

Agenda Setting and Micro-blog Use: An Analysis of the Relationship between Sina Weibo and Newspaper Agendas in China

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Abstract

The present study investigates the influence of micro-blogs on the major agenda-setting media in China in the immediate aftermath of a catastrophic railway accident. Study findings are based on a content analysis of micro-blog messages and traditional mainstream media reports that were published in the nine days subsequent to the July 23, 2011 bullet train crash accident. Results suggest that, in the immediate aftermath of a catastrophic train wreck, alternative online media played a decisive role in setting mainstream media agendas and providing a citizen forum on a sensitive issue that their conventional counterparts downplayed, ignored, or missed altogether. In particular, the traditional media's agenda setting power is no longer universal nor singular within micro-blogging outlets. Instead, traditional media—once a monolithic establishment—are now just one of the role players among many competing influences.

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In today's 24-hour digital media environment, news and information stand among the most popular audience staples. Emerging online news outlets are now blurring the distinctions between sources and receivers, mass v. interpersonal communication, etc. (e.g., Boczkowski & Mitchelstein, 2012; Jeffres & Atkin, 1996; Karlsson, 2011; Strömbäck & Karlsson, 2011). In addition to serving as alternative sources, "intermass" channels (Lin, 2002) - including online social media - enable citizen-journalists to report on breaking news (Wallsten, 2007). Recent events such as the Arab Spring, the Japanese tsunami, and the Occupy Wall Street movement highlight the use and effectiveness of micro-blogging in facilitating the quick dissemination of timely information to large masses of people (e.g., Lee & Chan, 2012).

Micro-blogging is a broadcast medium in the form of blog posts, the diffusion of which is expanding alongside social networking. Fotis' (2011) review of the social networking literature suggests that online social networks (OSNs) are displacing traditional mass media outlets as sources of information. Since their arrival on college campuses in 2005, OSNs have diffused to a critical mass in the U.S. population, having doubled in penetration between 2008 and 2011 to reach half of the adult population; the shorter-form (140 character) Twitter service is used by 13% of online adults and averages 40 million tweets a day (Lin & Atkin, in press).

Since it was initiated as the first micro-blog service in the U.S., Twitter has grown exponentially. On March 11, 2011--the day of the Japan earthquake and tsunami--the number of Twitter users exceeded the average daily tweets by 37 million, which amounted to 177 million tweets in a single day. Some 572,000 new accounts were created the following day (Huffingtonpost.com, 2011). Around the world, people sent more than 60 billion Tweets in 2011, each one reflecting a particular perspective and point in time.

These micro-blogs are one of the most fashionable and popular instant-message sharing platforms in China as well, where 23% of Internet users have adopted OSNs (of the 47% of Chinese who are online). Sina Weibo was first launched by Sina.com on August 14, 2009 and is the most popular micro-blogging website at present. According to the 28th report released by the China National Network Information Center (2011), "In the first half of 2011, the scale of micro-blog users remained a trend of soaring growth. By the end of

June 2011, the number of Chinese micro-blog users hit 195 million, having doubled in six months, for a growth rate: 208.9%.”

With the proliferation of micro-blogs, micro-blogging has been quickly gaining popularity and become an effective tool of communication for the quick organization of protests, help/advice, and sharing information from media sources, enabling unfamiliar groups of people to relay information of interest (Lee & Chan, 2012). This ability to disseminate information among social networks that lie outside the control of institutions—such as the traditional media—has had a profound impact on traditional media’s agenda setting power immediately after an accident. The present study investigates the influence of micro-blogs on the major agenda-setting media in China during the immediate aftermath of a catastrophic railway accident. In particular, we investigate whether the singular agenda setting function monopolized by the traditional Chinese media (e.g., Sun, 2010; Zhang & Zheng, 2012) is circumvented by micro-blogging following an accident that attracted national attention.

Literature Review

Walter Lippmann stated in his landmark book *Public Opinion* (1922) that people did not respond directly to events in the real world but instead lived in a pseudo-environment composed of “the pictures in our heads.” He nominated the media as a primary determinant of this pseudo-environment. Expanding on this agenda-setting effect, Cohen (1963) observed that: “The press may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about.” In their groundbreaking work, McCombs and Shaw (1972) concluded that the mass media exerted a significant influence on what voters considered to be the major issues of a political campaign. Studies of agenda setting have found a strong relationship between the media and public agendas. McCombs (2000) concludes, “The power of the news media to set a nation’s agenda, to focus public attention on a few key public issues, is an immense and well documented influence” (p. 1).

