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Why people share misinformation on social media? An integration of affordance and flow theories

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The widespread dissemination of misinformation on social media calls for an empirical investigation of why people share such content. By integrating affordance theory and flow theory, this study examines the underlying psychological mechanisms between social media affordances and misinformation sharing. With 533 valid questionnaires, the findings demonstrate that social media affordances (information accessibility, metavoicing and association) are positively associated with cognitive involvement and affective involvement, which then exert positive effects on users' misinformation sharing. The results further reveal that emotional ability negatively moderates the relationship between affective involvement and misinformation sharing. Theoretically, our empirical findings extend prior studies by complementing the positive connotation of social media affordances and demonstrating that social media affordances can drive misinformation sharing through the mechanism of flow. Practically, the findings imply that attention should be paid to the design and management of social media to curtail misinformation sharing.

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Introduction

Misinformation has rapidly emerged on social media since the outbreak of the COVID-19 pandemic (Bermes, 2021; Chen and Fu, 2022). As social media have been increasingly embraced as an effective avenue for obtaining pandemic-related information, the problem of misinformation has exponentially grown on these platforms (Moravec et al. 2022). For example, Facebook has reportedly processed about 40,000 pieces of misinformation every day since the start of the pandemic (Gilmore, 2021). Owing to the widespread dissemination of misinformation and its potentially damaging effects, measures have been taken to check misinformation (Islam et al. 2020; Moravec et al. 2022). However, fact-checking lags behind the diffusion of misinformation and requires additional resources, which limits its effectiveness in curbing misinformation. Given the pervasiveness of misinformation on social media, it is pressing to understand what entices users to share misinformation on social media.

Previous research largely regards misinformation sharing as a consequence of social media usage motivation (e.g., Apuke and Omar, 2021; Islam et al. 2020), information attributes (e.g., Zhou et al. 2021), social contexts (e.g., Kim and Dennis, 2019) or technical contexts (e.g., Bermes, 2021; Talwar et al. 2019). Although studies have confirmed that social media may amplify the issue of misinformation (Apuke and Omar, 2021; Kim and Dennis, 2019; Moravec et al. 2019), most existing studies regard social media as the background rather than the focal artifact of investigation, failing to fully profile the features of social media that contribute to misinformation sharing. By considering the role of social media in shaping users' behavior, this study seeks to understand the role of social media in engendering misinformation sharing.

The affordance lens of social media concerns what individuals can do by virtue of social media features (Lin and Kishore, 2021). As behavior on social media hinges on its features and how users act on these features, the perspective of affordance is appropriate for understanding users' misinformation sharing. Social media affordances have contradictory effects, and both positive and negative consequences can be activated (Majchrzak et al. 2013). Prior studies have emphasized desirable outcomes of social media affordances (Lin and Kishore 2021; Sun et al. 2020), ignoring unintended outcomes. To fill this gap, this study regards misinformation sharing as an undesirable outcome of social media affordances and proposes the first research question: *how do social media affordances influence users' misinformation sharing?*

Although the notion of affordance is useful in explaining misinformation sharing, utilizing this lens alone may ignore the role of individuals' complex psychological experiences. Social media enable people to access information and engage in interpersonal relationships based on their needs and interests, which fosters the experience of flow (Kwak et al. 2014). Flow refers to a state in which an individual is so involved in an activity that other unrelated tasks are neglected (Csikszentmihalyi, 1990). Previous research has confirmed the importance of flow experience in driving users' behavior on social media (Hyun et al. 2022). It has also been argued that the features of specific technologies may influence the likelihood of a flow experience (Finneran and Zhang, 2003). Specifically, some research has employed technology affordance theory to examine how technological factors affect users' flow experience (Shao et al. 2020; Zhao and Wagner, 2023). It is thus reasonable to expect that social media affordances can engender a flow experience, which further impacts users' behavioral outcomes. Therefore, this study holds that flow experience provides an appropriate lens to understand how social media affordances relate to misinformation sharing.

Flow experience can be conceptualized as a psychological state in which individuals engage in an activity with complete involvement (Hyun et al. 2022). Previous research has identified enjoyment and concentration as the two most salient dimensions of flow experience (Ghani et al. 1991), which manifest as a dual-state phenomenon encompassing both cognitive and affective components. However, many existing studies attribute great importance to the underlying cognitive mechanisms in spurring misinformation sharing (Gimpel et al. 2021), while the role of affective mechanisms has largely been overlooked. In fact, many people use social media for hedonic purposes (Moravec et al. 2022). Previous studies have emphasized the importance of affective states in individuals' online information diffusion (Stieglitz and Dang-Xuan, 2013). Recent research on misinformation has also found that emotion plays a critical role in invoking misinformation sharing (Zeng and Zhu, 2019). However, an empirical investigation regarding the affective mechanism underlying the link between social media use and misinformation sharing is lacking. Given that flow is characterized by individuals' complete involvement (Hyun et al. 2022) and encompasses both cognitive and affective dimensions (Ghani et al. 1991), this study conceptualizes flow experience as comprising both cognitive involvement and affective involvement rather than treating it as a one-dimensional concept. This study then proposes the second research question: *how do cognitive and affective involvement, as underlying psychological mechanisms, link social media affordances and users' misinformation sharing?*

