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When Corrections Fail: Effects of Misinformation Targets, Repeated Exposure, and Partisanship on Misinformation Beliefs

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This study evaluates the effectiveness of 3 misinformation-correction approaches—fact-based, narrative-based, and literacy-based—in countering politically polarized misinformation. Using a 2 (misinformation target: protesters vs. police) × 4 (correction approach: no correction, fact-based, narrative-based, literacy-based) between-subjects online survey experiment with a representative sample from Hong Kong, we also examined how repeated misinformation exposure and partisanship influence responses to misinformation and corrections. Findings reveal that (1) none of the correction approaches significantly reduced misinformation beliefs, with no differential effects among them; (2) repeated exposure to reinforced misinformation beliefs, contributing to their persistence; (3) participants' political affiliations shaped their beliefs in misinformation and corrections;

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and (4) exposure to partisan-incongruent misinformation increased acceptance of such misinformation. These results highlight the importance of considering political contexts and target sensitivity in misinformation correction strategies and underscore the need for tailored approaches, such as prebunking and media literacy, to build resilience against persistent misinformation.

Keywords: misinformation, correction, misinformation target, repeated exposure, partisanship

The proliferation of misinformation has become a central concern in political communication, fundamentally reshaping the information landscape and posing a significant threat to informed citizenship and the effective functioning of democracies (Jerit & Zhao, 2020; Li, 2020). The countering of political misinformation has garnered considerable scholarly attention in the face of increasingly polarized media and political environments worldwide (Carothers & O'Donohue, 2019; Clayton, Davis, Hinckley, & Horiuchi, 2019; Li, 2020). This challenge is especially acute in the context of contentious and polarized politics, where misinformation is often weaponized to discredit, delegitimize, and even attack opposing political camps (Feng, Tsang, & Lee, 2021; Tong, Gill, Li, Valenzuela, & Rojas, 2020). This raises a pressing and unresolved question: How effective are current correction approaches in countering misinformation targeted at politically polarized groups?

This question underscores a theoretical tension between two contradictory perspectives on the effectiveness of correction. Existing studies within controlled lab settings demonstrate the positive impact of corrective messages in countering misinformation (Bode & Vraga, 2018; Hameleers & van der Meer, 2020). They have explored which types of corrective messages more effectively refute misinformation in terms of message-level cues (Chan, Jones, Hall Jamieson, & Albarracín, 2017; Walter & Tukachinsky, 2020) and issue contexts of misinformation (Walter & Murphy, 2018). Conversely, real-world contexts steeped in contentious and polarized politics introduce the potential for diminished correction efficacy because of individuals' biased reasoning processes (Walter & Murphy, 2018). This phenomenon can manifest as the "continued influence effect" (CIE) of misinformation, where misinformed individuals, despite acknowledging corrective information, may be influenced by misinformation (Walter & Tukachinsky, 2020). Given this study's politically polarized and contentious contexts, we aim to examine both the effectiveness of correction approaches and the persistence of CIE, thus aligning with prior studies with the same approach (e.g., Kan, Pizzonia, Drummey, & Mikkelsen, 2021).

This study first investigates the effectiveness of various misinformation-correction approaches targeting politically polarized groups using the 2019 Hong Kong Anti-Extradition Law Amendment Bill (Anti-ELAB) movement as a case study. This proposed amendment permitted extradition to mainland China without formal agreements, prompting widespread public opposition and large-scale protests. This deeply polarized conflict was marked by widespread misinformation targeting both police and protesters (Feng et al., 2021; Lee, 2020a), during which fact-checking organizations employed diverse correction approaches like fact presentation, storytelling, and literacy enhancement (Feng et al., 2021). Analyzing this case allows us to evaluate correction efficacy within a real-world, politically charged environment, focusing on distinct

misinformation targets and correction methods. Specifically, we examine the main and interaction effects of the correction approach (non-correction, fact-based, narrative-based, literacy-based) and misinformation target (protesters vs. police) on misinformation beliefs. Second, we explore the potential for the CIE of misinformation through two mechanisms: (1) repeated exposure to misinformation, fostering an illusory truth effect that increases belief in misinformation through repetition, and (2) the impact of partisan bias on beliefs in misinformation and corrections. We further assess how repeated exposure and partisanship affect the relationship between correction approach and misinformation beliefs, offering insights into the persistence of misinformation among politically polarized groups.

This study contributes theoretically on three fronts. First, it provides insights into the global dynamics of misinformation and correction, particularly in non-Western societies, by assessing the effectiveness of different correction approaches within Hong Kong's unique sociopolitical landscape. Second, this study advances our understanding of the interplay between partisanship, misinformation, and corrective measures by examining how inconsistencies between misinformation targets and individuals' political stances influence misinformation beliefs and responses to corrections. This expands previous research that has focused primarily on source-partisanship mismatches (e.g., Clayton et al., 2019; Ecker, Sze, & Andreotta, 2021; Swire, Berinsky, Lewandowsky, & Ecker, 2017). Finally, it extends research on the CIE of misinformation in polarized political contexts, examining how repeated exposure, political stance, and misinformation targets interact to shape misinformation beliefs. This highlights the combined influence of mechanisms such as familiarity and partisan-motivated reasoning in real-world environments marked by political polarization.

Literature Review

Misinformation in the Anti-ELAB Movement

A Case of Contentious and Polarized Politics

In 2019, the Hong Kong government introduced the Extradition Law Amendment Bill (ELAB), which would allow local fugitives to be detained and transferred to other countries or territories (e.g., mainland China) without formal extradition agreements. This immediately sparked widespread public skepticism and opposition, as many questioned the government's underlying intentions, fearing it could lead to the extradition of Hong Kong citizens elsewhere for unfair trials. Initially, the movement called for the withdrawal of the bill. However, backed by a proestablishment majority in the Legislative Council, the government remained committed to pushing the amendment forward. The subsequent mass protests escalated into one of the largest and most sustained movements in Hong Kong's history, shifting focus to allegations of police misconduct and demands for reform. As the protests continued, they became increasingly characterized by intense confrontations and episodes of violence, often involving clashes between protesters and police.

This movement has been situated within a broader context of contentious politics, referring to collective political struggles involving various forms of contention (Feng et al., 2021; Lee, 2020a; Tilly & Tarrow, 2015). It also closely aligns with the rise of political polarization in Hong Kong, where opposing camps strongly attempted to discredit or delegitimize each other, employing various tactics and mobilizing

resources (Lee, 2020a). Driven by deep ideological divides, this polarization not only shaped the movement but also further entrenched the polarized conditions in Hong Kong society (Lee, 2020a; Shen & Yu, 2021).

The political spectrum of Hong Kong encompasses four main ideological camps, including localist, pandemocratic, neutral, and proestablishment (Lee, 2020b; Zhang & Gu, 2022). Over time, these camps polarized into two primary extremes. The localist and pandemocratic camps focused on a Hong Kong-centered identity, advocating for democratic reforms and expressing criticism toward the Hong Kong government. In contrast, the proestablishment camp placed emphasis on a Chinese national identity and generally supported government policies (Shen & Yu, 2021; Zhang & Gu, 2022). During the movement, citizens with proestablishment views expressed strong support for police measures aimed at controlling the activities of the movement's protesters (Zhang & Gu, 2022). Conversely, those aligned with localist or pandemocratic stances became fervent advocates of the protest movement and its participants, seeking to undermine the police's legitimacy by vocally condemning alleged abuses of power (Lee, 2020b; Zhang & Gu, 2022).

