A comparative case study: Network agenda setting in crisis and non-crisis news

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Abstract
In order to explore the Chinese traditional media role on social media platforms, this study examined the agenda-setting effects between the networked attribute agendas of Chinese traditional media and various opinion leaders on Weibo in one crisis and non-crisis news, respectively. The results showed that Chinese traditional media failed to lead the discussion on Weibo in both the crisis and non-crisis cases. However, business elites tended to be the most influential opinion leaders in both circumstances. Furthermore, the news agendas of traditional media and the opinion leaders changed in both cases.

Keywords
Agenda setting, crisis, network analysis, opinion leaders, social media, two-step flow

Introduction
Social media and Internet communication technologies gave rise to a new public sphere characterized by an active public, deterritorialized communication transcending national boundaries, democratic activism, and bottom-up advocacy on the Internet. As a result, traditional media outlets gradually lose their dominance in public discourse because social media serve as a supplement for news information. Meanwhile, social media tend to create a more fragmented news agenda than traditional media since they allow voices of underrepresented groups and generate discussions about issues neglected or less covered in traditional media. The new communication pattern on social media attracts scholarly attention to examine the news agenda on social media and the role of traditional media in this digital age. Many studies focused on the...
agenda-setting effects between traditional media and Twitter only (Conway, Kenski, & Wang, 2015; Groshek & Groshek, 2013; Hu et al., 2012; Kongthon, Haruechaiyasak, Pailai, & Kongyoung, 2012; Kushin, 2010; Kwak, Lee, Park, & Moon, 2010; Skogerbø & Krumsvik, 2015). Given the popularity of social media around the globe, other kinds of social media and social media in countries besides the United States have received much less scholarly attention.

Moreover, previous studies on social media mainly focus on one specific issue at a time, most of which are crisis news. Their results indicate that social media tend to set the traditional media agenda in moments of crisis, such as crisis in political activism, natural disasters, and social emergencies (Bruns, Highfield, & Burgess, 2013; Cho & Shin, 2014; Kim & Lee, 2006; Kongthon et al., 2012). Twitter’s agenda-setting function is quite frequent and evident in cases of natural disasters and social emergencies, such as the Sichuan earthquake in 2008, and the airplane crash in the Hudson River in 2009 (e.g. Cho & Shin, 2014; Kongthon et al., 2012). Another common theme of previous agenda-setting studies on Twitter is political issues (e.g. Colleoni, Rozza, & Arvidsson, 2014; Parmelee & Bichard, 2011). The reason that agenda-setting studies on Twitter concentrate on crisis news and political campaigns is self-evident; these issues easily capture public attention and generate fierce discussion in the world of social media. However, crisis news and political news are not the only matters that cause concern. Other kinds of issues, such as employment, race, gender, culture, and pollution, are among the trending topics on Twitter and Weibo. Unfortunately, these issues received much less scholarly attention.

Therefore, this study applied a network analysis to examine agenda-setting effects between the media outlets and opinion leaders on Weibo—one of the most popular Chinese social media platforms. It aims to broaden the subject areas of agenda-setting studies by comparing a crisis news—the case of Tianjin explosion—with a non-crisis news—the case of Tu Youyou winning the Nobel Prize in medicine. This study opens up a window for the Western world to know about Chinese social media. Moreover, it verifies whether agenda setting exists between the media outlets and opinion leaders on Chinese social media platforms and under what circumstances. The study also makes methodological contributions to agenda-setting studies as well. It tests the newly developed networked agenda-setting effect (network agenda setting (NAS) model) in Chinese social media, and expands the methodological development of agenda-setting theory to a different cultural context. It provides groundwork for future research that is interested in either the NAS model or agenda-setting effects within Chinese context.

The crisis and non-crisis cases

An easy way to define crisis and non-crisis news is to use two different real cases to represent these circumstances. As Yin (1994) said, case study is commonly used to investigate a contemporary phenomenon within its real-life context. Although the results of case study cannot be generalized statistically, the results can inform the relationships among a particular set of concepts or sequence of events, which can be applied to other cases with similar concepts or sequences. Yin (2009) defined this process as analytical generalizations. Moreover, analytical generalizations are not conclusions but rather “working hypotheses” that can be verified as future case studies continue to provide findings of the same kind. Therefore, this study selected two cases from the trending topics on Weibo in 2015, including the 2015 Tianjin explosion and Tu Youyou winning the Nobel Prize for medicine. The Tianjin explosion represents crisis news and the case of Tu Youyou represents non-crisis news.
The Tianjin explosion

A chemical warehouse at the port of Tianjin, China, exploded on 12 August 2015. Three huge explosions coupled with a series of small ones killed more than a hundred and injured hundreds of others (Tatlow, 2015). The large casualty and huge economic loss that resulted from the explosion have made it China’s worst industrial disaster for years (The Guardian, 2015). News of the incident was first broken by Chinese netizens on Weibo and suddenly became a national sensation within 2 hours (Weibo Report, 2015). More than a hundred trending topics regarding this incident emerged on Weibo and the most popular one is #Tianjin Tanggu Explosion#, which has been read by Chinese netizens over 7500 million times (Weibo Report, 2015). Shortly after the explosion happened, local media, national media, local governments, and various kinds of opinion leaders participated in the discussions of the incident on Weibo, focusing on different aspects of the issue and trying to help the city of Tianjin. Based on the above discussion, the Tianjin explosion provides an ideal example of crisis situation for this study.

