Exploring the effect of Weibo opinion leaders on the dynamics of public opinion in China: A revisit of the two-step flow of communication

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Abstract
Using a random sample of posts on Weibo, this study content analyzes the extent to which Weibo opinion leaders’ tweets are associated with the shifts and variations of public opinion—in terms of topic salience, emotional reactions, agent of responsibility, motivation for condemnation, rhetorical techniques, conviction of blame, and emotional intensity—in the case of the Tianjin Explosion. Building upon a burgeoning research agenda examining the role of Chinese Weibo in the context of two-step flow, this study found that opinion leaders generally reinforce Weibo users’ subjective assessment (e.g., attitudes and emotional responses) of the incident. An overwhelming sleeper effect is also observed in that most posts by the opinion leaders did not contribute to peaks until 2–3 days later. All opinion leaders achieved between one and three peaks.

Keywords
China, opinion leader, public opinion, social media, two-step flow, Weibo

A warehouse storing chemical materials in Tianjin City, one of China’s four major municipalities, exploded on 12 August 2015, killing 173 people, injuring 798, and with 8 missing. The official report published by the Accident Investigation Team concluded that it was an industrial accident. Since the explosion, two people have been detained for illegally using the warehouse to store chemicals (Rosenfeld, 2015). The scene of the explosion was first recorded by a nearby resident using her mobile phone. The resident uploaded the video to her Weibo page and it immediately
became viral, arousing widespread shock and public anger. Many accused the Tianjin City government of management oversights and lagging relief operations.

Instead of broadcasting the explosion in a breaking news segment, the Tianjin Satellite TV channel aired a Korean drama hours after the incident and was condemned by many on Weibo (Lam, 2015). For instance, some Weibo users quipped, “The whole world is looking at Tianjin, but Tianjin is watching a drama.” In response to such strong critiques from Weibo users, the Tianjin TV staff explained on social media that broadcast programming is controlled by higher authorities. Tianjin TV’s response triggered a nationwide discussion, with many on Weibo arguing Tianjin TV’s lack of coverage of the explosion as an issue of political censorship. Soon after, the Tianjin explosion became a trending topic on Weibo and became a national topic on social media.

With the rapid development of information technology, social media provide an arena that allows users to get together, develop communicative communities, and share sentiments and viewpoints about public events. Weibo, the Chinese version of Twitter, provided a vehicle that allows users to voice their opinions. The purpose of this study is to examine whether and how opinion leaders on Weibo influenced their followers’ perception of the Tianjin explosion, within the theoretical framework of the two-step flow of communication. In doing so, this study bridges the gaps that few studies have delved into the effect of opinion leaders in the context of China, using a temporal order, and with a timely and viral incident.

**Literature review**

**Weibo’s role in China**

Weibo is a Twitter-like social media platform that has a large user base in China. In Chinese, “Weibo” means “micro-blogging.” Like Twitter, Weibo enables multimedia content such as images, videos, and hyperlinks (Kaplan & Haenlein, 2011). The ease of use contributes to the popularity of Weibo (Aichner & Jacob, 2015).

China had about 688 million Internet users by the end of 2015, which translates into a 50.3% penetration rate (China Internet Network Information Center (CNNIC), 2015). Of those who are active on the Internet in China, about one-third (or 212 million) were active on Weibo, which represented an increase of 48% in social media usage compared to a year ago (CNNIC, 2015), making it one of the most visited online destinations in China (Alexa, 2016). With its being easy to use and free (Weibo runs ads, among other things, for financial sustainability), Weibo is particularly accessible to those living in the countryside and with lower income. As long as a person has access to an Internet café, she or he is free to comment, retweet, and like posts on Weibo. According to a recent report, more than 100,000,000 tweets are published on a daily basis (Li, Zhang, Chen, Cao, & Zhou, 2014). Even with the sheer amount of daily interactions, Weibo plays an important role in shaping how Chinese Netizens disseminate information, share different political viewpoints, interact with political campaigns, and have online debates about controversies. With the backdrop of authoritarian political environment, Weibo became particularly appealing to many people not only due to its ease of use but also its lack of censorship in comparison to other mass media (Rauchfleisch & Schäfer, 2015). Studies suggest that social interactions on Weibo have constructed different types of public spheres of varying scale on this digital platform. Common to these burgeoning public spheres, however, are shared characteristics such as openness, longevity, critical consciousness, and democratization of public opinion (Li, 2012; Rauchfleisch & Schäfer, 2015).
With the rise of online discussions and different thematic and types of public spheres on Weibo, new issue publics and opinion leaders are emerging on the Chinese Web (Stockmann, 2016). For instance, On 15 September 2012, “rational patriotism” began trending (e.g., being on the Hot Topic List) on Weibo, and it is the result of tens of thousands of users engaged in discussing an anti-Japanese patriotic parade in Xi’an City that focused on sovereignty dispute over Diaoyu Islands. A large number of Weibo users at the parade broadcasted the event live and took on the role akin to citizen journalists (Su, 2013). Many of these users also became sources that the state media quoted in the news. In the case of the Diaoyu Islands controversy, Weibo not only fundamentally changed the diffusion patterns on social networks and challenged the ways in which Chinese Netizens received information (L. Zhang, Zhao, & Xu, 2015) but also effectively contributed to self-mobilization, mobilization of others, and social coordination (Huang & Sun, 2016; Skoric, Zhu, & Pang, 2016).