Agenda setting was formulated when traditional media had monopoly power over the tools of content creation and distribution (Lippmann, 1949; McCombs, 2004). This conception allowed traditional media to be the central power in agenda setting over a passive public. The advance and diffusion of new media technologies

has given rise to research on intermedia agenda setting. This process addresses the ways in which different outlets can set agendas for each other. Pioneering work on intermedia agenda setting, following a topical approach, examined the salience transfer of individual agenda items between media outlets and modalities (e.g., Atwater, Fico, & Pizante, 1987; Reese & Danielian, 1989).

With the proliferation of social media, research on social media and agenda setting—as well as traditional media influences on the social media's agenda—began to emerge. For example, Adamic and Glance (2005) found that political blogs link to news articles more than other blogs, while Scott (2005) noted that mainstream media sources are the dominant source in the four A-list blogs in his study. Other work further underscores the dominant function of traditional media in agenda setting, with Reese et al. (2007) finding greater reliance on traditional media than citizen media within top, citizen media outlets.

McKenna (2007) finds that those so-called policy bloggers frequently fact check the media's coverage on the issues they blog about. The issue of whether social media has any agenda setting power that may affect the universality of traditional media agenda-setting reach was explored as well, with more and more citizen media platforms providing the average citizen greater opportunity to be a news source (Gillmor, 2004; Bowman & Willis, 2003). McCombs (2005) noted that, “whether the basic agenda setting effects of news media continue in much the same fashion as the previous decades or eventually disappear because of the changing media landscape, measuring these effects will remain high on the research agenda for at least the near term” (pp. 546). Two conflicting results were observed on the subject: Some scholars have found that a dominant, singular agenda setting power of traditional media is continuing, despite the rapid development of social media such as online bulletin boards, blogs, etc. Yu and Aikat (2006) proposed a convergent agenda setting phenomena between portal news outlets and traditional, elite media entities in the television and newspaper industries. Studies by Cornfield et al. (2005) showed a correlation of .78 for traditional media-to-blog influence as opposed to a correlation of .68 for blog-to-traditional media influence. Others have found that social media actually have the power in independent agenda setting to affect traditional media.

Roberts, Wanta and Dzwo (2002) stated that U.S. online media

were able to set the agenda for U.S. electronic bulletin board users successfully for three issues, with a time-lag influence varying between 1 to 7 days. By contrast, Anderson (2006) suggested an alternative model; he predicted that citizen media's efficacy is in its aggregate effect, an effect that is able to blunt the traditional media's singular agenda setting effect based on long tail media theory.

McCombs (2004) termed the relationship between source-media agenda setting the "fourth stage" of agenda setting. Correlations between numerous sources and news media support the notion of fourth-stage agenda setting. Intermediate agenda setting, a component of fourth-stage agenda setting, is the term that refers to those instances when the media agenda is shaped by other media (Lopez-Escobar et al., 1998; Reese & Danielian, 1989). Following the idea of intermediate agenda setting, Sweetser, et al.'s (2008) study provided evidence of the intermediate agenda-setting process and suggests that the news agendas of several leading broadcast news organizations were partially shaped by modern campaign tools such as blogs and political advertisements.

Current Study

Although a great deal of work has addressed the relationship between traditional media and blogs in terms of agenda setting, little research has been extended to examine the mutual effects of micro-blogs and traditional media. Owing to the feature of immediacy, conciseness and easy access of micro-blogging, the rise of citizen journalists has been witnessed (Sayre, Bode, Shah, Wilcox, & Shah, 2010), especially during the time of a significant national crisis or natural disaster, such as the 2008 Mumbai terrorist attack (Shachtman, 2008) and Japan's 2011 earthquake (Lawson, 2011). This raises the following question: Have micro-blogs and other social media outlets weakened or modified the agenda setting power of traditional media, owing to their free-flowing and ubiquitous nature?

