

## From Believing to Sharing: Examining the Effects of Partisan Media's Correction of COVID-19 Vaccine Misinformation

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Drawing on social identity theory and politeness theory, this study tested the effects of partisan media's correction of COVID-19 vaccine misinformation on individuals' message credibility perceptions and news engagement intentions. Based on a between-subjects online experiment in the United States, we found that partisans exposed to ingroup media perceived corrective messages as more credible (marginally) and held higher news engagement intentions than those exposed to outgroup media; nonpartisans rated corrective messages on partisan media as less credible and were less likely to engage than partisans. It also revealed that message credibility mediated the effects of exposure condition on news engagement intentions. Further, the results show that types of risk quantifiers moderated the direct effects of exposure condition on message credibility perceptions and the indirect effects on news engagement intentions via message credibility perceptions. We discuss the findings in light of how news media could combat misinformation in a polarized society.

*Keywords: social identity theory, politeness theory, message credibility, news engagement, misinformation correction, COVID-19*

The COVID-19 pandemic has considerably affected almost every aspect of people's lives around the globe. According to the Centers for Disease Control and Prevention (hereafter CDC), as of February 2022, the United States alone has reported more than 78 million cases of COVID-19 infections and more than 930,000 deaths. New variants of COVID-19 have continued to put millions of people's health in jeopardy as the community transmission remains high in most states. One of the effective ways to tame the spread of the disease is vaccination. Despite federal and state legislation on ramping up the delivery and administration of the COVID-19 vaccines, about 20% of the U.S. population who are eligible for COVID-19

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vaccination haven't been fully vaccinated, and tens of millions of vaccine doses have been left unadministered as of February 2022 (CDC, 2022). One factor that may contribute to vaccine hesitancy is the widespread misinformation surrounding the safety and efficacy of the vaccines (Lucia, Kelekar, & Afonso, 2020). Such misinformation is often dispersed with a political spin and gets increasingly politicized on news media and among the public (Hart, Chinn, & Soroka, 2020; Jiang et al., 2021). In this sense, it is important to put the correction of COVID-19 vaccine misinformation into the context of political polarization so as to increase individuals' vaccination acceptance and ultimately curb the disease.

Research on misinformation correction has grown substantially in recent years. There, however, exists two major gaps in the existing literature. First, most research has so far focused on nonpartisan fact-checkers, such as PolitiFact and AP Fact Check (Hameleers & van der Meer, 2020; Nyhan & Reifler, 2010). Yet, the role of mainstream media, partisan media included, in curbing misinformation is underexplored. From a normative lens, truth exposure and information verification are inherent to journalistic norms and culture (Tsfati et al., 2020). At a time with deteriorating media trust and growing political polarization, partisan media has the imperative to combat misinformation so as to rebuild their image and enhance public trust. Meanwhile, partisan media also have a larger audience base as compared to nonpartisan fact-checkers on social media such as Twitter.<sup>2</sup> Therefore, partisan media's efforts in misinformation correction could reach more people and render significant implications in improving the online information ecosystem.

Second, scholars have looked into the effectiveness of various correction strategies, including narratives, argumentations, and message sidedness (for a meta review, see Walter, Brooks, Saucier, & Suresh, 2020). However, the use of risk quantifiers to correct misinformation that is inherently uncertain is less explored. The two types of risk quantifiers—numeric and verbal quantifiers—connote varying degrees of preciseness and accuracy associated with certain risks (Bonnefon & Villejoubert, 2006). Numeric quantifiers refer to the use of exact statistics, such as frequencies, fractions, percentages, and point estimates to describe risks, whereas verbal quantifiers denote the use of probabilistic words and phrases (e.g., likely, possible, and rare) to convey risk information (Reyna, 2012). The use of numeric or verbal quantifiers has been found to affect individuals' risk perceptions, information processing, and behavioral intentions (Juanchich & Sirota, 2013; Juanchich, Sirota, & Butler, 2012; Liu, Juanchich, Sirota, & Orbell, 2021). Given that many public health crises-related topics such as COVID-19 vaccination are uncertainty-laden, it is crucial to examine the utility of risk quantifiers in communicating such uncertainty to the general public in misinformation correction.

With these in mind, the present study seeks to examine the effects of partisan media's correction of COVID-19 vaccine misinformation in the United States. Following previous research (Nyhan & Reifler, 2010), we define misinformation as misleading, false, or unsubstantiated information related to COVID-19 vaccines. We integrate social identity theory and politeness theory to identify how partisan media's use of different risk quantifiers as correction strategies impacts individuals' message credibility perceptions and news engagement intentions. Theoretically, the study provides valuable insights to explain the variations

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<sup>2</sup> As of February 2022, nonpartisan fact-checkers such as AP Fact Check has about 60.9K followers on Twitter, and PolitiFact has 690.6K followers. Partisan media *The New York Times* has about 51.6M followers, and *The Wall Street Journal* has 19.4M followers.

we see in the effectiveness of misinformation correction on an ideologically diverse audience. Practically, we offer viable tools for news media to correct misinformation and cultivate audience engagement in the current polarized environment.

### **Theoretical Framework**

#### ***Partisan Media: Ingroup Versus Outgroup Media***

Social identity theory posits that people have the natural tendencies to categorize others into ingroup and outgroup members, and as a result, they prefer members of ingroup to those of outgroup (Tajfel & Turner, 1979). Though the theory was initially proposed to study group communication in interpersonal settings, social identity could also influence how people approach media. Stroud, Muddiman, and Lee (2014) reveal that individuals tend to develop group orientations toward like-minded and discrepant media based on their ideological (dis)alignment. Democrats view liberal media as ingroup members and conservative media as the outgroup; Republicans see conservative media as ingroup members and liberal media as the outgroup. Because ingroup media often share one's attitudes and portray one's own group as more desirable, one usually considers the content on ingroup media as compelling and persuasive while discounting the information on outgroup media (Levendusky, 2013; Metzger, Hartsell, & Flanagin, 2020). Partisanship also affects individuals' reactions to misinformation correction, such that Republicans display stronger outgroup negativity and hostility toward fact-checkers than Democrats (Shin & Thorson, 2017).