Although the relationship between flow experience and individuals' behaviors has been discussed in prior studies, the factors that moderate this relationship have not been well investigated. Users in flow states are more likely to bypass information evaluation, leading to information sharing without verification (Serenko and Turel, 2019). Taking moderators into consideration can help develop effective interventions to curb the dissemination of misinformation. Individuals' information behavior is formed based on their information processing (Pennycook and Rand, 2019). As social media users tend to consume information without thinking critically (Kim and Dennis, 2019), their inherent cognitive ability plays an important role in determining their behavior (Ahmed, 2021). We assume that individuals' cognitive ability can moderate the relationship between flow experience and misinformation sharing. In addition, as a great deal of emotional information is involved in social media, a greater ability to regulate emotion results in less reliance on emotional cues in making decisions (Hasford et al. 2018). The existing literature suggests that cognitive bias and emotional arousal are strong predictors of misinformation sharing (Moravec et al. 2019; Zeng and Zhu, 2019), which indicates that both cognitive and affective mechanisms are involved in the processing of misinformation sharing. Hence, this study examines the moderation effects of cognitive ability and emotional ability. As involvements reflect users' experience after receiving information from social media (Li et al. 2017), cognitive and emotional ability would work after the formation of involvements. Therefore, we propose the third research question: *how do cognitive ability and emotional ability moderate the effects of involvement on users' misinformation sharing?*

This study builds a research model of misinformation sharing by unveiling the psychological mechanisms underlying the relationships between social media affordances and misinformation sharing and exploring the potential boundary conditions based on affordance theory and flow theory. An online survey with 533 valid responses was conducted to test the research model. In theory, this study complements the existing literature by providing a comprehensive view of the effects of social media on

users' misinformation sharing and exploring the boundary conditions. In practice, the results provide actionable guidelines on how to curtail the misinformation sharing on social media.

Theoretical background

Affordance theory. The concept of affordance originally describes an individual's action possibility in a specific environment (Gibson, 1986). Hutchby (2001) later introduced technology affordance to illustrate the relationship between users and technologies, developing an understanding of what users can do with technologies. With affordance as a focal concept, researchers have evaluated how social media shape social action by considering both the features of social media and users' subjective perceptions (Lin and Kishore, 2021; Majchrzak et al. 2013). Social media affordances capture different perceptions and use patterns related to social media by integrating social media features with users' goals, thereby providing an integrated lens to understand users' action possibilities (Majchrzak et al. 2013).

Various types of social media affordances have been identified. Some studies have identified general social media affordances. For instance, Majchrzak et al. (2013) proposed four social media affordances for online knowledge sharing: triggered attending, metavoicing, network-informed association, and generative role-taking. In an organizational context, Treem and Leonardi (2013) identified association, visibility, editability, and persistence as social media affordances. In the online healthcare context, Lin and Kishore (2021) identified affordances for social learning, community co-creation, and social relationships. In addition, some studies have examined the affordances of specific social media applications, such as Wikipedia (Mesgari and Faraj, 2012) and virtual worlds (Goel et al. 2011). This study considers general social media features as the basis for proposing the affordances of social media. The rationale is that individuals may engage with various social media platforms to acquire and share information. Focusing on general social media affordances can provide an exhaustive description of the action possibilities of social media (Lin and Kishore, 2021), based on which a comprehensive understanding of the effects of social media in driving misinformation sharing can be developed. Given that misinformation sharing in social media is concerned with information availability, opinion expression and relationship development, this study refers to prior studies to identify three social media affordances, namely information accessibility, metavoicing, and association (see Appendix A for details).

Information accessibility, metavoicing, and association are different from each other in terms of relied social media features and effects on users' behavior. Information accessibility describes the type and amount of information that is accessible to individuals (Hsu and Liao, 2014). By emphasizing the availability of information, information accessibility sets the stage for information sharing (Hsu and Liao, 2014). The increased information accessibility enabled by social media may exacerbate the difficulty of information evaluation (Hsu and Liao, 2014), which may lead to misinformation dissemination. Metavoicing describes the possibility that users can not only post original content but also expand upon others' content on social media (Lin and Kishore, 2021). Metavoicing fosters free opinion expression and productive information dissemination (Majchrzak et al. 2013). As social media platforms lack strict content review mechanisms, metavoicing may result in the sharing of misinformation (Majchrzak et al. 2013). Association refers to the possibilities of establishing connections between social media users or between users and content (Sun et al. 2020; Treem and Leonardi, 2013). Association allows information to traverse across the relational and content network (Sun et al. 2020), which provides opportunities for misinformation sharing.

Flow theory. Flow theory has been used in various contexts to explain individuals' cognition and behaviors, such as online shopping (Hyun et al. 2022; Tuncer, 2021), online gaming (Chang, 2013) and social media usage (Lin et al. 2020). The concept of flow provides a perspective to understand users' psychological experience when interacting with communication technologies. Past research has examined flow from three aspects, namely flow antecedents, flow experience and flow consequences.

Flow experience is the core of flow theory, and many researchers have employed this notion to describe individuals' psychological states during an activity. When experiencing flow, people concentrate on a specific activity, lose self-consciousness and narrow their awareness to a single activity without paying attention to other tasks (Tuncer, 2021). In social media, users who experience an ongoing state of flow are totally involved in social media activities, both cognitively and affectively. On the one hand, flow characterizes an individual's perception of an activity and reflects his or her cognitive absorption (Hyun et al. 2022). On the other hand, flow is related to users' emotions, reflecting an enjoyable and pleasurable experience in interaction with social media (Lin et al. 2020). In this study, flow experience is understood as a multi-dimensional concept and is conceptualized as both cognitive involvement and affective involvement. Cognitive involvement represents a cognitive state in which individuals devote cognitive effort to process information on social media, and affective involvement reflects an individuals' emotions felt toward social media usage (Craig and Choi, 2024). According to Krosnick et al. (1993), affective involvement is an independent concept that is not interchangeable with cognitive involvement. Craig and Choi (2024) further hold that affective involvement occurs independently of cognitive involvement. Therefore, to keep the parsimony of our research model and follow previous literature, this study examines the independent effects of cognitive involvement and affective involvement on misinformation sharing.