Tu Youyou’s case

Tu Youyou, an 84-year-old scientist with little fame in China, won the Nobel Prize for medicine in October 2015. Tu won the award because she discovered the malaria drug artemisinin, which is “humankind’s best defense against the mosquito-borne disease, which kills 450,000 people each year” (Hunt & Lu, 2015). Tu is the first Chinese Nobel laureate in medicine and the first Chinese citizen to receive the Nobel Prize in natural sciences. When receiving the award, she attributed her success to Chinese traditional medicine because she found the drug artemisinin from ancient Chinese medicine manuscripts. The news generated a heated debate on Weibo for mainly two reasons. First, Tu’s role in discovering artemisinin has been ignored by the whole country for more than 40 years since she started her research in this field in the 1970s. In the past few years, she applied several times for Academician of Chinese Academy of Sciences (CAS), the highest level of national honor for Chinese scientists, but was rejected. People questioned why Tu’s efforts had not been honored by the government and whether the selection criteria for the members of CAS were fair. Second, this news escalated the already fierce debate about whether Chinese traditional medicine is better than Western medicine. Tu Youyou’s case had nothing to do with any crisis, but was such a sensationalized event on Weibo that is worth analyzing. It provides a good example for this study to explore the agenda-setting effects in non-crisis circumstance.

Theoretical framework: Network Agenda Setting

As a news source, social media complicate news dissemination patterns by allowing people to connect with each other to form their personal networks and share information freely with others. To put it another way, social media have visualized people’s invisible personal and information networks in society, illustrating humans’ complex cognitive representations of connecting and associating various elements together to learn (Anderson & Bower, 2014; Kaplan, 1973). However, traditional agenda-setting theory is based on the assumption that information transmission between the media and the public is both linear and discrete, without overlap or interaction (Vu, Guo, & McCombs, 2014). It cannot detect how the public associate issues or attributes, or whether that is influenced by the media coverage or other factors. In response to the rise of social media, Guo and McCombs (2011b) introduced network analysis into the realm of agenda-setting studies, leading to the birth of the network agenda setting (NAS) model.
The NAS model uses network analysis to map out the interrelations among various elements in the media agenda and the public agenda, and then compares the two networked agendas (Guo, 2012). It argues that the salience of interrelationships among various issues and/or attributes can be transferred from the media to the public. Although the NAS model is relatively new, studies have shown that the salience of the networked relationships among objects and/or attributes can be transferred from the media to the public. For example, Guo and McCombs (2011a) compared the media and public agenda networks of the political candidate attributes in the Texas gubernatorial and US senatorial elections in 2002. The results found that the two networks were significantly correlated with each other, which supported the model. The NAS model is further supported in several intermedia agenda-setting studies, finding that the salience of networked news agendas can be transferred among different media outlets (Guo et al., 2015; Guo & Vargo, 2015; Vargo, Guo, McCombs, & Shaw, 2014; Vu et al., 2014).

In general, the NAS model improves traditional agenda-setting theory by expanding the discrete issue/attribute agenda to a networked agenda, which mimics humans’ cognitive representations of the world. It is especially efficient to test the agenda-setting effects in situations that involve various factors or attributes. It is because the NAS model can provide a comprehensive picture of an issue by presenting the interrelationships of its various attributes. As a result, the NAS model is a more optimal way to test the agenda-setting effects on social media, where the discussions of a trending topic always involve millions of posts emphasizing a wide spectrum of relative attributes of the topic. Since this study examines two trending issues on Weibo that consist of various attributes respectively, it utilized the NAS model to compare the networked attribute agendas of the media outlets and opinion leaders on Weibo for both cases.

**Literature: Chinese media and opinion leaders**

Chinese media at the outset are designed by political leaders as a government instrument for social and political control (Chan, 2007). For decades, the meaning of being a journalist in China, especially in official media organizations such as Xinhua News Agency, was different from that in the Western countries. Journalism was a political career and Chinese journalists were more like “publicists” who distributed information to mass audiences under the supervision of the state (Dong, Park, & Chang, 2013). Since 1978, when China’s marketization was set in motion, momentum toward less state control of the media has been building (Kalathil, 2002). The trends of globalization and marketization, coupled with the new media technology from live television as well as the Internet, have strongly challenged the media system in China. The opening-up process of the Chinese media together with the establishment of a press spokespeople system enabled journalists to be separate from the political system and conduct investigative reports (Dong et al., 2013).

**The official and commercial media in China**

The majority of Chinese media outlets had become financially independent by 2003, with the exception of a handful of official news organizations directly controlled by national and local governments, such as People’s Daily, Xinhua News Agency, and CCTV (Shirk, 2010). Meanwhile, a group of semi-privatized commercial media, such as Caijing, Phoenix television, and other local satellite television stations, emerged through the process of marketization, expanding press freedom in China to a great extent and quickly gaining unprecedented public trust and popularity.
(Dong et al., 2013). Commercial media outlets have been cautiously testing the limits of media control and are willing to push the state on politically sensitive topics such as government misconduct and free speech (Kalathil, 2002). They offer journalists opportunities to report of their own free will. Throughout the trends of marketization and pluralism, Chinese journalists have evolved from state employees to investigative reporters who have gained sufficient autonomy while covering the news except in regards to coverage of politics, political figures, or anything related (Lee, 2005). Chinese journalists have also learned to use “tactics” such as puns and historical allusions to evade and resist government control of the media (Pan & Lu, 2003). In addition to changes in the Chinese media system and journalism industry, the marketization trend has also led to changes in editorial and marketing strategies in Chinese news organizations. Rather than advocating government policies as before, both official and commercial news organizations began to tilt toward being audience oriented, with an emphasis on educating and entertaining the public, as well as promoting China’s economic development (Hong & Cuthbert, 1991; Zhao, 1998).

Overall, the trend of marketization and globalization in China transformed the Chinese media industry in many different ways. Mostly importantly, the trend gave birth to a number of commercial media organizations that are semi-privatized and driven by profits and journalistic professionalism. Compared to official media organizations, commercial media organizations in China provide more investigative reporting and human interest stories, have the courage to challenge the system, and in turn are considered more credible by the public. Based on the above discussion, the following research questions were proposed:

**RQ1.** What are the networked attribute agendas of (a) official media and (b) commercial media on Weibo in the Tianjin explosion?