Correction of COVID-19 vaccine misinformation serves as a compelling case to investigate the ways that people categorize partisan media into group members and their subsequent interactions with the media. First, the uncertainties pertinent to the COVID-19 pandemic make one's social identity salient. Research suggests that individuals often resort to their ingroups for knowledge and information to fend off uncertainties (Hogg & Grieve, 1999; Tajfel & Turner, 1979). During the pandemic, those who are prone to conspiratorial thinking engage in selective exposure to conservative media (Romer & Jamieson, 2021). Second, social identity and group categorization become salient in times of major crises. Because these crises not only trigger needs for group-based problem-solving and also intensify the intergroup relationships when individuals are involved in blame attribution (Reicher, Spears, & Haslam, 2010). In the COVID-19 pandemic, social identity, on one hand, buttresses group solidarity to fight the disease, and on the other hand, it leads to stigmatizing and scapegoating the other group (Abrams, Lalot, & Hogg, 2021). Third, issues related to the pandemic, such as COVID-19 vaccines, are highly politicized and polarized on news media as well as among the public (Hart et al., 2020; Jiang et al., 2021). Taken together, it is reasonable to argue that political identity serves as a salient factor in shaping individuals' evaluation of and interaction with content on partisan media during the pandemic.

To test our arguments, we focus on two constructs—message credibility and news engagement—as the outcomes of exposure to partisan media's correction of COVID-19 vaccine misinformation. Message credibility refers to individuals' evaluations of the accuracy, authenticity, and believability of a given message (Appelman & Sundar, 2016). In the journalistic context, message credibility is often used to examine audience evaluations of both printed and online content (Curry & Stroud, 2021; Metzger, Flanagin, Eyal, Lemus, & McCann, 2003). Research suggests that social identity could shape one's credibility

perception about messages attributed to ingroup versus outgroup members, such that messages attributed to ingroup sources are perceived as more credible and persuasive than those attributed to outgroup ones (Levendusky, 2013; Metzger et al., 2020). Extending this line of findings to the current study, we expect that individuals would evaluate corrective messages on partisan media differently depending on if they consider the particular media outlet as an ingroup or outgroup member. More specifically, they would perceive corrective messages on ingroup media as more credible than those on outgroup media.

In addition to partisan audiences, nonpartisans, who are not attached to either Republican or Democratic parties, should bear more scholarly attention. It is reported that the number of nonpartisans has increased to about 38% in recent years, and they oftentimes hold unfavorable opinions toward both Republicans and Democrats (Pew Research Center, 2019). One study shows that nonpartisans tend to rate liberal and conservative sources as less credible than an unbiased source (Metzger et al., 2020). Based on this line of evidence, we contend that nonpartisans may view partisan media, either liberal or conservative, as part of the outgroup as well. Therefore, we first posit the following hypothesis:

*H1: Partisans in the ingroup media condition will perceive corrective messages more credible than (a) partisans in the outgroup media condition and (b) nonpartisans.*

News engagement, or social media news engagement, is typically defined as audience interaction with news through liking, commenting, and sharing in the online environment (Curry & Stroud, 2021). In this study, we tap into both audience immediate engagement with corrective messages and their continued engagement with news outlets. On the one hand, audience immediate engagement, such as liking and sharing the news content, is an important indicator of the online virality of corrective messages. The more audience engagement, the wider circulation of corrective messages on the Internet. That said, audience immediate engagement could help curb the spread of misinformation online. On the other hand, audience continued engagement, such as seeking out more information from the media outlets, indicates their loyalty to the outlets (Napoli, 2011). Given that audience size signals the value of news media to advertisers (Nelson, 2021), audience continued engagement could enhance news media's business performance in the long run.

Social identity, partisanship in particular, impacts news consumption and engagement. Research on partisan selective exposure shows that partisans are more likely to consume and engage with content on ingroup media than outgroup ones (see Hasell & Weeks, 2016; Stroud, 2011). With respect to corrective messages, one pioneering study finds that partisan audiences tend to selectively share more fact-checking information that is in favor of their ingroup other than the outgroup (Shin & Thorson, 2017). This lends us to expect that partisans would have higher engagement intentions with ingroup media than outgroup media in the context of misinformation correction.

Despite the rich evidence on partisan audiences, research on how nonpartisans approach news media remains scarce. Scholars generally agree that nonpartisans pay less attention to news than their partisan counterparts (Gunther, Edgerly, Akin, & Broesch, 2012; Yeo, Cacciatore, & Scheufele, 2015). Nonpartisans are also found to be less likely to return to liberal or conservative news sources than to politically balanced news sources (Metzger et al., 2020). Hence, we anticipate that nonpartisans would not

engage with corrective messages on partisan media as actively as partisan audiences would do. Put together, we propose the following hypothesis:

*H2: Partisans in the ingroup media condition will be more likely to engage with corrective messages than (a) partisans in the outgroup media condition and (b) nonpartisans.*

Credibility judgment is conducive to subsequent news engagement. Extant research shows that perceived credibility of news content (e.g., satire, transparency elements) is a positive predictor of both immediate engagement—such as clicking, liking, and sharing the content—and continued engagement, such as returning to the site and reading more articles from the site (Curry & Stroud, 2021; Peifer & Myrick, 2021). Recent work has identified credibility judgment as a mediator to understand the psychological mechanisms underlying the effects of misinformation correction (Huang & Wang, 2020; Kim, Vraga, & Cook, 2021). To extend this line of research, we propose the following hypothesis to test the mediation mechanism:

*H3: Partisans in the ingroup media condition will perceive corrective messages as more credible, and such perceptions will lead to higher news engagement intentions as compared to (a) partisans in the outgroup media condition and (b) nonpartisans.*

#### **Boundary Condition: Numeric Versus Verbal Quantifiers**

Despite the prevalence of partisan selective exposure, it is worth noting that people do not and could not always selectively consume ingroup media content and avoid outgroup ones in reality, because some may intentionally seek out information from outgroup media to defend their own stances or counteract dissimilar views (Valentino, Banks, Hutchings, & Davis, 2009), while others may inadvertently come across outgroup media amid the mixed information curated by the algorithms and their social networks on the online platforms (Lu, 2020; Thorson & Wells, 2016). Taken as a whole, this poses new challenges to partisan media in correcting misinformation on social media, as they are increasingly faced with a diverse audience consisting of ingroup partisans, outgroup partisans, and nonpartisans. Now, the question arises: If individuals prefer only corrective messages sent by ingroup media, how could partisan media win the hearts and minds of outgroup partisans and nonpartisans? To address this puzzle, we draw on politeness theory and take into consideration risk quantifiers as a correction strategy that may move the needle in audience reaction to partisan media's misinformation correction.