Misinformation With Politically Polarized Targets

Since the movement involved highly intense and long-lasting protests, conflicts, and even violence, the prevalence of uncertainty-triggered misinformation was inevitable. There was a dramatic increase in the number of people who searched for the term "fake news" on Google during the movement (Tsang, 2022). As political camps manipulated misinformation as a weapon to discredit their opponents and reach their own sociopolitical demands (Feng et al., 2021; Lee, 2020a), most misinformation showed specific and identifiable targets, referring to a specific object that the misinformation was created to discredit, attack, delegitimize, or accuse (Feng et al., 2021; Lee, 2020a). There were two typical misinformation targets during the movement: the protesters and the police (Feng et al., 2021; Lee, 2020a). It was found that 70.3% of fact-checking posts published by a professional fact-checking outlet (called "Kauyim Media") on Facebook countered misinformation with a specific target to accuse and discredit; 21.5% of the debunked misinformation targeted the protesters or the movement, and 40.3% targeted the police or the government (Lee, 2020a).

Furthermore, politically polarized targets of misinformation warrant scholarly attention, as they serve as key cues that trigger individuals' partisan biases in processing both misinformation and corrections. Research indicates that people are more inclined to believe misinformation targeting opposing political groups than their own and are similarly less receptive to corrections addressing such partisan-incongruent misinformation (Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012). Such investigation also helps us understand how partisan biases distort misinformation or even correction processing. Most prior studies examined whether individuals' political stances are (in)congruent with (1) the partisanship of a false claim owner as a primary information source (i.e., who made the false claim; e.g., Republican vs. Democratic party in the misinformation generated during the 2016 U.S. presidential election; Ecker et al., 2021; Swire et al., 2017), and (2) the partisanship of secondary information sources (i.e., who relayed the false claim to people), e.g., CNN favored by liberals and Fox News endorsed by conservatives (Clayton et al., 2019). However, few existing studies considered whether and how partisan biases can stem from the (in)consistency between individuals' political stance and the partisanship of misinformation target (Jennings & Stroud, 2023). Identifying the partisanship of misinformation targets requires more cognitive efforts to

interpret which party a misinformation claim discredits rather than directly knowing what the source of the misinformation claim is.

Effect of Correction Approaches on Misinformation Beliefs

The effect of correction on refuting misinformation depends on various message-level factors, such as evidence type (Sangalang, Ophir, & Cappella, 2019; Vraga, Kim, Cook, & Bode, 2020; Vraga, Tully, & Bode, 2022), source (Clayton et al., 2019), and placement (Vraga et al., 2020). We focus on evidence type (i.e., what kind of information is used to debunk misinformation) as it reveals what kind of correction approach should be used in fact-checking practices and constitutes a key element of corrective messaging with stronger persuasion effects when countering misinformation (Vraga et al., 2020). Previous research has examined three main correction approaches with different evidence types (i.e., fact-, narrative-, and literacy-based) and compared their effectiveness in refuting misinformation.

Fact-based correction refers to corrective messages that provide accurate facts and informational evidence to audiences based on a rational approach to counter misinformation, evaluate the truthfulness of misinformation, and correct factual misperceptions (Boukes & Hameleers, 2023; Vraga et al., 2020). This approach has been widely adopted by fact-checking organizations (Boukes & Hameleers, 2023; Nyhan, Porter, Reifler, & Wood, 2020). Previous research has examined the effectiveness of such fact-based correction in debunking misinformation (e.g., Chan et al., 2017; Hameleers & van der Meer, 2020; Nyhan et al., 2020). This correction approach sometimes shows no significant effect in refuting misinformation (Walter & Murphy, 2018), and even providing factual information to audiences could trigger backfire effect (i.e., more beliefs in misinformation; Nyhan & Reifler, 2010; Walter & Murphy, 2018), especially when the factual information is incongruent with audiences' worldviews.

Narrative-based correction refers to corrective messages that share true information through a story describing the actual experiences of specific characters involved in the misinformation-related events or contexts (Dahlstrom, 2021; Vafeiadis & Xiao, 2021). Compared with factual information, storytelling has been considered a more effective approach: (1) it provides an alternative and vivid explanation to replace the story of misinformation that is embedded in individuals' mental models (Sangalang et al., 2019); (2) it engages the emotional responses of audiences, which makes the corrective message more salient in individuals' minds and creates an environment in which misinformation beliefs with persistent emotions are more readily refuted (Lee, 2022; Sangalang et al., 2019); and (3) it convinces people by information processing via storytelling (Vafeiadis, Han, & Shen, 2020). These positive effects of narrative-based correction have been examined and supported in health communication (Lee, 2022; Sangalang et al., 2019) and science communication studies (Dahlstrom, 2021). Nevertheless, there were contradictory findings showing that narrative corrections do not show any benefits in refuting misinformation related to environment and health (Ecker, Butler, & Hamby, 2020).

Literacy-based correction refers to corrective messages that explain the rhetorical techniques and deceptive tactics used to mislead audiences and provide concrete tips to detect misinformation (Cook, Ellerton, & Kinkead, 2018; Vraga et al., 2022). It emphasizes the logic-focused interventions that center on the logic of misinformation generation and misleading or deceptive techniques (Vraga et al., 2020), which

has been found to counter misinformation in an effective and scalable way (Schmid & Betsch, 2019; Vraga et al., 2020). Recent research further considers logic-based correction in an educational vehicle by incorporating news literacy into corrective messages (Vraga et al., 2022). There were some mixed findings. Vraga et al. (2020) found no significant effectiveness of introducing news literacy, whereas Hameleers (2022) found that a combination of news literacy and fact-checking was most effective at reducing individuals' misinformation beliefs.

A systematic comparison of the three correction approaches is essential, as such an investigation can improve fact-checking practices and inform public policy on addressing misinformation. This is particularly pronounced in the context of our study. Unlike other frequently examined issue areas (e.g., health, environment, science), the domain of contentious and polarized politics presents unique challenges. Here, partisan biases are intensified and more likely to interfere with correction efficacy (Li, 2020; Walter & Murphy, 2018).

Despite mixed findings about the effectiveness of the three correction approaches in combating misinformation, it remains uncertain whether these approaches can effectively reduce individuals' misinformation beliefs, especially in politically polarized contexts. Moreover, as aforementioned, during the Anti-ELAB movement, Hong Kong citizens frequently encountered misinformation about two polarized groups—the protesters and the police. A practical question thus arises: Can corrections effectively refute misinformation targeting both protesters and the police to the same extent? Understanding the interaction between correction approach and misinformation target is critical, as it can enhance our knowledge of how to apply different correction approaches effectively in polarized political environments (Li, 2020). This leads us to the following research question:

RQ1: Which correction approach (i.e., fact-, narrative-, or literacy-based) is most effective in reducing participants' belief in (1) misinformation targeting protesters and (2) misinformation targeting the police?

