysis. The Pearson correlation coefficient, r, was calculated to assess the strength and direction of the relationship between the variables. As shown in Table 2b in Appendix A, all correlation coefficients were in the expected directions. Both performance and share had a statistically significant relationship at the 0.01 level with AOT. The magnitudes of the correlation coefficients were relatively small, with a Pearson correlation coefficient of $|r| < 0.372$.

These results combined suggest a significant association between condition, AOT, performance, and share.

Impact of condition, AOT, and their interaction on performance

Our next step was to investigate how condition (the presence (coded as 1) or absence (coded as 0) of affective cues), AOT, and the interaction between condition and AOT are associated with performance and whether these relationships are statistically significant. We used the univariate ANOVA procedure in SPSS to examine the effects of condition (independent variable), AOT (independent variable), and their interaction on performance (dependent variable) while controlling for age, gender, ethnicity, and education. The overall model was statistically significant $F(13, 332)=4.130$, $p<0.001$ (see table 12), explaining 13.9% of the variance in performance ($R^2 = 0.139$, Adjusted $R^2 = 0.106$).

Appendix B (table 3) contains the reliability analysis results for the AOT construct.

Predictor	**SS**	**df**	**MS**	**F**	**p**
Corrected Model	93.535	13	7.195	4.130	<0.001
Intercept	438.702	1	438.702	251.824	<0.001
Age	7.373	4	1.843	1.058	0.377
Gender	9.231	2	4.615	2.649	0.072
Ethnicity	3.375	2	1.688	0.969	0.381
Education	5.943	2	2.972	1.706	0.183
Condition	5.979	1	5.979	3.432	0.065
AOT	16.081	1	16.081	9.231	0.003
Condition x AOT	0.668	1	0.668	0.384	0.536

Error	578.376	332	1.742		

Table 12. Tests of Between-Subject Effects for the impact on performance. R^2= 0.139 (Adjusted R^2= 0.106).

Main Effects

It is worth noting that none of the demographics variables had a significant effect on performance. Regarding the independent variables, analysis of the parameter estimates (table 13) revealed a statistically significant effect of condition on performance (B=-0.271, p=0.065). Since our hypothesis is directional (we expect that the presence of affective cues negatively impacts performance), we considered this result to be statistically significant at the 0.05 level (p=0.065/2=0.0325). Thus, we have sufficient evidence to claim a significant impact of affective cues on performance, and we reject the null hypothesis for H1. Results for the impact of AOT on performance demonstrate a significant positive effect on performance (B=0.307, p=0.003), indicating that higher AOT levels are associated with an improved ability to discern fake news headlines.

Parameter	**B (SE)**	**p**
Intercept	3.996 (0.673)	<0.001
Age = 18-24 years	-0.302 (0.270)	0.266
Age = 25-34 years	0.028 (0.239)	0.907
Age = 35-44 years	0.151 (0.238)	0.525
Age = 45-54 years	-0.143 (0.246)	0.560
Age = Over 55 years	Reference category	
Gender = Male	-0.900 (0.611)	0.142
Gender = Female	-0.599 (0.609)	0.326
Gender = Other	Reference category	
Ethnicity = White	0.018 (0.191)	0.925
Ethnicity = Black	-0.234 (0.221)	0.291
Ethnicity = Other	Reference category	
Education = High School	0.363 (0.197)	0.066
Education = Bachelor's	0.222 (0.188)	0.239
Education = Graduate	Reference category	
Condition	-0.271 (0.146)	0.065*
AOT	0.307 (0.101)	0.003
Condition x AOT	0.088 (0.142)	0.536

Table 13. Parameter estimates. Values of AOT are standardized. *value considered significant at the 0.05 level due to the two-tailed nature of the p value reported in the table.

Interaction Effect

As shown in tables 12 and 13, the impact of the interaction between condition and AOT on the intent to share fake news headlines was not statistically significant (F(1,332)=0.384, B=0.088, p=0.536). Thus, we cannot claim that high AOT levels reduce the negative impact of affective cues on performance, and we do not have sufficient evidence to reject the null hypothesis for H3.

Impact of condition, AOT, and their interaction on behavior

Next, we investigated how condition (the presence (coded as 1) or absence (coded as 0) of affective cues), AOT, and the interaction between condition and AOT are associated with behavior (i.e., the intent to share fake news headlines) and whether these relationships are statistically significant. We used the univariate ANOVA procedure in SPSS to examine the effects of condition (independent variable), AOT (independent variable), and their interaction on share (dependent variable) while controlling for age, gender, ethnicity, and education. As shown in table 14, the overall model was statistically significant, F(13, 332)=13.839, p<0.001, explaining 35.1% of the variance in sharing behavior.

Predictor	**SS**	**df**	**MS**	**F**	**p**
Corrected Model	363.671	13	27.975	13.839	<0.001
Intercept	85.754	1	85.754	42.423	<0.001
Age	20.652	4	5.163	2.554	0.039
Gender	16.657	2	8.328	4.120	0.017
Ethnicity	51.419	2	25.710	12.719	<0.001
Education	68.364	2	34.182	16.910	<0.001
Condition	5.919	1	5.919	2.928	0.088*
AOT	26.435	1	26.435	13.078	<0.001
Condition x AOT	3.179	1	3.179	1.572	0.211
Error	671.106	332	2.021		

Table 14. Tests of Between-Subject Effects. R^2= 0.351 (Adjusted R^2= 0.326). *value considered significant at the 0.05 level due to the two-tailed nature of the p value reported in the table.

Main Effects

Contrary to their effect on performance, each of the demographics variables had a statistically significant impact on the intent to share fake news headlines. For starters, age had a significant main effect, F(4,332)=2.554, p=0.039. Bonferroni post hoc comparisons indicated that participants aged 18-24 were significantly more likely to share false information compared to those

aged 35-44, p=0.017, with a mean difference of 0.824. No other age group comparisons were statistically significant. Gender also showed a significant overall effect, F(2,332)=4.120, p=0.017. Post hoc tests revealed that male participants were significantly more likely to share false information than female participants, p=0.014, with a mean difference of 0.471. No significant differences were found between either of these groups and participants identifying as “Other”. Ethnicity was also a significant predictor, F(2,332)=12.719, p<0.001. Bonferroni-corrected comparisons showed that Black or African American participants were significantly more likely to share false information than both White participants, p<0.001, and those identifying as “Other”, p=0.001, with mean differences of 1.002 and 0.838, respectively. No significant differences were observed between White participants and those identifying as “Other”. Finally, education was a strong predictor of sharing behavior, F(2,332)=16.910, p<0.001. Participants with a high school education or a bachelor's degree were significantly less likely to share false information compared to those with a graduate degree, p<0.001, with mean differences of -1.129 and -1.039, respectively. There were no significant differences between those with a high school diploma and those with a bachelor’s degree.

Regarding the independent variables, analysis of the parameter estimates (table 15) revealed a statistically significant effect of condition on sharing behavior (B=0.270, p=0.088). Since our hypothesis is directional (we expect that the presence of affective cues positively impacts the intent to share fake news), we considered this result to be statistically significant at the 0.05 level (p=0.088/2=0.044). Thus, we have sufficient evidence to claim a significant impact of affective cues on the intent to share fake news, and we reject the null hypothesis for H2. Results for the impact of AOT on performance demonstrate a significant negative effect on sharing

intention (B=-0.3939, p<0.001), indicating that higher AOT levels are associated with a decrease in the intent to share fake news headlines.

Parameter	B (SE)	p
Intercept	2.128 (0.725)	0.004
Age = 18-24 years	0.591 (0.291)	0.043
Age = 25-34 years	0.106 (0.258)	0.681
Age = 35-44 years	-0.233 (0.256)	0.364
Age = 45-54 years	0.089 (0.264)	0.736
Age = Over 55 years	Reference category	
Gender = Male	-0.010 (0.658)	0.988
Gender = Female	-0.481 (0.656)	0.464
Gender = Other	Reference category	
Ethnicity = White	-0.164 (0.206)	0.425
Ethnicity = Black or African American	0.838 (0.238)	<0.001
Ethnicity = Other	Reference category	
Education = High School	-1.129 (0.212)	<0.001
Education = Bachelor's	-1.039 (0.203)	<0.001
Education = Graduate	Reference category	
Condition	0.270 (0.158)	0.088*
AOT	-0.393 (0.109)	<0.001
Condition x AOT	-0.192 (0.153)	0.211

Table 15. Parameter estimates. Value of AOT is standardized. *value considered significant at the 0.05 level due to the two-tailed nature of the p value reported in the table.

Interaction Effect

The impact of the interaction between condition and AOT on the intent to share fake news headlines is not statistically significant (p=0.211). Thus, we cannot claim that high AOT levels reduce the negative impact of affective cues on sharing intent, and we do not have sufficient evidence to reject the null hypothesis for H4.

Discussion

Results of study 2 demonstrated a significant relationship between condition (i.e., the presence/absence of affective cues) and (i) performance (ability to discern between real and fake news headlines) and (ii) sharing intent of fake news headlines. Specifically, the presence of affective cues in social media posts decreased participants' ability to discern between real and fake news headlines, thereby supporting H1. Additionally, affective cues in social media posts increased users' intent to share fake news headlines, providing support for H2. We did not find

evidence for a moderating effect of AOT on the relationship between affective cues and (i) performance and (ii) the intent to share fake news headlines. Thus, H3 and H4 were not supported. Table 16 displays a summary of the hypotheses and whether they were supported.

Hypothesis	Prediction	Supported?
H1	Affective cues decrease the ability to discern between real and fake news headlines.	✅
H2	Affective cues increase the intent to share fake news headlines.	✅
H3	The impact of affective cues on the ability to discern between real and fake news headlines is reduced in people with high AOT.	❌
H4	The impact of affective cues on the intent to share fake news headlines is reduced in people with high AOT.	❌

Table 16. Summary of study 2 hypotheses and whether they were supported or rejected.

We argue that emotionally charged stimuli can evoke strong affective responses (Preston et al., 2021; Rosenzweig et al., 2021) that, if not regulated, may disrupt cognitive processing and promote impulsive decision-making. Valdez and Mehrabian (1994) argue that affective cues inherently possess the capacity to elicit and modulate emotional responses because they subconsciously convey emotional information. Extending this framework to our fake news context, a striking image or vibrant color scheme (affective cues, and hallmarks of social media platforms) associated with a news headline may trigger affective reactions that enhance its emotional salience, which increases a user's likelihood to perceive it as credible and to share it impulsively. This insight aligns with our empirical findings, which indicate that affective cues in an ICT stimulus (i) reduce individuals' ability to discern between real and fake news headlines and (ii) increase their intent to share fake news headlines.

Our results suggest that while AOT can regulate an internal surge of mood arousal (as demonstrated in study 1), its regulation role may be diminished when emotional signals are embedded directly within the stimulus through affective cues. This finding, namely a lack of a moderating effect of AOT on the relationship between the presence/absence of affective cues and (i) performance and (ii) behavior, was against our expectation. We propose that unlike mood

arousal, affective cues may be less amenable to regulation by AOT because of three reasons: (i) their source, (ii) the mechanism through which they operate, and (iii) the timing at which they operate.

To begin with, unlike an internally felt surge of mood arousal (which as per study 1 can be regulated through different mechanisms with moderate and high levels of AOT), affective cues are external, perceptual features of a stimulus that are processed automatically and outside of conscious awareness (Valdez & Mehrabian, 1994; Zhang, 2013). Because they are not experienced as a subjective emotional state (that we argue would normally cue affective regulation), affective cues are less likely to activate the deliberate regulation mechanism that an internal affective state such as mood arousal might prompt. Thus, because affective cues originate externally, they may not cue mechanisms to attenuate emotional reactions and buffer against arousal-driven susceptibility to misinformation. In a similar vein, they may not signal task-relevant goals rendering them unlikely to prompt the task-directed emotion regulation strategies (Tamir, 2009, 2016) discussed in study 1.

Timing may also play a critical role in the absence of a moderating effect of AOT in this study. Because affective cues reside within the ICT stimulus (P. Zhang, 2013), we argue that they evoke affective reactions even before the semantic content of the message is fully processed. In doing so, these rapid affective reactions set the initial tone for information encoding almost immediately, leaving little opportunity for the deliberate and reflective emotion regulation intervention by AOT. As a result, in the affective cues condition, AOT could no longer play its moderating role because the affective cues had already anchored individuals' perception of the headline's accuracy or share-worthiness as they performed the experimental task.

The three proposed explanations suggest that affective cues shape the initial framing and interpretation of news headlines in a rapid, automatic, and subconscious manner, bypassing the deeper critical evaluation that would normally enable the regulation of mood arousal through AOT. This is consistent with the Elaboration Likelihood Model (Petty & Cacioppo J. T, 1986), which posits that peripheral cues (such as images or layout features) dominate when the message is processed quickly or under low motivation to engage deeply. It also aligns with the finding that affective cues influence cognitive processing strategies (Soldat et al., 1997).

We propose that the affective cues embedded in the stimuli may have directly engaged the experiential system of the Cognitive Experiential Self-Theory (CEST) (Epstein, 1998), bypassing the rational system that would have otherwise evaluated the emotional input. In doing so, the affective cues became the dominant source of emotional influence, effectively displacing pre-task mood arousal and reducing the opportunity for individuals with moderate and high AOT levels to engage in mood arousal regulation. This interpretation aligns with research showing that individuals often rely on superficial, affect-laden cues online unless prompted to engage in deeper thought (Pennycook & Rand, 2019b) and that affective responses can occur without requiring in-depth perceptual or cognitive processing (Zajonc, 1980). Thus, when the framework for processing information is rapidly established by external, subconsciously created, and immediate affective reactions, AOT lacks the temporal window and ability to exert its moderating influence on arousal.

In sum, when considering the impact on belief in and the intent to share fake news headlines, our findings highlight a key distinction between (i) internal and external sources of affective influence, (ii) automatic versus reflective affective processing, and (iii) immediate affective responses versus those that require time for conscious evaluation. This multi-layered framework helps explain why both mood arousal and affective cues impaired fake news

discernment and increased fake news sharing, yet only mood arousal was moderated by AOT. Additionally, it underscores an important finding regarding research on fake news interventions. Specifically, enhancing individuals' thinking dispositions (such as AOT) is helpful but is not a one-size-fits-all solution to mitigate the impact of affect on the perception of fake news in the context of social media. Instead, it must be paired with strategies addressing the environmental and contextual factors (i.e., affective cues) that shape our online behavior both consciously and subconsciously. Only by tackling both the internal (emotional reasoning) and external (platform cues) affective influences can we hope to improve performance in correctly identifying fake news and reduce the uncritical sharing of misinformation.

Incorporating affective cues into the design of this study allowed us to capture a broader spectrum of affective processing and comprehensively examine how responses elicited by the inherent affective characteristics of a stimulus impact users' perception of fake news. This is in line with the recommendation by Zhang (2013) to take a systematic approach when considering the affective dimension of human interaction with ICTs. The affective cues condition, which mimicked a typical social media platform newsfeed, provided ecological validity to our attempt to understand how fake news is perceived in real-world digital environments, particularly on social media platforms and enhanced the generalizability of our findings beyond controlled experimental conditions.

Our findings suggest that when investigating the impact of different affective constructs on belief and behavior in a fake news context, it is important to distinguish between affective influences that are internal vs. external and conscious vs. subconscious. In study 3, we reference the ARM framework (P. Zhang, 2013) and characterize an additional layer of distinction between the affective influences: those that are prolonged and unrelated to stimuli, such as mood, and those

that are ephemeral and induced by specific stimuli, such as emotion. Accordingly, the next study investigates the impact of emotion, characterized by Zhang (2013) as a short-lived induced affective state that is triggered by specific stimuli, on the perception of fake news on social media. Our rationale is that momentary emotion may reduce or replace the impact of mood arousal on (i) the ability to discern fake news and (ii) the intent to share fake news, as observed in study 1. Additionally, a systematic review by Ali Adeeb and Mirhoseini (2023) revealed that existing research on the impact of emotion on fake news perception is almost entirely correlational, underscoring the need for experimental studies to establish causal relationships.

Study 3 Investigating the impact of emotion and AOT on belief in and intent to share fake news headlines on social media

We investigate the association between an induced affective state (users' emotion) and a cognitive disposition (users' AOT) with users' accuracy judgments and sharing intentions of fake news headlines. Emotion is an ephemeral "affective state induced by or attributed to a specific stimulus" (Zhang, 2013, p. 251). AOT is a willingness to engage with new evidence, reconsider preexisting beliefs, and integrate diverse perspectives (Baron, 2005; Stanovich & West, 1997). Our goal is to understand the impact of users' emotion on their (i) performance (ability to discern between real and fake news headlines) and (ii) behavior (intent to share fake news headlines) and to assess if and how emotion interacts with AOT to impact these variables. Additionally, we are interested in examining whether, as a result of experiencing different emotional states, the initial impact of mood arousal on belief and intent to share (observed in study 1) is reduced or replaced by momentary emotion.

Hypotheses

In line with research by Blanchette and Richards (2010) and the ARM framework (P. Zhang, 2013), we predict that momentary emotion reduces or replaces the impact of mood arousal on performance (the ability to discern fake news headlines).

H1: After being repeatedly exposed to emotional content, the impact of emotion is a stronger determinant of the ability to discern fake news headlines than is the impact of mood arousal.

Consistent with the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021) and research by Blanchette and Richards (2010), we predict that momentary emotion reduces or replaces the impact of mood arousal on the intent to share fake news headlines.

H2: After being repeatedly exposed to emotional content, the impact of emotion is a stronger determinant of the intent to share fake news headlines on social media platforms than is the impact of mood arousal.

Building on the Cognitive Experience Self Theory (CEST) (Epstein, 1998), we predict that increased levels of AOT lead to enhanced emotion regulation. This enhanced regulatory capacity, in turn, renders individuals with high AOT levels less susceptible to the negative effect of emotion when evaluating the authenticity of news headlines.

H3: The impact of repeated exposure to emotional content on the ability to discern fake news headlines is reduced in people with high AOT levels.

In line with the Cognitive Experience Self Theory (CEST) (Epstein, 1998) and the confusion-based account of the accuracy-sharing dissociation (Pennycook et al., 2020, 2021), we predict that increased levels of AOT lead to improved regulation of emotion. This enhanced regulatory capacity, in turn, should render individuals with high AOT levels less susceptible to the impact of emotion on their intent to share fake news headlines.

H4: The impact of repeated exposure to emotional content on the intent to share fake news headlines is reduced in people with high AOT levels.