According to politeness theory, people expect to have both their positive (need to be liked, valued, and approved) and negative (desire to be independent and autonomous) faces validated during interpersonal interactions (Brown & Levinson, 1987). Extant research has applied politeness theory to science and health communication contexts (Jenkins & Dragojevic, 2013; Jensen, 2008; Yuan, Ma, & Besley, 2019). The research suggests that reporting scientific uncertainty and persuading others to change their behaviors are face-threatening tasks, as these tasks raise concerns about the credibility of the scientific information and undermine individuals' autonomy in decision making. Likewise, we argue that attempting to correct misinformation on COVID-19 vaccines with limited evidence and to persuade people to get vaccinated is potentially face-threatening for both news outlets and their audiences. On the one hand, news

outlets put their positive faces at risk by offering probable information to rebut prevalent misinformation that audiences may believe. On the other hand, audiences' negative faces could be threatened by reading corrective messages that may challenge their prior beliefs, ask them to conform to advocated stances, and persuade them to adopt behaviors that involve risks. This is particularly true when audiences encounter corrective messages on media with which they are not aligned, because they may perceive greater threats to their negative face from outgroup media.

Scholars suggest that communicators could employ politeness strategies to minimize negative face threats (Brown & Levinson, 1987). Research in risk communication shows that the use of less forceful and controlling language would generate desirable outcomes, such as lowering blame attribution on the communicator, weakening source derogation, and leading to advocated behavioral intent (Jenkins & Dragojevic, 2013; Jensen, 2008; Juanchich et al., 2012). Accordingly, this study proposes that risk quantifiers, commonly used in conveying risks associated with certain behaviors, could serve as a potential tool for shifting the face-threatening tendencies triggered by partisan media's correction of COVID-19 vaccine misinformation. From the perspective of politeness theory (Brown & Levinson, 1987), the use of verbal quantifiers is a specific form of politeness because it is less forceful and controlling. This politeness could protect both the communicator's and the information recipient's face needs. It is revealed that individuals process information framed in vague and fuzzy phrases differently from information containing exact numbers, such that individuals rely more on contextual shortcuts (e.g., the desirability of an event) to intuitively inform their decision making with verbal quantifiers than with numeric ones (Liu et al., 2021).

Although no prior research has examined partisan media's use of risk quantifiers when communicating uncertainty, it is possible that different types of quantifiers used in misinformation correction could have varying implications on an ideologically diverse audience. First, we argue that numeric quantifiers used to describe risk associated with COVID-19 vaccines on ingroup media should enhance message credibility perceptions and subsequent news engagement intentions. As one generally holds ingroup favoritism, misinformation correction by ingroup media is not likely to threaten one's negative face. In this sense, the exactness and preciseness of numeric quantifiers reflect the competence of ingroup media, and, in turn, amplify one's favorable attitudes toward and engagement intentions with ingroup media. This is grounded in research on intergroup contact showing that competence is a fundamental ingroup trait that people value (Phalet & Poppe, 1997). Yet, the use of numeric quantifiers by outgroup media may exacerbate individuals' unfavorable attitudes toward outgroup media. Our rationale is that individuals may perceive a heightened threat to their desire for autonomy upon encountering corrective messages on outgroup media, especially when the messages adopt numeric quantifiers, which call for more effortful cognitive processing and scrutiny (Liu et al., 2021). Research demonstrates that controlling messages sent by dissimilar sources would provoke defensive message processing, thus leading to message derogation and noncompliance (Jenkins & Dragojevic, 2013; Kunda, 1987). Here, numeric quantifiers used by outgroup media are a type of language that falls short of politeness and ambiguity and do not offer adequate autonomy for individuals to interpret the risks associated with COVID-19 vaccines on their own. This would cause negative face threats and lead individuals to discount and disengage from the messages.

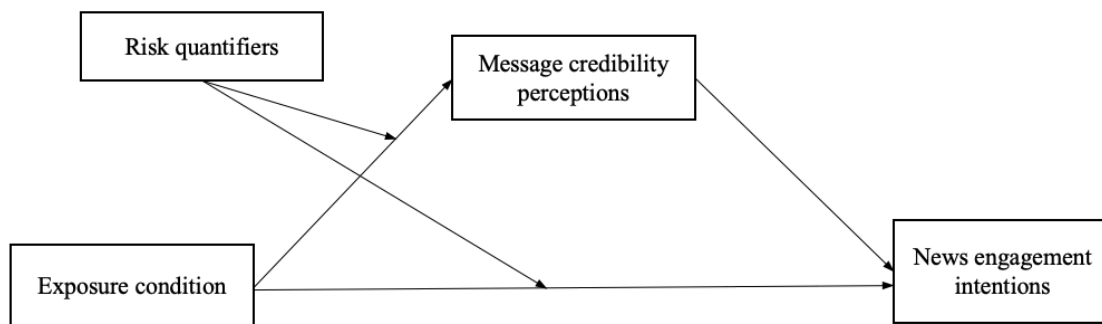
Additionally, we anticipate that the use of verbal quantifiers could soften the tone in corrective messages and, in turn, attenuate the face-threatening tendencies caused by outgroup media. Verbal

quantifiers, as compared to numeric ones, are less precise and open to interpretation (Juanchich & Sirota, 2013). Through granting individual freedom and autonomy to interpret, verbal quantifiers could downplay an undesirable fact—the risk associated with COVID-19 vaccines. As a result, the use of verbal quantifiers could reduce individuals' negative inferences about partisan media's hidden motives behind misinformation correction, and therefore narrow the gap in message credibility perceptions and news engagement intentions between ingroup and outgroup media. In sum, we propose an integrated conceptual framework (Figure 1) and state the following hypotheses and research question:

*H4: Types of quantifiers will moderate the effects of exposure condition on news credibility perceptions. Specifically, for numeric quantifiers, partisans in the ingroup media condition will perceive corrective messages more credible than partisans in the outgroup condition and nonpartisans; for verbal quantifiers, there will be no significant differences across exposure conditions.*

*H5: Types of quantifiers will moderate the effects of exposure condition on news engagement intentions. Specifically, for numeric quantifiers, partisans in the ingroup media condition will have higher news engagement intentions than partisans in the outgroup condition and nonpartisans; for verbal quantifiers, there will be no significant differences across exposure conditions.*

*RQ1: Will types of quantifiers moderate the indirect effects of exposure condition on news engagement intentions through message credibility perceptions?*



