



# Red media, blue media, and misperceptions: examining a moderated serial mediation model of partisan media use and COVID-19 misperceptions

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## Abstract

Misinformation and misperceptions about COVID-19 have undermined democratic system. Partisan media are regarded as one of the culprits for facilitating the spread of misinformation. Grounded in the extended communication mediation model, this study analyzes a U.S. survey sample and examines the conditional indirect effects of partisan media use on COVID-19 related misperceptions. Findings show that using conservative and liberal media both have positive effects on misperceptions and message derogation. Conservative media use has a negative impact on perceived response efficacy, whereas liberal media use positively influenced it. Furthermore, the effect of liberal media use on misperceptions became negative when serially mediated by perceived response efficacy and message derogation. Lastly, discussion network heterogeneity was a significant moderator, such that the indirect effects of partisan media use on misperceptions became weaker among those with a more heterogeneous discussion network. Theoretical and practical implications are discussed.

**Keywords** Communication mediation model · Misperception · Partisan media · Perceived response efficacy · Message derogation · Discussion network heterogeneity · COVID-19

The COVID-19 pandemic is undoubtedly the world's largest public health crisis in a century. In addition to the severe threat the virus poses to individuals' physical and psychological well-being, various types of misinformation, disinformation, fake news, and conspiracy theories related to the virus have formed an "infodemic" (Vraga et al., 2020). According to WHO, an "infodemic" refers to the state of overabundance and combination of verified and unverified information, resulting in difficulties in identifying trustworthy sources and guidance for the public to abide by (Zarocostas, 2020).

More worryingly, pundits lamented that such "infodemic" can lead to the crystallization of misperceptions as well as public skepticism and denials of science-based preventive measures, which likely intensify affective polarization, exacerbate societal cleavages, undermine trust in democratic institutions, and deteriorate democratic outcomes (Dan & Dixon, 2021; Zarocostas, 2020).

A bulk of studies has lent sufficient credence to the impact of emerging communication technologies on misinformation circulation (e.g., Su, 2021). However, legacy, partisan media can be another potential culprit for misinformation. Scholars aptly pointed out that the partisanship of the U.S. elite media are deemed a "powerful heuristic" that drives people to "form beliefs about political and scientific topics, including risks to public health" (Freiling et al., 2021, p. 4). Much of the previous efforts in exploring the role of the U.S. partisan media has been dedicated to political misperceptions, while the COVID-19 provides a novel context to revisit this vein of research. Considering that glaringly polarized attitudes have been emerging along partisan lines, this attempt is much warranted (Scheufele et al., 2020).

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As a heuristic, partisan media coverage of the pandemic can contribute to different perceptions regarding the preventive measures as well as their viewers' attitudes toward the pandemic. For instance, some partisan media's questioning over the effectiveness of vaccines and masks could lead their audiences to dismiss or even resist these measures, resulting in a negative assessment on the validity of recommended prevention (Ash et al., 2020).

Moreover, derogation of news has also attracted scholarly attention. Donald Trump's understatement of the epidemic severity made audiences to hold stronger belief that the nonpartisan media's portrayal of the pandemic is biased and overblown (Borah et al., 2022; Mitchell et al., 2021). Additionally, the decreased perceived response efficacy can also drive the derogation of messages wherein preventive measures are promoted (De Meulenaer et al., 2015; Roberto et al., 2021). In essence, the reduced belief in the recommended response contributes to the loosening of fear control (Roberto et al., 2021). In other words, "when individuals see no efficacious means of eliminating danger, they turn to the defensive reactions as a means of reducing their fear" such as avoiding and derogating the messages (Dillard et al., 2018, p. 974).

The silver lining, however, lies in the heterogeneity of individuals' discussion networks. Studies indicated that the more people are willing to talk with those of different social classes and heterogeneous viewpoints, the more likely they are to reduce misperceptions brought about by the effects of echo chambers, in which like-minded people strengthen the views of one another while denigrating the opposing ideas (Su, 2021), hindering self-reflection and correction.

Taken together, this study has three main purposes. First, it examines the impact of partisan media use on COVID-19 related misperceptions. Second, it investigates whether the effects of partisan media use are mediated through response efficacy and message derogation. Lastly, it explores the potential role of discussion network heterogeneity in mitigating the proposed indirect effects. Our research potentially enriches the literature on partisan media effect and provides insights into the global governance of the pandemic.

## Literature review

### The communication mediation model

This study is anchored by the Communication Mediation Model, which is also termed the O-S-O-R (orientation<sub>1</sub>-stimuli-orientation<sub>2</sub>-response) model. The O-S-O-R model is a heuristic framework that explains the conditional indirect effects of media stimuli on individuals' behavioral or attitudinal responses (McLeod et al.,

1994; Shah et al., 2007). In the O-S-O-R model, the first O (orientation<sub>1</sub>) refers to "structural, cultural, cognitive, and motivational characteristics" (McLeod et al., 1994, pp. 146–147), which serves as a moderator and is oftentimes operationalized as community integration, political ideology, and psychological preferences. The "S" (stimuli) represents a form of communication, including the reception of messages from mass or social media. The second O (orientation<sub>2</sub>) refers to "what is likely to happen between reception of the message and the response of the audience member" (McLeod et al., 1994, p. 146–147), which is often operationalized as efficacy or attitude that mediate the path from the stimuli to the response. The "R" (response) represents the outcome of the stimuli, including knowledge acquisition, government evaluation, and civic engagement (Lee & Kwak, 2014; Xiang & Hmielowski, 2017).

Since its inception, the O-S-O-R model has been examined in multiple contexts. Xiang and Hmielowski (2017) demonstrated that in China wherein plenty of international media and applications are banned, using foreign media (S) decreased regime support (R), and this effect is mediated through government trust (O<sub>2</sub>) while moderated by national pride (O<sub>1</sub>). Grounded in the O-S-O-R model, Lee and Kwak (2014) showed that political satire exposure (S) triggers political participation (R), while this main effect is mediated through negative emotions and moderated by education. Put specifically, consuming political satire elicits people's negative emotions toward politics and political figures, which in turn increases political participation; further, this indirect effect is stronger among highly educated ones (Lee & Kwak, 2014).

Along this line, the current study grounds itself in the O-S-O-R model and investigates the conditional indirect effects of partisan media use on COVID-19 misperceptions, with perceived response efficacy and message derogation as serial mediators while discussion network heterogeneity as moderator. In doing so, this study makes two potential contributions. First, prior O-S-O-R studies, albeit abundant, have paid less attention to the antecedents of misconception formation while focusing more on participatory action and knowledge acquisition. However, as the "R" variable pertains to both behavioral and attitudinal outcomes, our inclusion of misperception deems imperative.

Second, our study also extends the original O-S-O-R model through including two serial orientation<sub>2</sub> variables, namely, perceived response efficacy and message derogation. This attempt combines the O-S-O-R model with two key constructs of the Extended Parallel Process Model (EPPM hereafter), positing that politicized media coverage of COVID-19 would first affect people's evaluations on the effectiveness of the recommended responses, and further intensifies the tendency to "weigh information consistent

with their existing beliefs or social identities more heavily than contradictory information when motivated by a directional goal in forming an evaluation” (Bolsen et al., 2014, p. 236). The rationale of proposing each path is elaborated below.

### Partisan media in the united states

Ample evidence has been rendered to the role of news media in shaping individuals’ understandings of reality. News media use is a crucial predictor of knowledge acquisition, facilitating formation of awareness and perceptions (Eveland, 2001; McLeod et al., 1994). However, these outcomes do not always “accumulate uniformly” (p. 492) in that people’s political ideologies and (pre)propositions influence the ways in which they make sense of the contents they consume (Garrett et al., 2019).

Partisan media are conceptualized as “outlets that cover news and politics in a way favors one political party of ideology over others, and offer opinionated coverage” (Weeks et al., 2021, p. 3). Hence, unlike those prioritizing balance and fairness, partisan media are committed to the “framed, spun, and slanted” (Jamieson et al., 2007, p. 26) stories to advance certain agendas and systematically trigger misperceptions echoing the interest of the affiliated party (Garrett et al., 2019).