Factors Contributing to the CIE of Misinformation

The CIE of misinformation refers to the phenomenon where misinformation continues to influence people's thinking, reasoning, and behavior, even after they have been informed of its falseness through corrective messaging (Chan et al., 2017; Walter & Tukachinsky, 2020). In real-world misinformation, as opposed to constructed misinformation, it may be more difficult to debunk because of its potentially stronger CIE, especially in political contexts (Li, 2020; Walter & Murphy, 2018). Understanding CIE is crucial for developing strategies to combat misinformation across various domains, including politics (Li, 2020), health (Bode & Vraga, 2018), and science communication (Dahlstrom, 2021). This phenomenon highlights the complexity of the misinformation problem, prompting researchers to examine factors that influence the effectiveness of corrective measures, such as misinformation features (e.g., topic, valence, source, coherence, familiarity), audience characteristics (e.g., memory, worldview, cognitive ability, emotion), and their interactions (Walter & Tukachinsky, 2020). This study focuses on the effects of repeated exposure to misinformation (related to familiarity) and partisanship (as a political worldview), as these are key elements in the daily experiences of Hong Kong citizens during the Anti-ELAB movement.

Repeated Exposure to Misinformation

Repeated exposure to misinformation can strengthen the CIE of misinformation (Lewandowsky et al., 2012). The illusory truth effect suggests that individuals believe repeated messages regardless of their truth (Pennycook, Cannon, & Rand, 2018). The persistence of misinformation in an individual's mind is based on the mechanism of repetition and familiarity (Lewandowsky et al., 2012; Walter & Tukachinsky, 2020). Many online falsehoods were generated and disseminated rapidly during the Anti-ELAB movement, thus exposing Hong Kong citizens to more misinformation messages than ever before. When exposed to misinformation repeatedly, Hong Kong citizens were more likely to be familiar with the content and targets of the same or highly similar misinformation, thus strengthening the misinformation in their memories and triggering stronger beliefs in it (Lewandowsky et al., 2012). We propose misinformation preexposure as differentiated from the misinformation exposure commonly manipulated within the experimental setting (e.g., Pillai & Fazio, 2021); preexposure refers to participants' prior exposure to the same or highly similar misinformation as used in the current experiment. Citizens with misinformation preexposure could be more familiar with the misinformation message we manipulated and may generate more beliefs in it via repeated exposure. Thus, we propose the following hypothesis:

H1: Participants with misinformation preexposure are more likely to believe the misinformation than those without misinformation preexposure.

The illusory truth effect is not absolute and depends on several factors, such as the misinformation feature and the correction approach used (Pennycook et al., 2018; Pillai & Fazio, 2021). First, previous studies have shown that the illusory truth effect can differ based on various attributes of the misinformation, such as the nature of the statements, their valence, and the strength of the arguments (Pillai & Fazio, 2021). However, it remains unclear to what extent the illusory truth effect varies across different misinformation messages with politically polarized targets. Second, providing detailed corrections, rather than simple corrections, has been shown to be a more effective way to reduce the illusory truth effect (Ecker et al., 2020; Pillai & Fazio, 2021). For example, offering specific information about why the misinformation is problematic, rather than merely stating that it is false, has been found to be more effective (Ecker et al., 2020; Swire et al., 2017). Despite this, the degree to which the magnitude of the illusory truth effect is influenced by different detailed correction approaches remains empirically unclear. This line of investigation is vital in identifying which types of misinformation tend to persist among Hong Kong citizens from the time of the movement to the present. Thus, we propose the following research question:

RQ2: How does preexposure to misinformation interact with the misinformation target and correction approach to influence beliefs in misinformation?

Partisanship

Based on the theory of motivated reasoning (Kunda, 1990), political identities can influence how individuals process information through directional motivation and confirmation bias (Bolson, Druckman, & Cook, 2014). Political stance is an important aspect of worldviews and can also shape individuals'

misinformation beliefs despite the presence of corrections (Lewandowsky et al., 2012). When individuals are exposed to misinformation, they are motivated to evaluate whether the misinformation content is consistent with their political stances. Individuals seek and endorse misinformation that confirms their preexisting political stance (i.e., confirmation bias), whereas they counter and dismiss misinformation incongruent with their preexisting political stance (i.e., disconfirmation bias; Bolson et al., 2014; Jennings & Stroud, 2023). To protect their own partisan identifications, citizens with opposing political stances may show varying beliefs in misinformation with politically polarized targets (i.e., protesters vs. police). During the Anti-ELAB movement, citizens with proestablishment stance were more likely to believe misinformation that portrayed protesters negatively (i.e., partisan-congruent messages) but less likely to believe misinformation that portrayed the police negatively (i.e., partisan-incongruent messages; Lee, 2020a). A similar partisan bias was observed among citizens with localist or pandemocratic stances, who were more likely to accept misinformation aligning with their views.

Individuals' partisanship can also influence how they respond to corrective messages (Ecker & Ang, 2019; Jennings & Stroud, 2023). Yet, little research examined the impacts of partisanship on the belief in correction. As Jennings and Stroud (2023) suggested, the partisan-motivated reasoning involves two steps in processing misinformation and correction consecutively. During the Anti-ELAB movement, the first-step processing of misinformation with politically polarized targets very readily activates one's partisan-motivated reasoning. This implies that corrections following misinformation might also be perceived as partisan-(in)congruent, influencing acceptance or rejection based on perceived alignment with prior beliefs. It is plausible to assume that partisanship can shape beliefs in corrections. Based on this, we propose the following hypotheses:

H2: Compared to those with neutral stance or proestablishment stance, when participants who hold localist or pandemocratic stances read misinformation targeting the police, they are (a) more likely to believe such misinformation, (b) but less likely to believe related corrective message.

H3: Compared to those with neutral stance or those with localist or pandemocratic stances, when participants who hold proestablishment stance read misinformation targeting the protester, they are (a) more likely to believe such misinformation, (b) but less likely to believe related corrective message.

Furthermore, we seek to examine whether different correction approaches can lessen the influence of partisan bias on misinformation and correction beliefs. This leads us to the following research question:

RQ3: Do the relationships hypothesized in H2 and H3 vary across different treatments of correction approach?

Interaction Between Repeated Misinformation Exposure and Partisanship

Individuals' misinformation beliefs can be influenced by both repeated exposure to misinformation and their political stances, although previous research rarely explores how familiarity interacts with worldview congruence to influence individuals' beliefs in misinformation (Walter & Murphy, 2018). Two

significant patterns of this interaction effect require further testing. Repeated exposure to partisan-congruent misinformation may contribute to more beliefs in misinformation because of the positive effects of confirmation bias and the illusory truth effect, although this assumption has not been confirmed. On the other hand, when citizens are repeatedly exposed to partisan-incongruent misinformation, it is unclear to what extent they will believe such misinformation, as the effect of disconfirmation bias (reducing misinformation beliefs) and the illusory truth effect (increasing misinformation beliefs) may cancel each other out. Therefore, we propose the following research question:

RQ4: In two misinformation treatments (protesters as the target vs. police as the target), how does participants' preexposure to misinformation (yes vs. no) interact with their political stances (localist/pandemocratic vs. neutral vs. proestablishment) in differentially affecting their beliefs in misinformation?

