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# Twitter and Endorsed (Fake) News: The Influence of Endorsement by Strong Ties, Celebrities, and a User Majority on Credibility of Fake News During the COVID-19 Pandemic

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Focusing on a widespread COVID-19 conspiracy theory, this study examines how social endorsement systems on Twitter, represented by retweets and metrics indicating the number of engagements by others, affect assessment of credibility of (fake) news. Expanding studies on social influence and endorsement-based heuristics, we hypothesized that Twitter users would consider fake news retweeted by a strong tie and with cues indicating a greater number of likes, comments, and retweets as more credible than news retweeted by a celebrity and without the cues. Through a two-by-two survey experiment among 267 Twitter users, we found evidence to support these hypotheses. We additionally found that the effectiveness of strong ties and celebrities as retweeters varied by users' perceptions of their attributes and users' interactions with them. These findings add to the literature of news credibility by demonstrating the effects of endorsements from social media contacts. Our study partly explains how and why fake news and disinformation spread in the networked online environment. We conclude this study by discussing implications for interventions of fake news on social media.

*Keywords: fake news, disinformation, news credibility, endorsement-based heuristic, social media*

At the early stage of the COVID-19 pandemic, there was limited scientific knowledge about the virus' origin and cause and a lack of clear advice about prevention and cures (Cyranoski, 2020). Unverified

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rumors, conspiracy theories, and fake news such as that a powerful group of individuals intentionally spread the virus, became popular, especially on social media. Although the rise of conspiracy theories—which typically proliferate by taking advantage of social instability—is not a unique phenomenon of the COVID-19 pandemic, they are seemingly propagating more than at any other time of social upheaval. The World Health Organization (WHO) officially coined the term *infodemic* to describe the "overabundance" of wrong information about COVID-19 and announced its efforts to fight it (Ghebreyesus, 2020). Coupled with this infodemic, concerns and fears that social media mislead the public have continued to rise.

To prevent viral spread of conspiracy theories and fake news on social media, it is important to understand the context in which people evaluate the credibility of news and information on social media. People's evaluations are typically influenced by others. Hilligoss and Rieh (2008) defined the ways that people make judgments based on others' thoughts and opinions as *endorsement-based heuristics*. On social media, endorsements of news and information can occur both individually and collectively. For example, most social media platforms provide a content-forwarding feature (e.g., retweeting in Twitter) that encourages individuals to express support of news content. Research on *endorsement-based heuristics* shows that people trust news more easily when the news is shared by trusted others, such as family and close friends (i.e., strong ties) who secure opinion leadership through relational closeness (Turcotte, York, Irving, Scholl, & Pingree, 2015), and/or celebrities who enjoy fame, public recognition, and one-sided intimacy in parasocial relationships (Mena, Barbe, & Chan-Olmsted, 2020). In addition to content-forwarding features, social media posts are typically presented with numeric metrics indicating the popularity of their content, such as the numbers of likes, comments, and other engagements that likely improve credibility assessment (Borah & Xiao, 2018; Sundar, 2008). Likewise, it is possible that the endorsement-based heuristics afforded by various social media features mislead people's evaluation of news and further facilities an infodemic. However, there is not much empirical evidence that examines and compares the influences of those social media affordances and identifies their risks to an infodemic. To fill this gap, our work aims to uncover how social endorsement systems on social media change how people evaluate fake news—in this case, a specific theory regarding the COVID-19 vaccination.

We specify our research context to Twitter, as it recently serves as an important news source for many individuals and, accordingly, has been criticized as a major venue for fake news (Vosoughi, Roy, & Aral, 2018). Moreover, its design and exclusive use allow us to investigate the different cases of news sharing on social media where various endorsement-based heuristics interfere with people's evaluations both individually and in combination with one another. For instance, Twitter's content-forwarding feature ("retweet") enables users to acquire news recommended by diverse social contacts, including strong ties and celebrities, through one platform. Such retweeted news is typically displayed with numeric metrics indicating other users' engagements that make an individual user aware of who and how many others support the news.

In this work, we first reviewed pertinent theories and research regarding the heuristic process in credibility assessment and then proposed research questions and hypotheses by expanding them. Next, we conducted a two (the presence or absence of majority endorsement cues) by two (a strong tie or a celebrity endorsement cue) between-subject quasi-online experiment to test our research questions and hypotheses. Our results showed that people tend to consider fake news as more credible when retweeted by strong ties

rather than by celebrities and when posted with greater numbers of likes, comments, and retweets. However, the effectiveness of a retweeter varied by how users perceived attributes of the retweeter and how they interacted with them. We conclude this study by discussing implications of our findings, offering the potential direction of individual and societal efforts to prevent future infodemics.

## Background

### *Conspiracy, Fake News, and Credibility*

Conspiracy theories occurred in society long before the advent of social media. The terminology is drawn from what the philosopher Karl Popper called *the conspiracy theory of society* (Popper, 1966, 1972). He coined this term to criticize the approach to explaining a social phenomenon by mistakenly attributing its planning and propagation to a small number of people. During the COVID-19 pandemic, conspiracy theories about the origin of the virus, such as that Bill Gates intentionally launched the outbreak because of political or economic motivations, have been acute (Mitchell, Jurkowitz, Oliphant, & Shearer, 2020). The belief in such a conspiracy theory often leads to antivaccination attitudes (Jolley & Douglas, 2014). In that perspective, the conspiracy theory about COVID-19 vaccination can be defined as *disinformation*, referring to false information intentionally designed to cause public harm (Freelon & Wells, 2020).