The following case exemplifies Weibo’s role in grassroots mobilization and political influence in China (Gu, 2014): Dacai Yang, a Chinese provincial safety administrator, was photographed grinning at a bus crash scene wearing a luxurious timepiece (Kaiman, 2013). The photo went viral on Weibo, leading to a public outrage against the disrespect Yang showed as an authoritative figure at the scene of a tragedy, as well as public scrutiny about his financial background, given many thought Yang’s apparent affluence hinted at corruption-related fortunes. Many users on Weibo started a frantic online search for Yang, a collective behavior known as “human flesh search” in Asian communities, and uncovered an abundance of pictures with Yang wearing various luxurious timepieces. Yang was soon nicknamed “Wristwatch Ge” and swiftly became a symbol of official corruption online. The Weibo community’s dismay at Yang’s apparent corruption and lack of compassion became so viral that it attracted government attention. As a result, Yang was investigated and sentenced to 14 years in prison on corruption charges (Kaiman, 2013).

Weibo allows the government to assess public opinions and solve social issues in real time (Bomsel, 2014; Gu, 2014). As Bomsel (2014) concluded, “Weibo is more than a media, a brand, or a corporation. It is a piece of the Chinese institutional transition” (p.120).

The two-step flow of communication

With the introduction of the two-step flow of communication hypothesis in the 1940s, Lazarsfeld is the first scholar that coined the term “opinion leaders” (Lazarsfeld, Berelson, & Gaudet, 1948). Analyzing the process of decision-making during a political election campaign, Lazarsfeld et al. (1948) found that face-to-face communication tended to have a larger impact on changes in people’s political leaning than mass media, calling into question the applicability of the so-called “massive media effects paradigm” (Lazarsfeld et al., 1948). In short, the two-step flow of communication hypothesis is as followed: Mass media indirectly influence the public through opinion leaders. In Lazarsfeld et al.’s (1948) words, “ideas often flow from radio and print to opinion leaders and from these to the less active sections of the population” (p. 157).

Building upon the two-step flow theory, a spate of research has been conducted and the original hypothesis has been reexamined and revisited within various contexts during the successive decades. With the advent of the Internet, and social media platforms in particular, a plethora of two-step flow studies were carried out in the environment of emerging communication technologies. For instance, through reviewing concepts, measures, and strategies that can be applied to opinion leader campaigns on climate change in the United States, Nisbet and Kotcher (2009) found that there are likely to be significant trade-offs in comparison to face-to-face initiatives.
Likewise, Hilbert, Vásquez, Halpern, Valenzuela, & Arriagada (2017) analyzed the nature of communication flows during social conflicts on Twitter in the context of Chile, concluding that long-standing paradigms for social mobilization and participation are neither replicated nor replaced but reshaped.

With the rise of Weibo, two-step flow has garnered considerable attention in Chinese academia. Rather than testing the extent and applicability of the hypothesis in the Chinese context, many Chinese studies embrace the central tenets of two-step flow as an indisputable theory (Chen, 2013). In other instances, scholars have created new models based on two-step flow. For example, the “Pyramid model” (Wang, 2012) asserts that information disseminates in the pattern of “One to N to N plus,” with “One” being the opinion leaders. Elsewhere in the world, however, skepticisms remain as to whether two-step flow has empirical merit. For example, it has been argued that most two-step flow analyses lack an estimation of the significance of interpersonal relationships (Katz, 1957).

In light of the aforementioned literature, three glaring gaps emerged in the extant body of knowledge which this study aims to bridge. First, though the two-step flow of communication is an incredibly ripe area of research, oversimplified contextualization remains evident in previous literature; in other words, as mentioned above, limited studies have endeavored to examine the two-step flow hypothesis in the context of China, particularly through the Chinese social media platforms. Second, few studies have measured opinion leaders’ impacts via a temporal order. The original two-step flow hypothesis pertains to the effect of opinion leaders on the variations of public opinion; however, without gauging shifts over time, one can hardly draw inferences regarding the role of opinion leaders in influencing public opinion. Third, thematically, limited two-step flow studies have delved into a timely and viral incident on social media as a case study, in order to provide nuances and add pixels into the big picture of the theory. This study, however, seeks to assess whether Weibo opinion leaders influence the public’s opinions on the Tianjin explosion in the context of two-step flow, to bridge these gaps.

Public opinion formation on Weibo

With the increasingly prominent influence of Weibo in China, a plethora of Weibo-related studies have emerged, with many recent studies focusing on information propagation characteristics and mechanisms of Weibo. For instance, by applying hierarchical sampling, Liu, Peng, and Che (2012) proposed a growth law for the formation and dissemination of online public opinion. Liu asserted that information dissemination happens in three stages on Weibo: “formation, peak, and recession.” In the formation period, opinion leaders amalgamate new information and their own views on an issue to create new topics of discussion on Weibo. Their Weibo posts then create momentum and propel their followers carry on the conversation after they have set the tone and angle of discussion, reaching the “peak” of dissemination. Recession then follows when new topics emerge and divert people’s attention (Liu et al., 2012). Another study found a similar pattern in how public opinions evolve on Weibo. Specifically, it is found that the formation stage generally begins with the birth of a controversial event, the peak emerges with opinion convergence on Weibo, and the recession begins when the government intervenes (Jing, 2013).

L. Zhang et al. (2015) found that there are often more than one peaks in online discussion of a topic, and while opinion leaders on Weibo may shape public opinions during the first peak, the masses (e.g., non-opinion leaders) generally contributed to the second peak, which often garners significantly more traction than the first peak (L. Zhang et al., 2015).
Content analyzing the Wenling patient–doctor murder case, a study found that Weibo discussions of the case was, though diverse, driven by a handful of opinion leaders’ differing perspectives during the formation stage of public discourse (Y. Zhang, 2013). Zhang’s finding is consistent with Liu’s “One to N to N Plus” (2014) and Wang’s (2012) Pyramid structure.

Exemplifying the scope of their influence, M. Zhang, Zheng, and You (2014) found that opinion leaders on sites like Weibo have impacts both digitally and in the real world. For example, they found that some Weibo opinion leaders were able to mobilize their followers to join relief workers during the aftermath of a Ya’an earthquake (M. Zhang et al., 2014).