Methods

Design, Sample, and Statistical Power

The online survey experiment used a 2 (misinformation target: protesters vs. police) × 4 (correction approach: fact-based vs. narrative-based vs. literacy-based vs. no correction) between-subjects design. We conducted a statistical power analysis using the G*Power analytical tool to estimate the required sample size. With a relatively small effect size of .15 based on Cohen's (1988) criteria, a significance level of .05, and a power of .80, approximately 720 participants were needed for the between-group comparison across eight conditions. This required a minimum of 90 participants per group to detect an effect. In May 2022, we recruited participants from a Hong Kong panel managed by a private company called Dynata, known for achieving representative samples in Hong Kong through quota-based selection based on age, gender, income, and education (Tsang, 2022). A total of 800 participants were recruited for the study, of which 796 completed the survey experiment. The age and gender distribution of the participants closely mirrored the 2021 Hong Kong census population data (Census & Statistics Department of Hong Kong, 2022), indicating a representative sample. Participant ages ranged from 18 to 75, with an average age of 42.05 (SD = 4.22), and females accounted for 52.6% of the sample. Furthermore, most participants (70.8%) had postsecondary education, and 71.8% reported a monthly household income of 30,000 HKD or more, aligning with the average monthly household income in Hong Kong.

Experimental Stimulus

Before reading the misinformation messages, participants were asked to answer several questions related to their political stances, misinformation knowledge, and demographics. All participants were then randomly assigned to two manipulated treatments, each displaying misinformation messages targeting different groups. We chose and manipulated two real-world Facebook posts from the Anti-ELAB movement: one discrediting protesters, the other discrediting the police. To ensure internal validity, both posts shared several identical elements, like profile name, audience metrics (e.g., number of likes, comments, and reposts), and similar content features (e.g., post length, modality, and language style). We also designed a match between the misinformation post author and the target to make the posts resemble the real-world

context of the movement (see the online Supplemental Material for details[2]). Half of the participants read a misinformation post targeting protesters, posted by a user with a proestablishment profile picture and affiliation with a propolice group. The other half read a misinformation post targeting the police, posted by a user with a localist or pandemocratic profile picture and affiliation to an antipolice group.

After reading the misinformation message, participants were immediately asked to answer a question about their preexposure to misinformation. Within their respective misinformation treatments, participants were then randomly assigned to one of four treatments featuring one non-corrective message as control and three different corrective messages. Each corrective message was manipulated to have the same source (i.e., *AFP Fact Check*, a well-known digital verification service with neutral political stance), format (e.g., profile picture, post length, post modality), and audience metrics as aforementioned (see Supplemental Material for details). Finally, following the message exposure, whether control or corrective, participants were instructed to respond to questions about their preexposure to the message, their beliefs about the message, and their knowledge of the misinformation.

Measures

Misinformation Belief

Participants were shown a Facebook post showing a misinformation message. Subsequently, on reading a control or corrective message, they were tasked with assessing the misinformation post using Lee's (2022) four items on a 5-point Likert scale: (1) I think the post I just read is accurate; (2) I think the post I just read is authentic; (3) I think the post I just read is believable; and (4) I think the post I just read is reasonable (Cronbach's $\boldsymbol{\alpha}$ = .96, $\boldsymbol{M}$ = 2.46, SD = .99).

Correction Belief

Participants were presented a Facebook post showing a control or corrective message and asked to evaluate the post on 5-point scales using four items measuring correction belief (Lee, 2022): (1) I think the post I just read is accurate, (2) I think the post I just read is authentic, (3) I think the post I just read is believable, and (4) I think the post I just read is reasonable (Cronbach's $\boldsymbol{\alpha}$ = .93, $\boldsymbol{M}$ = 3.20, SD = .84).

Misinformation Preexposure

Given that we employed real-world misinformation messages as treatment materials, it is conceivable that participants may have encountered these misinformation messages before the study. Participants were asked to report any prior exposure to messages identical to the misinformation post they just read. A binary scale to measure misinformation preexposure was used: Yes (1) with 50.5% (402) of participants and No (0) with 49.4% (393) of participants.

[2] https://osf.io/p8ugy/?view_only=0027b6caf3ba4d18bdc488417d619804

Political Stance

Participants were asked to identify which political camp they belonged to with six answer categories: (1) localist, (2) pandemocratic, (3) neutral, (4) proestablishment, (5) no political leaning/political neutralist/no political affiliation, and (6) don't know/hard to say. By transforming the fifth and sixth categories into the third category as neutral and integrating the first and second categories into one, this variable was further classified into a categorical variable: localist or pandemocratic (1) with 26.1% (208) of participants, neutral (2) with 61.9% (493) of participants, and proestablishment (3) with 11.7% (93) of participants. This observed distribution pattern closely aligns with the results of a telephone survey conducted in 2021 by a third-party authority: 75.6% (no support for any political parties), 13.7% (proestablishment), and 10.7% (pandemocratic and localist; Hong Kong Institute of Asia-Pacific Studies at CUHK, 2022).

Control Variable: Misinformation Knowledge

Following Apuke and Omar (2020), we measured participants' misinformation knowledge, a key factor influencing belief in misinformation. Participants rated their agreement with five statements (e.g., "social media messages without a source are probably untrue") on a 5-point scale (1 = strongly disagree, 5 = strongly agree). This measure demonstrated good internal consistency (Cronbach's $\boldsymbol{\alpha}$ = .87, $\boldsymbol{M}$ = 3.68, SD = .71).

Manipulation Checks

Three items were used to check the manipulation of two independent variables: misinformation target and correction approach. Factual manipulation checks were employed to ensure that the participants understood the essential information in the related conditions and that the treatments worked as expected (Kane & Barabas, 2019). First, to check the manipulation of the misinformation targets, participants were asked to indicate who engaged in misconduct toward citizens after reading the misinformation post, with three answer categories: (1) police; (2) protesters; and (3) district councilor. Results from a chi-square test and z-tests for independent proportions showed that participants in both misinformation treatments were more likely to choose the correct answer (see Table 1 in Supplemental Material), $\boldsymbol{X}^2$ (1, $\boldsymbol{N}$ = 796) = 321.98, $\boldsymbol{p}$ < 0.0001. Second, to check the manipulation of the correction approach, participants were first asked to indicate the general topic of the corrective message with three answer categories: (1) information about Hong Kong tourism; (2) fact-check and rebuttal toward online misinformation; and (3) COVID-19 vaccination. Participants in all non-correction and correction treatments were more likely to choose the correct answer (see Table 2 in Supplemental Material), $\boldsymbol{X}^2$ (1, $\boldsymbol{N}$ = 793) = 583.03, $\boldsymbol{p}$ < 0.0001. Then, participants in the three correction treatments continued to indicate which statement was most relevant to the corrective message: (1) provide factual information to conduct fact-checking; (2) cite citizens' storytelling directly; or (3) list four misleading or deceptive techniques and call audiences' attention to similar misinformation. Participants in all three correction treatments were more likely to choose the correct answer (see Table 3 in Supplemental Material), $\boldsymbol{X}^2$ (1, $\boldsymbol{n}$ = 594) = 151.77, $\boldsymbol{p}$ < 0.0001. All participants were kept for the statistical analysis to avoid the bias of generating more significant results (Kotzian, Stoeber, Hoos, & Weissenberger, 2020).