With regard to flow antecedents, researchers have explored how task features (Kwak et al. 2014), technology attributes (Tuncer, 2021) and interaction with technologies (Chang, 2013; Kim, 2022) predict flow experience. By providing a platform for interaction and collaboration, social media foster absorption and immersion, which lay the foundation for the generation of flow experience (Kim, 2022; Lin et al. 2020). To date, little attention has been dedicated to examining how social media affordances lead to the state of flow, which invites further exploration. Thus, this study identifies social media affordances as flow antecedents.

In terms of flow consequences, previous research has examined how flow affects social media users' continuous usage (Chang, 2013), discontinuous intention (Lin et al. 2020), social media use (Kim, 2022), and self-disclosure (Kwak et al. 2014). A flow experience is so enjoyable and pleasurable that other tasks or stimuli may be overlooked (Csikszentmihalyi, 1990). Applied to the case of social media, users in a flow experience tend to bypass assessment and perceptions of social media information and create mental shortcuts, which results in behavioral decisions without deliberation (Lin et al. 2020; Serenko and Turel, 2019). Therefore, it is reasonable to expect that flow experience can increase the probability of misinformation sharing. This study thus chooses misinformation sharing as the consequence of the flow.

Research model and hypotheses development

This study builds on the flow theory to develop a research model to illustrate how social media affordances (flow antecedents) relate to users' cognitive and affective involvement (flow experience), thereby leading to misinformation sharing (flow

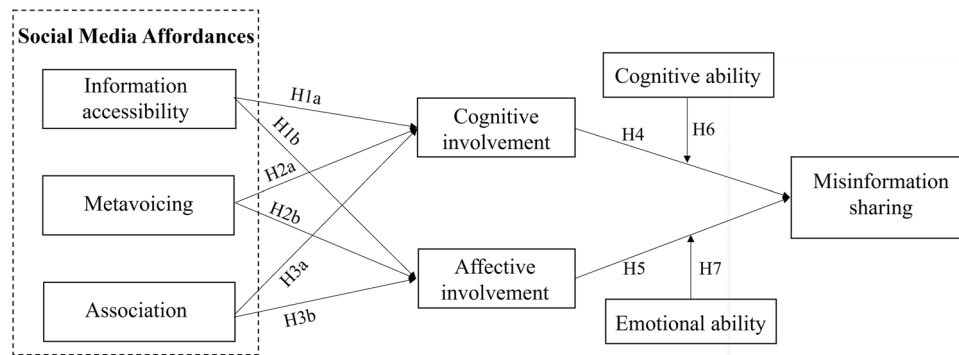


Fig. 1 Research model: impacts of social media affordances on misinformation sharing.

consequence). Cognitive involvement and affective involvement represent two distinct information processing pathways, with the former involving rational analysis and the latter involving emotional reactions. Cognitive ability influences the effectiveness of rational analysis, while emotional ability influences the effectiveness of emotional information management. Therefore, cognitive ability is hypothesized to moderate the effect of cognitive involvement, and emotional ability is assumed to moderate the effect of affective involvement separately. The research model is presented in Fig. 1.

Effects of social media affordances. The information accessibility affordance enables social media users to access information beyond the constraints of time and space (Hsu and Liao, 2014). Social media not only allow users to obtain information in a loose social network, but also enable them to access others' disclosed information (Zhang et al. 2019), which can lead to involvement. Beyond the convenience of information acquisition, social media also provide personalized information services based on users' historical data and personal interests (Liao et al. 2021), which increases the possibility that users will find online information to be relevant and interesting. Hence, information accessibility is positively related to users' involvement.

As social media use may be driven by instrumental purpose as well as hedonic purpose, users can experience both cognitive involvement and affective involvement (Li et al. 2017). From the cognitive perspective, information accessibility enables people to pay attention to and spend time on processing information that they find relevant and important, which promotes cognitive involvement. From the affective perspective, there is a great deal of sensationalistic information on social media. The emotional elements involved in posts are believed to be contagious (Stieglitz and Dang-Xuan, 2013), which drives affective involvement.

H1a: Information accessibility is positively related to users' cognitive involvement.

H1b: Information accessibility is positively related to users' affective involvement.

With the metavoicing affordance, social media users are able to voice their own opinions and react to others' points of view (Majchrzak et al. 2013). On the one hand, metavoicing provides the opportunity for people to present themselves (Jiménez-Barreto et al. 2022). When voicing their viewpoints, users are likely to get involved in specific information as it can reflect their self-images. On the other hand, by affording people to react to others' opinions, social media create an atmosphere of information conversation (Majchrzak et al. 2013). Such conversation enables people to co-create online information, which requires the devotion of effort and time. Hence, metavoicing can reinforce users' cognitive involvement.

The effects of metavoicing on affective involvement can be understood by considering the level of users' participation (Wu et al. 2015). As proposed by Madupu and Cooley (2010), there are two types of participators, namely non-interactive and interactive. In social media, non-interactive participators are lurkers who merely browse messages and are not highly involved (Madupu and Cooley, 2010). Meanwhile, interactive participators are those who actively engage in activities such as information posting and response giving (Wu et al. 2015). By providing opportunities for people to engage in information co-production, metavoicing allows people to become interactive participators, who devote both cognition and affection. Therefore, we predict a positive relationship between metavoicing and affective involvement.

H2a: Metavoicing is positively related to users' cognitive involvement.

H2b: Metavoicing is positively related to users' affective involvement.

The association affordance allows people to build connections with other users and content (Treem and Leonardi, 2013). In terms of the connection with content, people usually dedicate attention to topics of interest (Preece et al. 2004), which guarantees cognitive input. With regard to interpersonal connection, social media enable people to build social capital and maintain social ties beyond temporal and spatial boundaries (Ellison et al. 2015). Such interpersonal connections provide opportunities for people to exchange information with others in a social network, which fosters cognitive involvement. Therefore, there exists a positive relationship between association and cognitive involvement.