Censorship on Weibo

Prior to the advent of social media platforms, journalism in China used to be monotonously dominated by the party media, which commits to propagate and build positive image for the ruling party. The Chinese government employed government-controlled media as the “eyes, ears, tongue, and throat of the party” to inculcate ideologies and manipulate public agendas to maintain its governing legitimacy (Brady, 2017, p. 129). During the recent decade, although the ubiquity of online platforms such as Weibo pulled audience away from the party media (Guo, 2019) and facilitated the relative freedom of speech among their users, the absolute dominance of party mouthpieces has never been fundamentally challenged. This is due to the extensive and varied levels of control over the entire system that the regime imposes (King, Pan, & Robert, 2013). Scholars suggested that Weibo, for instance, comes under the same system of technical control and human scrutiny as other Internet service providers (e.g., Nip & Fu, 2016). More importantly, such censorship toward Weibo became institutional after the year of 2012, when mandatory real-name registration was implemented (Nip & Fu, 2016). The tightening censorship on Weibo has also been manifested by various initiatives, for instance, users who published the alleged “slanderous comments” become liable to defamation charges if their posts were viewed by more than 5000 times or retweeted for 500 or more times (Nip & Fu, 2016).

However, numerous studies have shown that such censorship does not possess an essential impact on the validity of data collection and analysis. Scholars pointed out that social issues or security incidents are on the fringe of censorship, as they do not constitute a direct threat to the legitimacy of the ruling party and to the overall social stability (e.g., Su, 2019; Su & Borah, 2019). Moreover, for the purpose herein, the Tianjin Explosion was not treated as the alleged sensitive words at the time (e.g., Zeng, Burgess, & Bruns, 2019; Zeng, Chan, & Fu, 2017). Therefore, the concern of the sampling bias caused by censorship is minimal.

Building upon the existing research on opinion leaders’ role on Weibo in China, this study examines whether and how opinion leaders shape public opinion in the context of the Tianjin explosion. Specifically, this study focuses on understanding the extent to which Weibo opinion leaders influence the Weibo community’s view of, and attitude toward, the explosion. The following research questions (RQs) are asked:

RQ1. To what extent are Weibo opinion leaders’ posts associated with the variations of the ways in which Weibo community talks about the explosion in terms of (a) topic salience and (b) agent of responsibility?

RQ2. To what extent are Weibo opinion leaders’ posts associated with the variation of the Weibo community’s motivation for condemnation?
RQ3. To what extent are Weibo opinion leaders’ posts associated with the variation of the Weibo community’s conviction of whom to blame for the explosion?

RQ4. To what extent are Weibo opinion leaders’ posts associated with the Weibo community’s attitudes toward the explosion in terms of (a) emotional reactions and (b) emotional intensity?

RQ5. In terms of rhetorical techniques, are Weibo opinion leaders’ posts associated with the variations of how the Weibo community expresses their anger and disappointment?

RQ6. How often does the Weibo community retweet posts by Weibo opinion leaders?

RQ7. Do Weibo opinion leaders’ posts contribute to peaks in topic convergence on Weibo? If so, how many?

Method

Data sets

This study performed a content analysis on data collected from Weibo, a Twitter-like micro-blogging platform in China.

Although plenty of empirical research have utilized hashtags to harvest data (e.g., Small, 2011), some researchers still argue that collecting tweets only using hashtag samples “misrepresent(s) important aspects of Twitter activity and may lead researchers to erroneous conclusions” (Rafail, 2018, p. 195), in that most tweets do not contain hashtags as well as “users often communicate about a range of topics that cannot be represented by single hashtags” (Ausserhofer & Maireder, 2013, p. 297). Therefore, I utilized both keywords and hashtags to maximally reduce the possibility of misrepresentation of online activities caused by biased samples. Specifically, Weibo’s Application Program Interface was utilized for collecting all tweets that included both the “Tianjin Explosion” keywords and the #TianjinExplosion# hashtag. To ensure that as many Weibo tweets on the Tianjing explosion were collected as possible, the researcher collected tweets from 12 August 2015 (the date of the explosion) to 11 March 2016 (7 months after the incident), which yielded a total number of 103,698 tweets. In the second phase, similar to many previous social media content analyses, the data were manually coded after a systematic random sampling (e.g., Su, 2019; Sweetser, Golan, & Wanta, 2008; Valenzuela, Puente, & Flores, 2017). Using the random number generator in Python, every 100th of the data were randomly selected, which generated a total of 1037 tweets. This randomization technique ensured both a feasible size of sample for manual coding and the normal distribution of the selected sample.

The next concern pertained to the data noise. Given that both keyword and its hashtag counterpart were utilized for sampling, some duplicated tweets were yielded in the initial sampling phase. Hence, through a round of screening, the coders were able to verify the extent of noise and manually removed all the duplicated tweets. Ultimately, 825 tweets were generated, and each tweet contained the following properties: identification number, nickname, the user’s number of followers, the user’s number of followees, time stamp, and status of verification. To ensure that as many Weibo tweets on the Tianjing explosion were collected as possible, the researchers collected tweets from 12 August 2015 (the date of the explosion) to 11 March 2016 (7 months after the incident). Then, the researchers manually went through all 825 tweets and identified 798 users who tweeted about the explosion. Tweets from spam accounts were removed from the dataset.
Identifying opinion leaders

Akin to Twitter’s “verified accounts,” Weibo marks verified accounts—mostly celebrities and prominent figures with a large following—as “VIP users,” which manifests as an orange “V” next to one’s verified Weibo handle (Guan et al., 2014). Scholars also suggested that this verification mechanism builds trust and authenticity to the source, and as a result, leading by the verified users, massive participation among ordinary users have been elicited (Chen & She, 2012).