**Figure 1. Integrated conceptual framework of partisan media's misinformation correction.**

## Method

### Participants

The project was approved by the Institutional Review Board of the first author's university. We performed a priori power analysis to determine the sample size needed to detect a medium-effect size with a value of 0.05 and a power of 0.95. Power analysis suggested that a sample size of 264 was able to meet our analytical goal. Considering the possibility of missing data and failure of attention checks from participants, we recruited 363 participants from Amazon's Mechanical Turk in late February 2021. After excluding those who failed the attention checks ( $n = 74$ , detailed below),<sup>3</sup> 289 valid responses were retained in the final analyses ( $M_{\text{age}} = 36.76$ ,  $SD = 10.49$ ). Most participants were male ( $n = 173$ , 59.6%); 72.3% were identified as Caucasian ( $n = 209$ ), 9.3% as African American ( $n = 27$ ), 7.6% as Asian or Pacific Islander ( $n = 22$ ), 7.3% as Hispanic or Latino/a ( $n = 21$ ), 1.0% as American Indian ( $n = 3$ ), and other ( $n = 7$ , 2.4%). Participants had a median household income of \$50,000–\$74,999. More than half of the participants were leaning toward left ( $n = 163$ , 56.4%), followed by right-leaning ( $n = 74$ , 25.6%) and politically independent ( $n = 52$ , 18.0%). At the time of the study, about 84.1% of the participants had not yet received any vaccine doses ( $n = 243$ ); 9.3% received one dose ( $n = 27$ ); 6.6% received two doses ( $n = 19$ ;  $M = 0.22$ ,  $SD = 0.55$ ).

### Procedures

To examine the proposed hypotheses and research question, we designed a 3 (exposure condition: ingroup media vs. outgroup media vs. nonpartisans<sup>4</sup>) by 2 (risk quantifier: numeric vs. verbal) by 3 (topic: vaccine inefficacy vs. side effects vs. death) between-subjects online experiment. The three selected topics reflected people's major concerns about COVID-19 vaccines at the time when the study was conducted. In this study, topic was treated as a replication factor, other than a treatment factor, to check the robustness of the results across different topics.

Participants were randomly assigned to read a Twitter thread published by partisan media. We created three exposure conditions. The ingroup media condition included participants who were left-leaning and exposed to liberal media, and participants who were right-leaning and exposed to conservative media ( $n = 127$ , 43.9%). The outgroup media condition included participants who were left-leaning and exposed to conservative media, and participants who were right-leaning and exposed to liberal media ( $n = 110$ , 38.1%). The nonpartisan condition included participants who identified themselves as political independents and were exposed to either conservative or liberal media ( $n = 52$ , 18.0%).

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<sup>3</sup> A 20% failure rate for attention checks is typical for online panel (Peer, Rothschild, Evernden, Gordon, & Damer, 2021). In our case, 74 of 363 participants failed the attention checks (failure rate = 20.4%), which is acceptable.

<sup>4</sup> Although political independents, who read corrective messages from partisan media, could be considered as a special case of outgroup condition, we label this group as nonpartisans because they are essentially different from partisans who read messages from media associated with the opposing party. We thank a reviewer for suggesting the terminology of the three exposure conditions.



After reading the tweets, participants were directed to complete the manipulation and attention check questions and a short questionnaire. For the manipulation check, we assessed if the manipulation of exposure condition was successful (see details in the results section). The variation in risk quantifiers is essentially an intrinsic message feature, which, according to O'Keefe (2003), does not require a manipulation check. The two attention check questions assessed if participants paid adequate attention to the media outlet and the topic of the tweet; only those who answered both questions correctly were included in the final analyses. On average, participants spent five minutes in finishing the survey experiment.

### ***Stimuli***

We designed twelve Twitter threads that varied in media outlets, types of risk quantifiers, and topics. A typical Twitter thread presents one of the three myths associated with COVID-19 vaccines (i.e., vaccine inefficacy, side effects, death), followed by relevant pieces of information that combat the myth. Two news outlets were chosen to represent partisan media: *The New York Times* (NYT) and *The Wall Street Journal* (WSJ). We chose the two outlets for the following reasons. First, the two news outlets are among the most-read newspapers that provide extensive daily coverage of current events in the United States (Cision Media Research, 2019). Second, they differ from each other in the political slant of their editorials and news coverage: NYT is considered as liberal and WSJ, conservative (Stroud, 2011). Third, as our main interest is to examine corrective messages in textual rather than audiovisual formats, these two newspapers capture more realism than cable news outlets, enhancing the ecological validity of the study. Finally, empirical evidence confirms that partisan audiences categorize the two newspapers into ingroup and outgroup members, respectively, based on ideological (dis)alignment (Stroud, Muddiman, & Lee, 2014). Taken together, we believe these two newspapers are ideal candidates for this study.

For the Twitter thread, we designed the first tweet stating myths about COVID-19 vaccines, the second using either numeric or verbal quantifiers to combat the myth, and the third as a call for individuals to get vaccinated (see appendix). To enhance generalizability, three topics associated with concerns about COVID-19 vaccines were chosen: vaccine inefficacy, severe side effects, and deaths that might be caused by the vaccines. Facts and evidence about these topics were obtained from the CDC's COVID-19 vaccine website (CDC, 2021). For example, in conditions where misinformation about COVID-19 vaccines causing deaths was debunked, facts were presented either using a verbal quantifier ("a few observed deaths") or a numeric one ("126 observed deaths") in the second tweet. Based on previous research (Walter et al., 2020), we used CDC expert Dr. Tom Shimabukuro as the attribution in the second tweet across all conditions to avoid any confounding effects.

### ***Measures***

Message credibility perceptions were measured by three items from the scale developed by Appelman and Sundar (2016). Participants were asked to rate the Twitter thread they read on a 7-point scale (1 = describes very poorly, 7 = describes very well) on three adjectives: accurate, authentic, and believable. The scale was reliable (*Cronbach's a* = .96) and higher ratings indicated greater levels of message credibility perceptions (*M* = 5.25, *SD* = 1.67).

News engagement intentions were measured by a modified 7-point news engagement scale (1 = very unlikely, 7 = very likely) developed by Curry and Stroud (2021). Participants reported their likelihood to engage in a range of activities: "liking this tweet, sharing this tweet with others, commenting on this tweet, reading another tweet from this outlet," and "seeking out news from this outlet." The scale was reliable (*Cronbach's a* = .89), and higher ratings reflected greater intentions for news engagement ( $M = 3.43$ ,  $SD = 1.77$ ).

## Results

### **Manipulation Check**

A manipulation check of the exposure condition was conducted to assess if participants rated the credibility of media outlets differently across exposure conditions.<sup>5</sup> The results, based on ANOVA tests, indicated that the manipulation was successful,  $F(2, 286) = 12.03$ ,  $p < .001$ ,  $\eta^2 = .08$ . Post hoc analyses based on Bonferroni correction showed that credibility ratings of ingroup media ( $M = 5.23$ ,  $SD = 1.50$ ) were significantly higher than outgroup media ( $M = 4.68$ ,  $SD = 1.65$ ,  $p = .03$ ). For nonpartisans, their ratings of partisan media ( $M = 3.96$ ,  $SD = 1.72$ ) were overall significantly lower than partisans in the ingroup ( $p < .001$ ) and outgroup conditions ( $p = .02$ ).