According to a national survey conducted by the Pew Research Center (Mitchell et al., 2020), American adults "who frequently turn to social media for news about the outbreak" are more likely to hear about conspiracy theories (para. 2). This is probably because on social media, conspiracy theories are shared in the format of news articles that mimic the mainstream news, often so-called *fake news* (Freelon & Wells, 2020). Of course, most stories and sources are likely fabricated in this format, but such a way of sharing gives the public the false impression that legitimate evidence and sources exist to support the allegations of conspiracy theories (Pennycook & Rand, 2019). It is difficult to identify who creates and spreads such fake news; what is evident, however, is that those who believe in the conspiracy theories are more likely to trust the relevant (fake) news and be willing to share that news with others (C. S. Lee & Ma, 2012). In that sense, believability of (fake) news is the driving force behind the spread of COVID-19 conspiracy theories.

Believability or credibility of news is not a novel topic in communication and journalism studies. Researchers have long been concerned with news credibility. News credibility is a subjective and implicit concept. People perceive news as credible when they judge it as having the "quality" of being believable (Tseng & Fogg, 1999, p. 39). Although various components comprising news credibility have been proposed in the literature (see Thorson, Vraga, & Ekdale, 2010 for details), we define news credibility using three subcomponents—unbiases, accuracy, and trustworthiness of news—that have been commonly referred to in studies of news credibility (Metzger & Flanagin, 2015; Meyer, 1988). These subcomponents are also employed when assessing types of information besides news articles, including weblogs and social media posts (Roberts, 2010).

### *How People Assess Credibility of News on Social Media*

As cognitive misers, people want to minimize their cognitive efforts when assessing information and making decisions. In many cases, individuals assess information using a *heuristic method* rather than

scrutinizing, unless that information is particularly relevant or important to them (Cacioppo & Petty, 1982). Assessing a news article is not an exception. People tend to evaluate news credibility based on who provides the news and how the news is formatted rather than by examining its content closely (Sundar, Knobloch-Westerwick, & Hastall, 2007). People's judgment is also affected by how others around them think about and support that news (Metzger, Flanagin, & Medders, 2010), or what Hilligoss and Rieh (2008) called *endorsement-based heuristics*.

With the advancement of social media, the role of endorsement-based heuristics in news credibility becomes more salient (Messing & Westwood, 2014). On social media, people are more likely to get news and information shared by their social contacts rather than from traditional media outlets, such as news company websites. For example, Twitter users can retweet a post created by another user to their followers. To put it in the context of news consumption, they can be incidentally exposed to news content shared by other users whom they follow regardless of their intentions. As suggested by Hilligoss and Rieh (2008), the social relationship that a user has with a retweeter (an endorsement-based heuristic) may affect the user's assessment of news credibility. A few studies have already offered empirical evidence showing that news shared through a message-forwarding system on social media tends to be perceived as more credible than those shared through traditional media outlets (Kaiser, Keller, & Kleinen-von Königslöw, 2018; Turcotte et al., 2015).

Retweeted posts on Twitter likely include heuristic cues in addition to the social relationships with retweeters. For instance, Twitter offers numeric metrics regarding the popularity of posts by default (e.g., the number of likes, comments, and retweets). Consistent evidence has been provided concerning the heuristic process through which the numeric metrics of popularity affect credibility assessment (see Sundar, 2008). It is possible that combinations of two endorsement-based heuristics create a synergy effect. Formally stated, the heuristic associated with endorsement from an individual user may interact with the heuristic associated with endorsement from a majority of users. However, there is a lack of scholarly efforts to compare and integrate the effects of these two endorsement-based heuristics within one research context. This makes it difficult to identify the relative roles of different social media features in the spread of fake news and provide cohesive guidance to prevent the social media infodemic. To resolve this difficulty, our attempt is not limited to examining the main effects of endorsement-based heuristics but is extended to exploring their interaction effects.

### *Endorsement From a Social Media Contact: The Influence of a Strong Tie Versus a Celebrity as an Endorser*

The research in social influence has long suggested that closely knit groups such as family and close friends (i.e., strong ties) have greater influence on people's choices and behaviors than any other social contacts (Krackhardt, 2003). Although Granovetter (1973) suggested the *strength of weak ties* in acquiring new information and innovations, strong ties are not only built upon emotional bonds but are also based on homophily such as similar values, beliefs, and lifestyles (McPherson, Smith-Lovin, & Cook, 2001). Words and information from strong ties are accordingly more compelling than those from any other social ties. With social media, people can make persistent and pervasive contacts with diverse people, including acquaintances and even strangers (Hampton, 2016), some of whom indeed serve as significant sources of

information and support (Burke & Kraut, 2014). News and information shared by such social contacts may be perceived as credible in the same way as those shared by strong ties.

In addition to personal networks, social media allow people to have direct and personalized access to celebrities like movie/pop stars who have fame and public recognition, established well before social media (see McCracken, 1989). Information endorsed by those celebrities often exerts compelling influence on individuals' choices (Weinstein, 2021). Although some studies have found that social media use enables celebrities to make close relationships with the public (Chung & Cho, 2017; Kim & Song, 2016), the nature of these relationships is still *parasocial*, signifying the one-sided intimacy and loyalty that individuals feel toward celebrities (Horton & Wohl, 1956). In other words, the social relationships that individuals make with celebrities on social media are different from those with other typical social contacts. The underlying mechanism behind a celebrity endorsement is thus distinct from that of a strong tie endorsement.