In terms of the measures of opinion leaders, previous studies have exhibited mixed operationalizations. Some studies on China’s online public opinion introduced the Chinese Opinion Leader Ranking to identify opinion leaders. Lei (2017), for instance, consulted this opinion leader ranking and its validity, arguing that it “is relatively transparent and reliable compared with others” (p. 123). Similarly, by combining the measures of the aforementioned ranking and the defining qualities of their sampled users, Y. Zhang, Liu, and Wen (2018) yielded 146 opinion leaders who are consisted of property tycoons, military officials, and renowned liberals. Hence, they argued that the integration of the institutionally established ranking and self-selected data ensures the user diversity and lowers the sampling bias (Y. Zhang et al., 2018).

However, treating VIP users on Weibo as opinion leaders has still been an extensively utilized operationalization in the existing literature. The VIP users usually have considerably greater influence that can reach a wider spectrum of readerships and trigger more retweets and comments. For instance, Chen and She (2012), through measuring the indegree influence, repost influence and reply influence to represent differing characteristics of one’s involvement in a social network and reconstruct a full angle of one’s influence capability, found that verified users such as celebrities had an overall much greater influence than non-verified users. Cha, Haddadi, Benevenuto, and Gummadi (2010) also examined the dynamics of user influence on topics over time according to three indicators of indegree, retweets, and mentions and came to the similar conclusion. Likewise, L. Zhang et al. (2015) identified the opinion leaders on Weibo by measuring the ratio of #Followers and #Followees among the users they harvested. Specifically, through plotting, L. Zhang et al.’s (2015) study treated the users with fewer followers and tweets as the non-opinion leaders, whereas the users with more followers and tweets as influential users.

In line with relevant literature (e.g., Cha et al., 2010; Chen & She, 2012; L. Zhang et al., 2015), this study initially operationalizes opinion leaders as those with VIP status on Weibo, because it generally denotes that the account has a large following, and then, this study measures the productivity of these users to guarantee the influence of them. In employing the combination of plotting the ratio of followers and followees and counting the descriptive statistics of sampled users, this study strengthens the sampling validity and makes sure that the observed leaders are influential enough to be identified as opinion leaders.

First and foremost, adapting from L. Zhang et al. (2015)’s measure, among all users in our dataset, I plotted the ratios of the followers of followees using Python. Figure 1 plots #Tweets as a function of the ratio between followers and followees. As Figure 1 exhibits, five verified users have more followers than followees, as all the red plots located at the top right of the figure; in contrast, all non-verified users have fewer followees than followers, as all the blue plots located around the axis of $10^0$, suggesting that most of them had higher numbers of following than followers. Hence, according to L. Zhang et al. (2015), the majority of verified users can be considered influential in this study.

To further validate this argument and ensure that these five users did possess higher defining qualities, the method of Y. Zhang et al. (2018) was replicated and the descriptive statistics of each
verified user were counted. As Table 1 shows, the five users consisted of renowned pre-journalist of China’s central television (@Lixiaomeng), well-known journalist of non-government-funded media platform (@Lijiajia), journalist of China’s metropolitan newspaper (@Caolin), famous author (@Zhengyuanjie), and renowned Internet celebrity (@Xiahe). Akin to Y. Zhang et al.’s (2018) argument, such diversity confirms that this is not a self-selected sample biased toward certain groups of people.

Juxtaposing Figure 1 and Table 1, this study identifies these five users as opinion leaders and analyzes their tweets about the Tianjin Explosion in terms of their influence upon the dynamics of public opinion on Weibo.

**Effects of opinion leaders**

To examine the influence of opinion leaders, this study assesses the Weibo community’s tweets before and after the opinion leaders’ tweets were published. Since opinion leaders are expected to diverge in their viewpoints, the analysis is thus done at the individual level. That is, the before and after are based on the time in which each opinion leader published his or her tweet. Since the data are collected based on the same keyword and hashtag and based on representativeness heuristics, this study made the assumption that the Weibo community sampled in this study have seen the tweets by the opinion leaders.

To contextualize the research findings, the scholars would like to suggest three ways of interpreting opinion leader effects: (1) Opinion Change: Opinion leaders influence the community by changing the community’s perspectives (e.g., the Weibo community might have emphasized X

![Figure 1. Ratio of the followers to followees and number of tweets between verified and non-verified users.](image_url)
before the opinion leaders shared their posts, but after the opinion leaders posted about Y, the community emphasis then changed to Y). (2) Opinion Reinforcement: Opinion leaders influence the community by crystallizing (or reinforcing) the community’s perspectives (e.g., instead of changing Weibo consensus, the opinion leaders reinforced what the community already believed in and led to more people in the community sharing the same view). (3) No Effect—that the opinion leaders’ posts do not seem to have apparent influences on the transformation in Weibo consensus overtime.

**Coding scheme**

To answer the RQs, the following variables are examined: blogger types, tweets content, bloggers’ emotional tendencies, condemned objects, bloggers’ motivation of condemn, rhetoric methods of criticism, blog types, uncertainty, and intensity of punctuation usage.

To ensure that all variables developed to examine the influence of opinion leaders on public opinion are comprehensive, all variables were developed via an inductive, data-driven approach. That is, using qualitative method, the principal researcher systematically went through the data prior to analysis to ensure that all of the operationalizations below are as all-inclusive as possible.

**Topic salience.** This study categorized 16 different ways in which Weibo users talked about the explosion: 1. Facts description (e.g., “The explosion made 10 buildings collapsed”). 2. Discussion about explosive substances. 3. Appealing to truth. 4. Blessing for victims. 5. Expressing disappointment. 6. Criticizing the government and officials. 7. Criticizing press. 8. Criticizing the original blogger (exclusively for retweeted bloggers). 9. Criticizing other Weibo users. 10. Supporting press. 11. Supporting the government. 12. Supporting the original blogger (exclusively for retweeted bloggers). 13. Supporting the firemen. 14. Urging for disaster relief. 15. Inspiring words (e.g., “Cheer up, China!”). 16. Objective comments (e.g., commenting on the nature of the chemical compounds that exploded without personal judgment).