### **Preliminary Analysis**

Before addressing the research hypotheses and question, we conducted a multifactorial ANCOVA to understand our data. The MANCOVA analyses mirrored the experimental design. We followed Mutz and Pemantle's (2015) suggestion by including the covariates that theoretically and empirically matter to the dependent variables under study. Based on previous research (Lu & Luqiu, 2020; Metzger et al., 2003), we included age, gender, and income, which are the key predictors of news credibility perceptions and news engagement intentions. We also included vaccination status as a covariate because whether individuals had received any COVID-19 vaccine doses upon taking the survey could influence their perceptions of and engagement intentions with vaccine-related messages. Results show no significant main effects of topics or any interaction effects of topics and the two experimental conditions on the dependent variables (full results of MANCOVA are available on request). As a result, we tested the hypotheses based on the 3 (exposure condition) by 2 (quantifier) experimental design.

### **Main Analysis**

To test H1a–b, we ran an ANCOVA with age, gender, income, and vaccination status included as the covariates and message credibility perceptions as the dependent variable. As shown in Table 1, there was a significant main effect of exposure condition on message credibility perceptions,  $F(2, 282) = 8.30$ ,  $p < .001$ , partial  $\eta^2 = .06$ . Post hoc analysis with Bonferroni correction shows that partisans in the ingroup

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<sup>5</sup> Media outlet credibility was measured by a 7-point scale (1 = strongly disagree, 7 = strongly agree) on descriptors such as "honest," "balanced," and "trustworthy." The scale was reliable (*Cronbach's a* = .97), and higher ratings reflected greater perceived media credibility ( $M = 4.79$ ,  $SD = 1.66$ ).

media condition perceived the messages as more credible ( $M = 5.62$ ,  $SE = 0.14$ ) than partisans in the outgroup media condition ( $M = 5.14$ ,  $SE = 0.15$ ,  $p = .06$ ) and nonpartisans ( $M = 4.57$ ,  $SE = 0.22$ ,  $p < .001$ ). Therefore, H1a was marginally supported, and H1b was supported.

To test H2a–b, we ran an ANCOVA with age, gender, income, and vaccination status included as the covariates and news engagement intentions as the dependent variable. Table 1 shows that exposure condition had a significant main effect on news engagement intentions,  $F(2, 282) = 14.29$ ,  $p < .001$ , partial  $\eta^2 = .09$ . The post hoc analysis with Bonferroni correction reveals that partisans in the ingroup media condition had higher news engagement intentions ( $M = 3.89$ ,  $SE = 0.15$ ) than partisans in the outgroup media condition ( $M = 3.36$ ,  $SE = 0.16$ ,  $p < .001$ ) and nonpartisans ( $M = 2.44$ ,  $SE = 0.23$ ,  $p = .003$ ), supporting both H2a and H2b.

**Table 1. Main Effects of Exposure Condition in Misinformation Correction.**

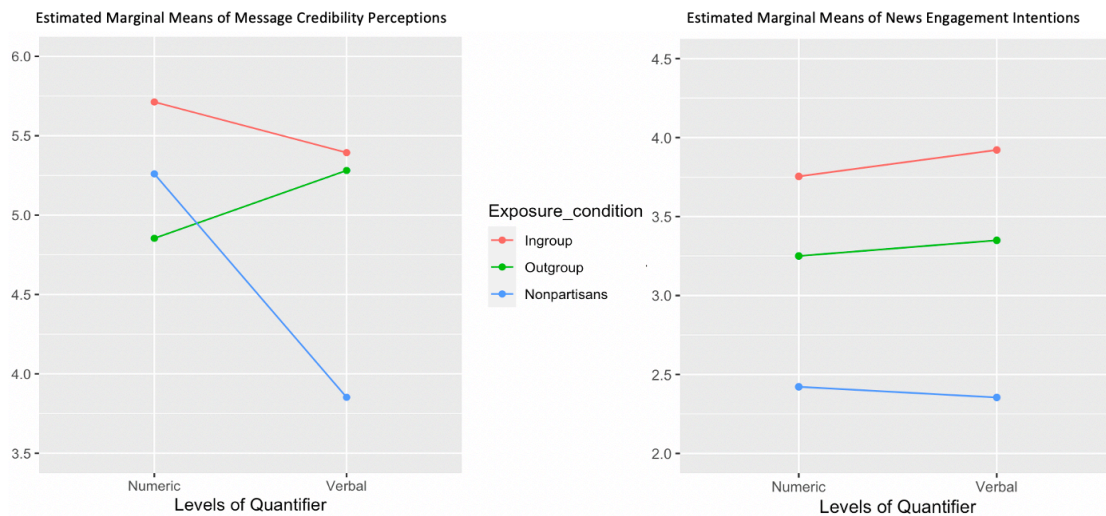
	Message Credibility Perceptions		News Engagement Intentions	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Ingroup media	5.62	0.14	3.89	0.15
Outgroup media	5.14	0.15	3.36	0.16
Nonpartisans	4.57	0.22	2.44	0.23
	$F(2,282) = 8.30$ , $p < .001$ , partial $\eta^2 = .06$		$F(2,282) = 14.29$ , $p < .001$ , partial $\eta^2 = .09$	

*Note.* *M* refers to estimated marginal means, and *SE* represents standard errors. The reported *F*s are based on the main effects in separate ANCOVA analyses, controlling for age, gender, income, and vaccination status.

To test H3a–b, we used PROCESS model 4 (Hayes, 2018) to estimate the indirect effects of exposure condition on news engagement intentions through message credibility perceptions. Based on two pairwise mediation analyses with 5,000 bootstrap resamples, we found that partisans in the ingroup media condition had higher message credibility perceptions, which, in turn, led to greater news engagement intentions as compared to partisans in the outgroup media condition ( $b = 0.23$ , *bootstrapped SE* = 0.10, 95% *CI* = [0.04, 0.41]) and nonpartisans ( $b = 0.44$ , *bootstrapped SE* = 0.13, 95% *CI* = [0.20, 0.72]). Hence, H3a–b were supported.