Method

We created a between subject experiment with three conditions using the online platform Qualtrics and collected data using the online platform Prolific. The three conditions referred to the emotions we were investigating: happy, sad, and neutral. To test our hypotheses, we used 6 of the 12 headlines used in the affective cues condition of study 2. We chose the headlines such that they were balanced in terms of truthfulness (true/false), and political stance (neutral/liberal

favorableness/conservative favorableness). Appendix E displays the headlines used in this study. We also created three types of emotional posts: 24 sad posts for the sad condition (for full list see Appendix F), 24 funny memes for the happy condition (for full list see Appendix G), and 24 neutral posts for the neutral condition (for full list Appendix H). An example of each of the posts is demonstrated in figure 6.

Figure 6 Example of a sad post (left), a funny meme (middle), and a neutral post (right) used in study 3.

Procedure

For each condition, we began the experiment by asking participants a series of demographics questions. Then, we measured participants' mood arousal (as we did in study 1). Next, we presented participants with the experimental task. During the task, the 6 news headlines and 24 emotional posts were presented in a series of blocks. Each block contained 4 randomly presented emotional posts followed by one of the six news headlines, also randomly presented. The emotional posts were sad posts (in the sad condition), funny memes (in the happy condition), and neutral posts (in the neutral condition). Thus, in each condition, each participant was presented with a total of 24 emotional posts and was asked to evaluate a total of 6 news headlines. When presented with the emotional posts, participants were asked to indicate their reaction to each post by choosing one of seven Facebook emoticons: Like, Care, Love, Laugh, Angry, Sad, and Wow. Similar to the procedure in studies 1 and 2, after being presented with each news headline,

participants were asked to evaluate its accuracy and report on their intent to share it. After completion of the task, participants' AOT was measured Figure 7 demonstrates the experimental design for the happy condition.

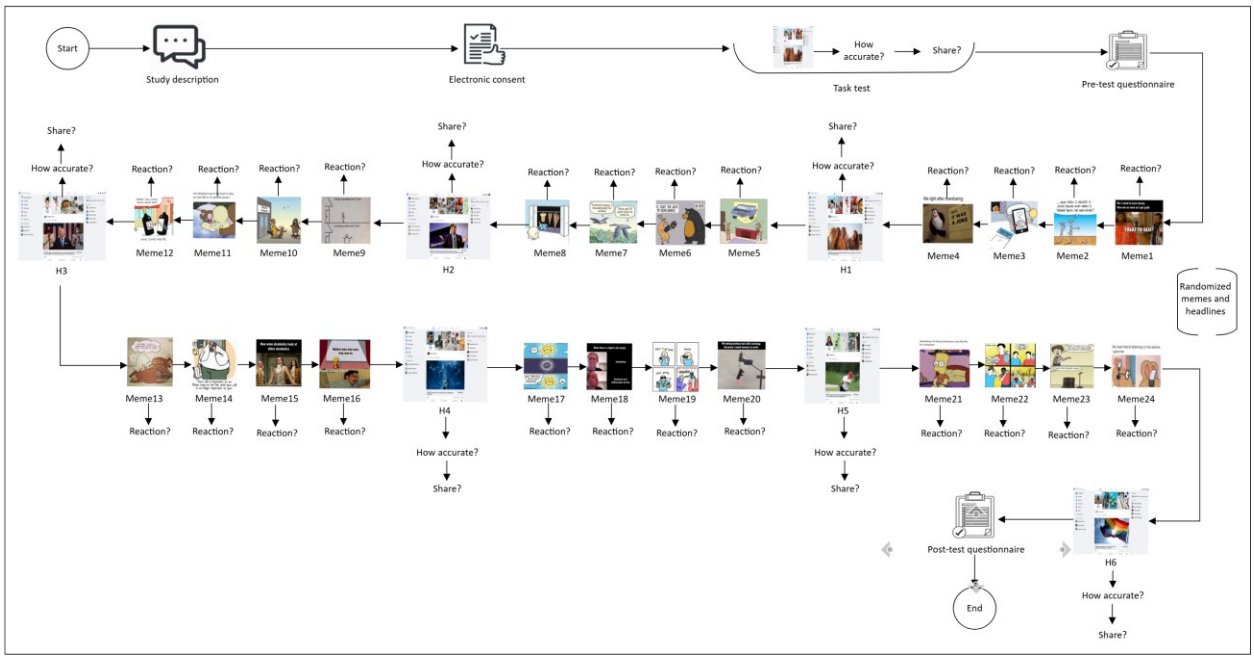


Figure 7 Study 3 experimental design (happy condition)

Measures

We used the same measures used in study 1. Because the news headlines were randomly presented in a series of blocks, we used the measure of time (1-6 for the 6 stimulus blocks) to reflect participant's progression through the task. Time in this context was a proxy for emotion since participants encountered increasing amounts of affect-laden content as they performed the experimental task (they viewed an additional four emotional posts with each successive block).

As a manipulation check, we compared participants' average reactions, measured by the Facebook emoticons they selected in response to each emotional post, across the sad, happy and neutral conditions.

Results

Participants

We collected data from 270 participants (95 in the sad condition, 94 in the happy condition, and 81 in the neutral condition). Our sample was 49% male, 50% female. One person classified as "other", and one person opted not to specify their gender. 17% of the participants were between 18-24 years of age, 32% were between 25-34 years of age, 26% were between 35-44 years of age, 15% were between 45-54 years of age, and 10% were over 55 years old. The ethnicities distribution of our sample was as follows: 5% Asian/Pacific Islander, 45% Black or African American, 4% Hispanic or Latino, ≈1% Native American or American Indian, 42% White, and 3% Other. 22% had a high school or high school equivalent degree, 48% had a Bachelor's degree, 25% had a Master's degree, and 5% had a Doctorate.

Descriptive statistics

Table 17 shows the descriptive statistics for the variables of interest across each of the three conditions. These include demographic variables (age, gender, ethnicity, and education) and our independent variables (mood arousal and AOT). For our dependent variables, in the sad condition, the average performance was 0.709 (SD=0.455) and the average intent to share was 0.246 (SD=0.431). In the happy condition, the average performance was 0.695 (SD=0.461) and the average intent to share was 0.259 (SD=0.439). In the neutral condition, the average performance was 0.502 (SD=0.501) and the average intent to share was 0.440 (SD=0.497). For analysis purposes, participants who indicated "Other" or "I prefer not to say" for gender were removed from the data (n=2). Participants who indicated "Asian/Pacific Islander", "Hispanic or Latino", "Native American or American Indian", or "Other" were pooled into a separate category "Other" (n=35). Finally, participants with a Master's or Doctorate level of education were pooled into a separate category "Graduate" (n=80).

		Condition		
Variable	Category	Sad (N)	Happy (N)	Neutral (N)
Age	18–24 years	10	11	27
	25–34 years	35	27	23
	35–44 years	23	32	15
	45–54 years	15	13	12
	Over 55 years	12	11	4
Gender	Male	40	49	44
	Female	55	44	36
Ethnicity	White	43	40	31
	Black / African American	38	41	42
	Other	14	13	8
Education	High School	20	26	12
	Bachelor's degree	51	30	51
	Graduate degree	24	38	18
Mood arousal	Mean (SD)	-0.126 (1.28)	0.096 (1.36)	0.235 (1.42)
	Min–Max	-3.167–2.833	-2.833–4.0	-3.5–4.0
AOT	Mean (SD)	4.868 (0.98)	4.836 (0.96)	4.685 (0.98)
	Min–Max	2.375–7.0	3.125–7.0	3.125–7.0

Table 17. Descriptive statistics for the variables of interest in study 3 across each condition

Emotional condition manipulation check

We conducted three paired-samples t-tests to evaluate the effectiveness of the emotional image manipulations (Neutral, Happy, and Sad). In the neutral condition, participants reacted significantly more with neutral (Like emoticon) responses ($M=0.45$, $SD=0.24$) than with emotional responses (Laugh, Sad, or Angry emoticons; $M=0.17$, $SD=0.12$), $t(80)=7.79$, $p<0.001$, $d=0.86$. In the happy condition, participants responded more with positive (Laugh emoticon) reactions ($M=0.47$, $SD=0.20$) than with non-target reactions (Like, Sad, or Angry emoticons; $M=0.35$, $SD=0.20$), $t(93)=3.07$, $p=0.003$, $d=0.32$. In the sad condition, participants reacted significantly more with negative (Sad or Angry emoticons) responses ($M=0.59$, $SD=0.23$) than with neutral or positive responses ($M=0.19$, $SD=0.16$), $t(94)=10.85$, $p<0.001$, $d=1.11$. These results confirmed that our stimuli in each condition were perceived as emotionally distinct, validating that the sad, happy, and neutral posts effectively elicited the intended emotional responses and supporting the integrity of our experimental manipulation.

Impact of emotion over time on outcome variables

To better visualize the impact of emotion over time on performance and share, we calculated the average performance (i.e., correct identification of fake news headlines) and average sharing intent of fake news headlines at each timepoint (blocks 1-6) across the three emotional conditions (sad, happy, and neutral). Figure 8 displays the trend over time for both performance and intent to share. While the sad and happy conditions followed relatively similar patterns across blocks, the neutral condition exhibited a distinct trajectory, marked contrary to our expectations, by lower performance and a higher intent to share. These findings are discussed in more detail in the post hoc analysis section.

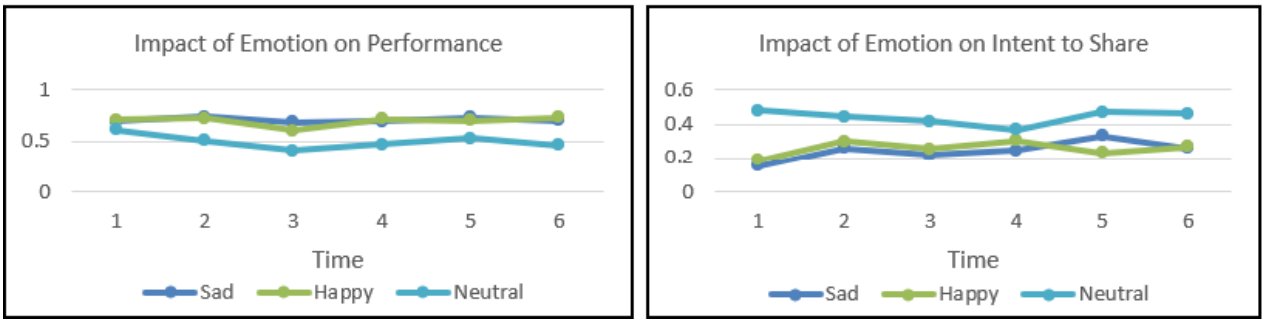


Figure 8 Average fake news discernment (left) and average intent to share (right) at each timepoint across the sad, happy and neutral conditions.

GLMM examining predictors of performance

Our first step was to examine if and how changes in emotion (indexed by time) and the interaction of AOT with emotion are associated with changes in fake news discernment and whether these relationships are statistically significant. We performed a Generalized Linear Mixed Model (GLMM) with a binary logistic link function to account for the repeated measures structure of our data and to appropriately model the binary outcome variable (fake news discernment) while controlling for individual-level random effects. The model included both between-subjects variables (Age, Gender, Ethnicity, Education, condition, mood arousal, and AOT) and the within-

subject variable of emotion (i.e., time). We added mood arousal to the model to investigate if and how it is impacted by the emotional posts.

Among the demographics variables, statistically significant effects were observed for Gender (p=0.0329) only. A pairwise comparison revealed that females were significantly better at discerning fake news than males (mean difference=-0.4077, p=0.0329; Odds ratio=0.665, 95% CI: 0.457 – 0.967).

A statistically significant effect was also found for AOT (p<0.0001), indicating that higher levels of AOT were associated with improved fake news discernment. Unlike what we observed in study 1, the impact of mood arousal was not significant (p=0.9290). Similarly, emotion or time, which indicated the block in which the participants saw the headlines, and by extension participants' progression through the experiment, had no impact on performance (p=0.3205). Finally, AOT did not show a moderating effect on emotion (p=0.1803). Results of the GLMM are displayed in table 18.

Type III Tests of Fixed Effects				
Effect	Num DF	Dem DF	F Value	p
Age	4	247	1.12	0.3489
Gender	1	247	4.60	0.0329
Ethnicity	2	247	0.55	0.5788
Education	2	247	2.51	0.0834
Condition	2	247	2.64	0.0734
Time	5	476	1.17	0.3205
Condition*Time	10	476	0.99	0.4531
AOT	1	247	45.91	<0.0001
AOT*Condition	2	247	2.02	0.1348
AOT*Time	5	476	1.53	0.1803
AOT*Condition*Time	10	476	0.95	0.4862
Mood arousal	1	247	0.01	0.9290
Mood arousal*Condition	2	247	0.04	0.9566
Mood arousal*Time	5	476	0.85	0.5138
Mood arousal*Condition*Time	10	476	1.09	0.3715
AOT*Mood arousal	1	247	0.28	0.5957
AOT*Mood arousal*Condition	2	247	0.04	0.9582
AOT*Mood arousal*Time	5	476	0.67	0.6485
AOT*Mood arousal*Condition*Time	10	476	1.20	0.2893

Table 18 Type III Tests of Fixed Effects from the Generalized Linear Mixed Model (GLMM) examining predictors of performance (fake news discernment).

GLMM examining predictors of intent to share

Next, we examined if and how changes in emotion and the interaction of AOT with emotion are associated with changes in fake news sharing intent and whether these relationships are statistically significant. We performed a Generalized Linear Mixed Model (GLMM) with a binary logistic link function to account for the repeated measures structure of our data and to appropriately model the binary outcome variable (intent to share) while controlling for individual-level random effects. Once again, we added mood arousal to the model to investigate if and how it is impacted by emotion.

Among the demographic variables, statistically significant effects were observed for Gender ($p=0.0001$), Ethnicity ($p<0.0001$), and Education ($p=0.0101$). For Gender, a pairwise comparison revealed that females were significantly less likely to share fake news than males (mean difference=0.8027, $p=0.0001$; Odds ratio=2.232, 95% CI: 1.490 – 3.342). For ethnicity, Black or African American participants were significantly more likely to share fake news than White participants (mean difference=1.0709, $p<0.0001$; Odds Ratio=2.918, 95% CI: 1.842 – 4.622) and participants classified as "Other", (mean difference=0.8676, $p=0.0099$; Odds Ratio=2.381, 95% CI: 1.234 – 4.595). No significant difference was found between fake news sharing intent of White individuals and individuals classified as "Other" ($p=0.5691$). For Education, participants with high school education were significantly less likely to share fake news than those with a bachelor's degree (mean difference=-0.9402, $p=0.0027$; Odds ratio=0.391, CI: 0.212 – 0.719) and those with a graduate degree (mean difference=-0.8272, $p = 0.0144$; Odds Ratio = 0.437, 95% CI: 0.226 – 0.847). No significant difference in sharing intent was observed between individuals holding a Bachelor's and Graduate degrees ($p = 0.6433$).

A statistically significant effect was also found for AOT ($p<0.0001$), indicating that higher levels of AOT were associated with decreased fake news sharing intent. Unlike what we observed in study 1, the impact of mood arousal was not significant ($p=0.3616$). Similarly, emotion or time, which indicated the block in which the participants saw the headlines, and by extension participants' progression through the experiment, had no impact on sharing intent ($p=0.1912$). Finally, AOT did not show a moderating effect on emotion ($p=0.1749$). Results of the GLMM are displayed in table 19.

Type III Tests of Fixed Effects				
Effect	Num DF	Dem DF	F Value	p
Age	4	247	0.93	0.4465
Gender	1	247	15.32	0.0001
Ethnicity	2	247	11.65	<0.0001
Education	2	247	4.68	0.0101
Mood arousal	1	247	0.84	0.3616
Emotion (Time)	5	476	1.49	0.1912
AOT	1	247	27.58	<0.0001
AOT x Emotion (Time)	5	476	1.54	0.1749

Table 19 Type III Tests of Fixed Effects from the Generalized Linear Mixed Model (GLMM) examining predictors of fake news sharing intent.

Discussion

The ARM framework (P. Zhang, 2013) emphasizes the importance of distinguishing between affective concepts when investigating human interaction with ICTs. We do so in this study by examining the impact of (i) participants' mood arousal carried into content consumption and (ii) participants' emotions arising from the content itself.

Results of this study demonstrated a lack of impact of emotion on either of our outcome variables. Thus, we did not find support for H1 and H2. Additionally, we did not find evidence for a moderating impact of AOT on the relationship between emotion and either of our outcome variables. Thus, H3 and H4 were not supported. Table 20 displays a summary of the hypotheses and whether they were supported.

Hypothesis	Prediction	Supported?
H1	After being repeatedly exposed to emotional content, the impact of emotion is a stronger determinant of the ability to discern between real and fake news headlines than is the impact of mood arousal.	✗
H2	After being repeatedly exposed to emotional content, the impact of emotion is a stronger determinant of the intent to share fake news headlines on social media platforms than is the impact of mood arousal.	✗
H3	The impact of repeated exposure to emotional content on the ability to discern between real and fake news headlines is reduced in people with high AOT levels.	✗
H4	The impact of repeated exposure to emotional content on the intent to share fake news headlines is reduced in people with high AOT levels.	✗

Table 20. Summary of study 3 hypotheses and whether they were supported or rejected.

The overriding of mood arousal

Although we did not observe a significant impact of emotion on our outcome variables, our results demonstrated that contrary to findings in study 1, the effect of mood arousal on either of fake news discernment or sharing intent was no longer significant. Consequently, while we cannot conclude that it is participants' emotion that replaced the impact of their mood arousal on both outcome variables, we can state that the emotional carryover from the affect-laden stimuli presented prior to the news headlines likely interfered with the impact of participants' mood arousal on fake news discernment and sharing intent, rendering it nonsignificant.

The idea that mood arousal's influence can be overridden is supported by Lühring et al. (2024), who found no association of baseline mood with news discernment when controlling for emotional reactions to the news itself but did find that people showed increased anger and less joy in response to false compared to real news, which directly influenced their judgments. In a similar vein and in the context of false memories, research by (W. Zhang et al., 2021) found that while participants' induced mood (positive, negative, or neutral) had no effect on false memories, the emotional content of a video they watched, whether upsetting, positive, or neutral, significantly influenced their susceptibility to false memory the next day. These findings combined suggest that immediate emotional reactions to content can override the influence of background mood,

highlighting that content-driven affect plays a more dominant role in shaping memory and, more relevant to our study, belief.