**Agent of responsibility.** Many tweets were critical of the event, though they do not always condemn the same individual or organization for the explosion. The data yielded 13 categorizations for condemned objects: 1. The local government and its officials (e.g., blocking information of number of deaths or not holding a press conference timely). 2. The central government and its officials (e.g., censorship). 3. National media (e.g., CCTV; People Daily). 4. Local media (e.g., Tianjin Daily.)

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### Table 1. Descriptive indicators of the five.

| User ID | Number of followers (in million) | Number of tweets | Number of likes | Number of comments | Number of retweets |
|---------|----------------------------------|------------------|----------------|--------------------|--------------------|
| @李小萌 | 7.64                             | 3501             | 9689           | 1907               | 5399               |
| @李佳佳Audrey | 0.44                        | 4476             | 1377           | 1221               | 452                |
| @夏河      | 3.11                             | 1982             | 5472           | 619                | 569                |
| @郑渊洁    | 4.25                             | 24,390           | 3378           | 2795               | 1088               |
| @中青报曹林 | 0.51                             | 2178             | 854            | 686                | 369                |

All the numbers of the indicators were valid upon the date of data sampling of this study. The numbers of likes, comments, and tweets refer to those of the single tweet analyzed.
The Press conference spokesmen. 6. Celebrities (e.g., “Are those celebrities dumb? Why are they so silent?”). 7. Other Weibo users (e.g., condemning other users for opinion disputes). 8. The nation and people’s national character (e.g., “Chinese people are always like this: once on shore and pray no more” or “This is a nation that forgets the past easily”). 9. The real estate developers (e.g., poor urban planning for building residential buildings near the factory). 10. Ruihai International Logistics Co., Ltd. (e.g., Storing dangerous explosives illegally). 11. The political system (e.g., “All problems stem from the authoritarian system”). 12. Experts that endorse the authority (e.g., “I really don’t understand why Sima Nan is always singing praises for Tianjin government, does he have any conscience?”; “I just read an editorial written by Ran Xiang and I’m shocked, is she supported by the government?”) 13. No condemns.

Motivation for condemnation. Eleven motivations were identified for why Weibo users condemned the aforementioned individuals and organizations: 1. Weibo censorship (e.g., “I saw some users posted harsh words that criticized some certain leaderships and their posts had been removed by the Weibo Group due to censorship”). 2. Media silence (e.g., “Sichuan Daily, Tianjin Daily reported nothing today” and “Tianjin Satellite TV is playing soap opera”). 3. Positivism (e.g., “Thumb up for the sacrificed firemen!”). 4. Skepticism toward media (e.g., “We do not trust the death toll that the television reported, we want the truth!”). 5. Celebrity silence (e.g., “Why are those active intellectuals afraid to speak out?). 6. Official incompetency (e.g., corruption and officials’ inability to answer press questions). 7. Opinion dispute with other users. 8. Catharsis (e.g., scolding or sarcasm with no specific recipient). 9. Empathy. (e.g., “I am so touched by those firemen who sacrificed, so I strongly condemn those responsible for the accident!”). 10. Ties with victims (e.g., “I’m shocked to learn that my high school classmate was killed in this explosion”). 11. No condemnations.

Conviction of blame. Weibo users differed in how certain they were about whom to blame. This study identified three degrees of uncertainty: 1. Using deterministic rhetoric. (e.g., “The Tianjin Government is definitely guilty.”). 2. Using uncertain expressions such as “maybe” or “might not be.” 3. Cannot determine (e.g., no manifest indication).

Emotional reactions. To understand how Weibo users feel about the Tianjin explosion, the following five emotional reactions were coded: 1. Sympathetic. 2. Condemn. 3. Support. 4. Objective, neutral, or no emotions. 5. Interrogatory.

Emotional intensity. Punctuation is used as a proxy for emotional intensity. Four categories were developed to classify emotional intensity: 1. Peaceful (e.g., ending a sentence with a conventional period. 2. Mixed feelings (e.g., a mixed use of different punctuations that ends with one exclamation mark at the end). 3. Mild anger (e.g., ending every sentence with one exclamation mark, such as “Shame on the spokesman! Shame on the government!”). 4. Moderate to high anger (e.g., using two or more exclamation marks in every sentence, such as “We are so disappointed with the government!!! The innocent people were dead because of corrupt society and politics!!!”).

Rhetorical techniques in criticism. To express their anger and disappointment, some users employed classic rhetorical techniques. From the data, the following rhetorical techniques were identified: 1. Analogies (e.g., comparing Chinese media and government with that of other countries). 2. “Poetic remarks,” which is a popular rhetorical device in Chinese language and classic literature. For
example, some quoted the following poem: “商女不知亡国恨，隔江犹唱庭花 (The songstress knows not the grief of a captive king, by riverside she sings the song of parting spring.”); 3. None employed.

Tweet type. Two types of tweets are analyzed in this study: 1. Original tweets. 2. Retweets.

Peaks. Consistent with established definitions (Jing, 2013; Li, 2012; L. Zhang et al., 2015), peaks are defined as an apex of topic convergence on Weibo between opinion leaders and the crowd (for illustration, see Figure 2).