A bulk of research and polls demonstrates that MSNBC and CNN are on the left end of the ideological spectrum of the U.S. media while the Fox News the right (e.g., Druckman et al., 2019; Grieco, 2020). Decades of media studies have almost invariably operationalized the U.S. conservative media as the Fox News and conservative radios such as the Rush Limbaugh Show while liberal outlets as MSNBC and CNN (Borah et al., 2022; Druckman et al., 2019; Iyengar & Hahn, 2009; Jamieson et al., 1996; Jamieson & Capella, 2008; Jones 2002; Myrick & Chen, 2022).

In terms of the conservative outlets, Jamieson et al. (1996) indicated that The Rush Limbaugh Show serves the brand of Republicanism, providing his audiences with a lexicon, arguments, and counter arguments to be used to reinforce the conservative ideology and mobilize party members for actions. Later, Jamieson and Capella (2008) suggested that The Rush Limbaugh Show and the Fox News constituted an echo chamber that promoted and defended conservatism. Late until the 2016 election, Rush Limbaugh still is “a vocal supporter of President Donald Trump and has attracted controversy” (Myrick & Chen, 2022, p. 141), aligning Jones’s (2002) indication that The Rush Limbaugh Show is of a strong partisan nature and profoundly affected its audience long-term ideology.

As for the Fox News programs, Iyengar and Hahn (2009) argued that the Fox News showed “a consistently

pro-Republican slant” (p. 22). Skocpol and Williamson (2016) also argued that the Fox News is the right-wing blogosphere. Aligning all these scholarly arguments, Hmielowski and associates (2014) operationalized conservative media using both specific channels: the Fox News programs and The Rush Limbaugh Show. The authors highlighted that both outlets were found to cover issues and events ranging from the Iraq War to the presidency campaigns “in a way that is more supportive of conservative and Republican interests than CNN, MSNBC, and the national network news programs” (Hmielowski et al., 2014, p. 868).

When it comes to the liberal outlets, Druckman and associates (2019) argued that MSNBC is traditionally the Democrats’ in-party source. Scholars have also termed CNN “blue media” as its contents “more closely matched the preferences of Democrats” (Iyengar & Hahn, 2009, p. 24) and “leaned toward the left” (Gil de Zúñiga et al., 2012, p. 600). Compared to the above partisan media, outlets such as the PBS News and the Associated Press are usually deemed less partisan. With the help of the literature, the current study operationalizes conservative media use as consuming the Fox News programs and the Rush Limbaugh Show while liberal media use as consuming MSNBC and CNN programs.

### From partisan media use (S) to COVID-19 misperceptions (R)

Using the O-S-O-R model, this study treats partisan media use as the “stimuli” while COVID-19 misperceptions as the “response.” A misperception denotes a belief in statements or positions that are “counter to the best available evidence” (Hutchens et al., 2021, p. 703). For decades, a sizable proportion of studies has exhibited the role of partisan media use in shaping misperceptions. The reason is that the very purpose of these partisan media is to promote ideas congruent with their political leanings and attack their counterpart (Garrett et al., 2016); hence, facts oftentimes give way to predisposed ideologies and political interests. In other words, partisan media’s creation of a “self-protective enclave of consistent messages” (p. 612) contributes to the misperception formation (Levendusky, 2013). Moreover, the one-sided messages are usually more “digestible” (p. 612) than balanced and mixed messages (Levendusky, 2013), soothing the cognitive stresses among audiences, thus leading to hasty formation of biased perceptions.

This positive effect is more pronounced for conservative media. Studies showed that using conservative news media and sources led to various misperceptions such as global warming skepticism and denial, the Obama birthplace misbeliefs, the death panel misperception, and so forth (Borah

et al., 2022; Garrett et al., 2016; Hmielowski et al., 2014, 2020; Meirick, 2013).

In the case of the COVID-19 pandemic, a few has also demonstrated consistent evidence regarding the role of conservative media use in facilitating misperceptions. For instance, Jamieson and Albarracine (2020) reported that conservative media covered multiple unfounded and unverified claims such as that China deliberately created the virus or that the virus was due to a laboratory leak. Chung and Jones-Jang (2021) documented that consuming conservative media and Trump briefing reduced people's tendency to believe that the pandemic is as serious as it is, as well as their acceptance to the recommended preventive measures. Likewise, Borah and associates (2022) found that information gathering from Trump was positively tied to COVID-19 misperceptions.

The reason pertains to the fact that conservative media have not only fed into "the politicization of the coronavirus response and appeared to energize protests demanding that states end their lockdowns early" (Evanega et al., 2020, p. 10), but also led to people's misperceptions regarding the origin, nature, and efficacy of preventive measures of the pandemic (Bhadelia, 2020). Therefore, our first hypothesis is posited:

H1: conservative media use would positively influence COVID-19 misperceptions

When it comes to the role of liberal media, however, evidence becomes mixed. On the one hand, many found that using liberal media is of similar effect to that of their conservative counterpart on perception driving (e.g., Garrett et al., 2016; Hmielowski et al., 2020). A poll reported that akin to using the Fox News programs, consuming liberally pitched media such as MSNBC also had a negative effect on people's knowledge about current events (PublicMind Poll, 2012). Garrett et al. (2016) demonstrated a positive linkage between liberal outlets reliance and political falsehood endorsement. Weeks and associates' (2021) recent research also showed that visits to both liberal and conservative websites were tied to misperceptions.

On the other hand, however, studies revealed either negative or null effect of liberal media use on misperceptions forming. Meirick (2013) found that unlike Fox News use, exposure to MSNBC and CNN did not affect the death panel misperception among Americans. Analyzing the 2012 and 2016 presidential elections, Garrett et al. (2019) suggested that the influences on the growing favorability gap and associated misperceptions are more pronounced in terms of conservatives than liberals. Hutchens et al. (2021) also indicated that liberal media use did not predict misperceptions unless it interacts with media trust. Chung and Jones-Jang (2021) as well as Borah et al. (2022) found that in the context of COVID-19, the effect of liberal media use on

people's perceptions was diametrically opposed to that of conservative media use.

These mixed findings suggested that the effect of liberal media use on misperceptions might be context sensitive. Given that extremely limited research in partisan media effects has been carried out in the context of COVID-19, there is little evidence as to whether the COVID-related coverage of liberal media such as MSNBC and CNN have intensified or undermined people's relevant misperceptions. Therefore, we put forth the following research question and conduct an exploratory analysis, with a view to provide new empirical evidence to the literature.

RQ1: how does liberal media use influence COVID-19 misperceptions?

### **Partisan media use (S), perceived response efficacy ( $O_{2a}$ ), and message derogation ( $O_{2b}$ )**

**From partisan media use (S) to perceived response efficacy ( $O_{2a}$ ).** One difference between conservative and liberal media coverage lies in the prisms through which these media assess the efficacy of the epidemic preventive measures such as mask wearing, vaccines, and social distancing (Chung & Jones-Jang, 2021; Moon et al., 2021). People's perceived response efficacy of COVID-19 is included as the first orientation<sub>2</sub> variable in this study.

Derived from the EPPM, perceived response efficacy is conceptualized as the extent to which one sees the recommended response strategies to cope with a health crisis as effective (Moon et al., 2021). Individuals' perceptions regarding the effectiveness of the recommended response to avoid the threat, upon exposure to threatening messaging, can determine whether to adapt to the very response (Thrasher et al., 2016). Exemplifying this pandemic, one could be regarded as high in perceived response efficacy when they believe that the recommended measures are effective in coping with the pandemic; vice versa (Chung & Jones-Jang, 2021).

In addition to the effect of partisan media use on misperceptions, this study is guided by the O-S-O-R model and probes whether using partisan media (S) would affect perceived response efficacy of COVID-19 ( $O_{2a}$ ). Multiple studies have rendered credence to this effect. Conservative media use was found to associate with greater preventive measure avoidance (Moon et al., 2021) and lower perceived response efficacy (Chung & Jones-Jang, 2021). A recent Pew report documented that conservative media sources largely echoed Trump Administration's conspiracy theories, which in turn undermined people's health knowledge (Jurkowitz & Mitchell, 2020). The decreased knowledge further led people to make light of the crisis and to believe the recommended measures are useless, and even were fabricated by

their liberal counterparts or China for malicious purposes (Jamieson & Albarracine, 2020)).