**RQ2.** What are the networked attribute agendas of (a) official media and (b) commercial media on Weibo in Tu Youyou’s case?

### The rise of social media in China

The existing media system has been further challenged by the rise of the Internet in China. The Internet brought about the information revolution in China and offers a participatory forum where individuals gather to share information, build alliances, voice alternative perspectives, and ultimately become empowered (Canclini, 2001; Downing, 2003; Kellner, 2000). Many commercial web portals make news coverage from different news organizations available and encourage competition among news organizations. News often comes out on the Internet earlier than traditional media can publish it, which pressures traditional media to follow and helps push the boundaries of acceptable news (Kalathil, 2002). Even official media outlets such as *People’s Daily* maintain a strong web presence that is more user-friendly than their official images. Their websites provide mixed news content ranging from politics to sports and entertainment, enhanced by a lively tone. Not only do official media outlets use the Internet to publish news content that is not acceptable on their official platforms, Chinese journalists also consider the Internet a pressure valve where they ventilate their story ideas and feelings suppressed by the system.

As of December 2014, China had 649 million Internet users and an Internet penetration of 47.9% (China Internet Network Information Center (CNNIC), 2015). With the proliferation of social media since 2009, the number of registered Chinese microblog users in 2015 reached 249 million, compared to 8 million users in 2009 (CNNIC, 2015; Esarey & Qiang, 2011; Jiang,
2013). As far as Weibo is concerned, it had 198 million monthly active users in China alone as of 2015, 96% of which were ordinary people. Although the group of Internet users is fairly large in China, what really matters is the purpose of using the Internet. Before the arrival of social media, Chinese cyberspace was mainly a place for socializing and entertainment (Guo, 2007). People communicated and shared information online, which had little to do with politics and public affairs. Since the advent of social media in China, more than half of Chinese netizens have used the Internet to express opinions intended to “supervise” government activities (Esarey & Qiang, 2011). The Internet has greatly contributed to political engagement in China by making different voices heard, creating a public sphere for political discussion, and organizing online collective actions (Wu, 2007).

Despite the growing openness and diversity on the Internet, China remains one of the most sophisticated countries for Internet filtering and information control in the world (OpenNet Initiative, 2009). As a result, many websites, such as Twitter and Facebook, are inaccessible to the majority of Chinese people. Thanks to computer technologies, Chinese people launched their own social media that are compatible with government censorship. As one of the most popular social media platforms in China, Weibo possesses almost the same designs, layout, and functions as Twitter. The major difference is that Weibo users are allowed to insert graphical emotions or attach multimedia contents in every post (Deutsch, 2015).

Chinese social media platforms are not merely another news source. They have revolutionized the way traditional media and journalists do their work. PR Newswire Asia surveyed 2503 Chinese journalists and revealed that more than 90% of the respondents consider news originating from social media valuable and almost half of them regularly use Weibo to obtain news (Dowell, 2010). Although traditional media in China are regulated by the government, ordinary people are able to utilize social media to break stories that are usually banned in traditional media. The cumulative public expression on social media platforms, therefore, not only attracts media attention but also legitimizes traditional media’s coverage on sensitive issues. It is because public opinion on social media platforms has become a barometer for the Chinese government to know about public sentiments and implement policies (Luo, 2011; Tai, 2006).

The opinion leaders on Weibo

Social media provide a platform where different news sources, either groups or individuals, interact with and adapt to each other in order to compete to lead the information flow on the Internet. They have greatly obscured the historical distinction between mass and interpersonal communications, leading communication scholars to rethink and redefine the communication pattern in this digital age. Some refer it to “masspersonal” communication (Walther et al., 2010), while others found similarities and connections between communication patterns on social media and the two-step flow model, which was first introduced by Lazarsfeld, Berelson, and Gaudet (1944) in their 1940 voting study and was further elaborated by Katz and Lazarsfeld in 1955. Two-step flow model mainly states that media effects are indirectly established through the personal influence of opinion leaders. The information flow predicted by two-step flow model is from the media to opinion leaders and then to the public who are less exposed to the media. Opinion leaders stand out because they are more likely to be exposed to the media and know more about the field where they are the leaders. If the media are no longer the only and first news source, as described on social media platforms, are all these hypotheses in two-step flow theory still valid?
Actually, western scholars found that media outlets and journalists are the most active users on Twitter (Wu, Hofman, Mason, & Watts, 2011). Lots of information shared on Twitter is from traditional media, especially news events and political discussions (Hu et al., 2012). Bloggers are also among the most influential users on Twitter. However, many famous bloggers are actually former or current journalists (Meraz, 2009). Cha, Haddadi, Benevenuto, and Gummadi (2010) found that the most followed users are a wide variety of public figures and media outlets, the most tweeted users are content aggregation service, businessmen, and news sites, and the most mentioned people are mainly celebrities. Other influential opinion leaders on Twitter include journalists, professors, celebrities, organizations, political bloggers, think tanks, and interest groups (Cho & Shin, 2014; Dubois & Gaffney, 2014; Leavitt, Burchard, Fisher, & Gilbert, 2009; Park, 2013; Parmelee, 2014).

Additionally, news flow on Twitter does not necessarily start from the media because the opinion leaders are capable of posting news information on Twitter as fast as or even faster than the media (Cho & Shin, 2014; Leavitt et al., 2009; Park, 2013; Parmelee, 2014). Furthermore, different opinion leaders play distinctive roles in the information dissemination process on Twitter. For example, media professionals are successful at breaking out the news at early stages, while celebrities are critical to spreading the news to the audience later on (Hu et al., 2012; Leavitt et al., 2009).