Additionally, by virtue of association, social media users can build a social network where people can connect with those who share similar interests and feelings, as well as connect with the content of interest (Sun et al. 2020). As people are usually attracted to like-minded others (Huang et al. 2013), the social network thus creates an atmosphere for individuals to engage in continuous communication and encourages emotional absorption, which further promotes affective involvement. In addition, engaging with content of interest can evoke a sense of enjoyment, thereby fostering users' affective involvement (Xu et al. 2025). Thereafter, we hypothesize that:

H3a: Association is positively related to users' cognitive involvement.

H3b: Association is positively related to users' affective involvement.

Effects of involvement. A high level of cognitive involvement indicates that a user finds the information to be relevant and useful (Li et al. 2017), which sets the stage for further information sharing. Nevertheless, due to the variety and fragmentation of online information, it is difficult for people to distinguish

misinformation from accurate information, which increases the risk of misinformation sharing. As members of social networks, people often engage in altruistic behavior by sharing information to keep others informed (Apuke and Omar, 2021). They spread information for the purpose of social exchange rather than information persuasion, and thus attach greater importance to information currency than truthfulness. Once a user deems a piece of information to be relevant, he or she may find it necessary to spread it without thorough deliberation (Nekmat and Ismail, 2019). Therefore, users who have high cognitive involvement are likely to share misinformation.

H4: Users' cognitive involvement is positively related to their misinformation sharing.

People are inherently motivated to share their emotions with others (Zeng and Zhu, 2019). Users' affective states are critical predictors of their behavior (Stieglitz and Dang-Xuan, 2013). Thus, many people use social media as an outlet for emotions, and social media content usually conveys the affective state of the sender (Stieglitz and Dang-Xuan, 2013; Zeng and Zhu, 2019). Therefore, people are likely to share information once they are effectively involved. In addition, as people mainly use social media for hedonic purposes, they may exert little effort to contemplate information (Moravec et al. 2022). In the meantime, misinformation is regarded to be a prominent phenomenon on social media (Bermes, 2021; Chen and Fu, 2022). In this situation, when users experience affective involvement, they are likely to share information without deliberation, which may lead to misinformation sharing.

H5: Users' affective involvement is positively related to their misinformation sharing.

Effects of moderators. Cognitive ability captures an individual's capability to process information (Wang et al. 2022). It is generally recognized that cognitive ability can enhance efficient information processing (Wang et al. 2022) and result in desirable decision-making (Gonzalez et al. 2005). Moreover, people with a high level of cognitive ability perform better in recognizing misinformation (Ahmed, 2021; Pennycook and Rand, 2019). Once individuals are cognitively involved in social media information, those with high cognitive ability are more likely to employ systematic cues to evaluate the information and those with low cognitive ability are more likely to depend on simple and heuristic cues to make judgment (Wang et al. 2022). This study, therefore, holds that individuals' cognitive ability negatively moderates the effect of cognitive involvement on misinformation sharing.

H6: The effect of cognitive involvement on misinformation sharing is negatively moderated by users' cognitive ability.

Emotional ability refers to a person's ability to reason about and apply emotional knowledge in a decision-making process (Hasford et al. 2018). The ability to regulate emotion allows people to be immune to emotional cues and pay attention to other information when making decisions (Kidwell and Hasford, 2014). Hence, when dealing with online information, users with higher emotional ability are less likely to rely on emotional cues to make judgments (Hasford et al. 2018). Instead, they are likely to process information in a calm state of mind. In contrast, users with low emotional ability are likely to be influenced by emotional cues and engage in impulsive information sharing (Kidwell and Hasford, 2014). As such, it is reasonable to believe that users with high emotional ability are skilled at managing their emotions and regulating their behavior even in an affectively involved context. As such, this study proposes the following hypothesis:

H7: The impact of affective involvement on misinformation sharing is negatively moderated by users' emotional ability.

Research method

Data collection and sample. This study employed an online survey to collect data. Data were collected in China owing to the large number of social media users in China and the omnipresent misinformation on social media platforms. Two assistant professors and a group of students in the fields of information management and information communication participated in the pre-tests to help refine the questionnaire for data collection. Since the instrument was translated from English, some questions in the questionnaire were modified to fit the expression requirements of Chinese in order to improve clarity and reduce ambiguity. After several rounds of revisions, 45 active social media users were invited to participate in a pilot study. The analysis of the pilot data demonstrated that our research model exhibits acceptable reliability and validity, which provided a strong justification for proceeding with formal data collection.

Announcement of the formal questionnaire was posted on Wenjuanxing (www.wjx.com), which is the largest survey platform in China. At the beginning of the questionnaire, the research context and purpose were described. We then set screening questions to check whether the participants frequently share information on social media. Participants were asked to report the social media platforms that they used most often to share information and recall the information they recently shared. In order to encourage participants to accurately report their unverified information sharing behavior, we promised to provide 10 RMB to the valid responses and ensured the anonymity of the questionnaire. Given the undesirability of misinformation sharing, anonymity is effective in encouraging honest responses and reducing social desirability bias (Burns et al. 2019). We received 551 responses in total and removed invalid responses according to several criteria. We first dropped questionnaires with consistent answers, and those failed to pass the attention-trap answers. In addition, we calculated the average time to finish the questionnaire and deleted any responses that took less than one-third of the average time because participants were unlikely to pay enough attention to the questions according to the pilot test (Lowry et al. 2019). We finally obtained 533 valid responses. The sample size indicates an adequate ration of observations to measurement items (20.5 observations for every measurement item) (Burns et al. 2019). Table 1 presents detailed information about the participants.