To summarize, celebrities and strong ties are good comparators to distinguish between the different qualifications associated with social media endorsers. However, no definitive conclusion exists regarding whose endorsements are more effective. This lack of research may result from a reading of the literature that did not place interactions with strong ties and celebrities in the same context. In the past, interactions with celebrities generally happened through mass media, whereas interactions with strong ties were in person. The "context collapse" (Marwick & boyd, 2011, p. 124) of social media now allows both interactions to occur in the same network setting. However, we find it unlikely that the introduction of social media undermines the existing trend in social endorsement. As suggested by the two-step flow model (Katz & Lazarsfeld, 1955), messages from mass media influence a person's behaviors when they are supported by that person's strong ties. Given this finding, Katz (1957) argued that relational closeness is a key component in constituting opinion leadership. Social media users may view news content as more credible when their strong ties share it with them. Therefore, we propose the first hypothesis as follows:

*H1: News endorsed by a strong tie will be perceived as more credible than news endorsed by a celebrity.*

As mentioned earlier, the attributes that distinguish a celebrity endorsement from a strong tie endorsement are relational closeness and fame. Individuals typically feel more connected to their strong ties than to celebrities while perceiving—usually correctly—celebrities to be more famous than their strong ties. However, both relational closeness and fame are subjective perceptions varying by individuals. In other words, the effects of strong tie/celebrity endorsement depend on how individual users perceive the relational closeness and fame of an endorser. A user could perceive that their strong ties are better known in social media than a celebrity, or they could feel just as connected with a celebrity as they do with their strong ties.

Although celebrities typically have greater numbers of connections and abilities to "trigger message replies, initiate conversations, and diffuse information" (Weeks, Ardèvol-Abreu, & Gil de Zúñiga, 2017, p. 217) on social media because of their frequent appearances on mass media, social media provide opportunities for "regular" individuals to emerge as *influencers* who can reach out to large audiences without mass media appearances (Freberg, Graham, McGaughey, & Freberg, 2011). Unlike traditional celebrities, social media influencers often build authentic relationships with their fans that go beyond parasocial intimacy (Baym, 2012). If a user perceives that a social media influencer—who exercises influence over a large

audience of followers—is indeed part of their social network, the endorsement effects from this social media contact may be greater than those from either traditional celebrities or their close friends. To examine the effects of this unique type of strong tie, we hypothesized:

*H2: News endorsed by strong ties who have fame on social media will be perceived as more credible than any other social media contacts.*

In a similar vein, relational closeness is not a quality necessarily attached only to strong ties. Research shows that frequent interaction represents and increases relational closeness, familiarity, and likeness (Caughlin & Sharabi, 2013). Regardless of the types of social relationships, those who frequently interact with each other feel strong relational closeness. News recommended by someone with whom a person regularly interacts is also more likely to be perceived as credible (Wright & Cantor, 1967). Although most social media users interact with strong ties more frequently than celebrities, some of them could become absorbed in interactions with celebrities and develop strong feelings of intimacy and loyalty toward them (Rubin & McHugh, 1987). In this case, a celebrity endorsement could have a synergistic effect as a result of the combination between the fame a celebrity typically holds and the (parasocial) closeness the user develops.

*H3: Those who frequently interact with a celebrity on Twitter will perceive news endorsed by that celebrity as more credible than that of strong ties.*

### *Endorsement From Many Users: Bandwagon Heuristic*

In addition to heuristic cues pertaining to who shares the news, other types of endorsement-based cues can be placed together in the shared news context. For example, most posts on Twitter include numeric counters indicating how many people like, comment on, and retweet each post. Independent from who creates and shares the news, users can be made aware of how many others support and engage in the shared news, which also functions as an endorsement-based heuristic in credibility assessment. Sundar (2008) defined a *bandwagon heuristic* as heuristic cues related to endorsement from a majority of users.

Providing cues related to the bandwagon heuristic is not a unique affordance of social media. Many online applications introduced before social media provide various forms of numeric metrics indicating content popularity. Considerable evidence shows that people heavily rely on these numeric metrics when making online decisions such as selecting news articles (Messing & Westwood, 2014), college courses (Steffes & Burgee, 2009), music to stream, and downloads (Salganik, Dodds, & Watts, 2006). People's tendency to rely on bandwagon cues can be explained by myriad theories in social influence such as conformity (Asch, 1955) and social validation (Rendon, 1994). The influences of bandwagon cues are especially increased when trustworthy information sources are ambiguous (Flanagin, 2017; Metzger et al., 2010). In the context of social media, the presence of bandwagon cues contributes to information credibility and further accelerates the speed of its diffusion (Borah & Xiao, 2018). Extending the previous research on the effects of bandwagon cues, we hypothesize that:

*H4: The presence of bandwagon cues will increase the perceived credibility of fake news about a conspiracy theory.*

In addition to the independent effect of the bandwagon heuristic from a celebrity/strong tie endorsement, the bandwagon heuristic could interact with a celebrity/strong tie endorsement. However, it is difficult to gauge the direction of this interaction effect. Only a few studies have examined the combination effects of heuristic cues, and their findings are mixed. For example, Sundar and colleagues (2009) examined the effects of various endorsement heuristics on commercial decisions but found no interaction among them, whereas Lee and Sundar (2013) discovered that the messages created by a high-authority source were perceived as more credible when they had bandwagon cues. Considering the real-world situation where endorsement from an individual endorser and endorsement from a group of endorsers happen together, our work attempts to examine the combined effects of two forms of endorsement-based heuristics, leading us to our final research question:

*RQ1: Does the bandwagon heuristic effect interact with a strong tie/celebrity endorsement effect?*

## Methods

We designed a two-by-two between-subject quasi-online experiment to investigate the effects of endorsement-based heuristic cues and their interactions with various intervening factors on credibility assessment. Our experiment specifically had four groups, or *treatments*: CN (celebrity—no bandwagon), CB (celebrity—bandwagon), SN (strong tie—no bandwagon), and SB (strong tie—bandwagon). To control the effects of social media platforms, we restricted participants to users of Twitter, one of the social media platforms heavily criticized over the proliferation of fake news (Vosoughi et al., 2018).

### *Sample*

A total of 380 Twitter users were recruited via Amazon MTurk between September 29 and October 14, 2020. We recruited participants through four batches on four different days of the week and at different times of the day. Considering recommended best practices (Peer, Vosgerau, & Acquisti, 2014) and our research purposes, we allowed only MTurk users who met the following criteria to participate in our experiment: American adults who have Twitter accounts and at least a 90% MTurk approval rating. The experiment took an average of 10 minutes. Participants were provided an incentive of $2.50 after completion. To improve data quality, we excluded responses from participants who failed attention checks (Kung, Kwok, & Brown, 2018). Of the 380 completed surveys, 29.7% failed at least one attention check (consisting of instruction-response items) or showed a pattern of answers that suggested impropriety (e.g., providing the same response to all questions or alternating answers in perfect patterns).

Among the 267 participants who provided valid answers, 38.58% were female. The average age of participants was 36.91 ($SD$ = 10.15). A majority of participants (81.65%) identified themselves as White, 6.74% as Asian and Asian Indian, 6.37% as Black or African American, and 5.24% as other races; In terms of ethnicity, 7.87% of the participants identified themselves as Hispanic, Latino, or Spanish. Nearly half of

the sample (49.44%) reported annual household income of less than $50,000, and 27.34% reported more than $75,000.

### *Procedure and Manipulation*

In the pretest, participants were asked to answer questions about their general Twitter use and their COVID-related knowledge and experience (i.e., whether they themselves or a family member had been recently diagnosed), as well as their Twitter use pertaining to COVID-related (fake) news (i.e., how frequently they were exposed to fake news and/or shared news about COVID-19 on Twitter). Next, they were requested to offer a first name, initials, or nickname of another Twitter user with whom they frequently interacted and felt strongly connected. Participants additionally noted whether this person was their immediate family member (24. 0%), close friend (57.7%), coworkers (10.0%), and/or other another acquaintance (14%)[2]. This specified individual was used to create a treatment if participants were assigned to SN or SB groups.

We selected Bruno Mars' Twitter account as our treatment for the celebrity conditions (i.e., the CN and CB groups). Bruno Mars is a celebrity with one of the highest number of followers (Wikipedia, 2021) and is known as politically neutral compared with other celebrities who often express political opinions (Inside Radio, 2019). We decided not to use different celebrities as the treatment to reduce the variations of personal preferences toward celebrities. Nevertheless, participants might have different feelings and attitudes toward Bruno Mars. To control these variations, we asked a series of questions regarding how influential participants thought Bruno Mars was and how often they interacted with Bruno Mars through liking, commenting, or direct messaging. These questions were employed as the manipulation check questions (see below) as well as the moderating variables in the regression analysis.

After answering all pretest questions, participants were randomly assigned into one of the four treatment groups. Across all treatment groups, participants were consistently instructed to read a Twitter post (see Figures 1–4) citing the news that the COVID-19 vaccination is a conspiracy planned by Bill Gates to implant microchips into human bodies. This post was originally created by a Twitter user—"@abellington"—whom we randomly fabricated. Participants in the SB and SN groups (i.e., the strong tie endorsement condition) were additionally exposed to a cue indicating that this post was retweeted by the Twitter user they named, whereas participants in the CB and CN groups (i.e., the celebrity endorsement condition) were exposed to a cue indicating that this post was retweeted by Bruno Mars. For the bandwagon endorsement, cues of "318K" likes, "6.7K" comments, and "139.2K" retweets were displayed together in CB and SB treatments (i.e., bandwagon endorsement condition), while none of those cues appeared in the CN and SN treatments (i.e., no bandwagon endorsement condition). To ensure the manipulation, we included a different instruction for each condition: "Please imagine that the following tweet goes viral and then is retweeted by [the name of the Twitter user whom participants indicated]/Bruno Mars" and "Please imagine that the following tweet is from [the name whom participants indicated]/Bruno Mars."

[2] Participants noted more than one choice.