Opinion leaders on Chinese social media platforms have received much less scholarly attention compared to Twitter. One study found that a typical opinion leader in China was a middle-aged scholar or businessman and the most influential opinion leaders on Weibo included media professionals, scholars, and businessmen (Su, Zhang, & Zhang, 2009). An agenda-setting study on Chinese online discussion forums argued that online activists and journalists were the major opinion leaders in the agenda-setting process on the Internet (Luo, 2011). More recently, Fu and Chau (2014) studied a grassroots movement on Weibo, finding that media professionals and business elites were playing a critical role in online grassroots movements. However, celebrities were opinion leaders for a sensational incident on Weibo that was not followed and covered by any media outlet. Based on the findings of previous studies, media professionals, celebrities, scholars, and public figures (e.g. business elites in China) are the most influential opinion leaders on social media outlets. Therefore, this study examined the networked agendas of different opinion leaders on Weibo, including media professionals, celebrities, scholars, and business elites. The following research questions were proposed:

*RQ3.* What are the networked attribute agendas of (a) media professionals, (b) celebrities, (c) scholars, and (d) business elites on Weibo in the Tianjin explosion?

*RQ4.* What are the networked attribute agendas of (a) media professionals, (b) celebrities, (c) scholars, and (d) business elites on Weibo in Tu Youyou’s case?

In order to compares the agenda-setting effects in crisis and non-crisis news, this study explored the interrelationships between the networked agendas of the media outlets and opinion leaders. The following research questions were proposed:

*RQ5.* Are the networked attribute agendas of (a) official media, (b) commercial media, and (c) the opinion leaders on Weibo correlated with each other in the Tianjin explosion?

*RQ6.* Are the networked attribute agendas of (a) official media, (b) commercial media, and (c) the opinion leaders on Weibo correlated with each other in Tu Youyou’s case?
**Method**

**Data collection**

The Tianjin explosion generated tens of thousands of Weibo posts and various trending topics. This study only focused on the microblog posts under the most popular trending topic #Tianjin Tanggu Explosion#, as discussed previously. A preliminary review of these microblog posts revealed that a large number of the posts appeared on Weibo within 2 weeks after the explosion (12 August 2015). Therefore, the study retrieved all the posts that included #Tianjin Tanggu Explosion# and were published between 12 August 2015 and 31 August 2015. Tu Youyou’s case received much less media and public attention compared to the Tianjin explosion; and it resulted in fewer Weibo microblog posts. The discussion about Tu Youyou’s case on Weibo lasted from October to December; the nomination came out on 5 October 2015 while the ceremony took place on 10 December 2015. As a result, this study retrieved all posts that included “Tu Youyou” and were published between 5 October 2015 and 31 December 2015. GooSeeker—a Weibo data crawler—was used to collect data from Weibo’s website. In general, 3909 Weibo posts were manually coded for the Tianjin explosion, among which 753 were from the official media (19.3%), 1405 from the commercial media (35.9%), 430 from media professionals (11%), 448 from celebrities (11.5%), 491 from scholars (12.6%), and 382 from business elites (9.8%). There were 972 Weibo posts for Tu Youyou’s case, among which 192 were from the official media (19.8%), 293 from the commercial media (30.1%), 133 from media professionals (13.7%), 71 from celebrities (7.3%), 167 from scholars (17.2%), and 116 from business elites (11.9%).

**Content analysis**

The study used a content analysis to construct the agendas of the media and the opinion leaders on Weibo for both cases. The unit of analysis is each original microblog post of the media outlets and opinion leaders. Each post was coded for source of the post, attribute of the case discussed in the post, and publishing date of the post. Source of the post was coded as (1) official media, (2) commercial media, (3) media professionals, (4) celebrities, (5) scholars, and (6) business elites. While the discussions of both cases on Weibo mentioned different aspects of the issue, this study thus focused on the attribute agendas of the media outlets and opinion leaders on Weibo for both cases. Because the attributes of each case were unknown, the study applied an inductive approach. Two coders randomly selected 10% of the data for each case, analyzed the selected posts, and defined the attributes of the case in each post. Based on this preliminary examination, the frequently appearing categories were recorded and refined as the codebook for the content analysis of the entire data. As a result, the attributes of the Tianjin explosion include (1) casualty, (2) economic loss, (3) pollution, (4) rescue, (5) damages, (6) accountability, (7) the cause, (8) firefighters, (9) social impact, (10) reconstruction, (11) the government, and (0) others. The attributes of Tu Youyou’s case include (1) sense of honor, (2) research achievement, (3) criticism of the system, (4) scientists, (5) Chinese medicine, (6) female scientists, and (0) others. The category “others” was excluded for both cases in the analysis. Please see Appendix 1 for more details.

The coding process was conducted by two journalism majors, who are fluent in both Chinese and English. The coders went through a short training session before the coding process. First, the coders coded 5% of the sample for each case to clarify and revise the definitions of the categories. Each coder was then given another 5% to code for pretesting. After the training sessions, the coders
separated the work and coded the samples independently. To calculate the intercoder reliability, the author randomly selected 10% of the sample for each case. Both coders used the same codebook and coded the sub-sample individually. Among the three variables coded for this study, the coders achieved 100% agreement on source of the post and publishing date of the posts. The Scott’s $\pi$ value for the attributes of the Tianjin explosion is 0.83, and the Scott’s $\pi$ value for the attributes of Tu Youyou’s case is 0.87. Both values are above the minimum requirement (0.75).

Network analysis

To prepare the data for network analysis, the study first constructed the networked attribute agenda for the official media, the commercial media, and four kinds of opinion leaders. The networked attribute agendas illustrate how different entities link various attributes of an issue together. To operationalize the links of various attributes of each issue, attributes that were mentioned on the same day were considered implicitly linked. The decision was made because it is rare for a single post to mention two attributes because of its 140-character limit (Vargo et al., 2014). Therefore, the number of times any two attributes were mentioned by a given source on the same day was calculated to measure the pair of issues’ strength of association. The data were then converted to network matrices that tallied the ties among the issues to build the matrices for each group involved.