Instrument development. We developed the instrument based on existing studies. The instrument was first translated into Chinese and then back-translated into English. All items in the formal survey were tested in a pilot study before execution. Measures for information accessibility, metavoicing and association were adapted from Hsu and Liao (2014), Dong and Wang (2018) and Sun et al. (2020), respectively. We measured cognitive involvement and affective involvement by asking subjects to indicate their feelings about the content they recently shared on social media, leveraging measures from Li et al. (2017). The measures for cognitive ability followed Ahmad et al. (2020), and the measures for emotional ability were adapted based on Rezvani and Khosravi (2019). For misinformation sharing, most social media users do not deliberately spread misinformation, but rather, unwittingly share it. Researchers have used misinformation sharing and unverified information sharing interchangeably (Islam et al. 2020), and unverified information sharing is believed to be a major cause of misinformation diffusion (Laato et al. 2020). Notably, it has been shown that 59% articles are retweeted without being clicked on (Gabiellov et al. 2016). Hence, this study employs unverified information sharing to represent users' misinformation sharing. The items for misinformation sharing

Table 1 Sample details (n = 533).

Demographics	Count (%)	Demographics	Count (%)
Age		Information sharing frequency (per month)	
18–25	103 (19.32%)	<3 times	19 (3.57%)
26–30	199 (37.34%)	3–10 times	133 (24.95%)
31–40	196 (36.77%)	11–20 times	142 (26.64%)
41–50	30 (5.63%)	>20 times	239 (44.84%)
More than 50	5 (0.94%)	Usage experience	
Gender		<6 months	6 (1.13%)
Male	224 (42.03%)	6 months to 1 year	18 (3.38%)
Female	309 (57.97%)	1–3 years	195 (36.58%)
Education		4–6 years	197 (36.96%)
High school or below	27 (5.07%)	7 years and above	117 (21.95%)
College	473 (88.74%)		
Graduate school or above	33 (6.19%)		

were formulated based on Laato et al. (2020) and Talwar et al. (2019). All items were measured on a 7-point Likert scale. The instrument is presented in Appendix B.

In addition, we included age, gender and education as control variables because these factors were found to exert effects on individuals' information sharing behavior in prior studies (Chen et al. 2015). In addition, individuals who have a high frequency of information sharing are more likely to share misinformation (Wu et al. 2024). Hence, information sharing frequency is included as a control variable, which is measured by determining how many times the respondent shares information per month.

Data analysis and results

SmartPLS 3.2.9 based on the partial least squares (PLS) structural equation model (SEM) was utilized to conduct data analysis. PLS puts minimal requirements on sample size and can simultaneously evaluate measurement model and structural model (Reinartz et al. 2009). The measurement model and structural model were analyzed sequentially.

Measurement model analysis. To assess convergent validity, we computed composite reliability (CR), Cronbach's alpha, item loadings and average variance extracted (AVE). The results are listed in Table 2. The CR values for all constructs were higher than the recommended value of 0.70. The Cronbach's alpha values for all constructs except affective involvement were above 0.70. As put by Garson (2016), 0.60 or higher is adequate reliability for exploratory research. The AVE of all constructs exceeded the suggested value of 0.50. Furthermore, all item loadings except one for cognitive involvement were above the suggested value of 0.70. As this item loading was 0.66, which approximated 0.70, we kept it in the measurement model for the sake of content validity. Thus, the collected data were deemed to have sufficient convergent validity. The discriminant validity was assessed by comparing the inter-construct correlation coefficients with the square roots of AVE (Fornell and Larcker, 1981). Table 3 revealed that the square roots of AVE for all constructs were greater than the correlation coefficients, which indicates that our constructs discriminate against each other. Table 4 further shows that all values of the Heterotrait-Monotrait ratio of correlations (HTMT) were less than the threshold of 0.85, indicating an acceptable discriminant validity (Henseler et al. 2015). This study further assessed multicollinearity. Multicollinearity is not likely to exist if the variance inflation factor (VIF) values are lower than 3 (Yang,

2021). Our values of VIF ranged from 1.24 to 2.41, indicating the absence of multicollinearity.

Common method bias. We further assessed the common method bias (CMB). First, Harman's single-factor test confirms that no single factor can explain the majority of the variance in our data (Podsakoff et al. 2003). Second, the existence of CMB can result in high correlations between constructs. The highest correlation coefficient in our results was 0.66, which was lower than the recommended value of 0.90. Third, we added a common method factor with indicators for all the principal constructs into the PLS model and computed each indicator's variance substantively explained by the principal construct and by the method (Podsakoff et al. 2003). The results in Appendix C demonstrate that the average substantively explained variance of the indicators was 0.636, and the average method-based variance was 0.004. Hence, the explained variance of the indicators was much larger than the method variance. Furthermore, most method factor loadings were not significant. As such, CMB was not a threat in this study.

Structural model analysis. We tested the structural model by calculating the path coefficients and corresponding *p*-values. The model explained 33.00% of the variance in misinformation sharing. No effects of control variables were observed.

The results indicate that information accessibility is positively and significantly associated with cognitive involvement ($\beta = 0.197, p < 0.001$) and affective involvement ($\beta = 0.160, p < 0.01$), lending support to H1a and H1b. The results confirm H2a and H2b by revealing that metavoicing exerts positive and significant impacts on cognitive involvement ($\beta = 0.305, p < 0.001$) and affective involvement ($\beta = 0.355, p < 0.001$). H3a and H3b explore the impacts of association on cognitive involvement and affective involvement. The data analysis demonstrates that association is positively and significantly related to cognitive involvement ($\beta = 0.187, p < 0.001$) and affective involvement ($\beta = 0.136, p < 0.05$), which supports H3a and H3b. H4 and H5 deal with how cognitive involvement and affective involvement relate to individuals' misinformation sharing. The results illustrate that cognitive involvement ($\beta = 0.225, p < 0.001$) and affective involvement ($\beta = 0.345, p < 0.001$) have positive and significant relationships with misinformation sharing, lending support to H4 and H5.