In the context of fake news, this aligns with the idea that integral affect, the immediate emotion elicited directly by the content, is a more potent driver of belief and sharing behavior than background mood, reinforcing a hierarchy of affective influence in fake news discernment and sharing intent. Consequently, building on the Affect-Infusion Model (Forgas, 1995), which posits that the degree of affect infusion into judgments varies along a processing continuum, we propose that in a fake news context, it is not only the degree of affect infused that matters, but also the nature of the affective construct (whether it is mood arousal or emotion) that shapes fake news discernment and sharing intent.

Impact of emotion on performance and behavior

Our finding that emotion did not impact either of fake news discernment or sharing intent can be accounted for by several possible explanations. To begin with, that participants' emotional responses may have waned with repeated exposure to the emotional posts, a process referred to as affective habituation (Leventhal et al., 2007). To that end, a study by Ferrari et al. (2020) demonstrated that participants' late positive potential (LPP) amplitude (which reflects emotional processing) to emotional images attenuated significantly after dozens of repetitions and remained lower even a day later. This suggests that participants adapt to ongoing emotional content, where subsequent stimuli elicit a weaker reaction. In the context of the current study, such emotional habituation could mean that after seeing multiple emotional posts, participants had a dampened emotional state which was not strong enough to impact fake news discernment and sharing intent as the experiment progressed.

Another possible explanation is that the repeated, stimulus-driven emotional responses may have led to processes unrelated to affect that may have nonetheless impacted both fake news discernment and sharing intent. One such factor is digital fatigue, which Fan et al. (2023) demonstrated diminishes emotional processing ability. The authors presented participants with positive, neutral, or negative pictures in an emotional processing task and found that higher self-reported fatigue correlated with lower LPP amplitudes to emotional stimuli, a sign that the brain's emotional response was reduced when participants were tired. This supports the idea that a fatigued participant may respond less intensely to emotional content. In the context of the current study, participants exposed to repeated emotional stimuli may have experienced increasing digital fatigue, which in turn blunted their emotional reactivity. As a result, their emotional responses may not have been strong enough to impact fake news discernment and sharing intentions, ultimately leading to uniform evaluations of both the true and false news headlines. It is important to note that this digital fatigue is unlikely to be attributed solely to the duration of the study because many of the participants are likely regular respondents to online studies on Prolific and likely had already spent a considerable amount of time online prior to starting our experiment.

Another possible factor unrelated to affect is inattention of the participants. To that effect, Codispoti et al. (2016) provided evidence for diminished allocation of attention to even a small number of repetitions of emotional pictures in a parity judgment task. While EEG results demonstrated that the LPP remained elevated for repeated emotional images (suggesting the brain continued classifying them as emotional), behaviorally, the attentional priority (indexed by slower reaction time) disappeared. This rapid habituation of attention implies that repeated exposure can flatten out behavioral differences between emotional and neutral conditions. Applied to the current

study, repeated funny meme or sad post viewing may have shifted participants' attention away from the task, leading them to respond in a similar fashion to the six news headlines.

Yet another possible explanation relates to the hierarchy of affect argument. While the design of the current study attempts to resemble the emotional fluctuations users commonly experience on social media (Preston et al., 2021; Vosoughi et al., 2018), ecological validity would have been further enhanced had participants spent time browsing their own social media platforms prior to beginning the experiment. This is based on a 2022 survey indicating that Americans spend on average approximately 144 minutes per day on social media (Lee et al., 2022). While this was not possible for practical reasons, our reasoning is that each individual funny meme or sad post had the potential to trigger a distinct emotional episode. Assuming that participants had the opportunity to browse their social media platforms prior to starting our experiment, the cumulative exposure to the sad posts or funny memes may have culminated in a salient emotional event that would become the dominant input into cognition. On the other hand, participants who saw only four emotional posts per stimulus block may not have reached this level of emotionality altogether.

Considering the existing literature and the limitation of this study, we believe the hierarchy of affect argument to be the most probable in explaining our finding of a lack of impact of emotion on fake news discernment and sharing intent. Our prediction is that as participants appraised the immediate, stimulus-induced emotional posts, this effectively overrode the diffuse mood arousal they brought into the experimental task. This explains why any unique variance in subsequent accuracy judgements and sharing decisions attributable to mood arousal was negligible. Consequently, we believe that the idea that integral affect (i.e., immediate, stimulus-driven emotion) exerts a direct influence on judgments that is both stronger and different in quality than any incidental mood arousal effects merits further research.

Lack of a moderating effect of AOT on emotion

Although AOT had a significant main effect on both fake news discernment and sharing intent, our findings demonstrated that unlike mood arousal, which is amenable to regulation by AOT, emotion was not subject to the same regulatory influence. We propose that this is due to two factors. First, in line with the affective primacy hypothesis (Zajonc 1980), emotional reactions (both positive and negative) can bypass cognitive processes (such as AOT). This suggests that an incidental emotion can subtly shape subsequent judgments without conscious awareness. Indeed, Zajonc's (1980) argument that "preferences need no inferences" aligns with the idea that emotional reactions can occur without deliberate thought. In the context of this study, the emotional posts preceding the news headlines may have anchored participants' thinking before any cognitive decoupling (the ability to separate reasoning from immediate context) (Stanovich & Toplak, 2023) enabled by AOT could occur. Thus, the emotional framing may have triggered fast, heuristic evaluations that AOT's reflective regulation mechanism could not easily intercept. Additionally, participants' focused attention on the emotional posts may have contributed to a peripheral (Petty & Cacioppo J. T, 1986) rather than systematic processing of the headlines, leaving no room for an individual's reflective disposition (such as AOT) to exert its influence.

The other possible reason for the lack of a moderating impact of AOT on emotion is that the emotional reaction(s) from the funny memes or sad posts may have triggered a dominant limbic response that suppressed the reasoned deliberation a reflective person would typically engage in. This is supported by L. C. and U. A. (2024), who demonstrated that intense emotional experiences can lead to a phenomenon termed the amygdala hijack, in which the amygdala (a brain structure involved in emotional processing) disrupts the normal functioning of the prefrontal cortex and leads to impulsive decision-making. In the context of our study, the repetitive emotional stimuli

may have resulted in intense emotional experiences that may have subsequently inhibited executive functioning (through AOT).

Post hoc analysis

Impact of condition on performance

Table 1 of Appendix I displays post hoc comparisons from the GLMM examining differences in fake news discernment across the three experimental conditions (sad, happy, and neutral). The comparisons reveal a significant difference in fake news discernment between both the sad and happy condition when compared to the neutral condition. Contrary to our expectations, participants in the sad and happy conditions outperformed those in the neutral condition (performance was higher in the sad compared to neutral condition (Estimate=0.6071, p=0.0176; Odds Ratio=1.835 95% CI: 1.113 – 3.027), and in the happy condition compared to neutral (Estimate=0.7834, p=0.0098; Odds Ratio=2.189, 95% CI: 1.210 – 3.958)). No significant difference was found between the sad and happy conditions. These findings suggest that affectively charged contexts, regardless of valence, may sharpen evaluative performance relative to emotionally neutral settings. This merits future investigation as it challenges theories on affect and cognition that predict either (i) a negative impact of any emotion on fake news discernment (the Resource allocation model (Ellis, 1988)) or (ii) a negative impact of positive emotion and a positive impact of negative emotion on fake news discernment (the Assimilative Accommodative Model of emotion (Bless & Fiedler, 2006)).

Impact of condition on behavior

Table 2 of Appendix I displays post hoc comparisons from the GLMM examining differences in fake news sharing intent across the three experimental conditions. The comparisons reveal a marginally significant difference in fake news sharing intent only between the happy and neutral

conditions (Estimate=-0.6060, p=0.0944; Odds Ratio=0.546, 95% CI: 0.268 – 1.111). Specifically, participants in the happy condition seemed to be less likely to share fake news headlines as compared to those in the neutral condition. This finding suggests that emotional condition may influence participants' intent to share fake news, but that this effect is more limited than its impact on performance. Specifically, it suggests that positive emotional states may reduce the likelihood of sharing misinformation, whereas negative emotional states do not appear to exert a similar influence. Future research should investigate whether this effect is driven by social norms associated with positivity.

Discussion (studies 1-3)

This study incorporated the multi-faceted notion of core affect in misinformation research by examining the impact of affective constructs that reside within a person (mood arousal), within an ICT stimulus (affective cues), and between a person and an ICT stimulus (emotion), alongside the cognitive disposition of AOT on fake news discernment and sharing intentions in a social media context.

Impact of affective constructs

In study 1, the impact of internal, prolonged, and free-floating mood arousal on fake news discernment varied from dysregulation to regulation to adaptive optimization. Its impact on sharing intentions varied from dysregulation to regulation. In study 2, the external and subconsciously operating affective cues resulted in a less analytic and more impulsive approach that impaired accuracy judgments and boosted the urge to share fake news headlines. In study 3, ephemeral and induced emotion residing between the user and stimulus did not impact fake news discernment or sharing intent, however, emotional reactions from the sad posts and funny memes likely rendered the impact of mood arousal on these outcome variables nonsignificant.

Our results collectively demonstrate (i) the salience of affective concepts in shaping how fake news is perceived on social media platforms, and (ii) the importance of distinguishing between affective concepts that differ across key dimensions including source (residing within a user, residing within a stimulus, or residing between a user and a stimulus), duration (prolonged vs. short-lasting), mechanism of action (conscious vs. subconscious), and method of induction (free-floating vs. induced). Consequently, we were able to answer our research question: *What is the impact of mood arousal, affective cues, and emotion on users' belief in and intent to share fake news headlines on social media platforms?*

Moderating impact of AOT

Study 1 findings demonstrate that mood arousal had a significant effect on fake news discernment at both low and high levels of AOT, with a caveat; the direction of this effect reversed, from impairing performance at low AOT levels to enhancing performance at high AOT levels. Additionally, mood arousal had no effect on fake news discernment at moderate AOT levels and a significant negative impact on sharing intent only in individuals with low AOT levels. These findings suggest that AOT can both buffer and amplify the effects of mood arousal. Specifically, moderate AOT levels mitigate the influence of mood arousal on fake news discernment, high AOT levels leverage mood arousal to improve fake news discernment, and moderate and high AOT levels dampen the effect of mood arousal on fake news sharing intentions.

Contrary to these findings, a moderating impact of AOT was not observed on affective cues (study 2). Affective cues, which are embedded in the stimuli, evoke emotional responses almost instantaneously, setting a perceptual "tone" that shapes subsequent processing in an automatic manner. Thus, they were less amenable to cognitive override by AOT. In the case of study 3, emotion triggered by the sad posts and funny memes bypassed cognitive control mechanisms and led to fast, heuristic evaluations, preventing AOT from exerting its influence.

Consequently, while AOT can in certain cases help counteract and in others leverage an internal surge of mood arousal by promoting reflective processing, it is not effective against external affective cues and externally induced emotion. We propose that the distinction lies in how the affective constructs are processed. To begin with, mood arousal, as an internal state, is subject to self-monitoring and correction and was indeed checked and regulated through different arousal regulation strategies in those inclined toward open-minded, analytical thought. To that end, AOT has been conceptualized as "a thinking disposition encompassing…a willingness to postpone

closure" (Stanovich & West, 1997), p.346. We propose that this postponement or pause is essentially a form of affect regulation in individuals with moderate AOT levels. Instead of automatically accepting information that feels true (or rejecting information that feels threatening or false), these individuals notice an increase in their mood arousal, buffer their immediate reaction, and analytically reassess. Supporting our proposition is the finding that AOT involves overriding one's initial reactions to give fair consideration to opposing evidence, a process that entails suppressing the attachment to one's prior beliefs (Baron, 2005). Additionally, Stanovich and Toplak (2023) argue that AOT provides "cognitive decoupling", the ability to decouple one's reasoning from the immediate context or feelings. For individuals with high AOT levels, we propose that the postponement of closure and the cognitive decoupling that occurs may lead them to consider mood arousal as a cue to be more critical of the information they come across. As a result, they consciously leverage their increased mood arousal to their advantage, i.e., improve their fake news discernment capabilities and reduce their intent to share fake news headlines. In the context of studies 2 and 3, it is possible that a postponement of closure and cognitive decoupling did not happen altogether because the externally present affective cues and the externally induced emotion immediately and subconsciously bypassed such signals.

These findings suggest that the moderating role of AOT is context dependent. It can serve as a protective factor (in moderate AOT individuals) or an enabling factor (in high AOT individuals) when the affective influence is internally generated (as in mood arousal), but its influence is diminished when the affective signal is an intrinsic part of the stimulus itself (as in affective cues) or resides in between the individual and the stimulus (as in emotion). The differential impact implies that effectively combating fake news on social media platforms may require a two-pronged approach whereby integrated strategies combine cognitive training with

design and regulatory interventions. This is important because previous studies have typically conceptualized reasoning and affect as unidimensional, implying that increased reasoning equates to decreased affective influence and vice versa (Martel et al., 2020). This underscores the importance of content design and presentation on social media and highlights the need for interventions beyond individual cognitive strategies.

The distinction between the impact of an internal and conscious affective influence (i.e., mood arousal) vs. the impact of an external subconsciously operating affective cue or an induced subconsciously operating emotion sheds light on the conditions in which AOT regulates affect in the context of fake news. Specifically, AOT's affect regulatory mechanism is both deliberate and time dependent. Consequently, we were able to answer our research question: *How does AOT interact with mood arousal, affective cues, and emotion to influence users' belief in and intent to share fake news headlines on social media platforms?*

Contributions to theory

The present work responds to calls for research on the mechanisms by which fake news become entrenched as well as mechanisms to quell the influence of fake news (Ali Adeeb & Mirhoseini, 2023a, 2023b; Bago et al., 2020, 2022; Bronstein et al., 2019; Horner et al., 2021; Lazer et al., 2018; Lewandowsky et al., 2012; Lutz et al., 2023; Martel et al., 2020; Pennycook & Rand, 2019a, 2021). It advances our understanding of how users interact with misinformation and contributes to the fake news literature through its focus on existing gaps in our understanding of the role of affective constructs in the perception of fake news on social media platforms. Asides from the studies by Bago et al. (2022), Horner et al. (2021), Lutz et al. (2023), and Martel et al. (2020), much of the existing literature on fake news has predominantly focused on reasoning, often neglecting the role of affective experiences. Findings from studies 1 and 2 fill this gap by

demonstrating that mood arousal, depending on context, can impair or enhance fake news discernment and amplify sharing intent of fake news headlines, and that affective cues can impair fake news discernment and increase fake news sharing intentions.

By shedding light on the role of affect in combination with the cognitive disposition of AOT in the phenomenon of misinformation, this research fundamentally redefines how IT-based fake news intervention methods, such as fact checkers, are understood and designed. This is an important topic because an increasing share of the population is obtaining their news via social media platforms, which rely on unknown sources (Gottfried & Shearer, 2016). Our findings suggest that effective interventions against fake news must consider the affective and cognitive aspects of thought processes. Addressing only one aspect may be insufficient; instead, an intervention approach that recognizes their synergistic interplay in shaping belief formation and sharing intent is likely to be more effective in building resilience against misinformation.

In contrast to the extensive research on the cognitive and behavioral dimensions of ICT interactions, relatively few studies have examined multiple affective constructs within a single experiment, and even fewer have explored the relationships among these constructs (P. Zhang, 2013). Such scant coverage limits an understanding of how affective constructs interrelate and may in part explain the inconsistent findings regarding the causes and effects of affective responses in ICT contexts. Our research addresses both points because it investigates the impact of more than one affective construct and a possible interaction (between mood arousal and emotion) on the perception of fake news in a social media context.

Implications for practice

The identification of AOT as a moderator of the relationship between mood arousal and (i) fake news discernment and (ii) fake news sharing intentions introduces a novel dimension to the

conversation around misinformation: the role of cognitive resilience in countering the emotionally charged, heuristic-driven environment of social media through mood arousal regulation. Our finding of a threshold-dependent mechanism through which AOT regulates mood arousal and impacts both performance and behavior enhances our understanding of the mechanisms by which fake news become entrenched. Additionally, it extends our understanding of individual differences in the susceptibility to misinformation, providing a compelling case for fake news interventions to be tailored to account for varying levels of cognitive resilience across individuals. This granular understanding of AOT's role of regulating mood arousal refines existing models of misinformation processing, which often assume uniform effects of cognitive traits across populations.

Our work uncovered a limitation of AOT in mitigating the effects of embedded emotional signals in ICT stimuli. Although AOT is a disposition, its application varies by context. Specifically, while AOT can buffer against mood arousal or leverage it to help achieve a given task goal, it does not automatically make one vigilant to every external subtle affective cue in an environment as stimulating as a social media news feed. This underscores the importance of content design and presentation on social media, highlights the need for interventions beyond individual cognitive strategies, and lays the foundation for interventions aimed at enhancing users' critical engagement with news online. Indeed, insights from this study may inform platform designers and policymakers in developing strategies to curb misinformation, such as regulatory guidelines that promote balanced visual presentations of news content to reduce the automatic influence of affective cues.

Ultimately, our findings underscore the need for a multifaceted approach combining affective and cognitive concepts, design, and policy to effectively counter the spread of fake news.

Limitations

Our unsupported hypotheses point to several limitations that warrant consideration. First, in study 1, mood arousal did not significantly increase the intent to share fake news despite decreasing fake news discernment. This suggests that mood arousal may not directly influence behavioral intentions or that other mediating factors such as social desirability or topic relevance may override the effect of mood arousal in the context of sharing. As such, a potential research question on this topic is *What cognitive or contextual factors moderate the relationship between mood arousal and the intent to share fake news?* Second, our finding that AOT did not buffer against the impact of affective cues raises an important question about the conditions under which cognitive traits such as AOT are effective in mitigating affective influences. Specifically, *Under what conditions does AOT impact fake news perception?* Third, in study 3, a longitudinal design may have been better suited to capture cumulative emotional effects on both belief in and intent to share fake news better than the short-term repeated exposure approach we used. Such a design could help address the question of *Does the emotional impact of repeated exposure diminish due to desensitization, or are there delayed effects that appear later that can impact the perception of fake news?*

There exist other limitations pertaining to this work. To begin with, our studies were not conducted as digital field experiments on social media platforms. This limits our ability to determine whether the findings generalize to (i) natural social media use and (ii) real-world (as opposed to hypothetical) sharing behaviors. Second, because we ran our experiments on Prolific, an online participant recruitment platform, we had little control over participants' environments while they completed the study. Third, the only format of headlines used in this work was a Facebook-style layout. Fourth, our sample was strictly U.S-based, which prevented us from accounting for cross-cultural differences in emotional responses that have been documented in the

literature by Mesquita and Frijda (1992). Fifth, we did not control for emotions based on personality traits. Sixth, the fake news headlines used in our study were not matched in emotional intensity or valence with the real news headlines. Seventh, we relied on self-report measures of affect, which may have influenced the emotional experiences of participants. As noted by Torre and Lieberman (2018), simply labeling an emotion can act as a regulatory mechanism and reduce its intensity.