***Figure 1. Strong tie—Bandwagon condition (SB).***


***Figure 2. Strong tie—No bandwagon condition (SN).***


***Figure 3. Celebrity—Bandwagon condition (CB).***


***Figure 4. Celebrity—No bandwagon condition (CN).***

### *Manipulation Check Questions*

To gauge the validity of manipulations regarding strong tie/celebrity and bandwagon endorsements, we compared participants' actual interactions with the Twitter user whom each participant named and Bruno Mars, along with the perceived fame of either the named user or Bruno Mars on Twitter. More specifically, participants were asked to indicate how often they frequently liked, left comments for, and sent/received direct messages with the Twitter user they named/Bruno Mars on a 5-point Likert scale (1–5) during the pretest. The average score for interactions with a Twitter strong tie was 3.09 (*SD* = .62). The average score for interactions with Bruno Mars was 1.50 (*SD* = .85). Further, we asked participants to rate the Twitter influence of their Twitter strong tie or Bruno Mars using a 5-point Likert scale (1–5). The average score for a strong tie's Twitter influence was 1.80 (*SD* = .91). The average score for Bruno Mars' perceived fame on Twitter was 3.45 (*SD* = .77). Regarding bandwagon cues, we asked a true or false question, such as "The tweet above received 318.2K 'likes.' True or False?" Those who provided correct answers were included in the analysis.

### *Dependent Variables*

We assessed participants' perceived information credibility using measures developed by Meyer (1988). Although Meyer developed multidimensional scales of news credibility, considering the limitations of survey experiments, we used only three subscales that have been widely used in studies of credibility assessment (Roberts, 2010). Participants were asked how much they agreed that the post they saw was accurate, unbiased, and trustworthy on a 5-point Likert scale (1–5). Participants' answers to these three questions were summed up for the analysis (*M* = 5.58, *SD* = 3.58, Cronbach's alpha = .940, range: 3–15).

### *Control Variables*

In addition to basic demographic information, we included participants' COVID-related personal experiences, knowledge about COVID-19, political orientations, and belief in the COVID-19 conspiracy theory as controls in the analysis. Results indicated that 7.12% of participants had been diagnosed with COVID-19, and 10.11% had family members in their households who had been diagnosed. We assessed participants' knowledge of COVID-19 by asking them seven facts about COVID-19. For the analysis, we summed up only the correct answers (*M* = 4.45, *SD* = .93). Belief in the COVID-19 conspiracy was measured by asking how much participants believed that the COVID-19 outbreak was intentionally planned based on a 5-point Likert scale (*M* = 1.99, *SD* = 1.35, range: 1–5). Participants also reported how often they encountered fake news and misinformation about COVID-19 (*M* = 3.66, *SD* = 1.13) and how frequently they shared information about COVID-19 on Twitter using a 5-point Likert scale (*M* = 2.91, *SD* = 1.49, range: 1–5). To measure political orientation, we asked participants the extent to which they supported Donald Trump's administration on a 5-point Likert scale (*M* = 2.33, *SD* = 1.67, range: 1–5).

## Results

### *Manipulation Checks*

Before testing the hypothesis and answering research questions, we checked to see whether the manipulation of strong tie/celebrity endorsement worked in the way we intended. We specifically expected participants in the strong tie endorsement condition to report higher levels of Twitter interaction with their Twitter contacts than the levels of interaction with the celebrity reported by participants in the celebrity endorsement condition. Conversely, participants in the celebrity condition were anticipated to rate the fame of the celebrity on Twitter as higher than that of the Twitter contacts reported by those in the strong tie endorsement condition.

ANOVA tests confirmed that participants in the strong tie endorsement condition ($M$ = 3.15, $SD$ = .60) had higher levels of interaction with their Twitter contacts than those in the celebrity endorsement condition did with the celebrity ($M$ = 1.46, $SD$ = .81, $F$ = 358.9, $p$ < .001). On the other hand, the Twitter fame of the celebrity as rated by participants in the celebrity endorsement condition ($M$ = 3.45, $SD$ = .72) was higher than that of the Twitter contact reported by participants in the strong tie endorsement condition ($M$ = 1.87, $SD$ = .95, $F$ = 233.8, $p$ < .001).

### *Main Analyses*

We conducted a set of three regression models predicting the credibility of (fake) news in R. Model 1 was conducted to test the main effects of treatments. Model 2 was carried out to explore the interaction effects between strong tie/celebrity endorsement and the qualifications of the endorser (i.e., frequent interactions and perceived fame on Twitter). Finally, Model 3 was designed to test the interaction effect between strong tie/celebrity endorsement and bandwagon endorsement. Participants' COVID-related personal experiences, knowledge about COVID-19, political orientations, and belief in the COVID-19 conspiracy theory were included as control variables along with their demographic characteristics across the models. The results are presented in Table 1.

We found that participants who were female, Hispanic, and non-White were more likely to perceive the news reflecting the conspiracy theory about COVID-19 to be credible (see Model 1 in Table 1). In addition to those specific demographics, participants who supported the Trump administration, believed that the COVID-19 outbreak was planned, and frequently shared COVID-related information on social media—but had a lack of correct knowledge about COVID-19—tended to trust the news allegations that Bill Gates contrived the outbreak. Those whose family members had been recently diagnosed with COVID-19 perceived this news to be more credible as well.