Mediation effects analysis. We employed bootstrapping analysis with 5000 samples to conduct the mediation test (Hayes, 2018). The results of the mediation test are presented in Table 5. With regard to the mediation effects of cognitive involvement and affective involvement, the 95% confidence intervals (CIs) for the indirect effects of all independent variables do not include zero, and the 95% CIs for the direct effects do not include zero. Hence, both cognitive involvement and affective involvement partially mediate the relationship between social media affordances and misinformation sharing.

Moderation effects analysis. H6 examines whether cognitive ability moderates the effect of cognitive involvement on misinformation sharing, while H7 examines whether emotional ability moderates the impact of affective involvement on misinformation sharing. To test these predicted moderation effects, we created interaction terms and added them to the model. We found that the moderation effect of emotional ability is negative and significant ($\beta = -0.103, p < 0.05$). However, the results fail to validate the moderation effect of cognitive ability ($\beta = 0.079, p > 0.05$). Therefore, H6 is unsupported, and H7 is supported.

Table 2 Convergent validity.

Constructs	Items	Mean	Standard deviation	Item loading	CR	Cronbach's alpha	AVE
Information accessibility (IA)	IA1	5.43	1.20	0.86	0.89	0.82	0.73
	IA2	5.19	1.25	0.84			
	IA3	5.31	1.23	0.86			
Metavoicing (MV)	MV1	5.66	1.05	0.79	0.85	0.76	0.58
	MV2	5.58	1.12	0.78			
	MV3	5.69	1.04	0.74			
	MV4	5.66	1.10	0.73			
Association (ASS)	ASS1	5.39	1.18	0.82	0.86	0.76	0.67
	ASS2	5.55	1.10	0.81			
	ASS3	5.38	1.17	0.83			
Cognitive involvement (CI)	CI1	5.78	1.10	0.73	0.82	0.70	0.53
	CI2	5.78	1.00	0.75			
	CI3	5.89	1.01	0.76			
	CI4	6.03	0.96	0.66			
Affective involvement (AI)	AI1	6.04	0.94	0.82	0.82	0.66	0.60
	AI2	5.93	0.99	0.76			
	AI3	5.87	0.92	0.74			
Misinformation sharing (MS)	MS1	5.78	0.95	0.81	0.83	0.70	0.63
	MS2	5.70	1.07	0.79			
	MS3	5.52	1.06	0.78			
Cognitive ability (CA)	CA1	5.28	1.16	0.84	0.84	0.71	0.63
	CA2	5.12	1.29	0.78			
	CA3	5.16	1.29	0.77			
Emotional ability (EA)	EA1	5.48	1.15	0.87	0.90	0.83	0.75
	EA2	5.03	1.38	0.83			
	EA3	5.22	1.32	0.89			

Table 3 Correlation matrix.

Construct	IA	MV	ASS	CI	AI	MS	CA	EA
IA	0.85							
MV	0.46	0.76						
ASS	0.66	0.51	0.82					
CI	0.46	0.49	0.47	0.73				
AI	0.41	0.50	0.42	0.57	0.77			
MS	0.49	0.45	0.50	0.42	0.47	0.79		
CA	0.43	0.35	0.34	0.40	0.35	0.40	0.79	
EA	0.41	0.32	0.32	0.37	0.26	0.34	0.43	0.87

Notes: The diagonal figures (in bold) show the square roots of AVE.

Table 4 Heterotrait-Monotrait ratio of correlation values.

Construct	IA	MV	ASS	CI	AI	MS	CA	EA
IA								
MV	0.58							
ASS	0.83	0.67						
CI	0.56	0.67	0.65					
AI	0.56	0.70	0.60	0.83				
MS	0.64	0.61	0.68	0.59	0.69			
CA	0.56	0.47	0.45	0.56	0.50	0.55		
EA	0.45	0.41	0.40	0.47	0.34	0.43	0.56	

Post-hoc analysis. We examined the differential impacts of the three affordances on cognitive involvement and affective involvement, and the differential effects of cognitive involvement and affective involvement on misinformation sharing by referring to the test described by Cohen et al. (2003). According to the results in Table 6, metavoicing exerted higher impacts on cognitive involvement and affective involvement than information accessibility and association; affective involvement had a stronger impact on

misinformation sharing than cognitive involvement. The differential impacts were further discussed in the discussion section.

Discussion

Discussion of results. This study has several interesting findings. Firstly, the effects of metavoicing on cognitive involvement and affective involvement are found to be stronger than information accessibility and association in Table 6. Compared with information accessibility that emphasizes the availability of information and association that highlights the relational ties, metavoicing is concerned with information interaction. Metavoicing allows people to voice their opinions as well as react to others' opinions on social media (Dong and Wang, 2018). On the one hand, metavoicing can enable a large number of individuals to attend to a common event and engage in mutual discussion (Majchrzak et al. 2013), which may increase individuals' cognitive involvement in the event. On the other hand, metavoicing can reinforce ideas and values through opinion expression, which reinforces affective involvement (George and Leidner, 2019). Hence, metavoicing plays a particularly important role in engendering involvement.

Secondly, affective involvement exerts a larger effect on misinformation sharing than cognitive involvement, according to the results in Table 6, emphasizing the role of the affective mechanism in engendering misinformation sharing. The findings are consistent with the argument that many people utilize social media for hedonic purposes rather than utilitarian purposes (Moravec et al. 2019, 2022). A person could be an emotional sensor, and the emotional expressions involved in a discourse can flow from the sender to the recipients (Zeng and Zhu, 2019). The stronger the emotion experienced by social media users, the more likely their sharing of information (Stieglitz and Dang-Xuan, 2013).

Thirdly, out of our expectation, the moderation effect of cognitive ability is not significant. One possibility lies in the motivation behind social media usage. Many people engage with

Table 5 Mediation analysis.