H4 and H5 predicted that the effects of exposure condition on message credibility perceptions and news engagement intentions would be contingent on types of quantifiers. We conducted two separate two-way ANCOVAs. As shown in Figure 2, there was an interaction effect between exposure condition and types of quantifiers on message credibility perceptions,  $F(2, 279) = 6.06$ ,  $p = .003$ , partial  $\eta^2 = .04$ . Post hoc analysis with Bonferroni correction shows that when numeric quantifiers were used, partisans in the ingroup media condition rated corrective messages as more credible ( $M = 5.78$ ,  $SE = 0.20$ ) than those in the outgroup media condition ( $M = 4.92$ ,  $SE = 0.21$ ,  $p = .01$ ), but there was no statistically significant difference between partisans in the ingroup media condition and nonpartisans ( $M = 5.32$ ,  $SE = 0.32$ ,  $p = .71$ ). For corrective messages with verbal quantifiers, no statistically significant difference in message credibility perceptions was found between partisans the ingroup media condition ( $M = 5.46$ ,  $SE = 0.20$ ) and outgroup one ( $M = 5.35$ ,  $SE = 0.21$ ,  $p = 1.00$ ). Yet, nonpartisans rated corrective messages ( $M = 3.92$ ,  $SE = 0.30$ )

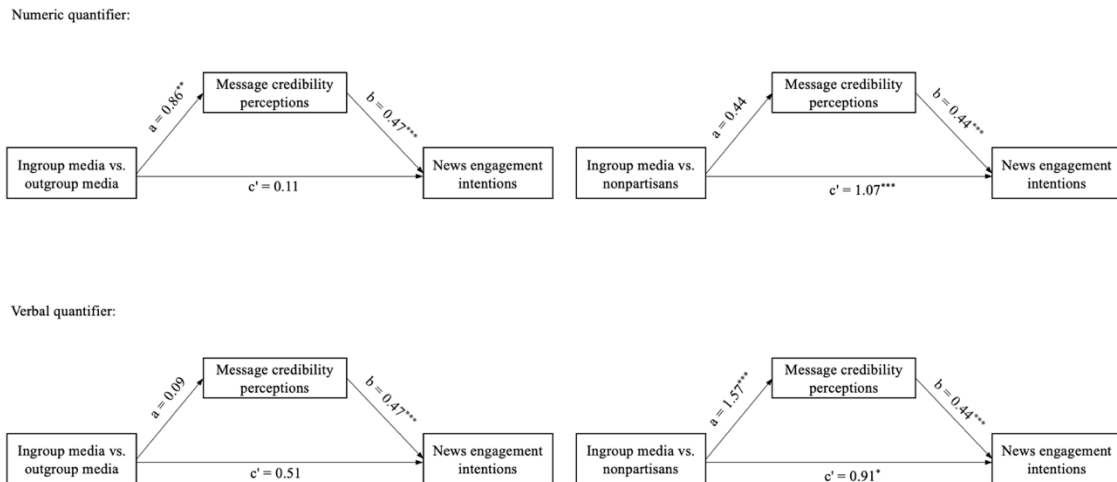
as significantly less credible than partisans in both ingroup ( $p < .001$ ) and outgroup media conditions ( $p < .001$ ). Finally, we found no interaction effects between exposure condition and types of quantifiers on news engagement intentions,  $F(2, 279) = 0.09, p = .91, \text{partial } \eta^2 = .001$ . Therefore, H4 was partially supported, and H5 was rejected.



**Figure 2. The effects of exposure condition by types of quantifiers in misinformation correction.**

To answer RQ1, we used PROCESS model 8 and conducted two separate pairwise moderated mediation analyses with 5,000 bootstrap resamples to investigate if the mediation pathways identified in H3a–b varied across numeric and verbal quantifiers.<sup>6</sup> Figure 3 shows that, relative to partisans in the outgroup media condition, partisans in the ingroup media condition had higher news engagement intentions, and this association was fully mediated by message credibility perceptions only when numeric quantifiers were used ( $b = 0.41, \text{bootstrapped } SE = 0.15, CI = [0.13, 0.71]$ ). Relative to nonpartisans, partisans in the ingroup media condition held higher message credibility perceptions, which, in turn, led to greater news engagement intentions, only when verbal quantifiers were used ( $b = 0.69, \text{bootstrapped } SE = 0.19, CI = [0.35, 1.09]$ ).

<sup>6</sup> For the two pairwise comparisons, ingroup media condition was coded as 1, and outgroup media condition or nonpartisan was coded as 0, respectively.



**Figure 3. Conditional indirect effects of partisan media's misinformation correction. Path a: direct effect of exposure condition on message credibility; path b: direct effect of message credibility on news engagement; path c: direct effect of exposure condition on news engagement. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .**

### Discussion

This study examined the effects of partisan media's correction of COVID-19 vaccine misinformation on individuals' message credibility perceptions and news engagement intentions. We draw on social identity theory and extend the "seeing media as group member" thesis (Stroud et al., 2014) to the context of audience consumption of misinformation correctives on partisan media. The evidence confirms that people tend to develop group orientations toward news media in times of uncertainties (i.e., COVID-19 pandemic). On the one hand, when partisans read corrective messages on media consistent with their political ideologies (i.e., ingroup media), they not only perceived such messages as more credible, but they also had higher engagement intentions as compared to those reading correctives on outgroup media. This finding is in line with the existing literature on partisan selective exposure showing that people are prone to consume and share information from like-minded media rather than from discrepant ones (Hasell & Weeks, 2016; Stroud, 2011). On the other hand, this study suggests that nonpartisans develop outgroup orientations toward partisan media, as they perceived corrective messages on partisan media as less credible and held lower news engagement intentions than partisans. This line of evidence empirically corroborates and advances the early accounts on nonpartisans' low levels of news consumption (Yeo et al., 2015).

Importantly, the study integrated insights from politeness theory and explored how the use of risk quantifiers in misinformation correction could exacerbate or attenuate the gaps in credibility judgment and news engagement intentions among different types of audiences. It shows that numeric quantifiers used in corrective messages enlarged the perceptual gaps in message credibility among partisan audiences, with partisans in the ingroup media condition perceiving these messages more credible than those in the

outgroup one. As corrective messages from the preferred ingroup media may not activate individuals' concerns about their negative face being threatened, they would use numeric quantifiers as a heuristic cue to infer the competence of ingroup media and make favorable judgments (see Phalet & Poppe, 1997). When it comes to outgroup media, partisans' desire to be independent and autonomous may be further undermined by evident and certain information delivered through numeric quantifiers. As previous research suggests the importance of information recipients' perceived intentions of communicators' politeness strategies (Juanchich et al., 2012), it is likely that partisans may assume outgroup media's attempts to manipulate them to buy in the presented information, which leads to defensive message processing and consequently, message derogation (Jenkins & Dragojevic, 2013; Kunda, 1987). This implies that precision may backfire in misinformation correction when audiences and media do not align in their political stances (see Nyhan & Reifler, 2010).