Consuming liberal media, on the contrary, was found to boost perceived response efficacy and facilitate prevention engagement (e.g., Chung & Jones-Jang, 2021; Moon et al., 2021). Evidence showed that liberal media conveyed rich sources directly from CDC and scientific agencies, who advocated the coping measures (Jamieson & Albarracine, 2020; Moon et al., 2021). Since the frequency by which one follows news from a particular source promotes their trust to the source, liberal media use also tied positively to trust in health experts and their recommendations (Moon et al., 2021). Hence, we posit:

H2a: Conservative media use would negatively influence perceived response efficacy of COVID-19.

H2b: Liberal media use would positively influence perceived response efficacy of COVID-19.

**From partisan media use (S) to message derogation (O<sub>2b</sub>).** As partisan media influence audiences' perceived severity of the pandemic, people may also form different attitudes toward the pandemic messages in the media other than the partisan ones they consume. One such attitude is message derogation (Roberto et al., 2021). Message derogation refers to a derogatory attitude to a message, such as criticizing the (source of the) message (Roberto et al., 2021). Researchers operationalize news derogation by the extent to which people see the information as exaggerated, distorted, or overblown (Thrasher et al., 2016). In the context of COVID-19, message derogation is reflected in a belief that the relevant news and messages on mass media exaggerate the threat and severity of the pandemic.

In terms of partisan media use amid the pandemic, scholars found that using conservative media resulted in rejection and derogation of news media (e.g., Conway et al., 2021). This is premised on the fact that conservative media consumers have an oppositional attitude toward the outbreak, a greater perceived pressure for change, and a firmer belief that objectively reported news threatens their agency and freedom (Thrasher et al., 2016).

The role of liberal media is found at odds because with richer scientific sources, consumers of liberal outlets do not easily tend to perceive the COVID news as exaggerated or overblown (Jamieson & Albarracine, 2020; Moon et al., 2021); instead, they are more likely to perceive the pandemic as of higher risk (Chung & Jones-Jang, 2021) and engage, rather than derogate, more actively in the recommended measures conveyed by the news (Moon et al., 2021). Hence, we formulate the following hypotheses:

H3a: Conservative media use would positively influence COVID-19 news derogation.

H3b: Liberal media use would negatively influence COVID-19 message derogation.

**A serial mediation mechanism (S-O<sub>2a</sub>-O<sub>2b</sub>-R).** As reviewed earlier, this study is anchored by the O-S-O-R model while extending the model by operationalizing the orientation<sub>2</sub> as two serial constructs of the EPPM, namely, perceived response efficacy and message derogation, positing that the two factors would mediate the effects serially.

The rationale of the directionality of the proposed mediation effects is as follows. First, in accordance with the EPPM, individuals' perceptions of the effectiveness of the recommended responses to avoid threat usually emerge immediately upon exposure to threatening messaging, which further lead them to evaluate the adaptiveness of the responses (Thrasher et al., 2016).

Next, perceived response efficacy can affect news derogation because people tend to defensively avoid information, derogate risk messages, and engage in maladaptive responses while regarding the responses as of low efficacy (Hong, 2011; McMahan et al., 1998). Two decades ago, McMahan et al.'s (1998) experiment have revealed the negative effect of perceived response efficacy on message derogation regarding unknown risks. Hong (2011) confirmed and showed that as individuals' health consciousness became high, their perceived response efficacy increased, and the latter led to higher message acceptance rather than derogation.

Finally, news derogation is a prerequisite of misperceptions. Scholars pointed out that questioning and derogating the credibility of the news and its sender can "critically undermine the persuasiveness of fact-checking messages" (Stubenvoll & Matthes, 2022, p. 325). Hence, derogating factual journalistic evidence emerges as a pivotal strategy people hold on to their misperceptions.

In summary, our formulation of the directionality of this serial mediating mechanism is mainly based on the theorization of the EPPM (McMahan et al., 1998). That is, upon exposing to fear-appeal messages, individuals are initially motivated to assuage the risk per se by engaging in the efficacy appraisal. Once perceived efficacy is boosted, people would further apply danger control such as message acceptance while lower the likelihood of defensive avoidance, denial, and derogation (Popova, 2012). In a nutshell, risk message exposure first leads to efficacy appraisal, and then elicits danger and fear control such as avoidance and derogation. Therefore, the following hypotheses are posited:

H4a: The effect of conservative media use on COVID-19 misperceptions would be serially mediated by response efficacy and message derogation.

H4b: The effect of liberal media use on COVID-19 misperceptions would be serially mediated by response efficacy and message derogation.

## Discussion network heterogeneity as a moderator (O<sub>1</sub>)

In addition, we include discussion network heterogeneity as the orientation<sub>1</sub> variable in the O-S-O-R model by which the study is anchored. Orientation<sub>1</sub> often refers to ‘structural, cultural, cognitive, and motivational characteristics’ (McLeod et al., 1994, pp. 146–147). Public discussion is deemed the soul of democracy because it maintains an informed citizenry and guarantees free flow of information (Yoo & Gil de Zúñiga, 2019). Discussion also differs according to the extent of network diversification. Defined as the extent to which individuals are exposed to diversified opinions and involve in discussions with people of different viewpoints and of different societal classes and groups, discussion network heterogeneity determines the quality of deliberative democracy (Kim & Chen, 2015) through boosting citizens’ political tolerance, promoting better knowledge of current affairs, and facilitating understandings of the rationales of various political views (Price et al., 2002; Scheufele et al., 2006).

A sizable proportion of research has confirmed the role of discussion network heterogeneity in facilitating factual political knowledge (McLeod et al., 1999). This is because within a heterogeneous discussion network, individuals are typically forced to “compromise between different viewpoints,” thus being motivated to reassess the “issues where conflict occurs” (Scheufele et al., 2006, p. 730). In other words, exposure to heterogeneous discussions can create greater cognitive burden (Su, 2021), which forces citizens to step out of their comfort zone, learn more about alternative perspectives, reflect on their pre-existing viewpoints, and become more politically sophisticated (Festinger, 1957; Kim & Chen, 2015; Scheufele et al., 2006). As knowledge itself is a negative predictor of misperceptions (Garrett et al., 2016), greater discussion network heterogeneity can reduce misperceptions (e.g., Röchert et al., 2022).

In the current study, we include discussion network heterogeneity as a moderator and propose that it would weaken the main and the mediated associations between partisan media use and misperceptions. The rationale is as follows. Partisan media use intensifies misperceptions through producing a “self-protective enclave of consistent messages” (Levendusky, 2013, p. 612), facilitating ideas aligning their political leanings (Garrett et al., 2016). Hence, exposure to heterogeneous opinions would presumably help individuals step out of this self-protective enclave, hearing more about different viewpoints, and being more immune to misperceptions. The last hypothesis is posited:

H5: The serially mediated effects of (a) conservative media use and (b) liberal media use on COVID-19 misperceptions would be contingent upon discussion network

heterogeneity, such that the effects are weaker among those with higher discussion network heterogeneity.

Figure 1 visualizes the proposed moderated serial mediation model.

## Methodology

### Sampling

Upon approval of the institutional review board (IRB) at a large public university in the U.S., this survey research was administered via a Qualtrics questionnaire between October 1st and 15th, 2021. Participants residing in the U.S. and aged 18 and above were recruited from Amazon Mechanical Turk (MTurk). A total of 1,004 respondents participated. Respondents came from a national poll wherein each was compensated with 1.1 dollars.

A growing body of research has utilized MTurk for sampling. Scholars argued that the demographics of MTurk participants are more diverse than student samples (Berinsky et al., 2012), and its data validity is equivalent to that of laboratory research (Xiao & Su, 2021). More importantly, researchers highlighted that MTurk can offer a reliable source of participants for research aiming to examine “cognitive processes such as attention and attitudes,” “rather than [to] infer general population estimates” (p. 168) as it provides acceptable psychometric properties with ideal validity (Amazeen, 2020).