Statistical Analysis

To answer our formulated hypotheses and research questions, we proposed different analytical strategies, and the detailed information is shown in Table 4.

Table 4. Analytical Strategies of Formulated Hypotheses and Research Questions.

Hypothesis and research question	Dependent variable	Analytical strategy
RQ1	Misinformation belief	Two-way ANOVA (misinformation target × correction approach)
H1 and RQ2	Misinformation belief	Three-way ANCOVA (misinformation target × correction approach × misinformation preexposure; control: misinformation knowledge)
H2a, H3a, and RQ3a	Misinformation belief	Three-way ANCOVA (misinformation target × correction approach × political stance; control: misinformation knowledge)
H2b, H3b, and RQ3b	Correction belief	
RQ4	Misinformation belief	Three-way ANCOVA (misinformation target × misinformation preexposure × political stance; control: misinformation knowledge)

Results

RQ1: Effectiveness of Correction Approaches With Different Misinformation Targets

No significant interaction effect was found between misinformation target and correction approach on misinformation beliefs, F (3, 787) = 0.15, p = .93. There were also no significant main effects for either misinformation target (F (3, 787) = 0.28, p = .84) or correction approach (F (3, 787) = 0.09, p = .97), indicating that the correction approach did not differentially influence belief reduction for misinformation targeting either protesters or police (see Figure 1). RQ1 was answered.

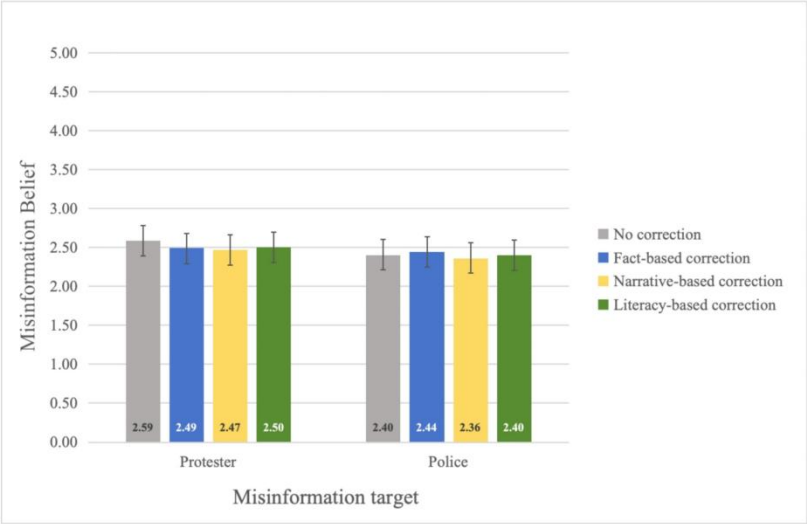

Figure 1. Effects of correction approach and misinformation target on misinformation beliefs.

H1 and RQ2: Impacts of Misinformation Preexposure on Misinformation Beliefs

No significant three-way interaction (misinformation target × correction approach × misinformation preexposure) was observed, F (3, 777) = 0.31, p = .82. Nevertheless, there was a significant main effect of misinformation exposure, F (1, 777) = 10.60, p < .001, with participants exposed to misinformation showing greater belief (M = 2.57, SE = .05) than those not exposed (M = 2.33, SE = .05, p < .001). H1 was supported.

Further analysis of the two-way interaction (misinformation target × misinformation preexposure) found that, despite the insignificant interaction, F (1, 777) = 2.58, p = .11, the above impact of misinformation exposure on misinformation beliefs was evident only in misinformation targeting the police, $M_{exposure}$ = 2.56 versus $M_{nonexposure}$ = 2.21, F (1, 777) = 11.51, p < .001, but not in misinformation targeting protester, $M_{exposure}$ = 2.58 vs. $M_{nonexposure}$ = 2.46, F (1, 777) = 1.51, p = .22. When further considering the variation of correction approach via the post hoc analysis of the three-way interaction, the above pattern was found only in "no correction" treatment (see Figure 2). Notably, across all corrections, the average level of misinformation beliefs in the preexposure condition was higher than that in the non-preexposure condition, although those differences were not statistically significant. This was particularly true for fact-based ($M_{exposure}$ = 2.55 vs. $M_{nonexposure}$ = 2.20, p = .08) and literacy-based ($M_{exposure}$ = 2.55 vs. $M_{nonexposure}$ = 2.15, p = .05) corrections. RQ2 was answered.

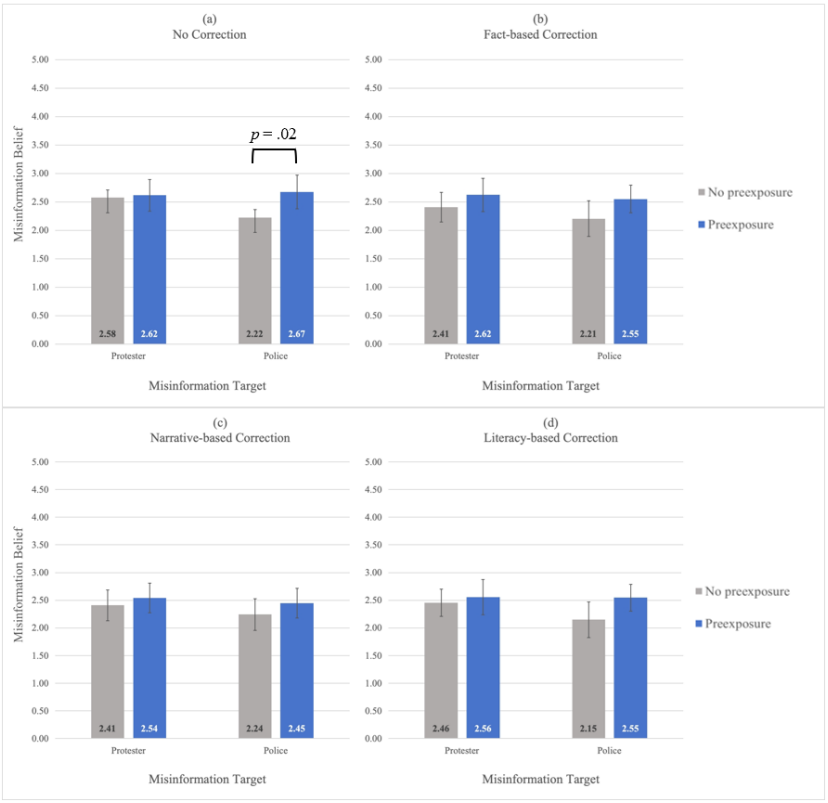

Figure 2. Effects of misinformation target, misinformation preexposure, and correction approach on misinformation beliefs.