***Table 1. Experimental Effects on Credibility (N = 267).***

| | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | b | (se) | b | (se) | b | (se) |
| **Treatments** | | | | | | |
| Bandwagon cue | .530* | (.263) | .534* | (.251) | .509 | (.358) |
| Strong tie vs. Celebrity cue | .516* | (.263) | −.035 | (1.349) | .495 | (.354) |
| **Control Variables** | | | | | | |
| Female | .898** | (.263) | 1.026*** | (.264) | .900** | (.274) |
| Hispanic | 1.245* | (.263) | 1.172* | (.490) | 1.251* | (.508) |
| White | −.781* | (.335) | −.727* | (.324) | −.783 | (.336) |
| Education | .163 | (.112) | .111 | (.110) | .163 | (.112) |
| Income | −.103 | (.072) | −.101 | (.070) | −.102 | (.072) |
| Age | −.017 | (.013) | −.018 | (.013) | −.017 | (.013) |
| COVID info sharing | .310** | (.094) | .202* | (.095) | .310** | (.094) |
| Exposure to COVID fake news | −.060 | (.116) | −.007 | (.112) | −.060 | (.116) |
| COVID knowledge | −.767*** | (.166) | −.589*** | (.163) | −.766*** | (.167) |
| COVID diagnosis (self) | −.240 | (.752) | −.089 | (.724) | −.235 | (.756) |
| COVID diagnosis (family) | 1.300* | (.652) | .75 | (.635) | 1.295* | (.656) |
| Influence of retweeter | – | – | −.120 | (.244) | – | – |
| Interaction with retweeter | – | – | .910*** | (.265) | – | – |
| Prebelief in planned COVID | 1.287*** | (.130) | 1.095*** | (.129) | 1.287*** | (.130) |
| Trump approval on COVID | 1.109*** | (.323) | .843** | (.317) | 1.113*** | (.327) |
| **Interactions** | | | | | | |
| Strong tie vs. Celebrity cue × Influence of retweeter | – | – | 1.191*** | (.339) | – | – |
| Strong tie vs. Celebrity cue × Interaction with retweeter | – | – | −1.067** | (410) | – | – |
| Bandwagon cue × Strong tie vs. Celebrity cue | – | – | – | – | .044 | (.523) |
| Constant | 5.149*** | (1.161) | 4.280** | (1.524) | 5.149*** | (1.163) |
| Adjusted $R^2$ | .674 | | .704 | | .673 | |

*Note. b = unstandardized coefficient.*

***Effects of Strong Tie/Celebrity Endorsement***

In H1, we anticipated the relative endorsement effect of strong tie over celebrity. We found that the retweeted news was perceived as more credible in the strong tie endorsement condition than in the celebrity endorsement condition ($b$ = .516, $p$ < .05). This result indicates that (fake) news would seem more credible when it is endorsed by someone from a person's strong ties than by a celebrity. However, the relative effect of strong tie endorsement (beta = .072) was less substantive than control variables such as the effects of prebelief in planned COVID-19 (beta = .485) and approval of the Trump administration (beta = .148).

Although our manipulation check analysis showed that our participants typically interacted more with their strong ties than with the celebrity—whereas they perceived the celebrity as having higher levels of fame on Twitter than their strong ties—the degree in Twitter interactions with strong tie/celebrity and the perceived Twitter fame of the strong tie/celebrity varied by individuals. H2 and H3 specifically examined whether and how the celebrity/strong tie endorsement effects were moderated by the frequency of interaction with the retweeter and the perceived Twitter influence of that retweeter.

Regarding H2, we found that the influence of strong tie/celebrity endorsement significantly interacted with the degree of perceived fame of the retweeter ($b$ = 1.095, $p$ < .001). As probed in Figure 5, the effects of the retweeter's fame on Twitter became significant only when the retweeter was the strong tie rather than the celebrity. This finding indicates that the effect of strong tie endorsement is improved when users perceive their strong ties as having the ability to reach out to large audiences on Twitter. On the other hand, the effects of celebrity endorsement on credibility did not vary by the perceived fame of the celebrity.

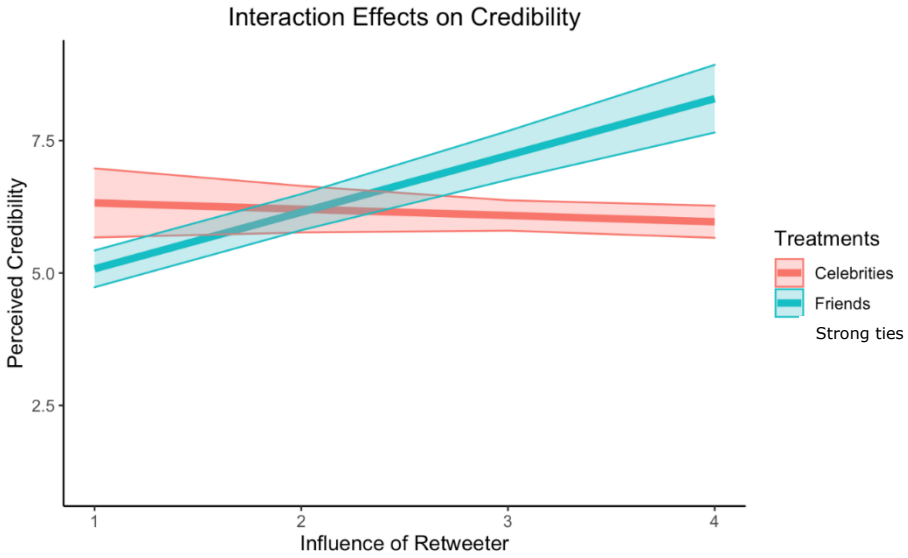


***Figure 5. Interactions between strong tie versus celebrity endorsement and perceived Twitter influence of retweeter.***

As hypothesized in H3, we found that regular Twitter interactions with an endorser significantly impacted the strong tie/celebrity endorsement effect. To further investigate, we decomposed the interaction effects, as illustrated in Figure 6. The findings revealed that the celebrity endorsement effect was contingent upon the frequency of regular interactions with the endorser; if the retweeter was the celebrity, then regular interaction with that celebrity was positively associated with credibility assessment ($b$ = .910, $p$ < .001). On the other hand, the frequency of Twitter interaction did not have any significant effects on credibility when the retweeter was the strong tie ($b$ = -.167, $p$ > .05). This indicates that if the levels of interaction with both the celebrity and the strong tie were identically higher (e.g., 4 points out of 5), fake news retweeted by that celebrity would seem more credible than the same content retweeted by the strong tie.