Upon raw data collection, samples were cleaned in two phases. First, incomplete samples were removed. Second, following previous studies (e.g., Amazeen, 2020; Greszki et al., 2015), we excluded those spent less than six minutes on the survey (*Median* = 12 min), because these participants were deemed “speeders” that likely provided low-quality answers. As a result, 906 valid samples were yielded. Our final respondents are aged between 18 and 71 (*M* = 37.47, *SD* = 11.08); slightly over half were male (56%), and the majority were White (79.5%), followed by Black or African American (8.1%), Asian (7.9%), Hispanic or Latino (3.7%), other (0.4%), and American Indian or Alaska Native (0.2%) and Native Hawaiian or Pacific Islander (0.2%). Additionally, the respondents’ monthly income (*M* = 3.63 [\$8000-\$10,000], *SD* = 1.61) and Party ID (1 = strong Republican, 5 = strong Democrat; *M* = 3.29, *SD* = 1.53) were also surveyed.

### Measures

**Conservative media use.** A plethora of studies has operationalized conservative media use as exposure to Fox News programs and The Rush Limbaugh Show (e.g., Gil

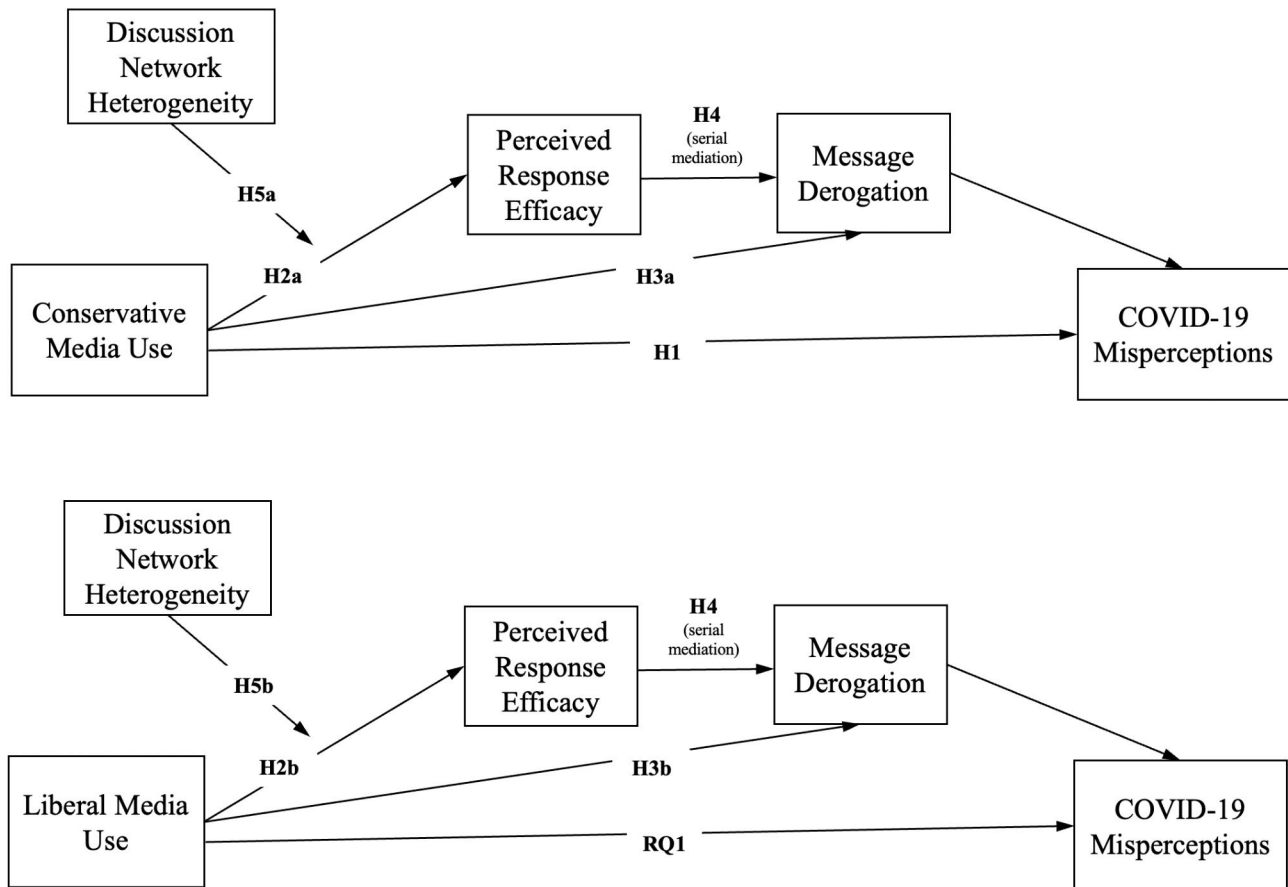


Fig. 1 The proposed moderated serial mediation model

de Zúñiga et al., 2012; Guess et al., 2021; Hmielowski et al., 2014; Jamieson & Cappella, 2008). Aligning this vein of research, our respondents were asked to indicate the frequencies with which they consume “Fox News programs” and “The Rush Limbaugh Show” via a 5-point Likert scale (1 = never, 5 = always;  $M = 3.46$ ,  $SD = 1.16$ ,  $R = .76$ ).

**Liberal media use.** Following prior studies (Gil de Zúñiga et al., 2012; Stroud, 2008), respondents indicated the frequencies with which they consume “CNN programs” and “MSNBC programs” via a 5-point Likert scale (1 = never, 5 = always;  $M = 3.71$ ,  $SD = 0.99$ ,  $R = .75$ ).

**COVID-19 misperceptions.** The respondents indicated the extent to which they agree with eight statements or conspiracy theories that are without any scientific evidence, including “5G radiant is the real cause of COVID-19,” “COVID-19 was engineered and intentionally leaked from the Wuhan Institute of Virology in China,” “COVID-19 is a part of a biological warfare program China waged,” “COVID-19 represents an attempt of China to hurt the Western world,” “COVID-19 was produced as the United Nations and governments around the world are colluding to wipe out 90% of the global population” “Bill Gates intends

to implant microchips in people via COVID-19 vaccination” and so forth, based on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $M = 3.88$ ,  $SD = 0.95$ ,  $\alpha = 0.95$ ).

**Perceived response efficacy.** Adapted from prior research (e.g., Koebele et al., 2021), the respondents were asked to indicate the extent to which they agree with the following three statements, “Wearing masks works in preventing COVID-19,” “Social-distancing is effective in preventing COVID-19,” and “If I get vaccinated, I would be less likely to get COVID-19,” via a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $M = 4.19$ ,  $SD = 0.70$ ,  $\alpha = 0.79$ ).

**COVID-19 message derogation.** Adapted from prior research (e.g., Roberto et al., 2021), the respondents were asked to indicate the extent to which they agree that the information provided about the COVID-19 on mass media in general is “exaggerated,” “manipulated,” “overblown,” “distorted,” and “biased,” via a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $M = 3.61$ ,  $SD = 1.21$ ,  $\alpha = 0.91$ ).

**Discussion network heterogeneity.** Adapted from prior research (e.g., Kim & Chen, 2015), the participants suggested the frequencies they discuss public affairs with

people “who have different viewpoints with you,” “who you disagree with,” “from different race or ethnicity,” and “from different social class with you,” via a 5-point Likert scale (1 = never, 5 = always;  $M = 3.60$ ,  $SD = 0.75$ ,  $\alpha = 0.86$ ).

**Exogeneous (control) variables.** In addition to the demographics, we also included internal efficacy, news interest, and political interest as controls. Internal efficacy is controlled because people’s beliefs and misperceptions are contingent on internal efficacy (Hart et al., 2020; Jang & Kim, 2018). Respondents indicated the extent to which they agree with three statements, “I feel that I have a pretty good understanding of the important political issues facing our country,” “I consider myself well-qualified to participate in politics,” and “I feel that I have the ability to change the society” via a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree;  $M = 4.08$ ,  $SD = 0.65$ ,  $\alpha = 0.72$ ). Controlling for interests in news and politics is also warranted to parse out the potentially confounding effects of the news use variables because we expect our respondents to be regular news consumers as well as the fact that the pandemic has been deeply politicized (Hart et al., 2020). Both were measured through a 5-point Likert scale (1 = not at all interested, 5 = extremely interested) ( $M_{news} = 3.90$ ,  $SD_{news} = 1.06$ ;  $M_{politics} = 3.71$ ,  $SD_{politics} = 1.07$ ). See supplementary information for detailed measurements of all variables.