Pretest

Two graduate students at two large public universities in the United States were trained as coders for the pretest. Fifteen percent of the data were randomly sampled for the first pretest. All variables except one (agent of responsibility) reached conventional standards of 80% or higher in percent agreement (Poindexter & McCombs, 2000, p. 203) and .75 or higher in Krippendorff’s alpha, the latter being a more conservative index that accounts for inter-coder agreement due to chance (Krippendorff, 2004). Upon review, the coding mechanism for “agent of responsibility” was revised to minimize subjective assessment: 1. Unsatisfied with the authority, media, celebrities, or other related subjects. 2. Support for authority, media, celebrities, or other related subjects. 3. neutral, objective, no emotions. 4. Interrogatory and questioning (e.g., “Man-made disaster? Then who is to blame in the end? Who should be responsible for it?”). 5. Sympathy toward victim or scarified firemen with no condemnation. 6. Condemn other Weibo users without comments on the event (e.g., “Shut up you mobs!”). 7. Only praising or supporting the original blogger, but no comments on the event.
A second round of pretest, using another 15% random sample from the data, was conducted for the only variable that did not achieve desirable Krippendorff’s alpha. After two rounds of pretest, all of the variables reached desirable percent agreement and Krippendorff’s alpha. Table 2 presents the findings.

**Analytical strategy**

To examine RQs 1 through 5, descriptive statistics of each variable were computed, and Wilcoxon’s signed-rank tests were performed. The Wilcoxon signed-rank test is a nonparametric test which is regarded as an alternative approach of t-test when the original sample size is extremely small or is non-normally distributed (Bridge & Sawilowsky, 1999). To answer RQ6, chi-square test was used.

**Results**

Using the “Tianjin Explosion” keyword and #TianjinExplosion# hashtag for data collection, five opinion leaders were identified for the purpose of this study. Table 3 summarizes attributes of the five opinion leaders’ tweets as well as the most popular attributes among tweets from the Weibo community, which were termed “Weibo consensus” in Tables 3 to 8. To summarize, the Weibo community predominately criticized government and officials for their incompetency, though they did not hold any agent in particular responsible for the accident. Also, most were sympathetic toward the explosion, and most of the tweets were peaceful and devoid of rhetorical techniques.

Comparing the opinion leaders’ and the community’s tweets, two overarching patterns emerged: (1) Weibo opinion leaders and the community share the same sentiments when there is consensus among the opinion leaders. Specifically, convergence is observed between the leaders and the community in terms of emotional reactions (the community and 4 out of 5 opinion leaders were sympathetic), use of rhetorical techniques (the community and 4 out of 5 opinion leaders did not employ any rhetorical technique), and emotional intensity (the community and all 5 opinion leaders were peaceful). (2) Weibo opinion leaders and the community diverge in sentiments at times when opinion leaders are divided (e.g., only 3 or fewer opinion leaders share the same sentiment), such as in terms of topic salience, agent of responsibility, motivation for condemnation, and conviction of blame.

### Table 2. Reliability tests after two pretests.

|                      | Percentage agreement | Krippendorff’s alpha |
|----------------------|----------------------|----------------------|
| Topic salience       | 92                   | .90                  |
| Emotional reaction   | 81                   | .77                  |
| Agent of responsibility | 97               | .95                  |
| Motivation for condemnation | 83            | .80                  |
| Rhetoric techniques in criticism | 91       | .88                  |
| Tweet types          | 1                    | 1.00                 |
| Conviction of blame  | 98                   | .94                  |
| Emotional intensity  | 95                   | .75                  |
| Opinion leaders | Topic salience | Emotional reactions | Agent of responsibility | Motivations for condemnation | Rhetorical techniques | Tweet types | Conviction of blame | Emotional intensity |
|-----------------|----------------|---------------------|-------------------------|-----------------------------|-----------------------|-------------|---------------------|---------------------|
| 1               | Criticize press| Sympathetic         | Local media             | Skepticism toward media     | None                  | Original    | Deterministic       | Peaceful            |
| 2               | Criticize government and officials| Sympathetic | Interrogatory | Official incompetency        | None                  | Original    | Deterministic       | Peaceful            |
| 3               | Criticize government and officials| Sympathetic | Local government and officials | Official incompetency | None                  | Original    | Cannot determine | Peaceful            |
| 4               | Support press  | Condemn             | None                    | None                        | Analogies             | Original    | Uncertain           | Peaceful            |
| 5               | Criticize press| Sympathetic         | Local media             | Positivism                  | None                  | Original    | Deterministic       | Peaceful            |
| Weibo consensus | Criticize government and officials (34%) | Sympathetic (35%) | None (22%)               | Official incompetency (35%) | None (97%)            | Retweets (97%) | Cannot determine (49%) | Peaceful (72%) |
RQ1 explores whether Weibo opinion leaders’ posts are associated with the variations of the way that the community talked about the explosion. In terms of topic salience (RQ1a), two of the opinion leaders (2 and 3) changed the community’s consensus from “criticizing press” to “criticizing the government and officials.” The Wilcoxon’s signed rank tests were performed, and the result was buttressed ($Z_1 = .72, p < .05; Z_2 = 1.24, p < .05$). However, there were also a few instances where the opinion leaders have no effect on shifts in Weibo consensus overtime (see Table 4). In terms of agent of responsibility (RQ1b), as Table 4 indicates, the opinion leaders do not appear to have systemic influences on whom the community holds accountable for the accident.

RQ2 asks whether Weibo opinion leaders’ posts are associated with the variations in the Weibo community motivation of condemnation. As Table 5 suggests, opinion leader 2 was associated with the community’s view from “none” to official incompetency, whereas opinion leader 3 crystallized the community’s view and contributed to more people (from 25% to 38%) believing that the reason for condemnation is official incompetency, which was buttressed by the result of the Wilcoxon’s signed rank test ($Z = .52, p < .01$). While the rest of the opinion leaders did not have noticeable influence on motivation for condemnation, it should be noted that there was unanimous consent among the community on “official incompetency” being the top motivation for condemnation after the five opinion leaders published their perspectives.