One limitation pertaining to study 3 is that we completely randomized the presentation of the headlines for each participant. In doing so, we ended up with varying frequencies of exposure to the true and false headlines at each timepoint and across the conditions. For example, in the sad condition, 46 participants saw a false headline at timepoint 1, 50 participants at timepoint 2, 41 participants at timepoint 3, 49 participants at timepoint 4, 45 participants at timepoint 5, and 54 participants at timepoint 6.

Another set of limitations pertains to our second dependent variable, the intent to share fake news headlines. First, we included a "full attention treatment" (Pennycook et al., 2021, p. 592), where participants always evaluated the accuracy of a headline immediately before reporting their sharing intentions. This may have introduced an "accuracy nudge", potentially influencing participants' sharing decisions, as was demonstrated to be the case in Pennycook et al. (2020) and (2021). As such, while the accuracy judgments were reliable in our study, the interpretation of participants' sharing intentions should be approached with caution. Second, our question regarding intent to share did not capture participants' underlying motivations for sharing. For example, some participants may have shared a given news headline because they mistakenly believed the content was accurate (confusion-based account of accuracy-sharing dissociation (Pennycook et al., 2021, 2021)). Another possibility is that participants may have knowingly shared misinformation

because the content is aligned with their political biases and because they prioritize political identity over truth (preference-based account (Pennycook et al., 2021, 2021)). Finally, participants may have decided to share misinformation simply because they were distracted (inattention-based account (Pennycook et al., 2021, 2021)). A final limitation is that the format of our sharing question was limited to yes/no responses, which made it impossible to differentiate between varying levels of sharing engagement such as passive sharing (reposting without comment) and active sharing (where users take the time to write their own post or add commentary).

Avenues for future research

Given that our stimuli were limited to Facebook-style headlines and our sample consisted solely of U.S. residents, further research is needed to assess the generalizability of our findings to other social media platform formats and to populations in different cultural and national contexts. Additionally, future work should align emotional content across fake and real headlines, which would help clarify whether stronger belief in fake news stems from its heightened emotional appeal or from a more general reliance on emotion. Another avenue for future research is the measurement of emotion using physiological measures instead of self-reported measures, as was done by (Lutz et al., 2023), and as highlighted as a key research gap in the fake news literature by Ali Adeeb and Mirhoseini (2023b). Finally, future research should measure sharing decisions separately by creating an accuracy condition and a sharing condition as per Pennycook et al. (2021).

Thesis Conclusion

The widespread use of social media as a primary source of news has amplified the societal risks posed by fake news. In these emotionally charged digital environments, it is crucial to understand how users navigate the interplay between affective and cognitive processes. While previous efforts to combat misinformation have focused primarily on cognitive mechanisms, this thesis underscores the often-overlooked role of affect and its interaction with the cognitive disposition AOT. The findings reveal that both affect and cognition influence fake news perception, and that their interaction is nuanced and context dependent. As such, interventions must extend beyond traditional, cognitively focused models. By illustrating how emotional and rational systems jointly shape susceptibility to fake news, this research challenges conventional approaches and promotes a more integrated, psychologically grounded framework.

Ultimately, insights from this thesis inform the development of more effective IT-based interventions that address not only *what* people believe, but *how* and *why* they come to believe and share misinformation in emotionally dynamic social media settings.

References

Ajzen, I. (1996). The social psychology of decision making. In *Social psychology: Handbook of basic principles* (pp. 297–325). Guilford Press.

Ali Adeeb, R., & Mirhoseini, M. (2023a). *Investigating the Impact of Mood and Emotion on the Perception of Fake News on Social Media Platforms*. 150–158.

Ali Adeeb, R., & Mirhoseini, M. (2023b). The Impact of Affect on the Perception of Fake News on Social Media: A Systematic Review. *Social Sciences*, *12*(12), Article 12. https://doi.org/10.3390/socsci12120674

Bago, B., Rand, D. G., & Pennycook, G. (2020). Fake news, fast and slow: Deliberation reduces belief in false (but not true) news headlines. *Journal of Experimental Psychology: General*, *149*(8), 1608–1613. https://doi.org/10.1037/xge0000729

Bago, B., Rosenzweig, L. R., Berinsky, A. J., & Rand, D. G. (2022). Emotion may predict susceptibility to fake news but emotion regulation does not seem to help. *Cognition and Emotion*, *36*(6), 1166–1180. https://doi.org/10.1080/02699931.2022.2090318

Baron, J. (2005). *Rationality and Intelligence*. Cambridge University Press.

Blanchette, I., & and Richards, A. (2010). The influence of affect on higher level cognition: A review of research on interpretation, judgement, decision making and reasoning. *Cognition and Emotion*, *24*(4), 561–595. https://doi.org/10.1080/02699930903132496

Bless, H., & Fiedler, K. (2006). Mood and the regulation of information processing and behavior. In *Affect in social thinking and behaviour* (pp. 65–84). Psychology Press.

Bowes, S. M., & Fazio, L. K. (2024). Intellectual humility and misinformation receptivity: A meta-analytic review. *Advances.in/Psychology*, *2*, e940422. https://doi.org/10.56296/aip00026

Bronstein, M. V., Pennycook, G., Bear, A., Rand, D. G., & Cannon, T. D. (2019). Belief in fake news is associated with delusionality, dogmatism, religious fundamentalism, and reduced analytic thinking. *Journal of Applied Research in Memory and Cognition*, *8*(1), 108–117. https://doi.org/10.1037/h0101832

Butler, L. H., Prike, T., & Ecker, U. K. H. (2024). Nudge-based misinformation interventions are effective in information environments with low misinformation prevalence. *Scientific Reports*, *14*(1), 11495. https://doi.org/10.1038/s41598-024-62286-7

Campitelli, G., & Gerrans, P. (2014). Does the cognitive reflection test measure cognitive reflection? A mathematical modeling approach. *Memory & Cognition*, *42*(3), 434–447. https://doi.org/10.3758/s13421-013-0367-9

Carretié, L., Hinojosa, J. A., & Mercado, F. (2003). Cerebral patterns of attentional habituation to emotional visual stimuli. *Psychophysiology*, *40*(3), 381–388. https://doi.org/10.1111/1469-8986.00041

Chen, X. (2016, March 10). The Influences of Personality and Motivation on the Sharing of Misinformation on Social Media. *iConference 2016 Proceedings*. iConference 2016: Partnership with Society, Philadelphia, USA. https://doi.org/10.9776/16145

Codispoti, M., De Cesarei, A., Biondi, S., & Ferrari, V. (2016). The fate of unattended stimuli and emotional habituation: Behavioral interference and cortical changes. *Cognitive, Affective & Behavioral Neuroscience*, *16*(6), 1063–1073. https://doi.org/10.3758/s13415-016-0453-0

Dias, N., Pennycook, G., & Rand, D. G. (2020). Emphasizing publishers does not effectively reduce susceptibility to misinformation on social media. *Harvard Kennedy School Misinformation Review*. https://doi.org/10.37016/mr-2020-001

Ellis, H. C. (1988). *Resource allocation model of the effect of depressed mood states on memory.*

Epstein, S. (1998). Cognitive-Experiential Self-Theory. In *Advanced Personality* (pp. 211–238). Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-8580-4_9

Fan, J., Li, W., Lin, M., Li, X., & Deng, X. (2023). Effects of mindfulness and fatigue on emotional processing: An event-related potentials study. *Frontiers in Behavioral Neuroscience*, *17*. https://doi.org/10.3389/fnbeh.2023.1175067

Farb, N. S., Anderson, A., & Irving, J. (2014). *M i n d f u l n e sI ns t e r v e n t i o n s andEmotionRegulation*.

Fazio, L. (2020). Pausing to consider why a headline is true or false can help reduce the sharing of false news. *Harvard Kennedy School Misinformation Review*, *1*(2). https://doi.org/10.37016/mr-2020-009

Ferrari, V., Mastria, S., & Codispoti, M. (2020). The interplay between attention and long-term memory in affective habituation. *Psychophysiology*, *57*(6), e13572. https://doi.org/10.1111/psyp.13572

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, *117*(1), 39–66. https://doi.org/10.1037/0033-2909.117.1.39

Frederick, S. (2005). Cognitive Reflection and Decision Making. *Journal of Economic Perspectives*, *19*(4), 25–42. https://doi.org/10.1257/089533005775196732

Gottfried, J., & Shearer, E. (2016). *News use across social media platforms 2016* (Analysis & Policy Observatory). PewResearchCenter.

Gross, J. J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *EMOTION REGULATION*, *2*(3), 271–299.

Gross, J. J. (2001). Emotion Regulation in Adulthood: Timing Is Everything. *Current Directions in Psychological Science*, *10*(6), 214–219. https://doi.org/10.1111/1467-8721.00152

Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*(3), 281–291. https://doi.org/10.1017/S0048577201393198

Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach*. Guilford Publications.

Holland, R. W., Vries, M. D., Hermsen, B., & Knippenberg, A. V. (2012). Mood and the Attitude–Behavior Link: The Happy Act on Impulse, the Sad Think Twice. *Social Psychological and Personality Science*, *3*(3), 356–364. https://doi.org/10.1177/1948550611421635

Horner, C. G., Galletta, D., Crawford, J., & Shirsat, A. (2021). Emotions: The Unexplored Fuel of Fake News on Social Media. *Journal of Management Information Systems*, *38*(4), 1039–1066. https://doi.org/10.1080/07421222.2021.1990610

Kim, C., & Yang, S.-U. (2017). Like, comment, and share on Facebook: How each behavior differs from the other. *Public Relations Review*, *43*(2), 441–449. https://doi.org/10.1016/j.pubrev.2017.02.006

Kohlberg, L. (1994). *Stage and sequence: The cognitive-developmental approach to socialization* (p. 134). Garland Publishing.

Kozyreva, A., Lewandowsky, S., & Hertwig, R. (2020). Citizens Versus the Internet: Confronting Digital Challenges With Cognitive Tools. *Psychological Science in the Public Interest*, *21*(3), 103–156. https://doi.org/10.1177/1529100620946707

L. C., O., & U. A., I. (2024). Amygdala Hijack: Contemporary Insights into Causes, Correlates and Consequences. *African Journal of Health, Nursing and Midwifery*, *7*(3), 102–111. https://doi.org/10.52589/AJHNM-KQM0NM27

Lazer, D., Baum, M. A., Benkler, Y., Berinsky, A., Greenhill, K. M., Menczer, F., Metzger, M. J., Nyhan, B., Pennycook, G., Rothschild, D., Schudson, M., Sloman, S., Sunstein, C., Thorson, E., Watts, D., & Zittrain, J. (2018). The science of fake news. *Science*, *359*(6380), 1094–1096. https://doi.org/10.1126/science.aao2998

Lee, D. S., Jiang, T., Crocker, J., & Way, B. M. (2022). Social Media Use and Its Link to Physical Health Indicators. *Cyberpsychology, Behavior, and Social Networking*, *25*(2), 87–93. https://doi.org/10.1089/cyber.2021.0188

Leventhal, A. M., Martin, R. L., Seals, R. W., Tapia, E., & Rehm, L. P. (2007). Investigating the dynamics of affect: Psychological mechanisms of affective habituation to pleasurable stimuli. *Motivation and Emotion*, *31*(2), 145–157. https://doi.org/10.1007/s11031-007-9059-8

Lewandowsky, S., & and van der Linden, S. (2021). Countering Misinformation and Fake News Through Inoculation and Prebunking. *European Review of Social Psychology*, *32*(2), 348–384. https://doi.org/10.1080/10463283.2021.1876983

Lewandowsky, S., Ecker, U. K. H., & Cook, J. (2017). Beyond misinformation: Understanding and coping with the "post-truth" era. *Journal of Applied Research in Memory and Cognition*, *6*(4), 353–369. https://doi.org/10.1016/j.jarmac.2017.07.008

Lewandowsky, S., Ecker, U. K. H., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and Its Correction: Continued Influence and Successful Debiasing.

Psychological Science in the Public Interest, *13*(3), 106–131. https://doi.org/10.1177/1529100612451018

Lühring, J., Shetty, A., Koschmieder, C., Garcia, D., Waldherr, A., & Metzler, H. (2024). Emotions in misinformation studies: Distinguishing affective state from emotional response and misinformation recognition from acceptance. *Cognitive Research: Principles and Implications*, *9*(1), 82. https://doi.org/10.1186/s41235-024-00607-0

Lutz, B., Adam, M. T. P., Feuerriegel, S., Pröllochs, N., & Neumann, D. (2023). Affective Information Processing of Fake News: Evidence from NeuroIS. *European Journal of Information Systems*, *0*(0), 1–20. https://doi.org/10.1080/0960085X.2023.2224973

Maertens, R., Roozenbeek, J., Basol, M., & van der Linden, S. (2021). Long-term effectiveness of inoculation against misinformation: Three longitudinal experiments. *Journal of Experimental Psychology: Applied*, *27*(1), 1–16. https://doi.org/10.1037/xap0000315

Martel, C., Pennycook, G., & Rand, D. G. (2020). Reliance on emotion promotes belief in fake news. *Cognitive Research: Principles and Implications*, *5*(1), 47. https://doi.org/10.1186/s41235-020-00252-3

McRae, K., Ciesielski, B., & Gross, J. J. (2012). Unpacking cognitive reappraisal: Goals, tactics, and outcomes. *Emotion*, *12*(2), 250–255. https://doi.org/10.1037/a0026351

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.

Mehrabien, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.

Mesquita, B., & Frijda, N. H. (1992). *Cultural variations in emotions: A review*. *112*(2), 179–204.

Mirhoseini, M., Early, S., El Shamy, N., & Hassanein, K. (2023). Actively open-minded thinking is key to combating fake news: A multimethod study. *Information & Management*, *60*(3), 103761. https://doi.org/10.1016/j.im.2023.103761

Newton, C., & Pennycook, G. (2020). *Deliberately Thinking About Analytic Thinking Style: Developing The Comprehensive Thinking Style Questionnaire*.

Ochsner, K., & Gross, J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, *9*(5), 242–249. https://doi.org/10.1016/j.tics.2005.03.010

Pennycook, G., Cheyne, J. A., Barr, N., Koehler, D. J., & Fugelsang, J. A. (2014). Cognitive style and religiosity: The role of conflict detection. *Memory & Cognition*, *42*(1), 1–10. https://doi.org/10.3758/s13421-013-0340-7

Pennycook, G., Epstein, Z., Mosleh, M., Arechar, A. A., Eckles, D., & Rand, D. G. (2021). Shifting attention to accuracy can reduce misinformation online. *Nature*, *592*(7855), 590–595. https://doi.org/10.1038/s41586-021-03344-2

Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G., & Rand, D. G. (2020). *Fighting COVID-19 Misinformation on Social Media: Experimental Evidence for a Scalable Accuracy-Nudge Intervention*. *31*(7), 770–780.

Pennycook, G., & Rand, D. G. (2019a). Fighting misinformation on social media using crowdsourced judgments of news source quality. *Proceedings of the National Academy of Sciences*, *116*(7), 2521–2526. https://doi.org/10.1073/pnas.1806781116

Pennycook, G., & Rand, D. G. (2019b). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*, *188*, 39–50. https://doi.org/10.1016/j.cognition.2018.06.011

Pennycook, G., & Rand, D. G. (2021). The Psychology of Fake News. *Trends in Cognitive Sciences*, *25*(5), 388–402. https://doi.org/10.1016/j.tics.2021.02.007

Petty, R. E., & Cacioppo J. T. (1986). *THE ELABORATION LIKELIHOOD MODEL OF PERSUASION* (pp. 1–24). Springer.

Piaget, J. (2013). *The Moral Judgment Of The Child*. Routledge. https://doi.org/10.4324/9781315009681

Preston, S., Anderson, A., Robertson, D. J., Shephard, M. P., & Huhe, N. (2021). Detecting fake news on Facebook: The role of emotional intelligence. *PLOS ONE*, *16*(3), e0246757. https://doi.org/10.1371/journal.pone.0246757

Remington, N. A., Fabrigar, L. R., & Visser, P. S. (2000). Reexamining the circumplex model of affect. *Journal of Personality and Social Psychology*, *79*(2), 286–300. https://doi.org/10.1037/0022-3514.79.2.286

Richards, J. M., & Gross, J. J. (1999). Composure at Any Cost? The Cognitive Consequences of Emotion Suppression. *Personality and Social Psychology Bulletin*, *25*(8), 1033–1044. https://doi.org/10.1177/01461672992511010

Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, *79*(3), 410–424. https://doi.org/10.1037/0022-3514.79.3.410

Roozenbeek, J., & Van Der Linden, S. (2019). The fake news game: Actively inoculating against the risk of misinformation. *Journal of Risk Research*, *22*(5), 570–580. https://doi.org/10.1080/13669877.2018.1443491

Rosenzweig, L. R., Bago, B., Berinsky, A. J., & Rand, D. G. (2021). Happiness and surprise are associated with worse truth discernment of COVID-19 headlines among social media users in Nigeria. *Harvard Kennedy School Misinformation Review*. https://doi.org/10.37016/mr-2020-75

Russell, J. A. (1980). *A circumplex model of affect*. *39*, 1161–1178.

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, *110*(1), 145–172. https://doi.org/10.1037/0033-295X.110.1.145

Russell, J. A. (2009). Emotion, core affect, and psychological construction. *Cognition & Emotion*, *23*(7), 1259–1283. https://doi.org/10.1080/02699930902809375

Russell, J. A., & Barrett, L. F. (1999). *Core Affect, Prototypical Emotional Episodes, and Other Things Called Emotion: Dissecting the Elephant*. *76*(5), 805–819.

Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, *44*(4), 695–729. https://doi.org/10.1177/0539018405058216

Schwarz, N. (2012). Feelings-as-Information Theory. In P. Van Lange, A. Kruglanski, & E. Higgins, *Handbook of Theories of Social Psychology: Volume 1* (pp. 289–308). SAGE Publications Ltd. https://doi.org/10.4135/9781446249215.n15

Sheppes, G., & Gross, J. J. (2012). Emotion Regulation Effectiveness: What Works When. In I. Weiner (Ed.), *Handbook of Psychology, Second Edition* (1st ed.). Wiley. https://doi.org/10.1002/9781118133880.hop205018

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research*, *177*(3), 1333–1352. https://doi.org/10.1016/j.ejor.2005.04.006

Smith, E. R., & DeCoster, J. (2000). Dual-Process Models in Social and Cognitive Psychology: Conceptual Integration and Links to Underlying Memory Systems. *Personality and Social Psychology Review*, *4*(2), 108–131. https://doi.org/10.1207/S15327957PSPR0402_01

Soldat, A. S., Sinclair, R. C., & Mark, M. M. (1997). Color as an Environmental Processing Cue: External Affective Cues Can Directly Affect Processing Strategy Without Affecting Mood. *Social Cognition*, *15*(1), 55–71. https://doi.org/10.1521/soco.1997.15.1.55

Šrol, J., & De Neys, W. (2021). Predicting individual differences in conflict detection and bias susceptibility during reasoning. *Thinking & Reasoning*, *27*(1), 38–68. https://doi.org/10.1080/13546783.2019.1708793

Stanovich, K. E., & Toplak, M. E. (2023). Actively Open-Minded Thinking and Its Measurement. *Journal of Intelligence*, *11*(2), 27. https://doi.org/10.3390/jintelligence11020027

Stanovich, K. E., & West, R. F. (1997). *Reasoning Independently of Prior Belief and Individual Differences in Actively Open-Minded Thinking*.

Strudwicke, H. W., Bodner, G. E., Williamson, P., & Arnold, M. M. (2024). Open-minded and reflective thinking predicts reasoning and meta-reasoning: Evidence from a ratio-bias conflict task. *Thinking & Reasoning*, *30*(3), 419–445. https://doi.org/10.1080/13546783.2023.2259548

Tamir, M. (2009). What Do People Want to Feel and Why?: Pleasure and Utility in Emotion Regulation. *Current Directions in Psychological Science*, *18*(2), 101–105. https://doi.org/10.1111/j.1467-8721.2009.01617.x

Tamir, M. (2016). Why Do People Regulate Their Emotions? A Taxonomy of Motives in Emotion Regulation. *Personality and Social Psychology Review*, *20*(3), 199–222. https://doi.org/10.1177/1088868315586325

Tamir, M., Vishkin, A., & Gutentag, T. (2020). Emotion regulation is motivated. *Emotion*, *20*(1), 115–119. https://doi.org/10.1037/emo0000635

Torre, J. B., & Lieberman, M. D. (2018). Putting Feelings Into Words: Affect Labeling as Implicit Emotion Regulation. *Emotion Review*, *10*(2), 116–124. https://doi.org/10.1177/1754073917742706

Valdez, P., & Mehrabian, A. (1994). *Effects of Color on Emotions*. *123*(4), 394–409.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, *359*(6380), 1146–1151. https://doi.org/10.1126/science.aap9559

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, *35*(2), 151–175. https://doi.org/10.1037/0003-066X.35.2.151

Zhang, P. (2008). Technical opinionMotivational affordances: Reasons for ICT design and use. *Communications of the ACM*, *51*(11), 145–147. https://doi.org/10.1145/1400214.1400244

Zhang, P. (2013). The Affective Response Model: A Theoretical Framework of Affective Concepts and Their Relationships in the ICT Context. *MIS Quarterly*, *37*(1), 247–274. https://doi.org/10.25300/MISQ/2013/37.1.11

Zhang, P., & Sun, H. (2009). The complexity of different types of attitudes in initial and continued ICT use. *Journal of the American Society for Information Science and Technology*, *60*(10), 2048–2063. https://doi.org/10.1002/asi.21116

Zhang, W., Cowan, G., Colombo, M., Gross, J., & Hayne, H. (2021). Emotional content of the event but not mood influences false memory. *Applied Cognitive Psychology*, *35*(6), 1418–1426. https://doi.org/10.1002/acp.3872

Appendix A –Analyses

Study 1					
		Mood arousal	AOT	Performance	Share
Mood arousal	Pearson Correlation	1	-0.204**	-0.173**	0.183**
	Sig. (1-tailed)		0.002	0.006	0.004
	N	205	205	205	205
AOT	Pearson Correlation	-.204**	1	.246**	-.0.292**
	Sig. (1-tailed)	0.002		<0.001	<0.001
	N	205	205	205	205
Performance	Pearson Correlation	-0.173**	0.246**	1	-0.310**
	Sig. (1-tailed)	0.006	<0.001		<0.001
	N	205	205	205	205
Share	Pearson Correlation	0.183**	-0.292**	-0.310**	1
	Sig. (1-tailed)	0.004	<0.001	<0.001	
	N	205	205	205	205
**. Correlation is significant at the 0.01 level (1-tailed).					

Table 1. One-tailed bivariate correlations between mood arousal (independent variable), AOT (independent variable), performance (dependent variable), and share (dependent variable). Values for mood arousal and AOT are standardized.

Study 2						
Dependent variable	No Affective Cues Condition Mean (SD)	Affective Cues Condition Mean (SD)	T (df)	p	Mean difference	Cohen's d
Performance	3.45 (1.25)	3.16 (1.52)	1.97 (327)	0.049	0.30	0.21
Share	1.15 (1.50)	1.52 (1.93)	-2.02 (319)	0.044	-0.38	-0.22

Table 2a. Independent samples t-test comparing average performance and average intent to share across conditions

Study 2				
		AOT	Performance	Share
AOT	Pearson Correlation	1	0.289**	-0.372**
	Sig. (1-tailed)		<0.001	<0.001
	N	346	346	346
Performance	Pearson Correlation	0.289**	1	-0.441**
	Sig. (1-tailed)	<0.001		<0.001
	N	346	346	346
Share	Pearson Correlation	-0.372**	-0.441**	1
	Sig. (1-tailed)	<0.001	<0.001	
	N	346	346	346
**. Correlation is significant at the 0.01 level (1-tailed).				

Table 2b. One-tailed bivariate correlations between AOT (independent variable), performance (dependent variable), and share (dependent variable). Value for AOT is standardized.

Appendix B – Reliability Analyses

Mood arousal scale – Study 1			
Overall Scale Reliability (α): 0.721			
Item	**Mean (SD)**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Stimulated – Relaxed	-0.48 (2.302)	0.477	0.676
Excited – Calm	-0.75 (2.271)	0.549	0.652
Frenzied – Sluggish	-0.86 (1.730)	0.546	0.664
Jittery – Dull	-0.91 (1.767)	0.430	0.692
Wide Awake – Sleepy	1.05 (2.355)	0.335	0.723
Aroused – Unaroused	-0.89 (2.232)	0.437	0.689

Table 1 Reliability analysis of the mood arousal scale in study 1.

AOT scale – Study 1			
Overall Scale Reliability (α): 0.842			
Item	**Mean (SD)**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
1	5.95 (0.847)	0.272	0.851
2	5.74 (1.088)	0.537	0.830
3	4.54 (1.542)	0.670	0.810
4	4.54 (1.800)	0.703	0.805
5	5.53 (1.470)	0.670	0.811
6	5.26 (1.350)	0.438	0.839
7	4.12 (1.825)	0.581	0.824
8	4.87 (1.757)	0.718	0.803

Table 2 Reliability analysis of the AOT scale in study 1.

AOT scale – Study 2			
Overall Scale Reliability (α): 0.827			
Item	**Mean (SD)**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
1	5.98 (8.94)	0.165	0.843
2	5.67 (1.072)	0.495	0.815
3	4.47 (1.603)	0.640	0.793
4	4.45 (1.795)	0.712	0.781
5	5.46 (1.455)	0.677	0.789
6	5.27 (1.303)	0.384	0.826
7	4.03 (1.825)	0.588	0.803
8	4.77 (1.758)	0.694	0.784

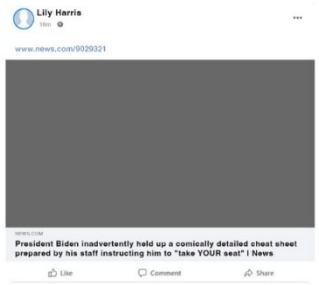
Table 3 Reliability analysis of the AOT scale in study 2.

Appendix C – Headline Posts used in study 1

True Neutral

True Liberal-leaning

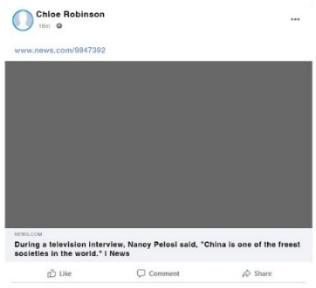
True Conservative-leaning



False Neutral

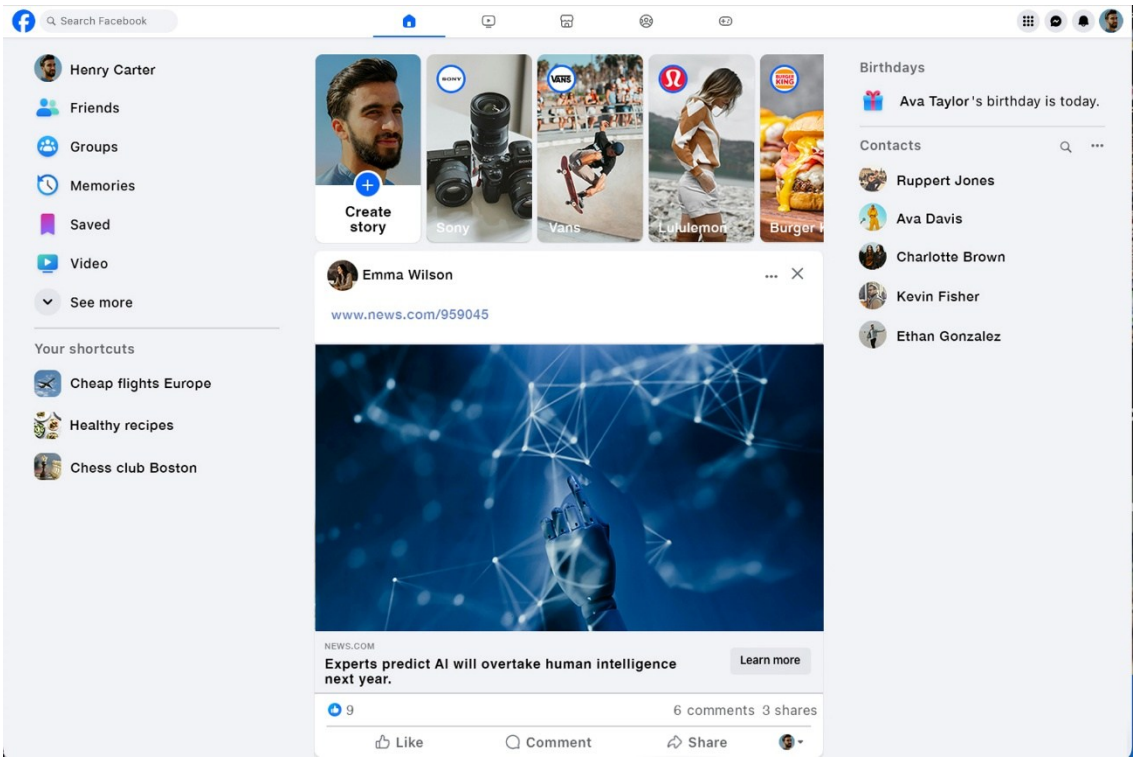
False Liberal leaning

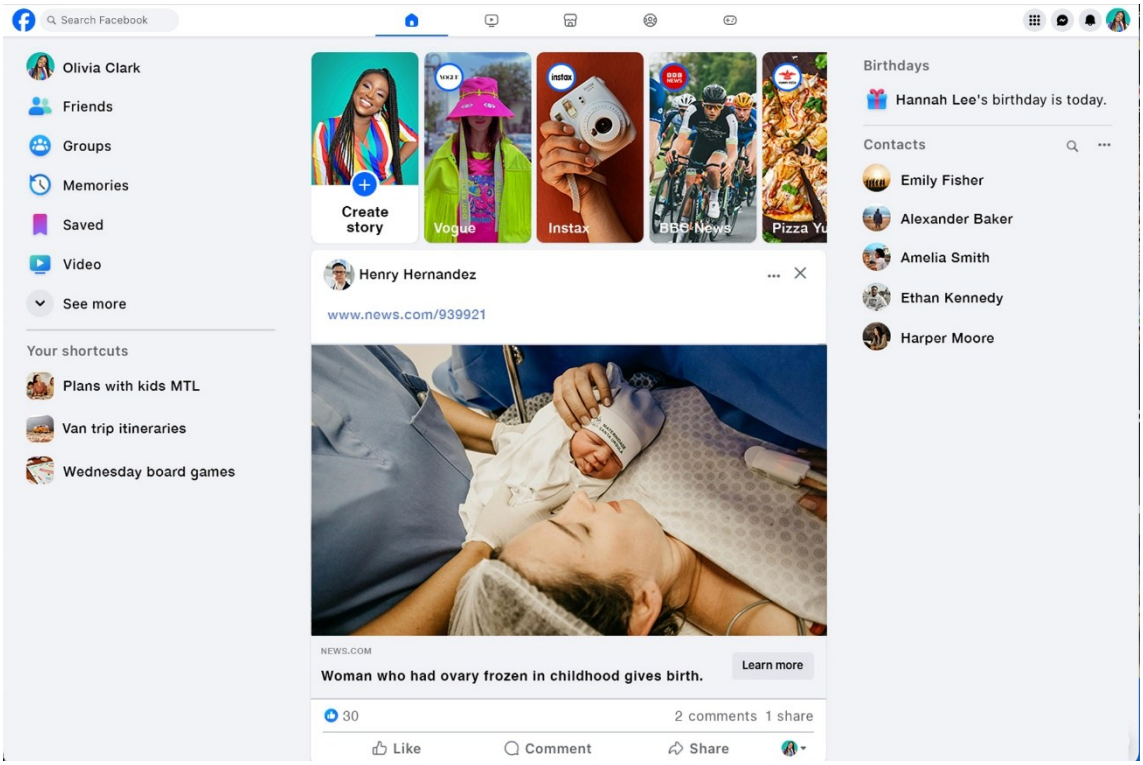
False Conservative leaning

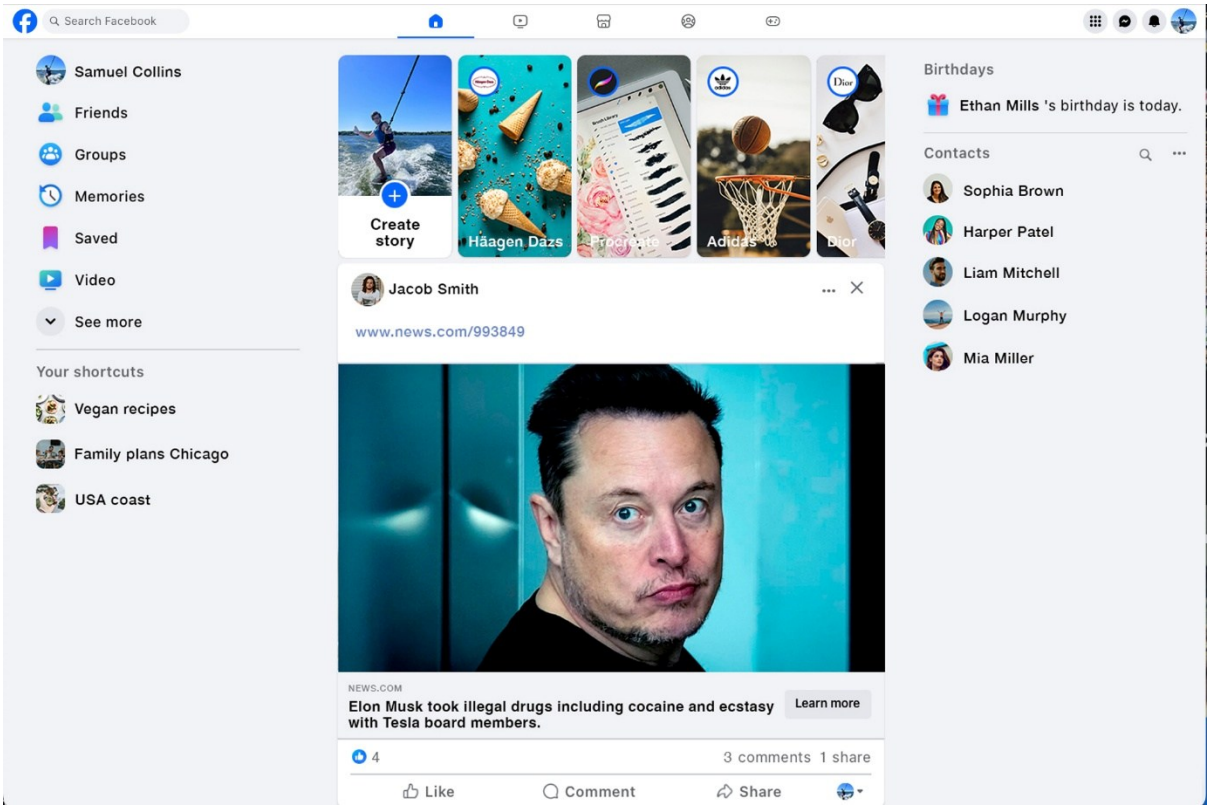


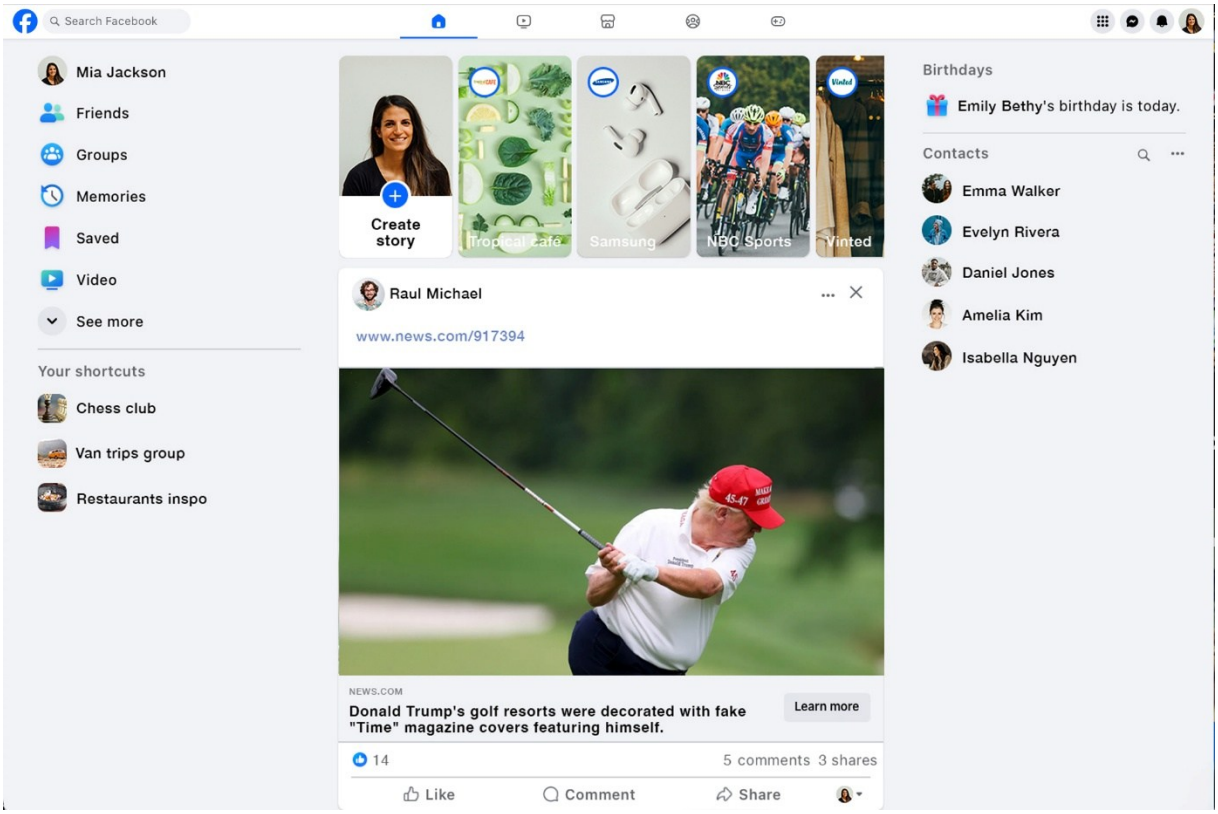
Appendix D – Headline posts used in the affective cues condition in study 2