## Analytical approach

The PROCESS macro models were applied to investigate the proposed Hs and RQ (Hayes, 2018). First, model 6 was performed to address the proposed main associations (H1, RQ1, H2a-b, H3a-b) and the serial mediation models (H4a-b). Model 86 was conducted to address the moderation and moderated serial mediation mechanisms (H5 and H6). Prior to the analysis, the bivariate correlations across all variables were computed using *R*, and Fig. 2 shows the heatmap that visualizes the correlations.

## Results

### Main effects

H1 postulates that conservative media use has a positive effect on COVID-19 misperceptions. As Table 1 shows, there is a positive association between conservative media use and COVID-19 misperceptions ( $B = 0.34$ ,  $SE = 0.02$ ,  $p < .001$ , 95% CI: [0.6046, 0.6901]), lending support to H1.

RQ1 asked about the effect of liberal media use on COVID-19 misperceptions. As can be seen in Table 2, our exploratory regression analysis exhibited a positive association between both factors ( $B = 0.22$ ,  $SE = 0.02$ ,  $p < .001$ , 95%

CI: [0.6802, 0.7561]). This exploratory result implies that among the respondents, using liberal media programs (i.e., MSNBC and CNN programs) led to greater misperceptions about COVID-19.

H2a and 3b investigate the effect of partisan media use on perceived response efficacy. Findings showed that conservative media use has a negatively impact on perceived response efficacy ( $B = -0.02$ ,  $SE = 0.04$ ,  $p < .05$ , 95% CI: [0.0085, 0.0883]), whereas liberal media use has a positively effect on it ( $B = 0.11$ ,  $SE = 0.03$ ,  $p < .001$ , 95% CI: [-0.4274, -0.2503]), rendering full support to H2a and 2b.

H3a and 3b probe the effect of partisan media use on message derogation. Findings showed that conservative and liberal media use were both positively associated with message derogation (conservative:  $B = 0.59$ ,  $SE = 0.02$ ,  $p < .001$ , 95% CI: [0.4180, 0.5117]; liberal:  $B = 0.33$ ,  $SE = 0.03$ ,  $p < .001$ , 95% CI: [0.2778, 0.4099]), lending support to H3a whilst reject to H3b.

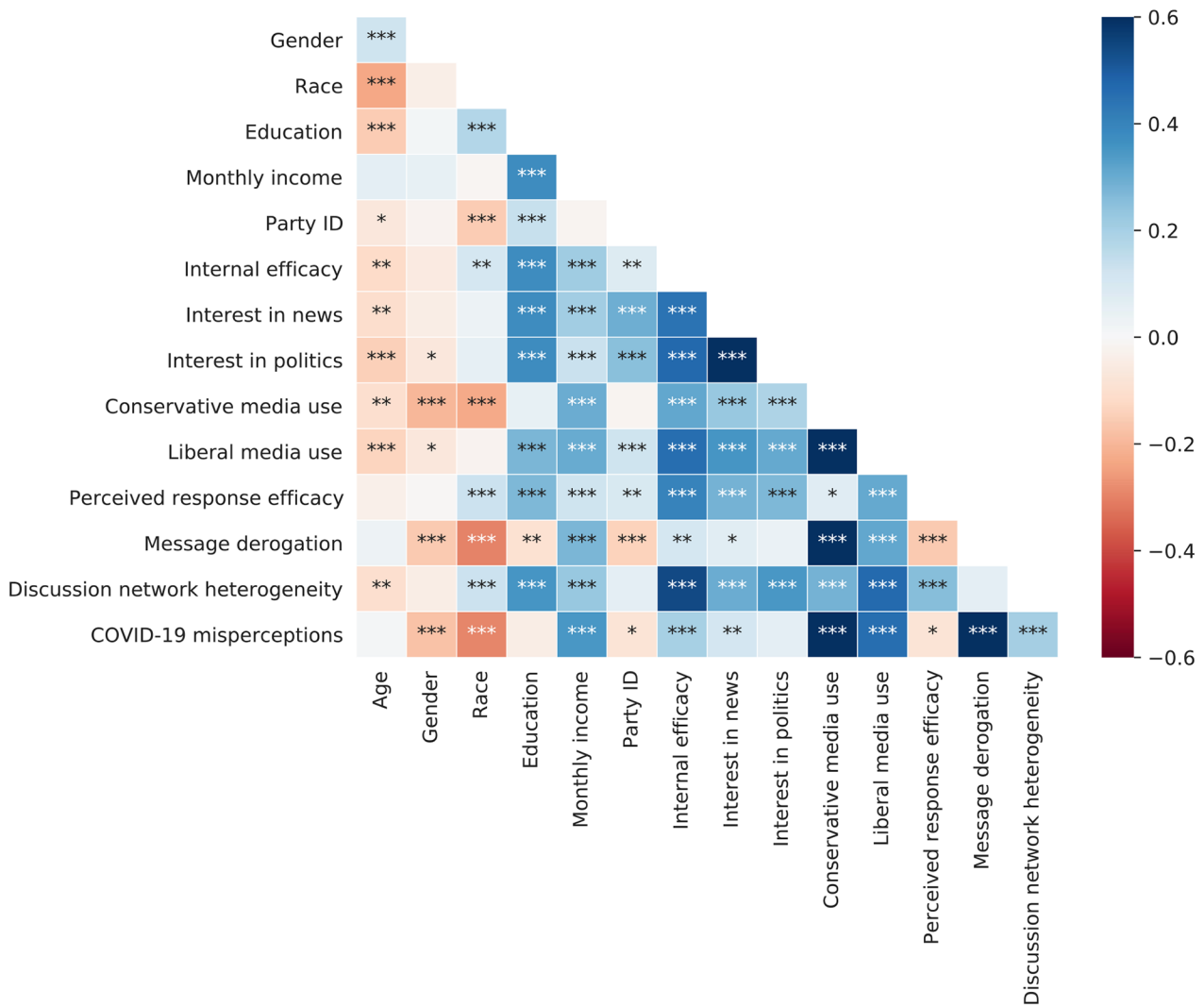
### Serial mediations

The mediation analysis demonstrates that there is not a serial mediating effect by which conservative media use indirectly influences COVID-19 misperceptions through perceived response efficacy and message derogation ( $B = 0.0032$ ,  $SE = 0.0035$ , 95% CI: [-0.0043, 0.0096]), rejecting H4a. However, there is a serial mediating effect by which liberal media use indirectly affects COVID-19 misperceptions through perceived response efficacy and message derogation serially ( $B = -0.0278$ ,  $SE = 0.0110$ , 95% CI: [-0.0514, -0.0081]). Specifically, using liberal media first increased perceived response efficacy ( $B = 0.32$ ,  $SE = 0.03$ ,  $t = 9.24$ ,  $p < .001$ , 95% CI: [0.2542, 0.3913]), the latter in turn lowered message derogation ( $B = -0.36$ ,  $SE = 0.05$ ,  $t = -7.83$ ,  $p < .001$ , 95% CI: [-0.4525, -0.2711]), which further tied to misperceptions ( $B = 0.72$ ,  $SE = 0.02$ ,  $t = 37.03$ ,  $p < .001$ , 95% CI: [0.6749, 0.7504]). The results lent support to H4b. This finding implies that the influence of liberal media use on misperceptions became significantly negative when mediated serially through an increased perceived response efficacy and a decreased message derogation.

### Moderated serial mediations

The moderated mediation model analyzed by PROCESS macro model 86 further demonstrates how discussion network heterogeneity varies the indirect effects (H5a and 5b). Results revealed a significant interaction between conservative media use and discussion network heterogeneity on perceived response efficacy ( $B = 0.10$ ,  $SE = 0.02$ ,  $t = 5.09$ ,  $p < .001$ , 95% CI: [0.0623, 0.1406]).