RQ3 asked whether Weibo opinion leaders’ posts are associated with the variations of the Weibo community’s conviction of whom to blame for the accident. As Table 6 suggests, opinion leader 5’s post was associated with the community’s reinforced determination about whom to blame, though the rest of the opinion leaders have no noticeable effects on the community. It should be noted that while opinion leader 3 appeared to have crystallized the community’s undetermined conviction, she or he did not contribute to more people from the community sharing this view, which weakens an argument in favor of reinforcement effects. This observation was also buttressed by the non-significant result of Wilcoxon’s signed rank test ($Z = -.02, p = .127$).

RQ4 questioned whether Weibo opinion leaders’ posts are associated with the variations in the community’s attitudes toward the accident. As Table 7 suggests, a majority of the opinion leaders’ (1–3) posts were associated with the community’s sympathy toward the accident (RQ4a), and the same is true in that all five opinion leaders crystallized the community’s talking about the accident peacefully (e.g., no excessive use of exclamation marks; RQ4b). In short, Weibo opinion leaders are found to play a key role in crystallizing the community’s emotional attitudes.

RQ5 asks whether Weibo opinion leaders’ posts are associated with the variations of the ways in which the Weibo community employed rhetorical techniques. The data suggest that a majority of the opinion leaders’ (all except 4) posts were associated with the Weibo community’s tendency of not using any rhetorical techniques when expressing their opinions about the accident. However, since most of the Weibo community (between 97% and 99%) originally did not employ any rhetorical technique to begin with, the likelihood of a reinforcement effect is not stronger than that of a possible ceiling effect.

Answering RQ6, the data suggest that a majority of the posts from the Weibo community are retweets (73.5%) as opposed to original tweets (26.5%). According to the chi-square analysis, the quantities of both were significantly different: $\chi^2 (1) = 825, p < .001$. 
### Table 4. Weibo consensus before and after opinion leaders’ posts—topic salience (RQ1a) and agent of responsibility (RQ1b).

| Topic salience                      | Opinion leader’s posts | Weibo consensus before | Weibo consensus after | Agent of responsibility | Opinion leader’s posts | Weibo consensus after |
|-------------------------------------|-------------------------|------------------------|-----------------------|-------------------------|-------------------------|------------------------|
| Criticize press (33%)              | 1. Criticize press      | Criticize government and officials (36%) | Local media (27%)     | 1. Local media          | Local government and officials (23%) |                      |
| Criticize press (35%)              | 2. Criticize government and officials | Criticize government and officials (36%) | Local media (29%)     | 2. Press/conference spokesmen | Local government and official (23%) |                      |
| Criticize press (34%)              | 3. Criticize government and officials | Criticize government and officials (37%) | Local media (30%)     | 3. Local government and officials | Local government and official (24%) |                      |
| Criticize government and officials (34%) | 4. Support press        | Criticize government and officials (33%) | Local government and officials (25%) | 4. None | None (29%) |                      |
| Criticize government and officials (34%) | 5. Criticize press      | Criticize government and officials (54%) | None (22%)             | 5. Local media          | None (29%) |                      |

Cell entries are categorical variables with valid percentage in parentheses.
RQ7 questioned whether Weibo opinion leaders’ posts contribute to peaks in topic convergence on Weibo. If so, how many? To answer this RQ7, Figure 2 examines the topic convergence between Weibo users and each opinion leader from the time each leader published their posts. Overall, the five opinion leaders contributed to between one and three peaks. Opinion leaders 2 and 3 contributed to the largest peaks, with nearly 50% of topic convergence between 2 and 4 days after their original posts. It should be noted that except for opinion leader 2, all

Table 5. Weibo consensus before and after opinion leaders’ posts—motivation for condemnation (RQ2).

| Motivation for condemnation | Weibo consensus before | Opinion leaders | Weibo consensus after |
|-----------------------------|------------------------|----------------|----------------------|
| None (21%)                  | 1. Skepticism toward media | Official incompetency (38%) |
| None (21%)                  | 2. Official incompetency | Official incompetency (38%) |
| Official incompetency (25%) | 3. Official incompetency | Official incompetency (38%) |
| Official incompetency (36%) | 4. None                 | Official incompetency (32%) |
| Official incompetency (35%) | 5. Positivism           | Official incompetency (33%) |

Cell entries are categorical variables with valid percentage in parentheses.

Table 6. Weibo consensus before and after opinion leaders’ posts—conviction to blame (RQ3).

| Conviction to blame | Weibo consensus before | Opinion leaders | Weibo consensus after |
|---------------------|------------------------|----------------|----------------------|
| Uncertain (39%)     | 1. Deterministic       | Cannot determine (47%) |
| Cannot determine (59%) | 2. Deterministic         | Cannot determine (47%) |
| Cannot determine (51%) | 3. Cannot determine          | Cannot determine (48%) |
| Cannot determine (50%) | 4. Uncertain               | Cannot determine (48%) |
| Cannot determine (50%) | 5. Deterministic          | Deterministic (54%) |

Cell entries are categorical variables with valid percentage in parentheses.

Table 7. Weibo consensus before and after opinion leaders’ posts—emotional reactions (RQ4a) and emotional intensity (RQ4b).

| Emotional reactions | Weibo consensus before | Opinion leaders | Weibo consensus after |
|---------------------|------------------------|----------------|----------------------|
| Sympathetic (44%)   | 1. Sympathetic         | Sympathetic (56%) |
| Sympathetic (46%)   | 2. Sympathetic         | Sympathetic (56%) |
| Sympathetic (43%)   | 3. Sympathetic         | Sympathetic (58%) |
| Sympathetic (54%)   | 4. Condemn             | Sympathetic (56%) |
| Sympathetic (56%)   | 5. Sympathetic         | Condemn (46%) |

| Emotional intensity | Weibo consensus before | Opinion leaders | Weibo consensus after |
|---------------------|------------------------|----------------|----------------------|
| Peaceful (70%)      | 1. Peaceful            | Peaceful (72%) |
| Peaceful (69%)      | 2. Peaceful            | Peaceful (72%) |
| Peaceful (72%)      | 3. Peaceful            | Peaceful (72%) |
| Peaceful (70%)      | 4. Peaceful            | Peaceful (77%) |
| Peaceful (73%)      | 5. Peaceful            | Peaceful and mixed (46% and 46%) |

Cell entries are categorical variables with valid percentage in parentheses.
of the leaders’ posts had sleeper effects on public opinion—that is, topic convergence waned after the other four opinion leaders posted and that their respective peaks did not occur until 2 days later.