True Headline Posts






Search Facebook
Samuel Collins
Friends
Groups
Memories
Saved
Video
See more
Your shortcuts
Vegan recipes
Family plans Chicago
USA coast
Create story
Häagen Dazs
Adidas
Dior
Jacob Smith
www.news.com/993849
NEWS.COM
Elon Musk took illegal drugs including cocaine and ecstasy with Tesla board members.
Learn more
4
3 comments 1 share
Like
Comment
Share
Birthdays
Ethan Mills 's birthday is today.
Contacts
Sophia Brown
Harper Patel
Liam Mitchell
Logan Murphy
Mia Miller


Search Facebook
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Friends
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Memories
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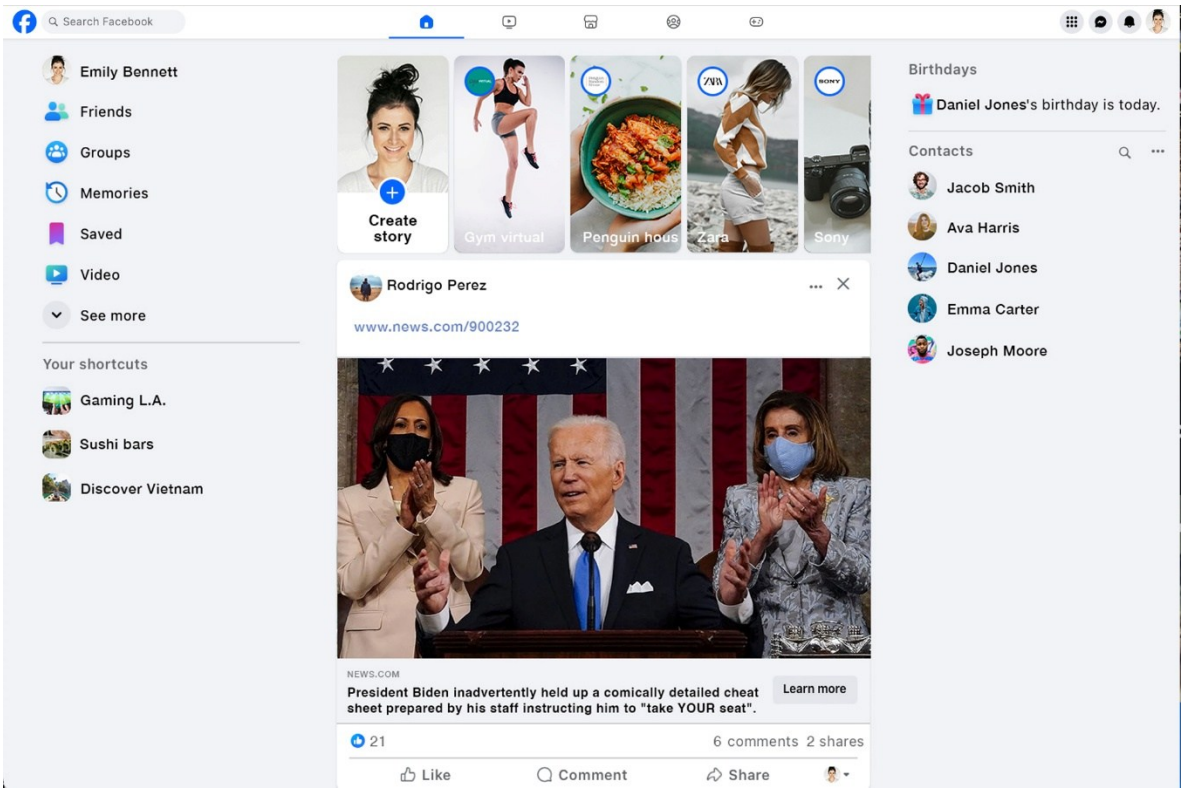
Video
See more
Your shortcuts
Chess club
Van trips group
Restaurants inspo
Create story
Tropical Cafe
Samsung
NBC Sports
Vinted
Raul Michael
www.news.com/917394
NEWS.COM
Donald Trump's golf resorts were decorated with fake "Time" magazine covers featuring himself.
Learn more
14
5 comments 3 shares
Like
Comment
Share
Birthdays
Emily Bethy's birthday is today.
Contacts
Emma Walker
Evelyn Rivera
Daniel Jones
Amelia Kim
Isabella Nguyen


Search Facebook
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See more
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Sushi bars
Discover Vietnam
Create story
Gym virtual
Penguin hous
Zara
Sony
Rodrigo Perez
www.news.com/900232
NEWS.COM
President Biden inadvertently held up a comically detailed cheat sheet prepared by his staff instructing him to "take YOUR seat".
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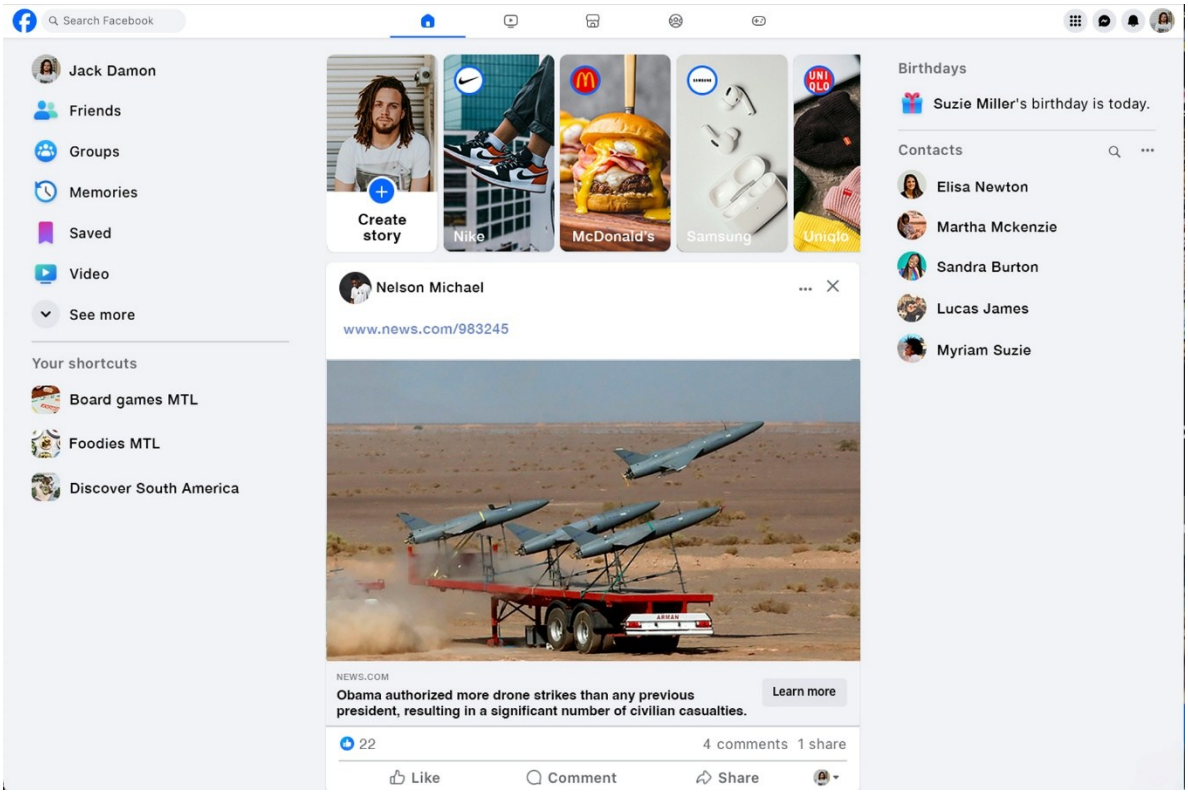
21
6 comments 2 shares
Like
Comment
Share
Birthdays
Daniel Jones's birthday is today.
Contacts
Jacob Smith
Ava Harris
Daniel Jones
Emma Carter
Joseph Moore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Foodies MTL
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Create story
Nike
McDonald's
Samsung
Uniqlo
Nelson Michael
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NEWS.COM
Obama authorized more drone strikes than any previous president, resulting in a significant number of civilian casualties.
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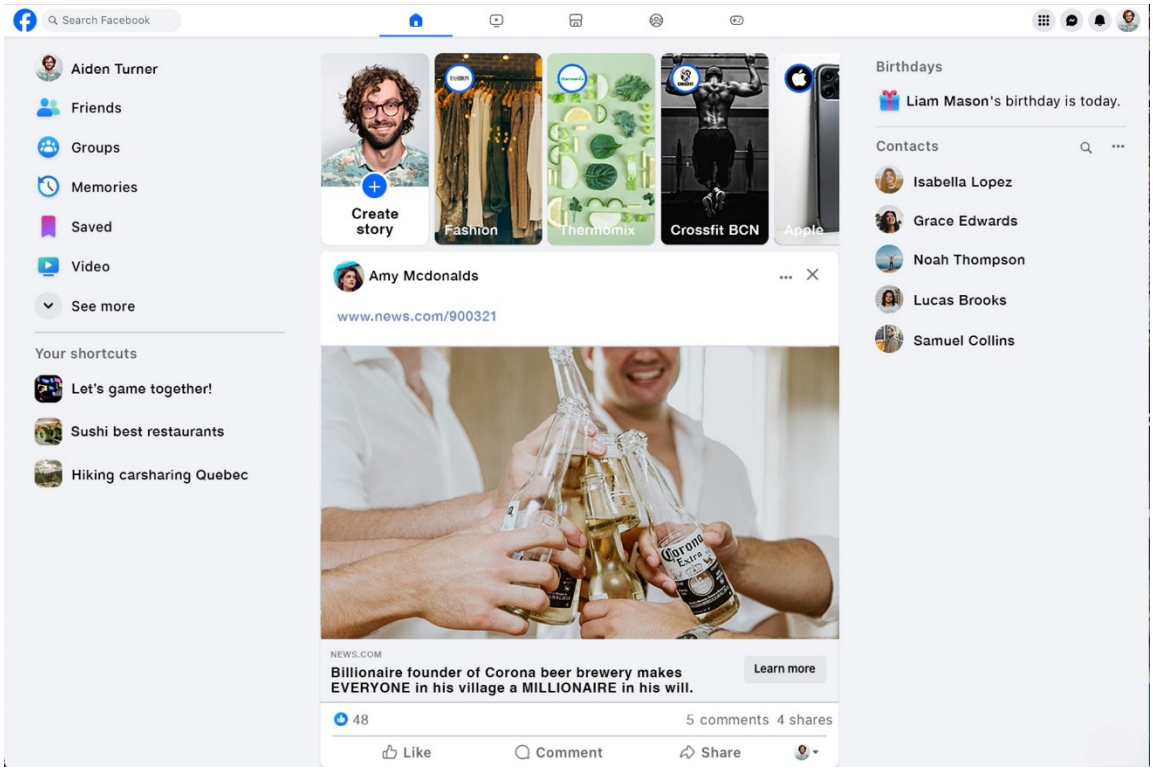
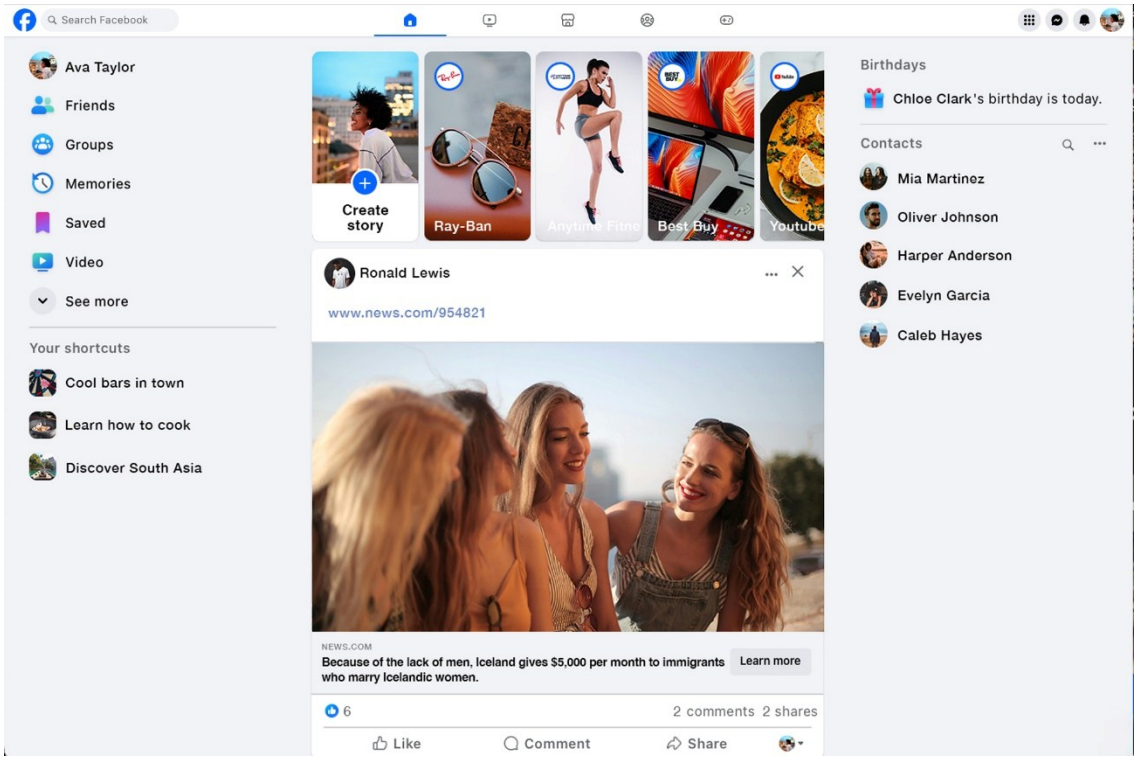
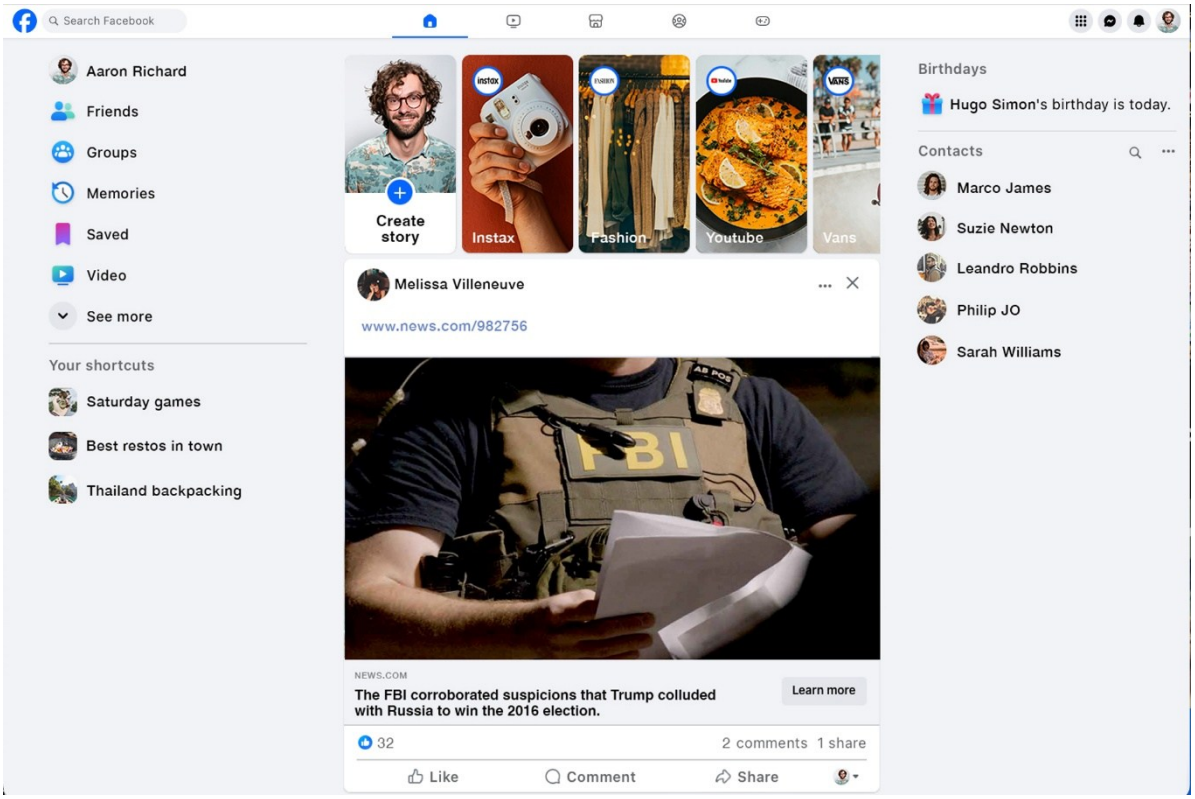
22
4 comments 1 share
Like
Comment
Share
Birthdays
Suzie Miller's birthday is today.
Contacts
Elisa Newton
Martha Mckenzie
Sandra Burton
Lucas James
Myriam Suzie