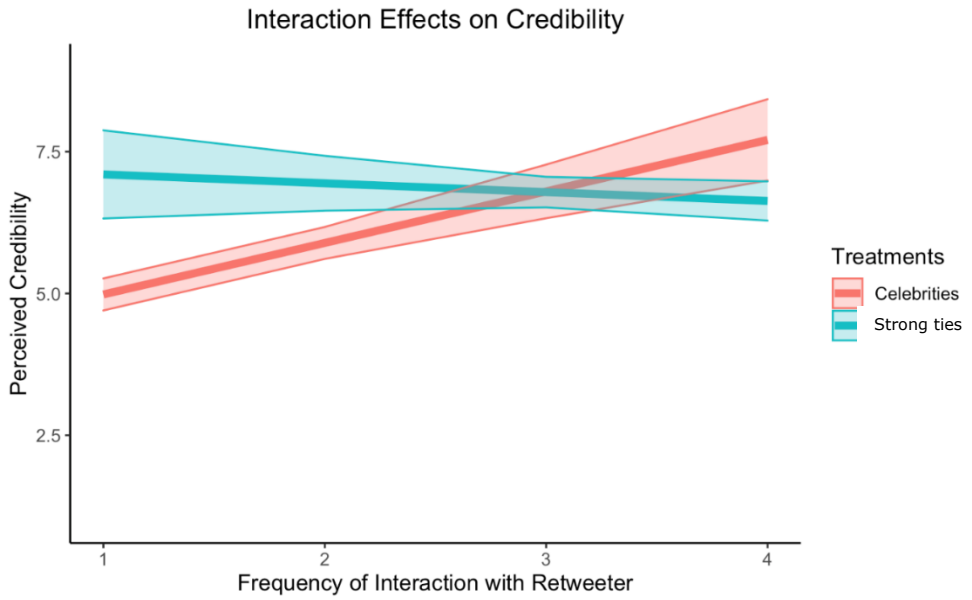


***Figure 6. Interactions between strong tie versus celebrity endorsements and frequency of interactions with retweeter.***

***Effects of the Bandwagon Heuristic and Its Interactions With Strong Tie/Celebrity Endorsement***

There was clear evidence to support H4 suggesting the effectiveness of bandwagon cues in credibility assessment; news with bandwagon cues was more likely to be considered credible than news without bandwagon cues ($b$ = .530, $p$ < .05). Compared with the relative effects of a strong tie endorsement over a celebrity endorsement (beta = .072), the effect of bandwagon cues is slightly more substantive (beta = .074) but does not overweigh the effects of preconception on conspiracy theory (beta = .485) and approval of the Trump administration (beta = .148).

Regarding RQ1, we did not find any significant interaction effect between a strong tie/celebrity endorsement and a bandwagon endorsement. This finding indicates that endorsement from an individual

entity and endorsement from a group of people have independent impacts on credibility assessment. The combination of those two endorsements did not elicit a synergistic effect.

## Discussion

Considering the COVID-19 pandemic, where unverified and inaccurate information continues to circulate on social media, this study explored how the endorsement-based heuristic cues afforded by social media affected people's credibility evaluation of (fake) news. In this work, we proposed hypotheses and research questions associated with strong tie/celebrity endorsement and bandwagon endorsement presented through retweeting and the numbers of engagements on Twitter. The results of our hypothesis testing are summarized in Table 2.

***Table 2. Summary of Hypothesis Testing.***

| | Hypothesis/Research Question | Results |
|---|---|---|
| H1 | News endorsed by a strong tie would be perceived as more credible than news endorsed by a celebrity. | H1 was supported |
| H2 | News endorsed by a strong tie who has fame on Twitter would be perceived as more credible than news endorsed by any other social media contacts. | H2 was supported |
| H3 | News endorsed by a celebrity with whom an individual frequently interacts on Twitter would be perceived as more credible than news endorsed by a strong tie. | H3 was supported |
| H4 | The presence of bandwagon cues will increase the perceived credibility of fake news about a conspiracy theory. | H4 was supported |
| RQ1 | Does the bandwagon heuristic effect interact with a strong tie/celebrity endorsement effect? | Interaction effect was not found |

Although strong ties and celebrities are comparable examples of trusted endorsers, their underlying mechanisms as endorsers are derived from different attributes—relational closeness and fame. Extending Katz's (1957) argument of personal influence, we hypothesized that a strong tie would be a more influential endorser of news than a celebrity (H1) and found clear support for this hypothesis. It is often thought that social media introduce greater and more diverse social contacts so that the use of social media weakens strong ties' influence on an individual's life (see Vriens & van Ingen, 2018 for details). Counter to this conventional view, strong ties remain the most influential contacts in our participants' lives. This finding further suggests the risk of heavy reliance on strong ties in news credibility. To combat an infodemic effectively, individuals' efforts to be critical of news and information, even that which is shared by their strong ties, should precede any interventions and regulations on social media.