The study used UCINET software to analyze the networked attribute agendas of the media and opinion leaders. Degree centrality of each networked attribute agenda was calculated by the function of centrality and the power. Quadratic assignment procedure (QAP) was used to test the correlations of these networked attribute agendas, which in turn reveals the differences and relationships among these networks. In network analysis, degree centrality refers to the number of ties that a node has in a network (Wasserman & Faust, 1994). Applying this concept to the current study, it means the number of connections an attribute has with other attributes in the network of an issue. The more connections an attribute has with other attributes, the more central it is in the network. The higher degree centrality of an attribute signifies the greater importance of the attribute in the network. The degree of centrality in network analysis explains the similarities and differences between two networked agendas, while the correlations reveal the interrelationship between these agendas.

Results and analysis

The agenda-setting effects in crisis news

RQ1 and RQ3 explore the networked attribute agendas of the media outlets and opinion leaders in the Tianjin explosion. Table 1 displays the degree centrality of each attribute on the networked attribute agendas of the official and commercial media outlets. The table shows that casualty of the explosion was the most central attribute of Tianjin explosion for both the official media ($n=104$) and the commercial media ($n=131$), indicating that both kinds of media outlets cared most about casualties in the explosion. Rescue operations ($n=87$) and the pollution caused by the explosion ($n=86$) ranked second and third on the networked agenda of the official media, while the second most central attribute on the networked attribute agenda of the commercial media was the explosion’s social impact ($n=130$), followed by accountability ($n=122$), meaning who should be held accountable for the explosion. The differences indicate that official media outlets focused on the incident itself while commercial media outlets tended to investigate the stories behind the scenes. Figures 1 and 2 display the networked attribute agendas of the official and commercial media
through visual graphics. The node size was adjusted to match the degree centrality of each attribute. The bigger a node, the greater degree centrality the node has. The visual display of each networked attribute agenda clearly shows which attribute is located at the center of the network and which attribute is peripheral. The visualization software Netdraw was used to create these figures (Borgatti, 2002).

Table 2 displays the degree centrality of each attribute in the networked attribute agendas of different opinion leaders. The top three central attributes on the networked attribute agenda included the government (n = 89), accountability (n = 77), and casualty (n = 75). The attribute “the government” mainly refers to criticism toward the government in terms of controlling the media, withholding the truth, and acting irresponsibly in the crisis. The results indicate that media professionals not only made efforts to uncover the truth behind the explosion, but they also questioned the corruption and incompetence of the local government. The networked attribute

### Table 1. Degree centrality (DC) for the networked agendas of the media in the Tianjin explosion.

| Official media (DC/rank) | Commercial media (DC/rank) |
|-------------------------|---------------------------|
| Casualty                | 104 (1)                   | 131 (1)                   |
| Rescue                  | 87 (2)                    | 92 (9)                    |
| Pollution               | 86 (3)                    | 115 (4)                   |
| Social impact           | 81 (4.5)                  | 130 (2)                   |
| Accountability          | 81 (4.5)                  | 122 (3)                   |
| Reconstruction          | 78 (6)                    | 109 (6)                   |
| Firefighters            | 70 (7)                    | 112 (5)                   |
| The cause               | 66 (8)                    | 70 (11)                   |
| Damages                 | 61 (9)                    | 94 (8)                    |
| Economic loss           | 55 (10)                   | 102 (7)                   |
| The government          | 53 (11)                   | 71 (10)                   |

![Figure 1. Official media network in the Tianjin explosion.](image)
agenda of business elites was similar to that of media professionals, with the government being the most central attribute on the networked attribute agenda (n = 66), followed by casualty (n = 59) and accountability (n = 58). The top two central attributes on the networked attribute agenda of scholars were the government (n = 94) and accountability (n = 89), which is the same as media professionals’. Scholars also devoted their Weibo posts to discussions about the firefighters in the explosion (n = 83), which was the third most central attribute on their networked attribute agenda. Finally, celebrities cared most about who should be held accountable for this explosion. The attribute “accountability” (n = 50) was the most central attribute on celebrities’ networked attribute agenda,
followed by the firefighters \((n=48)\) and casualty \((n=46)\). Figures 3 to 6 display the networked attribute agendas of different opinion leaders through visual graphics.

In sum, official media outlets merely reported facts and numbers of the explosion in their Weibo posts, including the death toll, number of injuries, rescue operations, the pollution caused by the explosion, and other social impact resulted from the disaster. In fact, information about the explosion reported by official media outlets was highly censored by the government. The networked attribute agendas of all kinds of opinion leaders presented a quite different picture from the agendas of the media outlets. The opinion leaders tended to discuss more about the slow reaction of the...
Figure 5. Scholars’ network in the Tianjin explosion.

Figure 6. Business elites’ network in the Tianjin explosion.
local government to this explosion, the mishandlings of the crisis by the local government, and the innocent firefighters who were sacrificed in the explosion.

Looking back at the case of the Tianjin explosion, there are two things that made this explosion even more disastrous. First, the local government neither responded to the explosion immediately nor acted properly to the crisis. Before determining the nature of the explosives, local government officials sent groups of firefighters into the explosion without proper equipment and skills. The first group of firefighters were all killed by the subsequent explosions that occurred right after they entered the area. The following groups suffered heavy casualties because they were not trained or prepared for a large-scale chemical fire. They sprayed water into the fire, which actually caused several secondary explosions. Second, local government officials remained silent until they held the first press conference 17 hours after the explosion. Within the 5 days after the explosion, the local government held six press conferences with low-ranking, uninformed municipal officials who infuriated both the central government and the media outlets. It is because these officials did not know anything about the explosion and failed to provide valuable information. When no real information came from the press conferences, rumors circulated on the Internet, which incurred the government’s crackdown on the Internet 2 days after the explosion. Official media outlets were only reporting facts filtered by the government on Weibo. Conversely, the opinion leaders’ criticism of the government and quest for the truth struck home with citizens.