False Headline Posts



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Best restos in town
Thailand backpacking
Create story
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Fashion
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2 comments 1 share
Like
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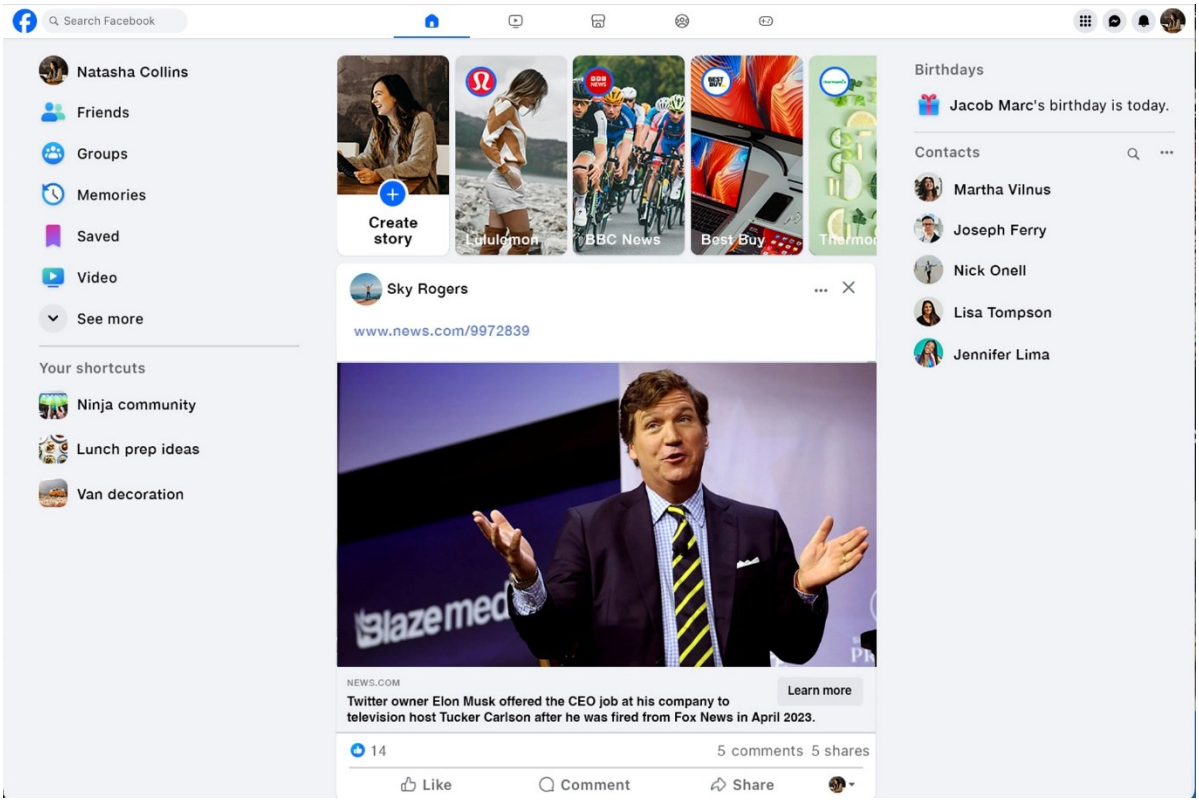
Share
Birthdays
Hugo Simon's birthday is today.
Contacts
Marco James
Suzie Newton
Leandro Robbins
Philip JO
Sarah Williams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Ninja community
Lunch prep ideas
Van decoration
Create story
Lululemon
BBC News
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www.news.com/9972839
Blazemedia
NEWS.COM
Twitter owner Elon Musk offered the CEO job at his company to television host Tucker Carlson after he was fired from Fox News in April 2023.
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Like
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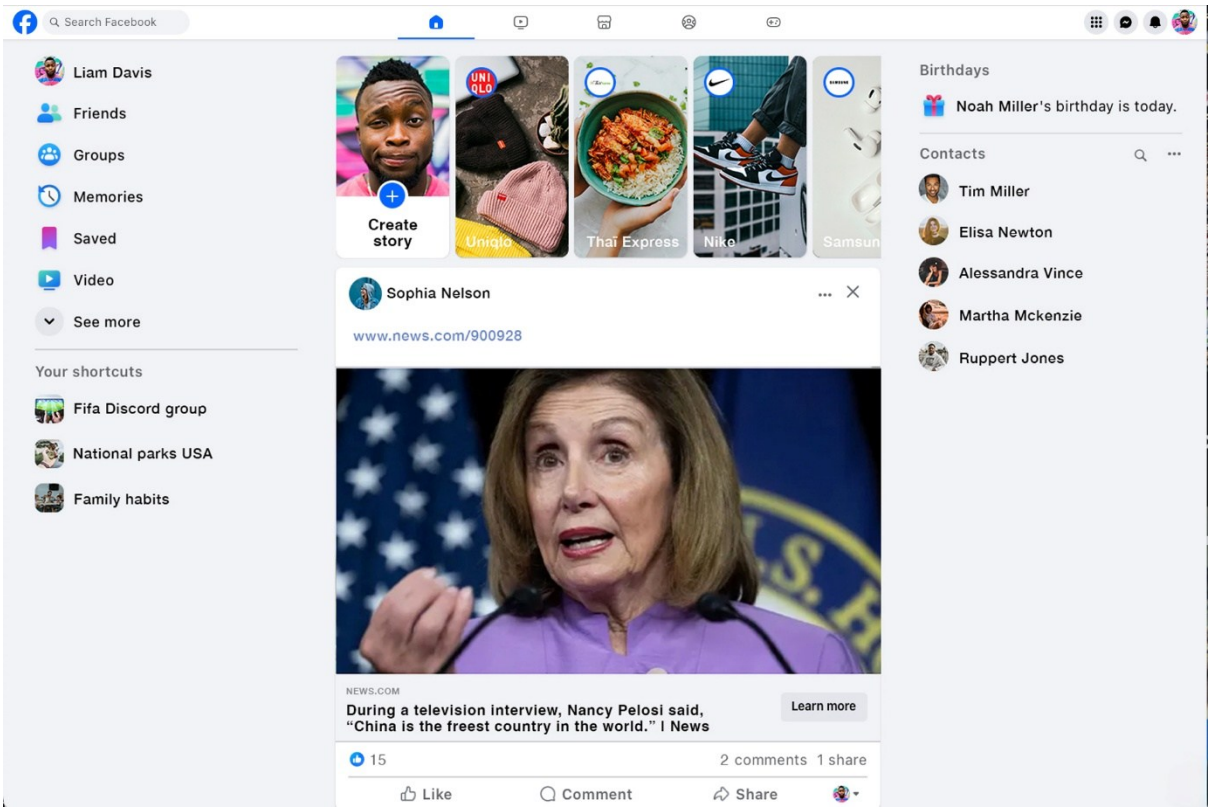
Share
Birthdays
Jacob Marc's birthday is today.
Contacts
Martha Vilnus
Joseph Ferry
Nick Onell
Lisa Tompson
Jennifer Lima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Family habits
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Thai Express
Nike
Samsun
Birthdays
Noah Miller's birthday is today.
Contacts
Tim Miller
Elisa Newton
Alessandra Vince
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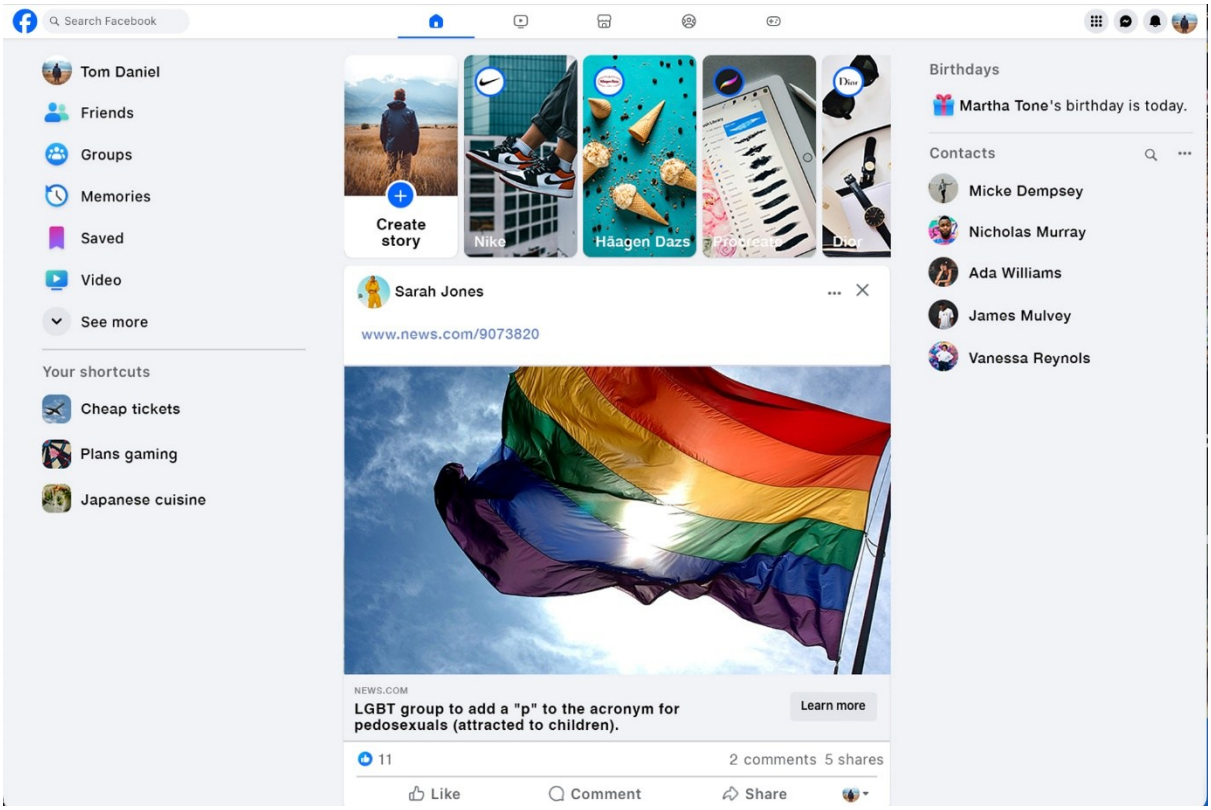
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Cheap tickets
Plans gaming
Japanese cuisine
Create story
Nike
Häagen Dazs
Birthdays
Martha Tone's birthday is today.
Contacts
Micke Dempsey
Nicholas Murray
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James Mulvey
Vanessa Reynols
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LGBT group to add a "p" to the acronym for pedosexuals (attracted to children).
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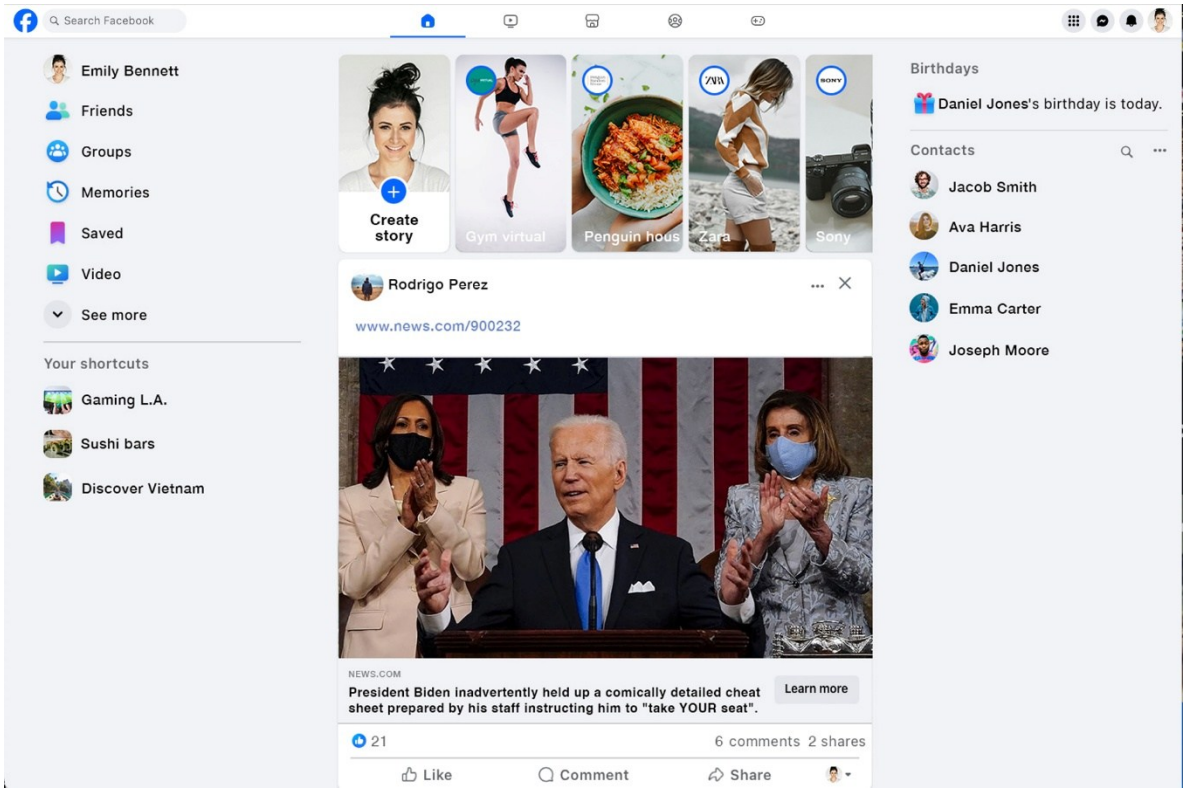
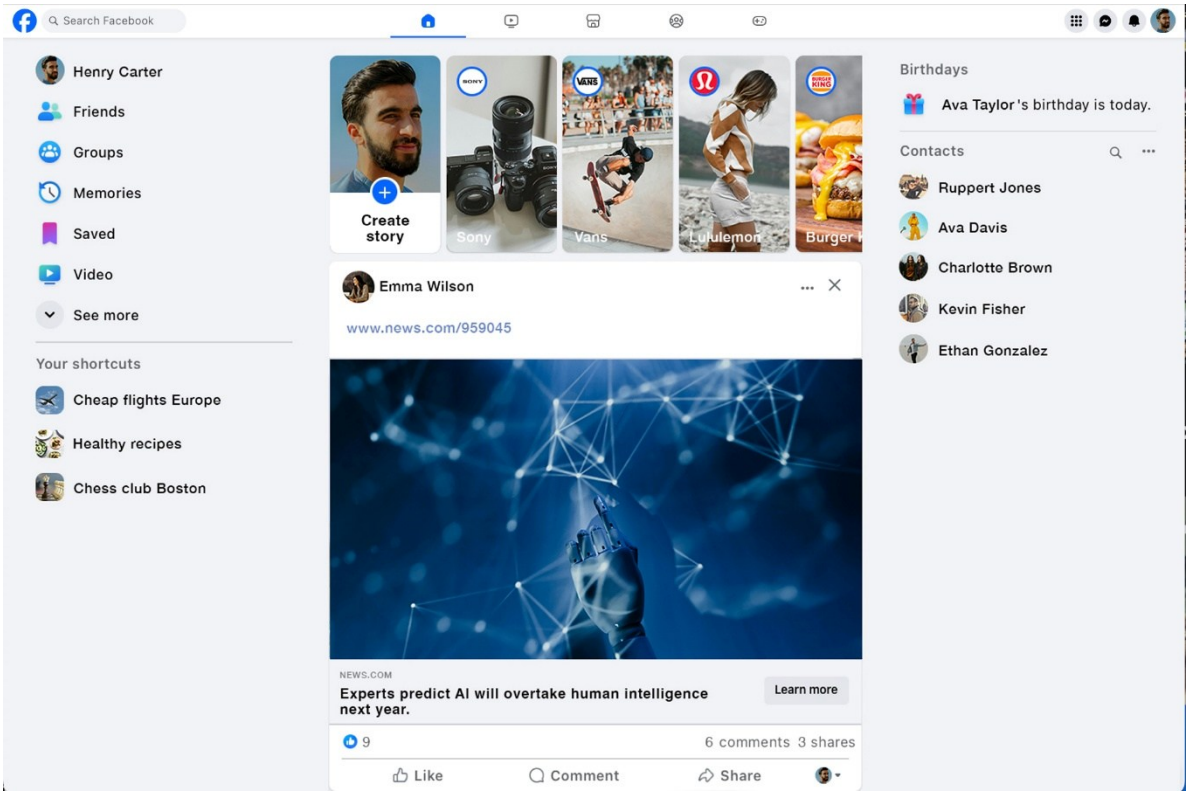
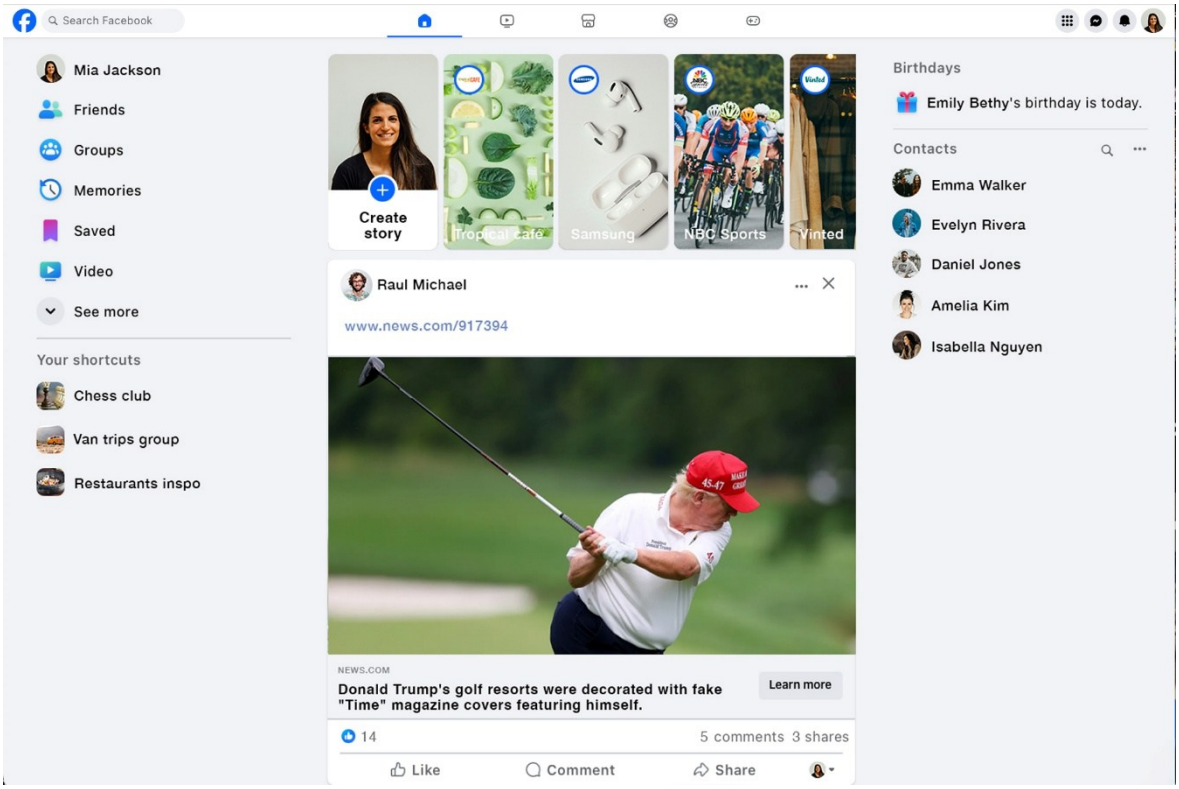
2 comments 5 shares
Like
Comment
Share