**Fig. 2** Heatmap of the bivariate correlations across all variables  
 Notes: The color density of cells was based on the correlation coefficients. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

There is a significant moderated serial mediation between conservative media use and COVID-19 misperceptions (*Moderated mediation index* = -0.0146, *SE* = 0.0038, 95% CI [-0.0224, -0.0077]). Specifically, the bootstrapped 95% bias-corrected confidence intervals suggest that conservative media use influenced COVID-19 misperceptions by first lowering perceived response efficacy and then enhancing message derogation only when respondents had a low-level discussion network heterogeneity ( $B = 0.0150$ ,  $SE = 0.0051$ , 95% CI: [0.0047, 0.0252]), but not a moderate ( $B = 0.0076$ ,  $SE = 0.0040$ , 95% CI: [-0.0008, 0.0153]) or a high level ( $B = -0.0034$ ,  $SE = 0.0038$ , 95% CI: [-0.0120, 0.0030]). Figure 3 visualizes the moderation effect, indicating that discussion network heterogeneity affects the portion (from conservative media use to perceived response efficacy) of the indirect effect on misperceptions, and the

moderation represents the divergent positive type of contingent moderation under the typology coined by Holbert and Park (2020). Hence, H5a is supported.

Same analysis was performed to address H5b. Results once again exhibited a significant interaction between liberal media use and discussion network heterogeneity on perceived response efficacy ( $B = 0.07$ ,  $SE = 0.02$ ,  $t = 3.08$ ,  $p < .01$ , 95% CI: [0.0245, 0.1102]).

Further, there is a significant moderated serial mediation effect between liberal media use and COVID-19 misperceptions (*Moderated mediation index* = -0.0175, *SE* = 0.0094, 95% CI: [-0.0368, -0.0005]). Specifically, the bootstrapped 95% bias-corrected confidence intervals suggest that the significant positive effect of liberal media use on COVID-19 misperceptions mediated serially through perceived response efficacy and message derogation became more

**Table 1** Serial Mediation and Moderated Mediation with Conservative Media Use as Independent Variable

	Model 1. Perceived response efficacy	Model 2. Message derogation	Model 3. COVID-19 mispercep- tions
<i>Predictors and mediators</i>			
Conservative media use	-0.02(0.04) *	0.59(0.02) ***	0.34(0.02) ***
Perceived response efficacy		-0.27(0.04) ***	-0.07(0.03) **
Message derogation			0.54(0.02) ***
<i>Moderator</i>			
Discus- sion network heterogeneity	-0.27(0.07) ***	0.02(0.05)	0.06(0.07)
<i>Interactions</i>			
Conservative media use × discus- sion network heterogeneity	0.10(0.02) ***		
<i>Controls</i>			
Gender	0.04(0.04)	-0.10(0.05) *	-0.05(0.03)
Age	0.001(0.002)	0.003(0.002)	0.001(0.002)
Race	0.04(0.02) **	-0.10(0.02) ****	-0.04(0.01) **
Education	0.10(0.03) **	-0.11(0.03) **	-0.06(0.02) *
Income	0.003(0.02)	0.09(0.02) ***	0.07(0.01) ***
Party ID	0.01(0.01)	-0.08(0.02) ***	0.002(0.01)
Internal efficacy	0.37(0.04) ***	-0.01(0.05)	0.08(0.03) *
News interest	0.06(0.03) *	-0.001(0.03)	0.003(0.02)
Political interest	0.02(0.03)	0.03(0.03)	-0.05(0.02) *
Constant	2.68(0.26) ***	3.39(0.25) ***	0.73(0.23) **
R <sup>2</sup>	0.22 ***	0.58 ***	0.83 ***

Notes: Cell entries are unstandardized betas with standard errors in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

negative when individuals have a higher level of discussion network heterogeneity ( $B = -0.0447$ ,  $SE = 0.0151$ , 95% CI: [-0.0772, -0.0178]) than those with a moderate ( $B = -0.0316$ ,  $SE = 0.0121$ , 95% CI: [-0.0584, -0.0106]) and a lower level of discussion network heterogeneity ( $B = -0.0229$ ,  $SE = 0.0120$ , 95% CI: [-0.0496, -0.0018]). Figure 4 visualizes the moderation effect, denoting that discussion network heterogeneity affects the portion (from liberal media use to perceived response efficacy) of the indirect effect on misperceptions, and the moderation speaks for the divergent positive type of contingent moderation under Holbert and Park's (2020) typology. H5b is also buttressed.

In sum, the results suggest that the varying indirect effects of partisan media use on COVID-19 misperceptions are contingent upon discussion network heterogeneity. When

**Table 2** Serial Mediation and Moderated Mediation with Liberal Media Use as Independent Variable

	Model 1. Perceived response efficacy	Model 2. Mes- sage derogation	Model 3. COVID-19 mispercep- tions
<i>Predictors and mediators</i>			
Liberal media use	0.11(0.03) ***	0.33(0.03) ***	0.22(0.02) ***
Perceived response efficacy		-0.27(0.04) ***	-0.07(0.03) **
Message derogation			0.54(0.02) ***
<i>Moderator</i>			
Discus- sion network heterogeneity	-0.27(0.07) ***	0.02(0.05)	0.06(0.07)
<i>Interactions</i>			
Liberal media use × discus- sion network heterogeneity	0.07(0.02) ***		
<i>Controls</i>			
Gender	0.03(0.04)	-0.33(0.06) ***	-0.13(0.03) ***
Age	0.003(0.002)	-0.003(0.003)	-0.001(0.002)
Race	0.05(0.02) **	-0.22(0.02) ***	-0.06(0.01) ***
Education	0.08(0.03) **	-0.24(0.04) ***	-0.10(0.02) ***
Income	-0.01(0.01)	0.14(0.02) ***	0.08(0.01) ***
Party ID	0.01(0.01)	-0.14(0.02) ***	-0.01(0.01)
Internal efficacy	0.30(0.04) ***	0.13(0.06) *	0.08(0.03) *
News interest	0.04(0.03)	0.04(0.04)	0.01(0.02)
Political interest	0.02(0.03)	0.03(0.04)	-0.06(0.02) *
Constant	2.51(0.32) ***	5.15(0.29) ***	0.63(0.29) *
R <sup>2</sup>	0.22 ***	0.36 ***	0.80 ***

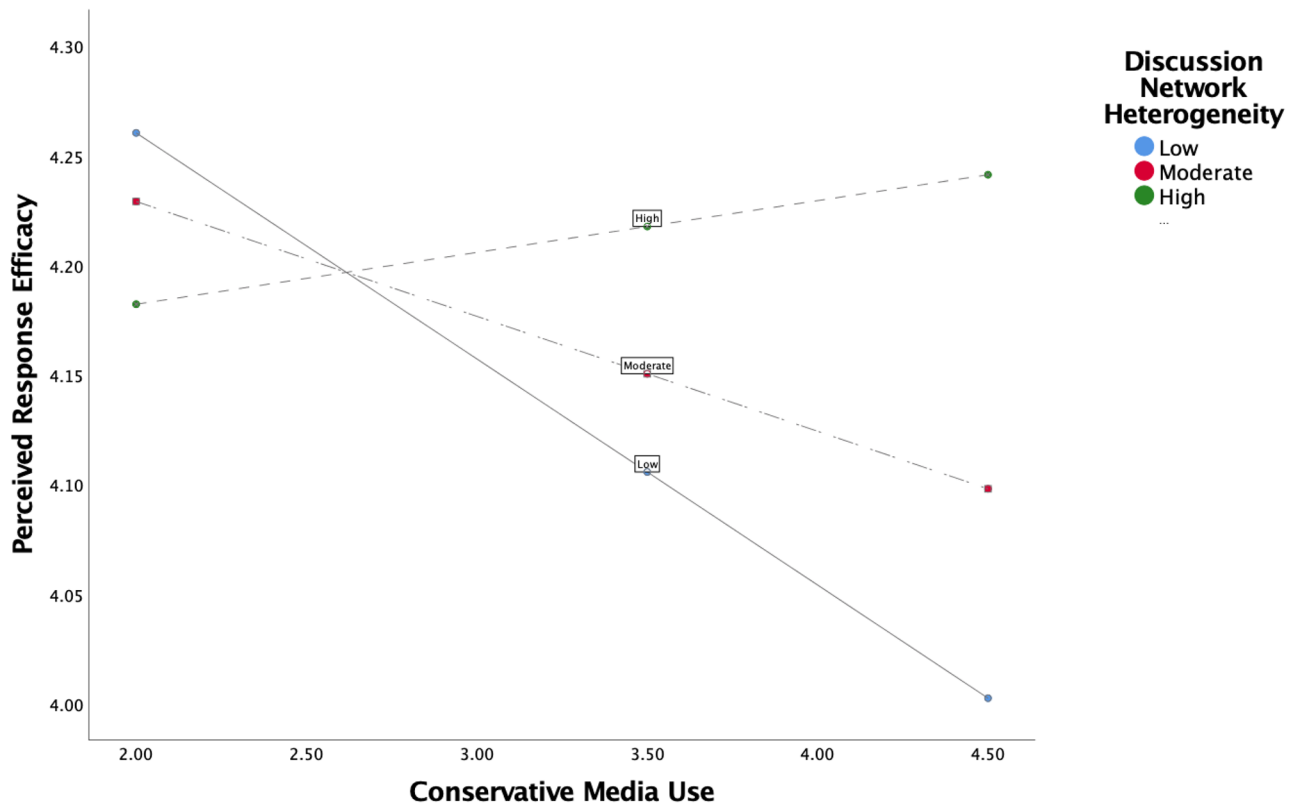
Notes: Cell entries are unstandardized betas with standard errors in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