IV	M	DV	Indirect effect	95% CI lower	95% CI upper	Direct effect	95% CI lower	95% CI upper	Mediation effect
IA	CI	MS	0.082 (0.023)	0.044	0.134	0.291 (0.032)	0.228	0.355	Partial mediation
	AI		0.102 (0.025)	0.057	0.154	0.277 (0.031)	0.217	0.337	Partial mediation
MV	CI		0.128 (0.315)	0.071	0.196	0.313 (0.043)	0.228	0.397	Partial mediation
	AI		0.160 (0.036)	0.093	0.237	0.280 (0.042)	0.197	0.363	Partial mediation
ASS	CI		0.097 (0.027)	0.048	0.152	0.327 (0.036)	0.360	0.488	Partial mediation
	AI		0.114 (0.030)	0.063	0.179	0.310 (0.034)	0.243	0.376	Partial mediation

Table 6 Comparison of path coefficients.

Path coefficient	Results	Conclusion
<i>Cognitive involvement</i>		
$\beta_{IA \rightarrow CI}$ vs. $\beta_{MV \rightarrow CI} = 0.197^{***}$ vs. 0.305^{***}	$t = -2.261^*$	$\beta_{IA \rightarrow CI} < \beta_{MV \rightarrow CI}$ (\checkmark)
$\beta_{IA \rightarrow CI}$ vs. $\beta_{ASS \rightarrow CI} = 0.197^{***}$ vs. 0.187^{***}	$i = -0.104$	$\beta_{IA \rightarrow CI} < \beta_{ASS \rightarrow CI}$ (\times)
$\beta_{MV \rightarrow CI}$ vs. $\beta_{ASS \rightarrow CI} = 0.305^{***}$ vs. 0.187^{***}	$t = 2.032^*$	$\beta_{MV \rightarrow CI} > \beta_{ASS \rightarrow CI}$ (\checkmark)
<i>Affective involvement</i>		
$\beta_{IA \rightarrow AI}$ vs. $\beta_{MV \rightarrow AI} = 0.160^{**}$ vs. 0.355^{***}	$t = -3.679^{***}$	$\beta_{IA \rightarrow AI} < \beta_{MV \rightarrow AI}$ (\checkmark)
$\beta_{IA \rightarrow AI}$ vs. $\beta_{ASS \rightarrow AI} = 0.160^{***}$ vs. 0.136^*	$t = 0.111$	$\beta_{IA \rightarrow AI} > \beta_{ASS \rightarrow AI}$ (\times)
$\beta_{MV \rightarrow AI}$ vs. $\beta_{ASS \rightarrow AI} = 0.355^{***}$ vs. 0.136^*	$t = 3.503^{***}$	$\beta_{MV \rightarrow AI} > \beta_{ASS \rightarrow AI}$ (\checkmark)
<i>Misinformation sharing</i>		
$\beta_{CI \rightarrow MS}$ vs. $\beta_{AI \rightarrow MS} = 0.255^{***}$ vs. 0.345^{***}	$t = -2.111^*$	$\beta_{CI \rightarrow MS} < \beta_{AI \rightarrow MS}$ (\checkmark)

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

social media for pleasure, and they may avoid effortful deliberation to determine whether information distributed on social media is right or wrong (Moravec et al. 2019). Due to the hedonic mindset and fragmented content, social media users' cognitive ability may not be sufficient to enable careful information filtering when users engage in a flow experience on social media.

Theoretical and practical implications. By illustrating the underlying mechanisms of misinformation sharing in the use of social media, this study develops an integrated understanding of how social media affordances relate to users' misinformation sharing.

This study offers several theoretical implications. Firstly, this study addresses a significant gap in the existing literature by demonstrating that social media affordances can not only yield positive outcomes, such as user engagement, but also lead to negative consequences, such as misinformation sharing. Although social media is often regarded as a "double-edged sword" (Cenfetelli and Schwarz, 2011), prior research has predominantly focused on its positive effects (Lin and Kishore, 2021; Sun et al. 2020), with limited attention paid to its potential negative consequences. By exploring the negative consequences of social media affordances, this study avoids privileging the desirable effects of social media over the undesirable effects in explaining users' behavior. The results of this study also call for attention to the unintended consequences that technological affordances may generate in social media. By revealing the potential negative impacts of social media affordances, this study offers a more comprehensive explanatory framework for the theory of technological affordances.

Furthermore, this study makes a complement to the research on misinformation sharing by empirically validating a new set of relationships that illustrate how social media affordances affect users' misinformation sharing. Unlike previous studies that merely treated social media as the background context (Apuke and Omar, 2021; Moravec et al. 2019), this research delves into how users perceive and utilize social media functionalities,

thereby providing a more nuanced explanatory framework for understanding the dissemination of misinformation. Specifically, this study not only confirms the critical role of social media affordances in predicting users' misinformation-sharing but also explores the differential impacts of various affordance factors. Although existing research primarily focuses on the informational and relational attributes of social media (Lin and Kishore, 2021; Zhou et al. 2021), this study finds that metavoicing plays a pivotal role in information sharing. The post-hoc analysis indicates that, compared to other affordance factors, metavoicing has a more significant impact on cognitive and emotional engagement. This finding offers new insights into the complex mechanisms of social media affordances and highlights the need for scholars to delve into the intricate role of social media in shaping users' behavior.