H2, H3, and RQ3: Impacts of Political Stance on Beliefs in Misinformation and Correction

There was a significant two-way interaction between misinformation target and political stance, ***F*** (2, 767) = 120.42, ***p*** < .001. As expected by H2a and H3a, participants' political stances influenced their beliefs in misinformation with different targets (i.e., one's own camp vs. opposing camp; see Figure 3). Proestablishment participants believed misinformation targeting protesters more (***M*** = 3.39, ***SE*** = 0.14) than neutral (***M*** = 2.58, ***SE*** = 0.06, ***p*** < .001) or localist/pandemocratic participants (***M*** = 1.98, ***SE*** = 0.09, ***p*** < .001). H2a was supported. Conversely, localist/pandemocratic participants believed misinformation targeting the police more (***M*** = 2.93, ***SE*** = 0.09) compared with neutral (***M*** = 2.29, ***SE*** = 0.06, ***p*** < .001) or proestablishment participants (***M*** = 1.57, ***SE*** = 0.15, ***p*** < .001). Neutrals fell between the two extremes in both cases. H3a was supported.

Also, the three-way interaction (misinformation target × correction approach × political stance) was significant, ***F*** (6, 767) = 2.26, ***p*** = .036. As shown in Figure 4, although the pattern of political bias in misinformation belief remained under the "no correction, narrative-based correction," and "literacy-based correction" treatments, fact-based correction seemed to partially mitigate this bias. The fact-based correction condition revealed two unexpected results: (1) localist/pandemocratic participants, who might be

expected to have lower belief in the protester-targeted misinformation, displayed the similar level of misinformation belief (***M*** = 2.23, ***SE*** = .18) as neutral participants (***M*** = 2.45, ***SE*** = .12, ***p*** = .31); and (2) proestablishment participants, who might also be expected to have lower belief in the police-targeted misinformation, showed similar belief levels (***M*** = 1.99, ***SE*** = .25) as neutral participants (***M*** = 2.34, ***SE*** = .11, ***p*** = .21). These findings suggest that fact-based correction may be more effective in reducing political bias in misinformation processing.

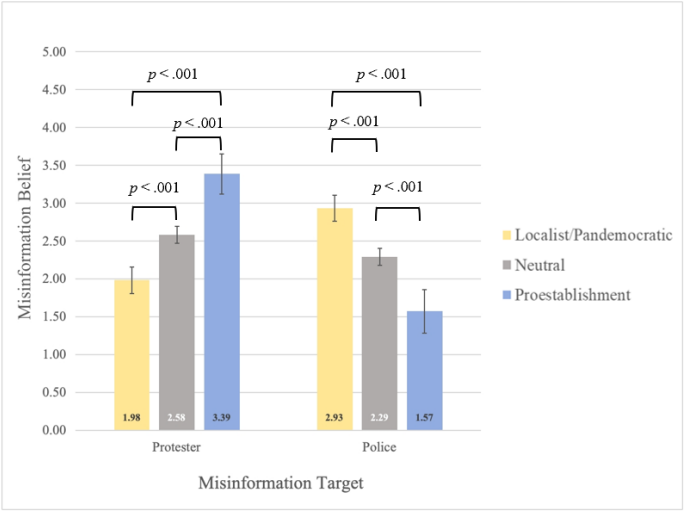

Figure 3. Effects of political stance and misinformation target on misinformation beliefs.

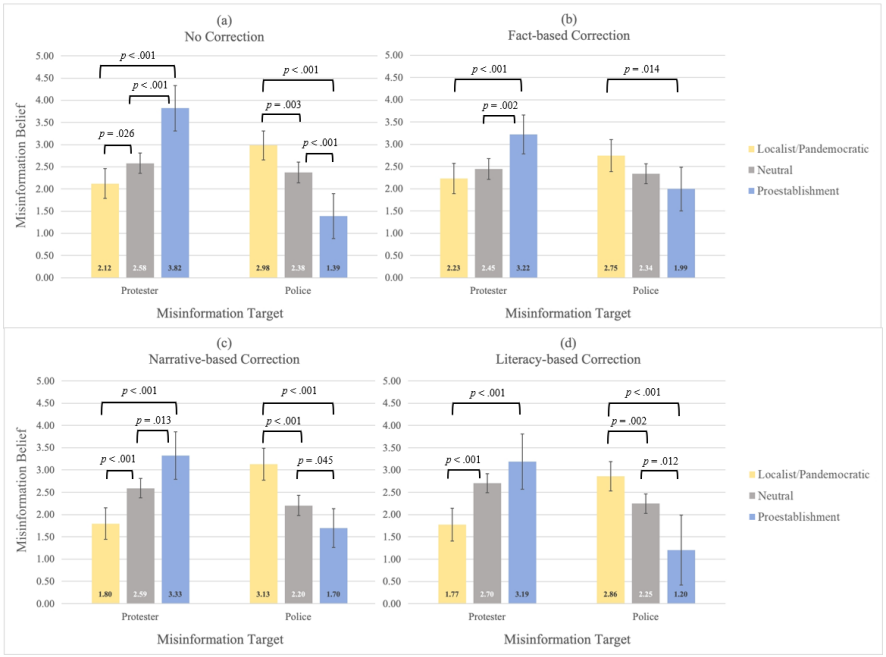

Figure 4. Effects of misinformation target, political stance, and correction approach on misinformation beliefs.

There was a significant two-way interaction between misinformation target and political stance on correction beliefs, ***F*** (2, 764) = 8.68, ***p*** < .001. As predicted by H2b and H3b, participants favoring the target of the misinformation found the corresponding correction more believable (see Figure 5). Proestablishment participants rated corrective message (that counters misinformation targeting protesters) as less credible (***M*** = 2.87, ***SE*** = 0.09) compared with neutral (***M*** = 3.08, ***SE*** = 0.09, ***p*** < .001) or localist/pandemocratic participants (***M*** = 3.57, ***SE*** = 0.8, ***p*** < .001). H2b was supported. Conversely, localist/pandemocratic participants expressed less beliefs in corrections (that addresses misinformation targeting the police; ***M*** = 2.98, ***SE*** = 0.09) compared with neutral (***M*** = 3.09, ***SE*** = 0.09, ***p*** < .001) or proestablishment participants (***M*** = 3.48, ***SE*** = 0.8, ***p*** < .001). H3b was supported.

Furthermore, a significant three-way interaction (misinformation target × political stance × correction approach) was identified, ***F*** (6, 764) = 2.96, ***p*** = .007. Political bias in shaping correction beliefs seemed to be relatively mitigated by the correction approach (see Figure 6). Narrative-based correction showed reduced influence of political stance on correction beliefs, particularly for misinformation targeting protesters. With narrative-based correction, participants across the political spectrum showed similar belief in the correction regardless of the misinformation target. In contrast, the "fact-based" and "literacy-based correction" treatments still displayed a pattern of political bias in correction belief, especially for misinformation targeting protester (see Figure 6). These findings suggest that narrative-based correction may be more effective in reducing political bias when participants evaluate corrective messages. RQ3b was answered.