the level of discussion network heterogeneity increases, the indirect effects of both conservative and liberal media use on misperceptions are weakened.

## Discussion

Experts lamented that mounting misinformation and relevant misperceptions about the COVID-19 pandemic have hindered the global epidemic governance. Analyzing a survey sample, this study investigates the conditional indirect



**Fig. 3** Interaction between conservative media use and discussion network heterogeneity on perceived response efficacy

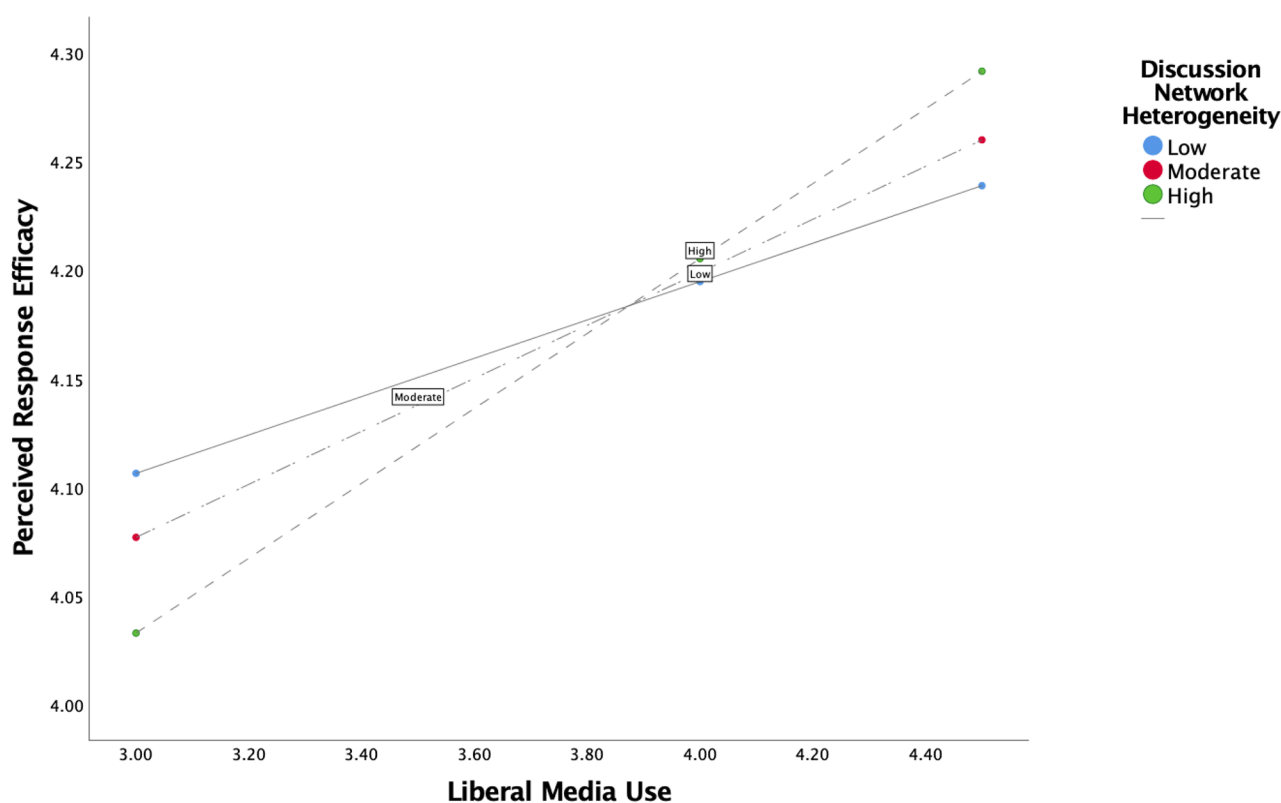
effects of partisan media use on COVID-19 misperceptions. Several important findings warrant further discussions.

First, as expected, using conservative media is tied to greater misperceptions about the COVID-19 pandemic. The finding echoed the argument that conservative media conveyed plenty of misinformation and conspiracy theories amidst the pandemic to spin the facts and shirk responsibility from the then incumbent administration to their opponents (Ash et al., 2020; Chung & Jones-Jang, 2021; Jamieson & Albarracine, 2020).

However, what is more intriguing pertains to the positive role liberal media plays in shaping COVID-19 related misperceptions. Decades of research has lent mixed and even antithetical evidence to the very association between liberal media use and misperceptions, thus, the query as to whether the U.S. liberal media plays a role of accelerator or buffer of misinformation remains unanswered. This might be dependent on different cases and issues. Specifically put, using liberal media does not necessarily guarantee an exposure to authentic or verified information, instead, whether liberal media can facilitate or mitigate misinformation and misperceptions is sensitive to the issue per se. For instance, when it comes to political misinformation such as the birthplace of Obama, the liberal media play a role to refute conservative media's coverage and defend the Democrat's

candidate (Garrett et al., 2016). However, when it comes to false claims about prominent Republicans, using liberal media was found to facilitate their viewers' endorsement about these false claims (Weeks et al., 2021).

The issue-sensitive nature of liberal media's effect on misperception-shaping and the novelty of the COVID-19 pandemic make our exploratory analysis much warranted and our findings contributory. Our findings that akin to the frequent viewers of conservative media, those of liberal outlets also exhibited heavier misperceptions might be due to two potential reasons. First, motivated reasoning can happen on both sides. According to a report (i.e., PublicMind Poll, 2012), liberals did not perform better on public knowledge than their conservative counterpart. Research also indicated that heavy viewers of liberal media such as MSNBC and CNN are the least informed and knowledgeable and are extremely likely to fall for misinformation (Garrett et al., 2016; Hmielowski et al., 2020). Amid the pandemic, media of both partisanship have spread unfounded information, and the intensified polarization and political brinkmanship are the fundamental accelerators of misperceptions, notwithstanding being asymmetrical in conveying expert sources. Consequently, those at the two ends of the spectrum are equally vulnerable to misinformation.



**Fig. 4** Interaction between liberal media use and discussion network heterogeneity on perceived response efficacy

Second, an open question concerns why the relationship between liberal media use and misperceptions differed across cases. Although liberal media sometimes do not trigger misperceptions (Garrett et al., 2019; Hutchens et al., 2021; Meirick, 2013), the international nature of the COVID-19 pandemic has enabled misinformation to transcend the party lines and allowed both media to unanimously point the finger at external factors such as China. Notably, the pandemic occurred at a time of tension in the strategic relationship between both powers, which helped media of both partisanship to communally attribute domestic issues and the failure of the epidemic management to the alleged rise of China, the threat of communism, and the conspiracy theory regarding the intentional laboratory leak (Thacker, 2021). Reports already showed that both conservative and liberal outlets have long adopted a homogeneously negative valence in their coverage of China (Galston, 2021); this valence has been further exaggerated and rendered into their pandemic portrayals. To test this conjecture, we ran a follow-up Chi-square examination on the associations between liberal media use and each specific misperception item, and our speculation is buttressed (see Supplementary Information).