RQ5 investigates the correlations between the networked attribute agendas of the media outlets and opinion leaders in crisis news. As shown in Table 3, none of the networked attribute agendas of the opinion leaders were correlated with the media agendas. The result reveals that there were no agenda-setting effects between both kinds of media outlets and the opinion leaders in the Tianjin explosion. However, the networked attribute agenda of the commercial media was significantly correlated with that of the official media in the Tianjin explosion ($r = +.64$, $p < .01$). The finding indicates that news coverage of both the official and commercial media outlets were restricted by the government’s media blockage.

|               | Official media | Commercial media | Media professionals | Celebrities | Scholars | Business elites |
|---------------|---------------|-----------------|---------------------|------------|----------|-----------------|
| Official media| 1.00          |                 | .64**               | .21        | .26      | .08             |
| Commercial media| 1.00          |                 | .18                 | .22        | .14      | .16             |
| Media professionals | 1.00          |                 | 1.00                | .81**      | .87**    | .89**           |
| Celebrities    | 1.00          |                 |                     | 1.00       | .73**    | .87**           |
| Scholars      | 1.00          |                 |                     |            | 1.00     | .84*            |
| Business elites|              |                 |                     |            |          | 1.00            |

QAP: quadratic assignment procedure.

*p < .05.

It is notable that the networked attribute agenda of media professionals was highly, significantly correlated with that of celebrities ($r = +.81$, $p < .01$), scholars ($r = +.87$, $p < .01$), and business elites ($r = +.89$, $p < .01$). Moreover, the networked attribute agenda of business elites was highly, significantly correlated with that of celebrities ($r = +.87$, $p < .01$) and scholars ($r = +.84$, $p < .01$). Finally, the networked attribute agenda of celebrities was also correlated with that of scholars ($r = +.73$, $p < .01$).

Table 3. QAP correlations between the networked agendas of the media and opinion leaders in the Tianjin explosion.
The results show that the networked attribute agendas of all kinds of opinion leaders were highly inter-correlated among each other, indicating great similarities among these agendas. In addition, the highest correlation value appeared between the agendas of media professionals and business elites, which were highly correlated with the other agendas. Therefore, media professionals and business elites were the most influential opinion leaders in the news of this crisis.

The agenda-setting effects in non-crisis news

RQ2 and RQ4 explore the networked attribute agendas of the media outlets and opinion leaders in a non-crisis news situation. This study examined the case of Tu Youyou and found six major attributes of the case that appeared in the Weibo posts studied. The first attribute was “sense of honor,” which refers to the fact that Tu is the first Chinese citizen to receive the Nobel Prize in natural sciences and the award brought about strong national pride among the Chinese people. The second attribute was “research achievement,” referring to Weibo users’ positive attitude toward the achievement of Chinese scientific research. After Tu won the Nobel Prize, many people believed that Chinese scientific research overall has made great progress and deserves public praise. “Criticism of the system” refers to Weibo users’ criticism of the bureaucracy within Chinese academic institutions. Since Tu Youyou’s application to the members of CAS was rejected several times, the public discussed on Weibo about whether the promotion mechanism in Chinese academic institutions was fair and impartial. “Scientists” refers to the discussions about the little public attention given to scientists compared to celebrities in China. The fifth attribute was “Chinese medicine,” referring to the discussions that involved the comparison between Chinese traditional medicine and Western medicine. As discussed before, Tu Youyou attributed her success to Chinese traditional medicine, which generated a heated debate about whether Chinese traditional medicine is better than Western medicine. The last attribute was “female scientists,” which refers to the discussions about the achievements and qualifications of Chinese female scientists. Because Tu Youyou is a female scientist, her achievement gave rise to more public attention to female scientists in China.

Table 4 displays the degree centrality of each attribute on the networked attribute agendas of the official and commercial media. As it shows, Chinese medicine was the most central attribute on the networked attribute agendas of both the official media (n=27) and commercial media (n=49), indicating that both kinds of media outlets more often discussed the comparison between traditional Chinese medicine and Western medicine. Sense of honor ranked second on the networked attribute agendas of both the official media (n=26) and commercial media (n=43). The top two central attributes on the networked attribute agendas of the official and commercial media were the

| Official media (DC/rank) | Commercial media (DC/rank) |
|-------------------------|---------------------------|
| Chinese medicine        | 27 (1)                    | 49 (1)                    |
| Sense of honor          | 26 (2)                    | 43 (2)                    |
| Scientists              | 20 (3)                    | 38 (5.5)                  |
| Female scientists       | 14 (4)                    | 41 (3.5)                  |
| Research achievement    | 11 (5)                    | 38 (5.5)                  |
| Criticism of the system | 10 (6)                    | 41 (3.5)                  |
same, indicating that both kinds of media outlets paid more attention to the same attributes of Tu Youyou’s case than the others. Scientists (n = 20) ranked third on the networked attribute agenda of the official media. Differently, commercial media outlets paid more attention to criticism of the system (n = 41) and female scientists (41), which tied for the third place on the agenda of the commercial media. Despite the top two issues, the networked attribute agenda of the official media in the case of Tu Youyou differs from that of the commercial media. Commercial media outlets dedicated more posts to criticizing the bureaucracy in Chinese academic institutions while official media outlets discussed more about public attitude toward scientists. Figures 7 and 8 display the networked attribute agendas of the media outlets through visual graphics.