Appendix E – Headline posts used in study 3

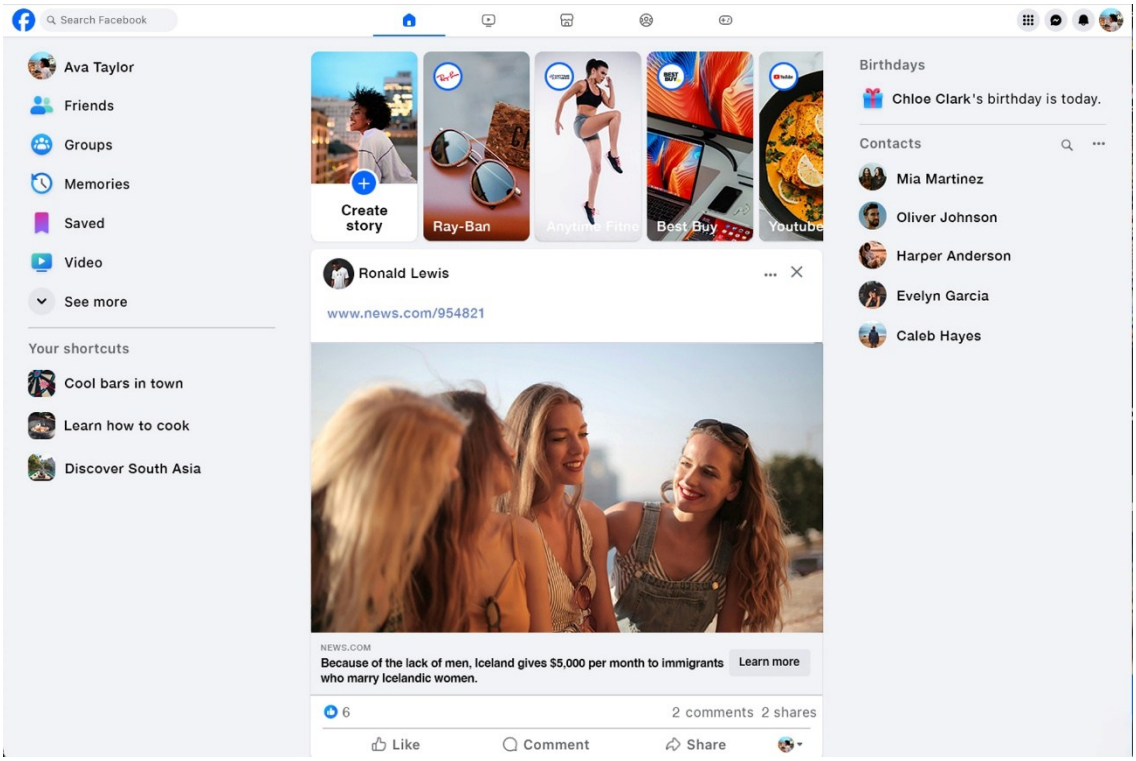
True Headline posts

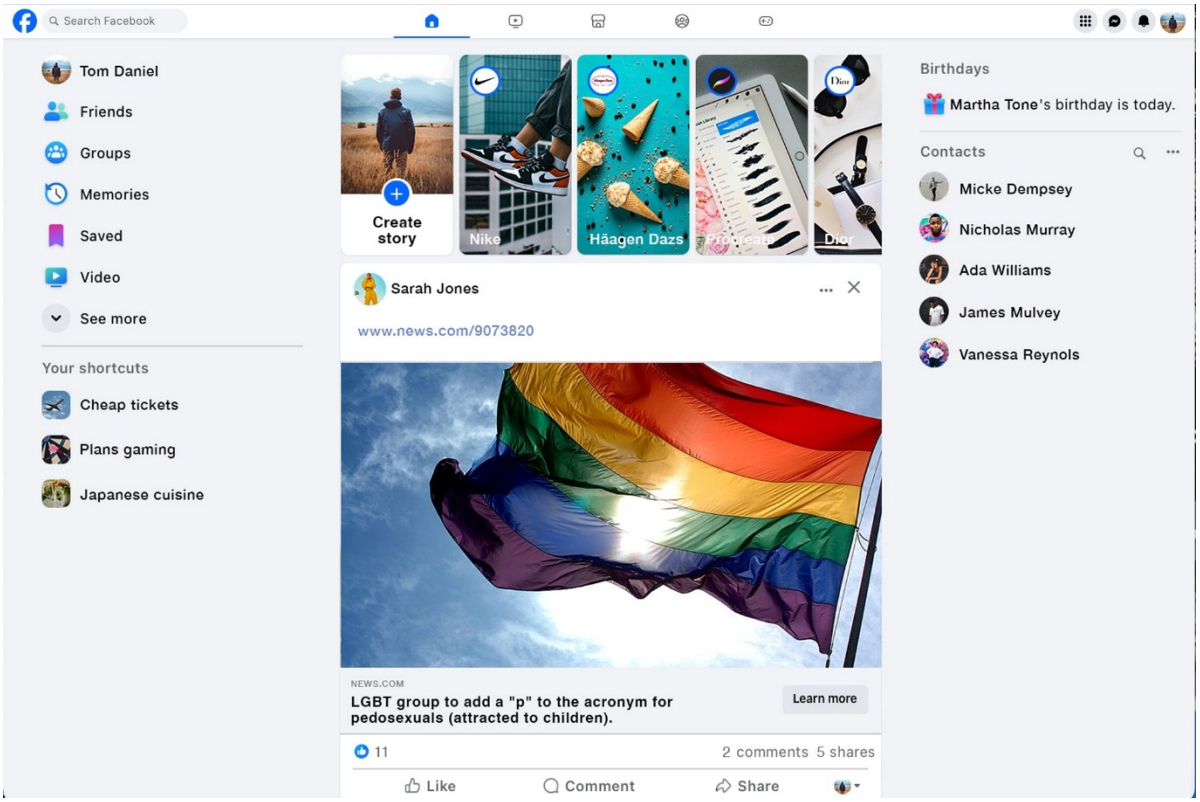






False Headline posts




Search Facebook
Tom Daniel
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See more
Your shortcuts
Cheap tickets
Plans gaming
Japanese cuisine
Create story
Nike
Häagen Dazs
Sarah Jones
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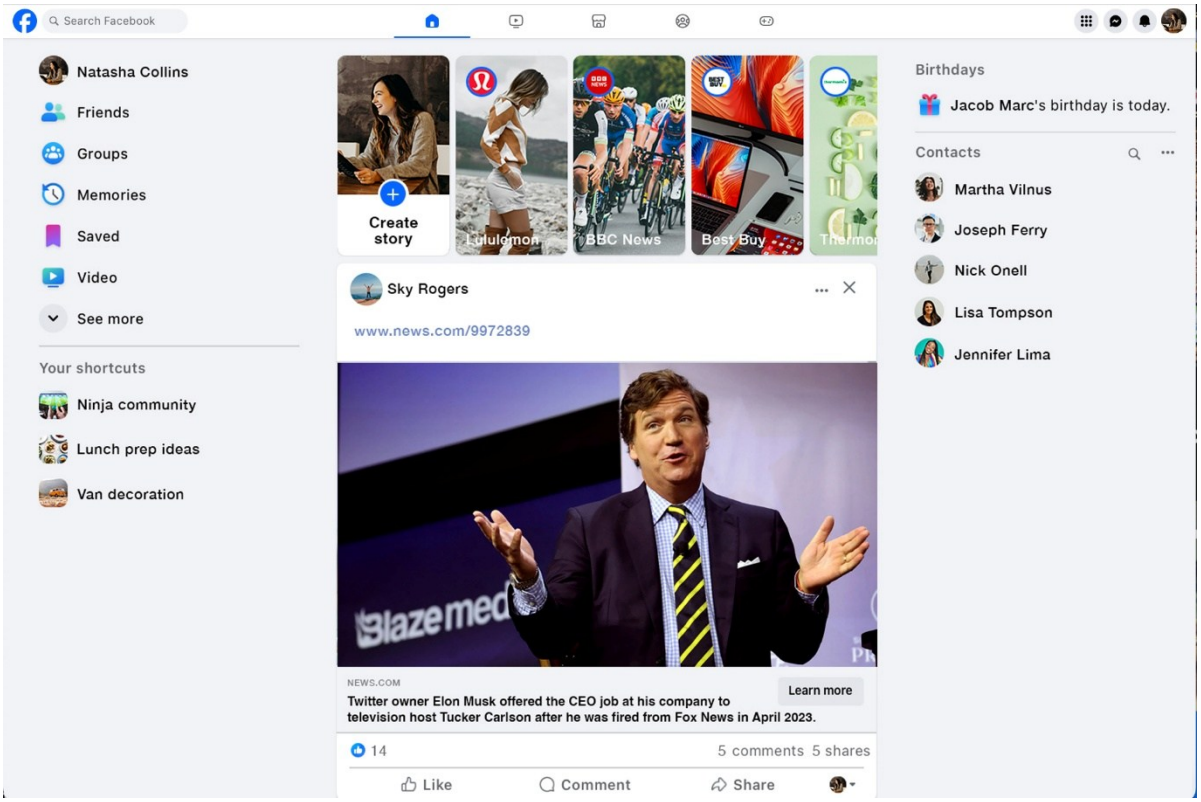
Comment
Share
Birthdays
Martha Tone's birthday is today.
Contacts
Micke Dempsey
Nicholas Murray
Ada Williams
James Mulvey
Vanessa Reynols


Search Facebook
Natasha Collins
Friends
Groups
Memories
Saved
Video
See more
Your shortcuts
Ninja community
Lunch prep ideas
Van decoration
Create story
Lululemon
BBC News
Best Buy
Sky Rogers
www.news.com/9972839
Blazemedia
NEWS.COM
Twitter owner Elon Musk offered the CEO job at his company to television host Tucker Carlson after he was fired from Fox News in April 2023.
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14
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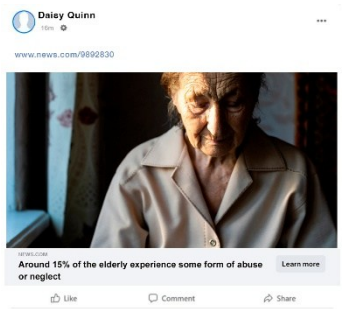
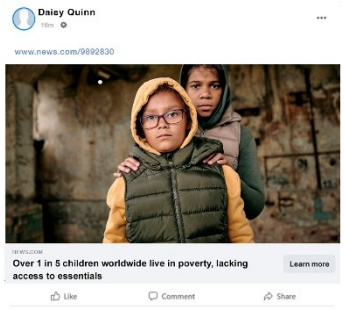
Comment
Share
Birthdays
Jacob Marc's birthday is today.
Contacts
Martha Vilnus
Joseph Ferry
Nick Onell
Lisa Tompson
Jennifer Lima

Appendix F – Sad posts used in study 3





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Chronic stress leads to feelings of overwhelming loneliness

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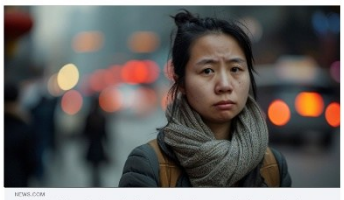

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She walks through the city for hours, feeling overwhelmed and alone

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Ethan Wilson

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NEWS.COM

Social isolation can elevate stress hormones by 50%

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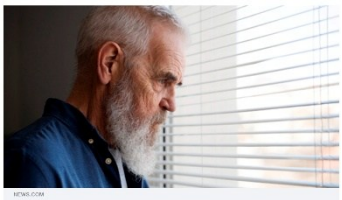
Christopher Davis

www.news.com/9839475



NEWS.COM

Late-life depression often goes undiagnosed and untreated

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On any given night, more than 150 million people worldwide experience homelessness

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Major depressive disorder affects more than 264 million people worldwide

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Melissa Hudson

www.news.com/9883920

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Individuals, facing financial constraints, often forego meals due to unaffordable groceries.

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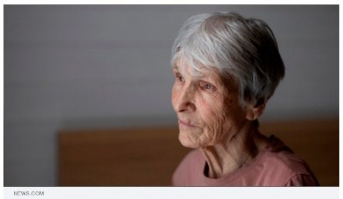
Chloe Robinson

www.news.com/9847392



NEWS.COM

Struggling with loss and declining independence, some seniors contemplate giving up on living.

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Benjamin Taylor

www.news.com/9849302

NEWS.COM

Over 10% of the global population lives in extreme poverty, surviving on less than $1.90 per day.

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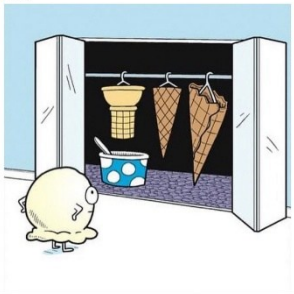
Appendix G – Funny memes used in study 3

Shay Miller 14 h



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Shay Miller 14 h

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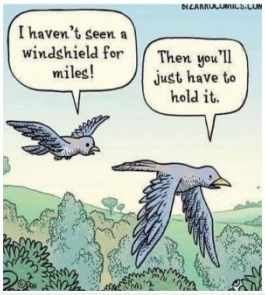

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Shay Miller 14 h

Me right after oversharing:

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me refusing to go to bed just to stay up and talk to my favorite person

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Shay Miller 14 h

My best friend listening to the advice I give her

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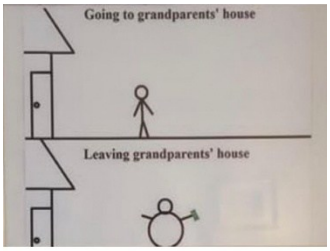
Shay Miller 14 h



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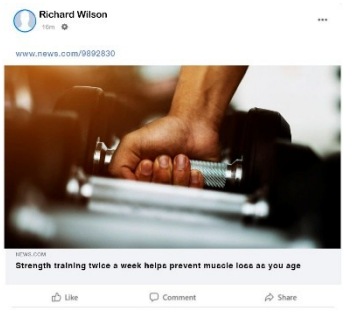
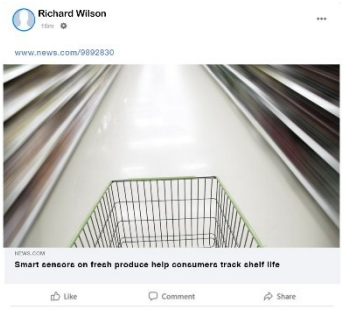
Appendix H – Neutral posts used in study 3





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Audrey Robins
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More than 2.5 billion cups of coffee are consumed worldwide each day

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Scientists design edible packaging to combat food-related waste

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Studies suggest sleep quality plays a significant role in heart health outcomes

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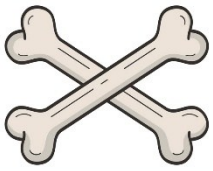

An adult human skeleton contains 206 bones

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The Eiffel Tower grows about 6 inches taller in the summer due to metal expansion

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Ostrich eggs are the largest eggs in the world

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Marie Butler
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Handwashing with soap shown to reduce the risk of diarrheal diseases by up to 40%, studies show

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Human brain contains around 86 billion neurons, researchers report

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Consuming five servings of fruits and vegetables daily is linked to a longer lifespan

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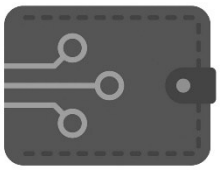

Smart wallets with GPS help users track lost or stolen items

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Bananas are the most exported fruit in the world

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Daisy Quinn
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The average person walks about 75,000 miles in their lifetime

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Appendix I – Post hoc Analysis: Pairwise Differences of Least Squares Means

Differences of Condition Least Squares Means on Performance							
Condition	Condition	Estimate	SE	p	Odds Ratio	Lower Limit	Upper limit
Sad	Happy	-0.1763	0.2797	0.5291	0.838	0.483	1.455
Sad	Neutral	0.6071	0.2541	0.0176	1.835	1.113	3.027
Happy	Neutral	0.7834	0.3008	0.0098	2.189	1.210	3.958

Table 1. Differences of the impact of condition (sad, happy, neutral) on performance (fake news discernment).

Differences of Condition Least Squares Means on Behavior							
Condition	Condition	Estimate	SE	p	Odds Ratio	Lower Limit	Upper limit
Sad	Happy	0.3903	0.3249	0.2307	1.477	0.779	2.802
Sad	Neutral	-0.2157	0.2812	0.4437	0.806	0.463	1.402
Happy	Neutral	-0.6060	0.3609	0.0944	0.546	0.268	1.111

Table 1. Differences of the impact of condition (sad, happy, neutral) on behavior (fake news sharing intent).