In addition, this study not only validates the impact of flow experience on misinformation sharing but also reveals the multidimensionality of flow experience by distinguishing between cognitive and affective involvement. Different from prior studies that treat flow experience as a one-dimensional concept (Hyun et al. 2022; Shao et al. 2020; Zhao and Wagner, 2023), dividing flow experience into cognitive and affective states enriches our understanding of the complexity of flow experience. The post-hoc analysis provides further evidence that affective involvement is a stronger predictor of misinformation sharing than cognitive involvement. This finding is particularly relevant in social media, where sensational content is prevalent. The findings imply that the characteristics of the research context should be considered when adopting flow theory to explain human behavior. By contextualizing the research, this study expands the existing understanding of flow experience to provide a novel perspective to investigate multifaceted pathways through which flow experience shapes human behavior. Additionally, by incorporating technology affordance theory, this study expands the existing literature's understanding of flow experience and lays the groundwork for future research to investigate the relationship between technological features and user behavior.

Last but not least, our study provides a complete view of misinformation sharing in social media by integrating the

affordance theory and flow theory. Based on the guideline of theory integration (Okhuysen and Bonardi, 2011), the integration of affordance theory and flow theory is appropriate since they both reflect individuals' reactions in a technical environment. Both of these theories have been applied to explain users' behaviors in the social media context. Thus, our integration of these two theories satisfies the proximity and compatibility requirements of theory integration (Deng et al. 2024). Although the affordance theory provides a comprehensive perspective about which social media affordances could engender misinformation sharing, the underlying mechanisms of the effects of these social media affordances would be still not clear if we only rely on the affordance theory. By applying flow theory, the underlying mechanisms of the effects of social media affordances are revealed. Therefore, the whole working process of the effect of social media on misinformation sharing is described based on combining flow theory and affordance theory.

Our findings can provide actionable guidelines to practitioners. First, the results highlight the need to pay attention to the design and management of social media. By enabling people to access information, voice opinions, and associate with others, social media can inspire users to be cognitively and affectively involved, which increases misinformation sharing. We therefore suggest that designers should be aware of the negative consequences of social media usage when developing technical features. For instance, social media designers should consider adding reminders to promote rational thinking in order to reduce the cognitive and affective involvement, which may lead to misinformation sharing.

In addition, this study sheds light on the necessity of managing social media users. Our findings demonstrate that individuals' emotional ability negatively moderates the effect of affective involvement on misinformation sharing. It implies that once individuals have the ability to regulate their emotions, they are less likely to be motivated by affective states to share misinformation. As social media content has powerful impacts on user's affective states (Steinert and Dennis, 2022), measures should be taken to regulate one's misinformation sharing in response to affective content. Particularly, social media managers can help cultivate or improve users' emotional ability in dealing with social media content by providing educational materials and giving gentle reminders. Meanwhile, platforms can evaluate users' emotional ability and perform fact-checking for users with low emotional ability.

Limitations and future directions. This study has several limitations that call for future research. This study employed a cross-sectional survey to collect data. Although this method is effective in examining the relationships between constructs, it is weak in testing causality effects and is limited in explaining misinformation sharing behavior in the long run. Future research could conduct longitudinal studies to compare whether people in different periods exhibit different behavioral patterns in misinformation sharing.

Moreover, the findings reveal that social media affordances account for 33.00% of the variance in misinformation sharing. The perspective of affordances offers an in-depth understanding of both social media features and users' behavior patterns in explaining misinformation sharing. However, the literature indicates that technological, political and societal factors can contribute to the diffusion of misinformation (Lewandowsky et al. 2017). Future research can explore how societal and political factors relate to misinformation diffusion.

Additionally, the results revealed that the relationship between social media affordances and misinformation sharing is partially

mediated by cognitive involvement and affective involvement. When considering the role of social media in misinformation sharing, future research should examine other mediators and provide more insights into the underlying mechanisms.

Conclusion

In order to develop an understanding of how the use of social media may lead to misinformation sharing, this study explored how social media affordances relate to users' misinformation sharing. Building on the flow theory, we theoretically proposed and empirically tested a research model illustrating how social media affordances (flow antecedents) can affect users' cognitive involvement and affective involvement (flow experience), thereby leading to misinformation sharing (flow consequence). The results also confirm the moderation effect of users' emotional ability in inhibiting the influence of affective involvement on misinformation sharing. The findings provide insights for curbing social media users' misinformation sharing by considering the affordances of social media as well as the underlying psychological processes, which are critical to the governance of misinformation on social media.

Data availability

According to the confidential agreements with the participants, the dataset analyzed during the current study are not publicly available. However, the dataset can be obtained from the corresponding author upon reasonable requests.

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Author contributions

MW: Conceptualization, methodology, resources, writing—original draft, writing—review and editing, project administration. TW: Conceptualization, methodology, writing—review and editing, Project administration. YX: Data analysis, writing—review and editing.

Competing interests

The author declares no competing interests.

Ethical approval

This study was conducted in accordance with the ethical principles of the 1964 Helsinki Declaration and its later amendments, meeting the criteria for exemption from formal ethical review under China's Measures for the Ethical Review of Life Science and Medical Research Involving Humans (National Health Commission, 2023; https://www.gov.cn/zhengce/zhengceku/2023-02/28/content_5743658.htm) as it involved only anonymous questionnaire data collection without sensitive content or human experimentation. Following institutional research governance standards, the protocol received approval from the Ethics Committee of Tongji Medical College of Huazhong University of Science and Technology (approval number: 2024S246; date of approval: 25 January 2024). The study design ensured participant protection through comprehensive anonymization measures that minimized risks of physical or psychological harm, privacy breaches, or commercial conflicts.

Informed consent

This study employed the online survey platform for data collection. Before accessing the questionnaire, all respondents received comprehensive information regarding the study's objectives, the voluntary nature of participation, the right to withdraw at any time without penalty, and the scope of informed consent. Informed consent was obtained separately for the survey. The survey in our study was conducted from 2 to 9 February 2024. Respondents confirmed consent by selecting the agreement option before proceeding to the survey. Rigorous confidentiality protocols were implemented throughout the study, including guarantees of complete anonymity, strict limitations on data usage for academic research purposes only, and explicit assurances that no participant information would be shared with third parties.

Additional information

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