Alternatively, it is illuminating to find that verbal quantifiers used in corrective messages could mitigate the gaps of credibility perceptions between the ingroup and outgroup partisans, underscoring the utility of verbal risk quantifiers in misinformation correction. One explanation could be that verbal quantifiers, featuring fuzziness and vagueness, carve out room for interpretation (Juanchich et al., 2012; Juanchich & Sirota, 2013; Reyna, 2012). Like other politeness strategies used in science communication (e.g., hedging, Jensen, 2008), verbal quantifiers, by granting individuals autonomy and independence in interpreting risks, meet and protect their face needs and, in turn, enhance their perceptions of corrective messages on outgroup media as credible. Although previous studies show mixed evidence on the effects of polite and impolite language on credibility judgment (Jensen, 2008; Yuan et al., 2019), our study clarifies this puzzle by showing that politeness strategies, verbal quantifiers in this case, are particularly useful in communicating risks to partisan outgroups in the context of misinformation correction.

Contrary to our expectation, nonpartisans, although arguably viewing partisan media as an outgroup member, did not follow the patterns of partisans in the outgroup media condition. One plausible explanation is the involvement difference between partisans and nonpartisans (see Yeo et al., 2015). Past research in hostile media effects, for instance, noted that nonpartisans were not very sensitive to partisan information, which further affected their information processing, evaluations, and judgments (Gunther et al., 2012). In this study, we reckon that misinformation correction by partisan media might not appear to be face-threatening to nonpartisans, because of the lack of attention they paid to such content. Also, nonpartisans might not be as defensive as their partisan counterparts when reading corrective messages on outgroup media. Taken together, numeric quantifiers in corrective messages did not backfire, and verbal quantifiers did not reduce negative face threats among nonpartisans.

Moreover, this study revealed that message credibility served as a mediator in understanding the effects of misinformation correction on news engagement intentions. The results show that partisans in the ingroup media condition were more likely to engage because they deemed the corrective messages more credible as compared to partisans in the outgroup media condition and nonpartisans. This finding corresponds with previous research on the key role of credibility judgment in generating desirable outcomes in misinformation correction (Huang & Wang, 2020; Kim et al., 2021). In addition, it also connects misinformation correction research to the broader scholarly interest in news consumption and engagement

in the digital era (Curry & Stroud, 2021; Lu & Luqiu, 2020; Peifer & Myrick, 2021) by showing misinformation correction, if used properly, could foster news engagement.

Last but not least, the conditional indirect pathways revealed in this study delineate the mechanisms of how risk quantifiers could modify the effects of partisan media's correction of misinformation on news engagement intentions via credibility judgment. It suggests that the use of verbal quantifiers could reduce the gap in credibility judgment between ingroup and outgroup partisans, which, in turn, narrows the engagement gap between them. The use of numeric quantifiers by partisan media could close the engagement gap between ingroup partisans and nonpartisans via credibility perceptions. Taken together, these findings offer crucial insights on using risk quantifiers as a specific politeness strategy to downplay undesirable outcomes in misinformation correction. More broadly speaking, our study carves out a promising direction for integrating theories originated in interpersonal communication to understand phenomenon in the mass communication realm.

### ***Practical Implications***

The current research yields several practical implications. Recently, there is growing worry about the possibilities that news media would help disseminate misinformation by covering such information (Tsfati et al., 2020). One way for news media to address this issue is to proactively and routinely correct misinformation. Our study presents the utility of Twitter threads in misinformation correction by stating the myth, along with factual information that busts it. This effort could enhance message credibility and encourage news engagement behavior both immediately and long term. That said, misinformation correction efforts could be a viable way for news media to build audience trust and loyalty in an era featuring declining media trust and prevalent misinformation.

It should be acknowledged that partisan media face substantial challenges in correcting misinformation to an ideologically diverse audience during a fast-evolving and politicized public health crisis. Our findings suggest that the design of corrective information, with even a small tweak of the risk quantifiers, matters. When reporting politicized issues in times of uncertainties, partisan media should consider how the evidence can be strategically presented, so as to tailor to different ideological groups. For audiences who tend to disagree with or resist what is normally reported, news media should consider adopting politeness strategies, such as verbal quantifiers, in correcting misinformation to reduce potential backfires. For those ingroup partisans and nonpartisans who are less likely to involve themselves in defensive message processing, news media can correct misinformation with precise language, such as numbers.

### ***Limitations and Future Research***

Despite these insights, the study has a few limitations. First, we tested the effects of misinformation correction with COVID-19 vaccines, a salient issue at the time of study. Although we are confident about the findings across the three pertinent topics, future research should apply our conceptual framework to other issues. Second, we used *NYT* and *WSJ* to represent partisan media in this study. The marginal significant difference in partisans' message credibility perceptions about ingroup and outgroup media points

to the need for expanding the scope of inquiry to other partisan media with more evident political slant. Next, although this study shows that verbal quantifiers could reduce the gap in partisans' credibility judgment of and engagement with ingroup versus outgroup media, researchers may want to look into the underlying mechanisms, such as the extent to which these quantifiers would trigger negative face threats and defensive message processing. It is also crucial to sort out how nonpartisans process corrective messages on partisan media, which can help draw a rigorous conclusion. Finally, given that we fielded the experiment based on a convenience sample, the findings may not be generalized to the online population. It would be ideal to validate our findings using online field experiments that involve diverse users in the realistic setting.