The influence of strong ties was intensified when users perceived that their strong ties had fame in the context of social media (H2). This finding links to the concept of *social media influencers*, who can make interpersonal relationships with large audiences on social media. Unlike traditional celebrities "approaching online audiences as 'fans' who are necessarily less powerful," social media influencers strategically build close relationships with their online followers by "engaging them as equals" (Baym,

2012, p. 286). Although we did not analyze the impacts of social media influencers directly, our findings about the interaction between strong ties and the fame on Twitter suggest that the blurred boundary between fanship and friendship can accelerate the process through which fake news and misinformation spread on social media.

Although the main effects of celebrity endorsement are less substantive than those of strong ties, celebrity advocacy for political and health issues should be carefully employed and monitored. We found that celebrity endorsement became effective if individuals regularly interacted with the celebrity through Twitter (H3). This result is consistent with previous studies claiming a parasocial relationship as the underlying mechanisms of celebrity endorsement (Chung & Cho, 2017). Frequent interaction through Twitter may strengthen the one-sided intimacy that individuals can feel toward celebrities (Kim & Song, 2016). In that sense, if a celebrity posts false information and advocates unhealthy practices on social media (for real-life examples, see Martinez-Berman, McCutcheon, & Huynh, 2020), it could mislead a subgroup of social media users, such as their fans who use social media as tools for interaction with that celebrity.

Moreover, the finding that bandwagon heuristics—such as the number of likes, comments, and retweets—increased the credibility of news indicates (H4) that social media users should not equate popularity of information with accuracy (Hilligoss & Rieh, 2008). Especially on social media, such cues indicating people's engagement could be manipulated by bots and computational tools. Literacy education raising people's awareness of the potential bias of bandwagon cues needs to be promoted as a component of future interventions for infodemics.

We did not find any evidence to support the notion that bandwagon cues and a strong tie/celebrity endorsement have a synergistic effect (RQ1). Yet it would be hasty to conclude that there is full independency among endorsement-based heuristics. As an exploratory approach, we focused on examining two heuristic cues—bandwagon heuristic and a strong tie/celebrity endorsement—commonly used across social media platforms. However, each social media application has its own features that offer various cues triggering endorsement-based heuristics (e.g., emoji reactions to posts on Facebook or the verified account mark on Twitter). People could evaluate news shared on social media differently depending on those cues. A scholarly attempt to examine the combined effects of various heuristic cues should be continued to better understand the social heuristics process on social media.

### *Limitations*

Although we strived to simulate the actual context on Twitter where fake news is shared, our study relied on participants' imaginations for the experimental manipulation. This deficit in the manipulation could underestimate the effects of social endorsement cues in credibility assessment. However, we believe that it was the most feasible method, considering ethical issues. Prior works on this topic have adopted similar ways of manipulation (Kaiser et al., 2018). To improve participants' imaginations, we asked each of them to provide the real name of someone in their personal network, used the actual name of an existing celebrity, and formatted the layout of treatments in the same ways that fake news is posted on Twitter. Moreover, we restricted the celebrity endorsement to one specific celebrity, Bruno Mars, to reduce confounding effects.

However, as shown in our analysis, female, Hispanic, and non-White participants were more likely to respond to fake news posted by Bruno Mars. A more nuanced approach to diversify and compare endorsements from various celebrities would be recommended. Further, some critical factors, such as interests or the need for cognition, were not included in our analysis because of the limited space and time in online survey experiments. Future research should focus on using participants' real experiences of social media endorsements outside experimental settings. Finally, our current focus was on fake news of a specific topic: a COVID-19 vaccination conspiracy theory. This type of false information, often called *disinformation* (Freelon & Wells, 2020), is intentionally created as a hoax to mislead the public for the economic and political interests of the creators. In addition to disinformation, *misinformation*, which does not intend to harm anyone but simply to spread inaccurate information, can be shared through social media. Endorsement-based cues might have different impacts on misinformation credibility from disinformation credibility. Future research needs to explore the differences between misinformation and disinformation in more detail.

## ***Conclusion***

Our study suggests that endorsements by social media contacts could mislead people's perceptions and beliefs in (fake) news—specifically, in this case, regarding the COVID-19 pandemic. Given our findings, we support the need for intervention to ensure fact verification of social media posts and/or to prevent posts from provoking prejudices and discrimination against other human beings. In fact, Twitter and Facebook, the leading companies in the social media industry, recently implemented their own policies and programs to regulate posts reflecting misinformation (see Clegg, 2020; Twitter, 2021 for details). A natural next step would be to examine how such regulations improve people's judgments and reduce the spread of fake news and misinformation.

Nevertheless, we do not blame the use of social media alone for the current infodemic. Although endorsement-based heuristics afforded by social media can be a risk factor for an infodemic, what determines the influence of messages and information is the relationship between individuals and information providers/sharers. In that sense, the conclusion of this study is linked with Barzilai-Nahon's (2008) idea of "networked gatekeepers." With the emergence of social media, the power of individuals—what Barzilai-Nahon (2008) called "gated"—has increased and plays a pivotal role in the spread of news and information. Furthermore, as shown in our analysis, users' predispositions, such as prebelief in planned COVID-19, political orientation, and overall knowledge about COVID-19, still play crucial roles in credibility assessment of fake news. Before problematizing social media use, it is necessary to explore in more detail the relationships between the use of social media and people's confirmation biases, as well as those contexts and factors leading to biased judgments.

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