Furthermore, as expected, conservative media use was negatively associated with perceived response efficacy

while liberal media use positively associated with it. The reasons pertain to the very discrepancy between both media in terms of their assessments on the effectiveness of preventive measures, including mask-wearing, social distancing, and vaccination, as well as the extent to which they convey scientist sources (Jamieson & Albarracin, 2020; Moon et al., 2021). However, what is at odds with our expectation was the finding that using both media led to greater message derogation. In other words, the more the individuals used partisan media, regardless of the conservative or the liberal, the more likely they believed that the overall coverage of the pandemic in the mass media is manipulated, biased, exaggerated, or overblown.

This finding is not incomprehensible somehow. One of the very differences between partisan media and the media dedicated to relative balance, objectiveness, and fairness lies in the former's framed, spun, and slanted stories, which commit to pursuing political interests rather than informing their audiences with facts (Jamieson et al., 2007; Meirick, 2013). Hence, heavy partisan media viewers tend to live in the pseudo environment constructed by the slanted media they consume and believe that the information construction of other media are biased (Levendusky, 2013). Accordingly, the consumers of liberal media are not less prone to derogate and resist other media simply because liberal media

emphasized the severity of the epidemic more than their conservative counterpart; rather, they would still derogate whatever contradicts their ideological line. That is, this derogation essentially stems from the incompatibility and incongruency between the partisan media they consume and other media, particularly those nonpartisan ones, instead of the mere contents the partisan media cover.

When it comes to the serial mediation, we did not see a significant linkage between conservative media use and misperceptions, but a significant indirect association did emerge between liberal media use and misperceptions. Specifically, mediated through the increased perceived response efficacy and the subsequently lowered derogation of messages, the effect of liberal media use on misperceptions became negative. It is because a high perceived response efficacy usually means a higher acceptance of scientific measurements (Chung & Jones-Jang, 2021), and once individuals have higher confidence in these measurements, they would further become less likely to be misinformed while more likely to engage in healthy behaviors (Cameron et al., 2009).

This mediating mechanism also echoes the proposition of the EPPM. That is, people's assessments on the effectiveness of the recommended responses to avoid threat usually emerge right after exposing the risk messages. Next, if their evaluations on the effectiveness (i.e., perceived response efficacy) are low, and they find no better means to cope with the situation, they tend to avoid and derogate information defensively. On the contrary, if people's perceived response efficacy become high upon exposure to risk messages, they would apply positive danger control such as message acceptance rather than avoidance or derogation (Popova, 2012).

This serial mediating mechanism not only meets the original theorization of the O-S-O-R model that an orientation factor (i.e.,  $O_2$ ) "is likely to happen between reception of the message and the response" (McLeod et al., 1994, p. 146–147) but also echo the EPPM regarding the mediation of efficacy appraisal between threat-appeal message exposure and danger control.

Finally, discussion network heterogeneity functioned as a moderator, which significantly weakened both serially mediated relationships. In essence, partisan media triggers misperceptions, which are further intensified by the partisan echo chambers wherein like-minded discussions endorse one another (Su, 2021). A heterogeneous discussion network, however, allowed the partisan media consumers to encounter different viewpoints, thus being motivated and endowed more opportunities to revisit "the issues where conflict occurs" (Scheufele et al., 2006, p. 730), making self-reflections and corrections. Considering the state of politicization of the COVID-19 in the U.S. and the affective

polarization among its citizens, promoting heterogeneous discussion networks deems imperative.

## Limitations

This study comes with a few caveats. First, it should be noted that over half of our recruited respondents were white males (79.5% White and 56% male), which might potentially affect the inferences we came to, although these factors have been controlled for analysis. Future studies can benefit from analyzing a more demographically diverse sample. Next, the data used is cross-sectional, we thus encourage other researchers to consider analyzing panel data to better infer causative effects. Moreover, our measure of partisan media, albeit consistent with a plethora of previous research, did not include a most exhaustive list of outlets. Future researchers can expand the selection, and a particular attention can be paid to the fringe, rather than mainstream, media. Also, as social media platforms have reached ubiquity and become major sources for people's information acquisition, future scholars are encouraged to consider taking social media news consumption and its effects into consideration.

Additionally, our measurement of message derogation mainly covers respondents' assessment of the COVID-19-related messages *in general*. Albeit justified, improvement of this measurement can still be made. Future researchers can narrow down the sources of messages, say, derogation of messages from nonpartisan media, to minimize the confounding effects. Finally, the effect of partisan media consumption on the formation of misperceptions may also be contingent upon other literacy- or personality-related factors such as science literacy, neuroticism, and openness to experience, as well as one's goals and preexisting ideologies and beliefs, future scholars are encouraged to include these variables into examination.

## Implications

Despite these limitations, this study has several crucial conceptual and practical implications. First, in theoretical term, our study provides new credence to the validity of the communication mediation model through situating it into the COVID-19 context. We also extended the model through combining it with the EPPM. Moreover, this study not only consolidates the symbiosis between conservative media use and misperceptions but also unpacked a similarly positive relationship between liberal media use and misperceptions. Prior literature does not provide a conclusion on the role of liberal media in shaping misperceptions. Our research adds important evidence to the currently mixed findings, helping future scholars to have a clear case-specific reference.

In practical term, we recommend, based on this finding, that people avoid exposing to media that are merely at the extreme ends of the ideological spectrum, while consuming more diversified or less slanted coverage, to circumvent partisan-dominated motivational reasoning, thereby building a relatively balanced and complete knowledge structure.

Second, our examination of the two EPPM variables illustrates the nuanced mechanism as to how using partisan media use affects misperceptions. Specifically, the findings that these two fear-control-related factors can serially mediate the effect of left-leaning media use on misperceptions about COVID-19 pointed to a clear direction for future governance of misinformation and misperceptions. Individuals are encouraged to adopt a more positive rather than reluctant nor antagonistic attitudes toward the preventive measures recommended by scientists and experts, and to take an objective and rational view of all types of media coverage and information, rather than to hastily regard those at odds with their own preexisting ideologies as biased and exaggerated. According to our results, this implication is more important to those liberal media consumers.

Finally, a heterogeneous discussion network emerged as a silver lining for misperception elimination for all individuals. Media practitioners, campaigners, and educators should devote more efforts in facilitating the heterophily of people's discussion networks, either through strengthening relevant education, enriching the K-12 curricular, initiating proper campaigns, or by revamping citizens' discussion spaces, especially the online ones. For instance, reducing algorithm-based feeds of homogenized information and lessening those shared interest-based group discussion spaces could be beneficial to curb the echo chamber effects.

## Conclusion

This study is anchored by the O-S-O-R Model and extended the framework using two EPPM constructs. Analyzing a U.S. survey sample, we found that using both conservative and liberal media have positive effects on the COVID-19 misperceptions and message derogation. Further, using conservative media has a negatively impact on perceived response efficacy, whereas using liberal media has a positive influence on it. Moreover, although using liberal media can lead to an increased COVID misperceptions, such effect became negative when serially mediated by an increased perceived response efficacy and a subsequently decreased message derogation. Finally, discussion network heterogeneity was a significant moderator, such that the conditional indirect effects of partisan media use on misperceptions were weaker among those with a more heterogeneous discussion network.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s12144-022-03772-x>.

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**Data Availability** Data can be made available upon reasonable request.

## Declarations

**Conflicts of Interest/Competing interests** The authors have no conflicts of interest to declare that are relevant to this article.

**Ethics approval** The materials and procedures of the study was reviewed, and exemption determination of IRB review was attained from the Ethics Committee of the Human Research Protection Program at the university with which the first author was affiliated while designing and performing this research (IRB # 18846).

**Consent to participate** Informed consent was obtained from all individual participants included in the study.

**Consent for publication** Participants signed informed consent regarding publishing their data.

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