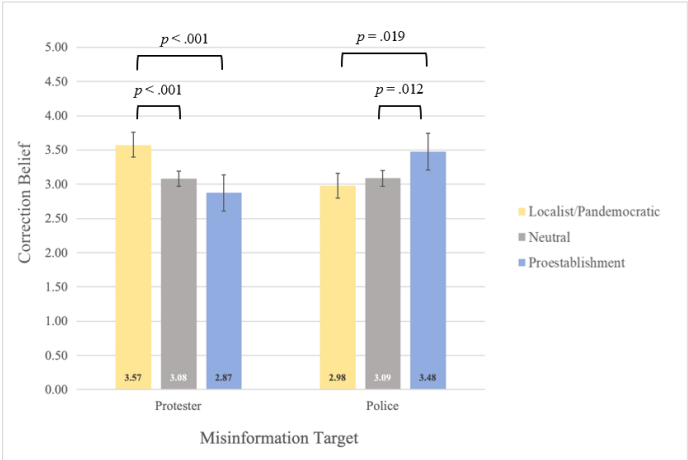

Figure 5. Effects of political stance and misinformation target on correction beliefs.

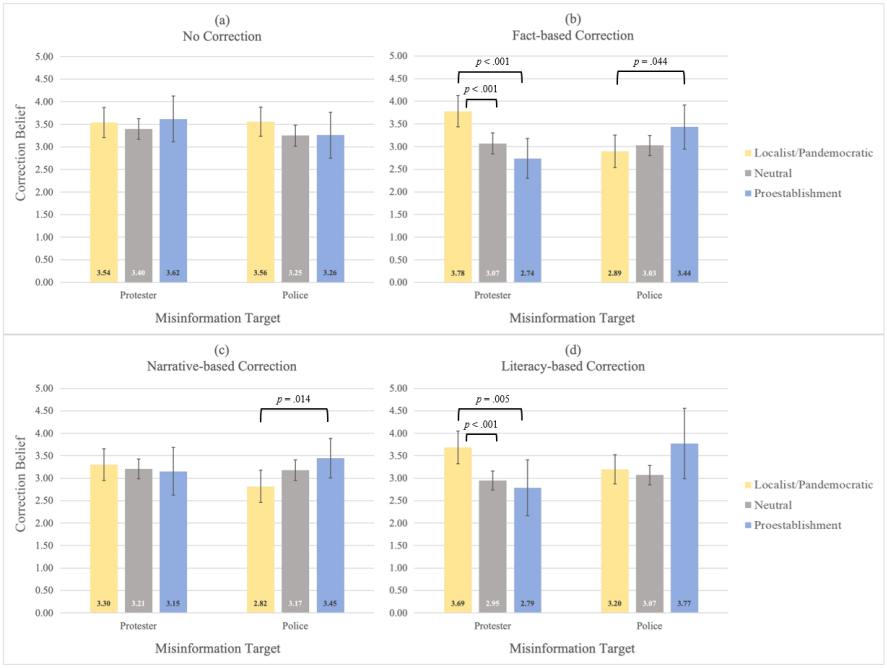

Figure 6. Effects of misinformation target, political stance, and correction approach on correction beliefs.

RQ4: Interaction Effect of Misinformation Preexposure and Political Stance

There was a significant three-way interaction effect (misinformation target × political stance × misinformation preexposure), ***F*** (2, 771) = 4.02, ***p*** = .02. For participants exposed to misinformation

targeting protesters, those with preexposure were more susceptible than those without preexposure ($M_{exposure}$ = 2.21 vs. $M_{nonexposure}$ = 1.65), but only among those with localist/pandemocratic stances (Figure 7a), F (1, 771) = 8.80, p = .004. This effect was not observed for neutral (F (1, 771) = .06, p = .81) or proestablishment participants (F (1, 771) = .45, p = .503). A different pattern emerged for misinformation targeting the police (Figure 7b). Here, preexposure only increased misinformation beliefs among neutral participants, $M_{exposure}$ = 2.47 versus $M_{nonexposure}$ = 2.09, F (1, 771) = 8.13, p = .004), not those with localist/pandemocratic stances (F (1, 771) = .57, p = .45). Although preexposure seemed to increase misinformation beliefs among proestablishment participants ($M_{exposure}$ = 1.87 vs. $M_{nonexposure}$ = 1.37), there was no statistically significant difference, F (1, 771) = 3.51, p = .062. These findings suggest participants with disconfirmation bias (e.g., localist/pandemocratic participants with less beliefs in protester-targeted misinformation; proestablishment participants with fewer beliefs in police-targeted misinformation) seem more susceptible to repeated misinformation exposure. RQ4 was answered.

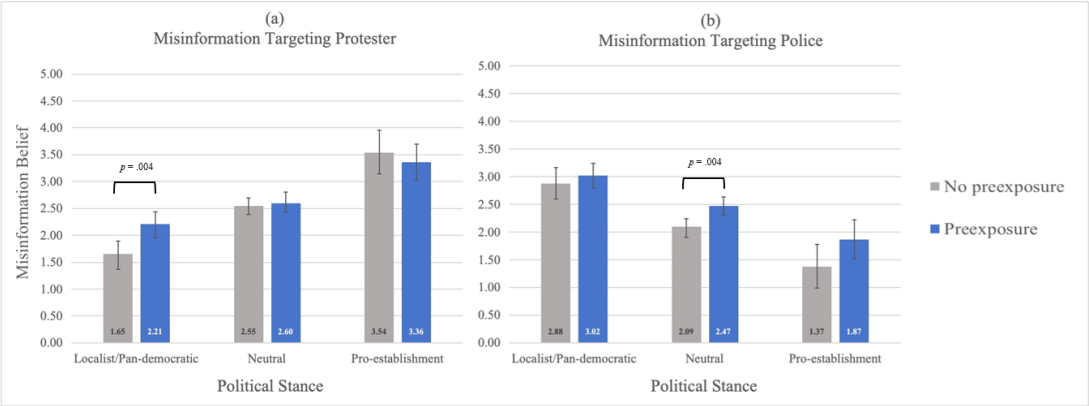

Figure 7. Effects of political stance, misinformation preexposure, and misinformation target on misinformation beliefs.

Discussion

Our findings shed light on why citizens' beliefs in politically polarized misinformation persist and remain difficult to correct in Hong Kong's context. Despite utilizing three different correction approaches, we observed that misinformation beliefs persisted, highlighting the significant impact of the CIE in contentious political issues (RQ1). The persistence of misinformation beliefs can be attributed to a combination of repeated exposure to misinformation (H1 and RQ2) and individuals' political stances (H2, H3, and RQ3). Moreover, repeated exposure to misinformation modifies the influence of partisanship on misinformation beliefs by reducing the disconfirmation bias typically triggered by partisan incongruence (RQ4).