Table 5 displays the degree centrality of each attribute on the networked attribute agendas of the opinion leaders. It shows that media professionals (n = 22), scholars (n = 25), and business elites (n = 18) all paid more attention to the criticism of the system than the others, indicating that most of their Weibo posts were criticizing the unfair promotion system in Chinese academic institutions. The second most central attribute on the networked attribute agenda of media professionals was female scientists (n = 21), followed by sense of honor (n = 19) and scientists (n = 19). Differently, the attributes of female scientists (n = 8) and sense of honor (n = 8) tied for the second place on the networked attribute agenda of celebrities. The second most central attribute on the networked attribute agenda of scholars was sense of honor (n = 23), followed by scientists (n = 21) and Chinese medicine (n = 21). The second most central attribute on the networked attribute agenda of business elites was scientists (n = 17), followed by sense of honor (n = 12).

The results show that both the media outlets and opinion leaders expressed their sense of honor when discussing Tu Youyou’s case on Weibo. Most of the Weibo posts mentioned that Tu is the first Chinese Nobel laureate in medicine, which is considered a point of national pride by the
people. However, the media outlets discussed more about Chinese traditional medicine in their Weibo posts, while opinion leaders on Weibo devoted their posts to criticizing the bureaucracy in Chinese academic institutions. Figures 9 to 12 display the networked attribute agendas of different opinion leaders through visual graphics.

RQ6 investigated the correlations among the networked attribute agendas of the media outlets and opinion leaders in this non-crisis news event. Table 6 contains the QAP correlation matrix for Tu Youyou’s case. As it shows, none of the networked attribute agendas of the opinion leaders were correlated with the media agendas, indicating that no agenda-setting effects existed between the media outlets and opinion leaders on Weibo in this non-crisis news event. The networked attribute agendas of the official and commercial media were not correlated in Tu Youyou’s case, indicating that they had different attribute agendas. The significant correlations only appeared among the networked agendas of the opinion leaders. The networked attribute agenda of media professionals was significantly correlated with that of celebrities ($r=+.70$, $p<.05$). Moreover, the networked attribute agenda of business elites was significantly correlated with that of media professionals ($r=+.59$, $p<.05$), celebrities ($r=+.64$, $p<.05$), and scholars ($r=+.59$, $p<.05$). The results suggest that, in Tu Youyou’s case, none of the opinion leaders followed the media coverage on Weibo.
Instead, they discussed the case from different aspects and a critical approach. Additionally, media professionals, celebrities, and scholars presented different networked attribute agendas in this case.
Discussion

Both the Tianjin explosion and Tu Youyou’s case were an overnight sensation in China. Differently, media blockage played a role in the Tianjin explosion but not in Tu Youyou’s case. Tianjin’s explosion was caused by hazardous materials improperly or illegally stored in a warehouse that was covered up by the local government. Therefore, local government remained silent throughout the process and the state enforced a media blockage shortly after the explosion. However, Tu Youyou’s Nobel Prize award is honorable and praiseworthy. Many posted on Weibo that the award was also a glorious international debut of Chinese traditional medicine, which generated national pride.
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Comparison of the two cases, the study discovered the following.

First, the networked attribute agendas of the media outlets and opinion leaders on Weibo differed significantly in both crisis and non-crisis news. In the Tianjin explosion, the media outlets on Weibo focused on the death toll and rescue operations. Moreover, official media outlets frequently shifted their attention from reporting the explosion to dispelling rumors. Because no real news came out from official channels, rumors about the death toll and the cause of the explosion circulated on the Internet. Official media outlets kept squelching rumors and updating the official death toll, which was highly censored by the state. Their attempts made things even more chaotic since few people tended to believe in the official data.

Some of the commercial media outlets, such as Caixin News, made a foray into the investigation and spared no effort to uncover the background of the illegal warehouse. Most of the time commercial media outlets followed the news of official media outlets because of the government control. Independent investigation of the crisis on the Internet was banned and non-official information was removed immediately. The government’s media control seems to have come up short in front of the opinion leaders. They mainly posted about who should be responsible for this explosion and why local government remained silent. Although it was common that accounts were closed and posts were removed, opinion leaders on Weibo made great efforts to evade media control and question the authenticity of the official information.

The discussion of Tu Youyou’s case centered around two aspects, including the debate about Chinese traditional medicine and criticism of the Chinese academic system. Both official and commercial media outlets discussed more about the former while all kinds of opinion leaders but celebrities focused on the latter. Obviously, the media outlets tended to seek this opportunity to advocate traditional culture and boost national pride. Very few posts of official media outlets criticized the Chinese academic system, which was the most peripheral attribute on their networked agenda. Commercial media outlets differed from official media outlets by sometimes criticizing the Chinese academic system. Conversely, all kinds of opinion leaders except celebrities focused their attention on the bureaucracy within the Chinese academic system. They paid more attention to the social status of scientists in China as well and barely discussed Chinese traditional medicine.

In sum, the official media’s role as the mouthpiece of the government is evident in both the crisis and non-crisis news events. Official media outlets strictly followed the party script and dedicated their efforts to maintaining social stability in time of crisis. When non-crisis news happened,

### Table 6. QAP correlations between the networked agendas of the media and opinion leaders in Tu Youyou’s case.

|                  | Official media | Commercial media | Media professionals | Celebrities | Scholars | Business elites |
|------------------|----------------|------------------|---------------------|-------------|----------|-----------------|
| Official media   | 1.00           | .51              | −.38                | −.06        | .32      | −.33            |
| Commercial media | 1.00           | −.25             | −.05                | .32         | .36      | −.18            |
| Media professionals | 1.00         | .70*             | .36                 | .64*        | .59*     |                 |
| Celebrities      | 1.00           | .41              | .64*                | .59*        |          |                 |
| Scholars        | 1.00           | .32              | .59*                | .59*        |          |                 |
| Business elites | 1.00           |                  |                     |             |          |                 |

QAP: quadratic assignment procedure.