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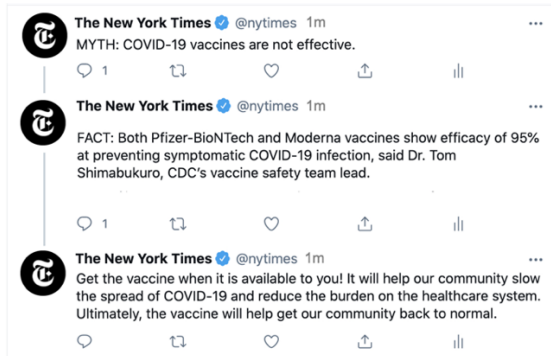
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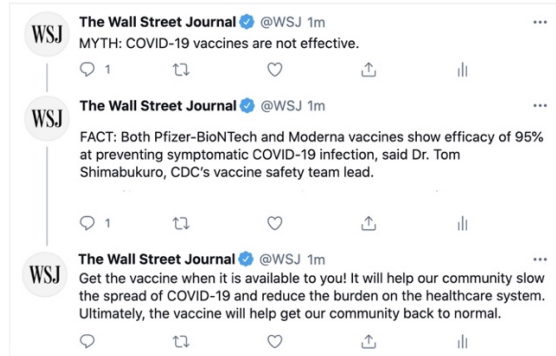
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**Appendix: Stimuli Material**



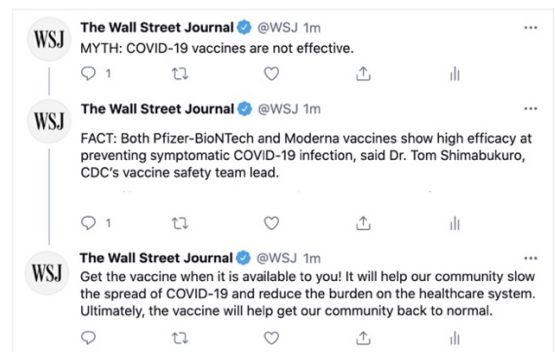
**Figure A1. NYT/numeric quantifier/vaccine inefficacy.**



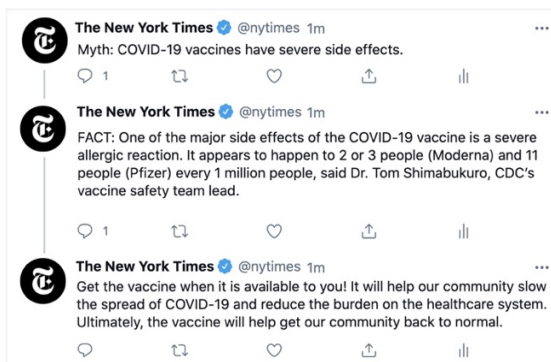
**Figure A2. WSJ/numeric quantifier/vaccine inefficacy.**



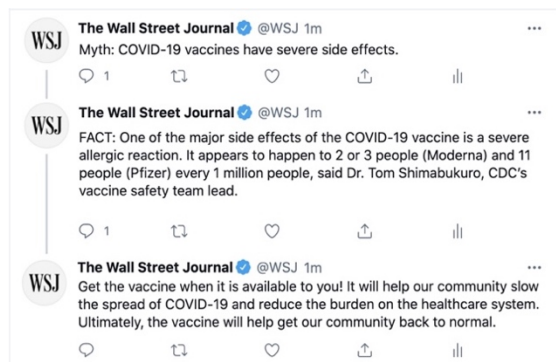
**Figure A3. NYT/verbal quantifier/vaccine inefficacy.**



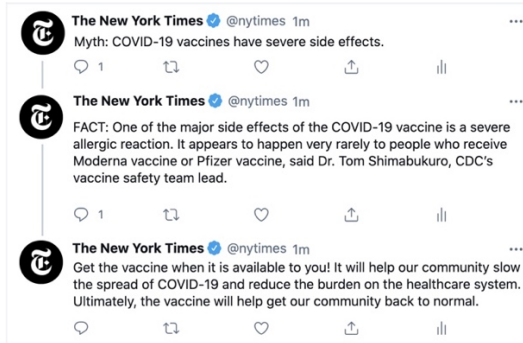
**Figure A4. WSJ/verbal quantifier/vaccine inefficacy.**



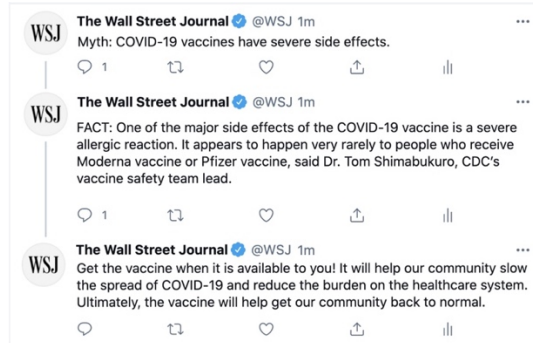
**Figure A5. NYT/numeric quantifier/vaccine side effects.**



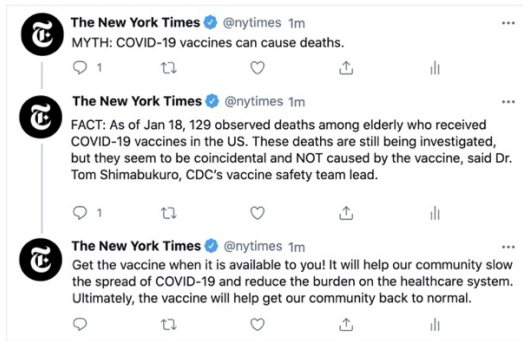
**Figure A6. WSJ/numeric quantifier/vaccine side effects.**



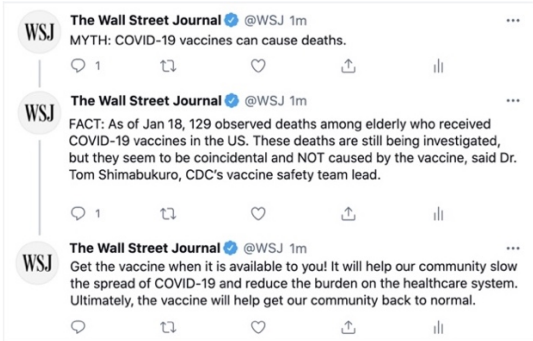
**Figure A7. NYT/verbal quantifier/vaccine side effects.**



**Figure A8. WSJ/verbal quantifier/vaccine side effects.**



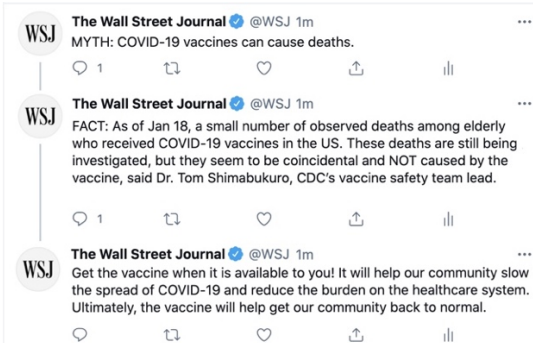
**Figure A9. NYT/numeric quantifier/death.**



**Figure A10. WSJ/numeric quantifier/death.**



**Figure A11. NYT/verbal quantifier/death.**



**Figure A12. WSJ/verbal quantifier/death.**