Ineffectiveness of Correction Approaches in Reducing Misinformation Beliefs

We find no significant differences between the three correction approaches' effectiveness in reducing misinformation beliefs. This aligns with prior studies by Ecker and colleagues (2020) and Vafeiadis and Xiao (2021), showing no differences between narrative and nonnarrative or between story-based and

informational corrections, respectively. However, it contradicts Vraga and colleagues' (2020) research that noted varying effects between fact- and logic-focused corrections. Our findings also challenge the prevailing view that corrections universally reduce misinformation beliefs (Bode & Vraga, 2018; Hameleers & van der Meer, 2020; Walter & Murphy, 2018). This does not necessarily imply that misinformation is impervious to correction in all contexts. Rather, in politically polarized contexts, the effectiveness of correction efforts may be influenced by a complex interplay of factors such as individuals' political bias, the degree of political polarization at demographic level, and features of sociopolitical movement. This insight could contribute to a more nuanced and adaptive approach to misinformation correction, one that is better suited to the complexities of the information landscape in varying contexts. Practically, this revelation poses significant challenges for strategies aimed at combating misinformation during intense sociopolitical events marked by political polarization. It is essential to customize correction approaches to the attributes of the target audience and the nature of the misinformation at hand. Alternatively, if misinformation correction is suboptimal, bypassing misinformation (focusing other ways of shaping attitudes rather than corrections) can be a plausible strategy (Calabrese & Albarracín, 2023).

Repeated Exposure, Partisanship, and the CIE of Misinformation

Factors contributing to the CIE of misinformation are also investigated. We first identify the illusory truth effect, in which participants' prior exposures to misinformation reinforced their misinformation beliefs, despite the correction was presented. This aligns with prior research on the familiarity mechanism of misinformation (Lewandowsky et al., 2012; Walter & Tukachinsky, 2020). Notably, the effect was more pronounced for police-targeted misinformation, suggesting a lasting impact of repeated exposure on beliefs in misinformation targeting the police despite the movement's decline. This could be because of unresolved low trust in the police during the Anti-ELAB movement (Lee, 2020b; Zhang & Gu, 2022). Such asymmetrical impact was clearly observed in three treatments (except for narrative-based correction), though it was only statistically significant in the non-correction treatment. This suggests narrative-based corrections might have a relative effect on mitigating the illusory truth effect.

Partisanship can also influence the believability of misinformation and corrective messages, which depends on the congruence or incongruence between individuals' political stance and the target of misinformation. Confirmation bias (via partisan congruence) can work together with disconfirmation bias (via partisan incongruence) to equally affect beliefs in misinformation and corrective messages at the political spectrum's extremes (localist/pandemocratic vs. proestablishment). Apart from the investigation of political stance, our additional test of political preference (see details in Supplemental Material) provides similar findings, which can offset social desirability bias when respondents only report their favored political camp. Our findings bolster existing research on partisan-motivated reasoning in misinformation studies (Ecker & Ang, 2019; Jennings & Stroud, 2023; Walter & Tukachinsky, 2020). Particularly, the impacts of partisanship on correction beliefs showed a pattern of target-based motivated reasoning, which further extends Jennings and Stroud's (2023) two-step motivated reasoning processes. Overall, the symmetrical effects of partisanship on both misinformation and correction beliefs reflect the deep political polarization in Hong Kong (Lee, 2020a; Shen & Yu, 2021). Nevertheless, the finding that neutral participants' (presumably less susceptible to partisan bias) misinformation beliefs did not vary across correction approaches warrants further investigation. One possible reason may concern the source credibility of corrective messages.

Despite using AFP Fact Check (a French news agency with a global reach and neutral political stance) as the source for all corrections, its unfamiliarity to participants might reduce perceived trustworthiness, potentially leading to dismissal of the message, even by neutral participants (Walter & Murphy, 2018).

Repeated misinformation exposure can further interact with political stance to shape misinformation beliefs. Interestingly, repeated exposure did not strengthen the confirmation bias, but it did weaken the disconfirmation bias. Repeated exposure to misinformation targeting their own political camps increased participants' beliefs in such misinformation. This finding appears to contradict the expectation of disconfirmation bias, where individuals tend to reject misinformation that discredits their own camps. This suggests the disconfirmation bias is less potent and can be disrupted by repeated misinformation exposure. Such novel interaction sheds light on the complex interplay of familiarity and partisanship in shaping misinformation beliefs, particularly within polarized politics. Future research can explore methods to prevent repeated exposure and develop targeted interventions considering the varying strengths of confirmation and disconfirmation biases.

Why Corrections Fail: Theoretical and Practical Implications

Several key factors contribute to the limited effectiveness of corrective approaches in the polarized political landscape of Hong Kong. First, the sensitive nature of misinformation related to the Anti-ELAB movement readily activates partisan-motivated reasoning among Hong Kong citizens, reducing their openness to corrections. Given the contentious atmosphere surrounding the movement, citizens—especially those with strong political affiliations—tended to process information through a partisan lens (26.1% localist/pandemocratic, 11.7% proestablishment). This ideological divide shaped beliefs in misinformation, with some groups more susceptible than others to accepting false information. Such variability may account for why correction efforts failed to significantly alter misinformation beliefs across the surveyed population. Furthermore, repeated exposure to politically polarized misinformation may create an "illusory truth effect," wherein misinformation feels more credible through repetition alone. This phenomenon is especially relevant considering the extensive misinformation encountered by Hong Kong citizens during the Anti-ELAB movement, which likely compounded the challenge of effective correction.

These observations yield several important theoretical and practical implications. First, the target of misinformation warrants greater scrutiny in theoretical frameworks, particularly in politically polarized contexts. Although misinformation studies often emphasize the source, the target itself—especially when it pertains to divisive political issues—can strongly trigger partisan-motivated reasoning. Incorporating target characteristics into theoretical models may thus provide a more nuanced understanding of why certain misinformation is more persistent. Practically, misinformation interventions should consider strategies beyond traditional fact-checking focusing on source credibility, which aim to build cognitive awareness about the techniques of how misinformation messages are manipulated to discredit given targets. Second, the persistence of misinformation beliefs in the real-world context is often intertwined with factors like partisanship and familiarity, highlighting the need to enhance our understanding of how these elements interact to shape the processing of misinformation. Implementing algorithmic corrections on social media platforms, drawing on McLoughlin and Brady's (2024) strategies of design-centered interventions, presents a pragmatic approach. For example, crafting algorithms aimed at demoting misinformation with overt

political targets and/or extensive reach, particularly within the context of contentious and polarized political climates, could be an effective measure.

Limitations and Future Direction

This study has several limitations. First, the literacy-based correction method used factual information, which may have posed interpretative challenges for participants. This problem is not exclusive to our research and has been observed in prior studies (Vraga et al., 2020). Subsequent research should focus on evaluating how well participants understand and interpret corrective information, rather than solely assessing their beliefs in misinformation. Second, our methodology used a binary scale to gauge participants' prior exposure to misinformation, which lacks the nuance of a continuous scale that could measure the frequency of such exposure. Future studies should employ a continuous scale to more precisely determine the "degree" of influence misinformation may have.

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