**Discussion**

Integrating the findings from this study, the data suggest that Weibo opinion leaders most frequently reinforced the community’s attitudes toward and opinions about the Tianjin explosion, contributing to the spread of opinion convergence on Weibo. There were a few instances where Weibo opinion leaders contributed to change in how the community talked about the accident. For example, two opinion leaders contributed to changing the ways in which the community discussed topic salience, and one opinion leader changed the community’s consensual reason for condemning those whom they blame for the accident. Nonetheless, such changes did not occur in a systematic manner. Also, none of the opinion leaders changed the community’s view about who is responsible for the accident. Juxtaposing the aforementioned findings, one may conclude that Weibo opinion leaders are relatively effective at reinforcing the Weibo community’s subjective assessment (e.g., attitudes and emotional responses) of the Tianjin explosion, but have no effect changing the community’s objective assessment of who is at fault.

The overarching reinforcement effects found in this study are consistent with contemporary media effects literature’s paradigmatic argument against massive media effects (McGuire, 1986; Valkenburg & Peter, 2013). That is, while the researcher did observe the opinion leaders influencing the crowd’s attitudes toward and opinions about Tianjin explosion, the effect is mostly that of crystallization, which is similar to what Lazarsfeld, Berelson, and Gaudet (1948) found in *The People’s Choice* before the rise of the Internet and social media. In other words, just as Lazarsfeld et al. (1948) found that mass media mainly reinforced people’s inclinations in the context of voting, this study found that opinion leaders largely reinforced Weibo users’ subjective attitudes and opinions about the Tianjin explosion.

The fact that most tweets (73.5%) on the Tianjin explosion from the Weibo community were retweets of the opinion leaders’ posts suggest that the five opinion leaders identified in this study are influential in dictating the flow and direction of conversation surrounding the Tianjin explosion on Weibo. After all, most people tend to retweet content that they agree, rather than disagree, with. Future studies are encouraged to conduct an in-depth analysis on the five opinion leaders’ typical content to examine what made these individuals the opinion leaders on this particular social issue.
Such analysis may also shed light on why some opinion leaders’ posts led to more and higher peaks than that of other opinion leaders.

**Contributions**

This study has three noteworthy contributions that merit further discussion. First, this study contributes to the opinion leader’s research by examining the extent to which opinion leaders exert influence on the public in the age of social media. While the use of representative data in this study increases the generalizability of this study’s findings, one should be cognizant of the possibility that the effects of opinion leaders on public opinion may differ depending on the issue, crowd-composition, and social media platforms. After all, different people may gravitate toward different issues and different media, just as different opinion leaders may be more outspoken about different issues. In short, findings from this study may not be generalizable to other types of Chinese social issues on Weibo (e.g., murder trials or celebrity gossip), but it offers a case study of how Weibo opinion leaders influence the community in a large-scale accident in China.

Second, this study bridges the gap that limited research has contextualized in China. With the rapid development of Chinese social media and their expansions of population globally, revisiting conventional communication theories using China’s data is beneficial. This study contributes to the diversity of the contextualization of the two-step flow research; thus, it adds pixels to the panorama of the empirical study within this theoretical framework.

Last but not least, this study measures opinion leaders’ effects on the Weibo community via a temporal order (e.g., looking at opinion change before and after opinion leaders published their posts). According to the original two-step flow hypothesis, ideas often flow from mass media to opinion leaders and then to the less active sections of the population; hence, gauging shifts and variations before and after the second “step” are key to testify to the effectiveness of the hypothesis. Unfortunately, few empirical studies have endeavored to do so, this study fills the gap to canvass the dynamics of public opinion through a temporal order.

**Limitations and future directions**

This study is not without limitations. First, due to data constraints, this study is unable to ascertain whether the crowd contributed to peaks in topic convergence. Future studies are encouraged to incorporate more time points in the study (e.g., to include opinion leaders’ subsequent tweets on a topic) to examine possible reciprocal effects, as documented by L. Zhang et al. (2015). Moreover, a deductive assumption was made that most Weibo users who used the Tianjin explosion keyword and the #TianjinExplosion# hashtag shortly after the incident have seen the opinion leaders’ posts, but this assumption cannot be verified without surveying the actual Weibo users, which remains another limitation of this content analysis study. Nonetheless, since the opinion leaders and the crowd used the same keyword and hashtag, which suggest that both parties are cognizant of this issue and issue public on Weibo, it is highly unlikely that the opinion leaders’ posts did not reach the Weibo community examined in this study. Still, future studies are encouraged to build on this content analysis’ findings to incorporate other research methods—such as experiments—to truly test the opinion leaders’ reinforcement effects on Weibo users. Furthermore, though this study quantitatively verified the potential of influence of the selected opinion leaderships, it cannot guarantee that the changes among other sampled tweets were necessarily elicited by their original tweets. After all, in light of Weibo’s functionality, it is not
impossible that the users changed their attitudes by seeing other users’ comments. Future study may employ a more sophisticated model to canvass these possibilities. Last but not least, the results generated by a limited sample size and with manual coding may jeopardize the validity; future scholars are suggested to use advanced analytical tools, such as ReadMe (Hopkins, King, Knowles, & Melendez, 2010), to fill the gap.

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