*p < .05.
they tended to promote national pride and traditional culture. It is not difficult to see the commercial media’s effort to diverge from the discourse of the official media in both cases. Commercial media outlets endeavored to disclose the truth in time of crisis, although under the pressure of media control. They included voices of both praise and criticism in their coverage of this non-crisis news event. However, their effort was pointless because of the media blockage in this crisis event, which was confirmed by the finding that the networked attribute agendas of the official and commercial media outlets were significantly correlated in the Tianjin explosion. The commercial media presented a different agenda from the official media without media control, just as it did in the case of Tu Youyou. The agendas of the opinion leaders changed in crisis and non-crisis news as well. On one hand, the agendas of the opinion leaders tended to be similar to each other when there was strong media control in the Tianjin explosion. On the other, their agendas were diverse and less correlated in non-crisis news, when the public discourse was liberal and free in Tu Youyou’s case.

Moreover, no agenda-setting effects were found between the media outlets and opinion leaders on Weibo in both cases because they were not correlated at all. The result suggests that neither the official media nor the commercial media are able to set the agendas on Weibo when big news happens. It is easy to understand that none of the opinion leaders on Weibo followed the news of official media outlets in both cases. It is interesting that the networked attribute agendas of the opinion leaders in both cases differed from the commercial media agenda. Although commercial media outlets have brought energy and vitality to journalism in China, it is still difficult for them to reshape the stereotypical image of Chinese media that is deeply rooted in people’s mind. Additionally, commercial media outlets quickly lose their autonomy when crisis news happens and the media blockage kicks in. Therefore, they are unable to set the agendas for the opinion leaders on Weibo when big news happens.

Finally, business elites were the most influential opinion leaders in both these crisis and non-crisis news situations on Weibo. Some scholars argue that media organizations and media-affiliated individuals are major information disseminators on Western social media platforms (e.g. Hu et al., 2012). However, the findings of this study show that business elites were the most influential Weibo users because almost all the other agendas in both the crisis and non-crisis news events correlated with the agenda of business elites. Business elites’ significant influence on Weibo can be possibly explained by their networks with the government and the power of money over politics. Zhu (2012) argued that business elites have strong influence in the policy decision-making process in China. Some of them were once government officials while others have gradually gained political influence through long-term business operations (Zhu, 2012).

**Limitations and future research**

The major drawback of this study comes from its data source. Because of the government control in China, Weibo’s content is monitored and filtered all the time. Therefore, the data collected for the Tianjin explosion in this study are filtered and incomplete. However, this is an inevitable problem if future research studies Chinese social media. Furthermore, this study only examined two events representing crisis and non-crisis news. Future studies should include more cases and on different topics in order to rule out idiosyncratic issue characteristics.

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Appendix 1

Coding instruction for the second study

1. Source of the post
   (1) **Official media**: state-owned newspapers, television stations, magazines, radio stations, websites, and so on.
   (2) **Commercial media**: semi-privatized newspapers, local television stations, commercial magazines, commercial websites, and so on.
   (3) **Media professionals**: journalists, hosts, anchors, officials and founders of media companies, media specialists and experts, and so on.
   (4) **Celebrities**: famous individuals in entertainment, fashion, sports, and other cultural fields.
   (5) **Scholars**: experts in a specific field, professors in colleges and universities, and so on.
   (6) **Business elites**: high-level officials (manager or above) in corporations and companies, business founders, and so on.

2. Publishing date
   ● Example: 08/12/2015

3. Attributes of Tianjin explosion
   (1) **Casualty**: the death toll, injuries or any information related, stories about injured people, and so on.
   (2) **Economic loss**: the value of the damaged properties, personal economic loss, national economic loss, and so on.
   (3) **Pollution**: any kind of pollution caused by the explosion and its social impact.
   (4) **The rescue**: rescue operations by the government, non-governmental organizations (NGOs), organizations, and individuals; skills, tips, and any other information related to the rescue operation.
   (5) **Damages**: damage compensation to the affected people by insurance companies, real estate companies, and the government; legal disputes involved in this process, and so on.
   (6) **Accountability**: discussions about the individuals, companies, and government officials who were accountable for this explosion; investigations of the involved companies and individuals; and so on.
   (7) **The cause**: the cause of the explosion, the materials stored in the warehouse, the inspection of the materials, reports on the warehouse, and so on.
   (8) **Social impact**: aftermath of the explosion, donations, rumors on the Internet, Internet fraud, impacts on other cities in China, social activities regarding the explosion, and so on.
   (9) **Reconstruction**: clearance of site, recovery actions, accommodation of the affected people, and so on.
   (10) **The government**: criticism of the local and central governments for withholding the truth, acting irresponsibly to the disaster, and controlling the media.
   (0) **Others**
4. Attributes of Tu Youyou’s case

(1) **Sense of honor**: the honor of the award, national pride, people’s exciting feeling of the award, and so on.

(2) **Research achievement**: development of Chinese scientific research, achievements of Chinese scientific research, positive attitudes toward Chinese scientific research, and so on.

(3) **Criticism of the system**: questions about why Tu Youyou was not elected as member of Chinese Academy of Sciences (CAS), criticism of the promotion mechanism within Chinese academic institutions, criticism of the bureaucracy in Chinese academic institutions, and so on.

(4) **Scientists**: public attitudes toward scientists, social status of scientists, the comparison of social status between celebrities and scientists, and so on.

(5) **Chinese medicine**: the comparison between traditional Chinese medicine and Western medicine; the debate about whether Chinese medicine is better than Western medicine or vice versa.

(6) **Female scientists**: social status of female scientists, achievements and qualifications of female scientists, social status of women, and so on.

(0) Others