A raft of recent work (e.g., Meraz, 2009) documents the emergence of bloggers as key players in directing mainstream media agendas. Lim's (2006) study of South Korean online newspapers and wire services found that these online-only platforms set the agendas for each other. But this inter-media agenda setting phenomenon does not necessarily apply to citizen bloggers, as Maier (2010) found that

fewer than a third of stories linked to OSN's and blogs are the same as those listed as top stories on newspaper sites. These cross-media dissemination processes can be framed within the traditional agenda setting process, as noted in early work addressing pioneer Internet services during the 1990s. For instance, Brosius and Weimann (1996) found that "early recognizers" exert an agenda setting influence on the public as well as the media.

Interestingly, these new media affordances may precipitate a reverse agenda setting influence for most popular sections of the newspaper. Since little research has investigated this phenomenon, the present study is exploratory in nature. In particular, we seek to examine the role of micro-blogs in setting national news agendas during the period that immediately followed a major traffic accident: – the "July 23 railway accident" in 2011 in China.

On that day, a bullet train rammed into another near the city of Wenzhou, Zhejiang province in eastern China. With a death toll of 40 and almost 200 injured, this accident was considered to be one of the most severe train accidents in recent years (LaFraniere, 2011; Netease News, 2011). The first report of the crash appeared on Weibo, the Chinese equivalent of Twitter, more than two hours earlier than the first news media report. Within 16 hours after the crash, more than three million messages were sent as first-person accounts through Sina Weibo – one of the most popular micro-blogging services in China – by eyewitnesses from the scene of the accident (Duan, He, & Zhang, 2011). In the subsequent days after the accident, Weibo continuously functioned as a major platform for users to share updates and express anger toward the inefficient official rescue and response. This train crash accident was regarded as "a watershed moment for Sina's Weibo microblog service" (Buckley & Lee, 2011, "Criticising officials...").

An event of this magnitude thus provides an ideal case to examine whether micro-blog did act as the news source immediately after the July 23 accident in China. Given the dearth of scholarly literature on this incident, and on the impact of micro-blogging on news agendas in general, it is useful to explore the following research questions:

RQ1: What are the micro-blog agenda-setting effects in the consecutive days after the accident?

RQ2: To what extent do the traditional news media depend on

micro-blogs to provide the accident reports?

RQ3: Is there any time lag for micro-blog agenda-setting effects to occur? If so, how long is the time lag?

RQ4: What kinds of micro-blogging messages — e.g., informational v. opinion-based — are the most influential sources for traditional news reports?

RQ5: Which issues in the second-level (message type) scheme are traditional newspapers most keen on running?

Method

Sample

The present study is based on a content analysis of micro-blog messages and traditional mainstream media reports that were published in the nine days subsequent to the July 23, 2011 bullet train crash accident. The study uses a case study approach to analyze the criterion messages and reports.

In particular, we tracked the volume of micro-blogs over a period of nine days since the accident happened.¹ The micro-blog and news content referring to the 7-23 bullet train crash accident was collected from two types of sources: Sina Weibo and two conventional newspapers. During the aftermath of the accident, Sina Weibo played a significant role as an information-sharing tool and thus represents an ideal online comparison point. Two newspapers, China Youth Daily (Zhongguo Qingnian Bao) and Xinjing Newspaper (Xinjing Bao), were chosen to represent the mainstream news media due to the following reasons.

Although both newspapers are issued in Beijing, the capital of China, they reflect the idea of a dualistic discourse system as pointed out by He (2000). In other words, Chinese journalism represents a spectrum of ideology, from the Party line to grassroots modalities. China Youth Daily, directly led by the Chinese Communist Youth League, leans toward being a “mouthpiece” of the government. By contrast, Xinjing Newspaper, as the first newspaper run like a Western corporation in China, represents a more grassroots voice. By including both newspapers, we expect to have a more complete picture of the news reports in this accident. Secondly, both newspapers are

¹Sina Weibo is one of the most popular micro-blogging sites in China, claiming more than 140 million registered users by May 2011 (XinhuaNet, 2011).

daily newspapers and they both enjoy large circulations.

And lastly, both newspapers archive electronically online; so their content is easy to access. Sample messages were retrieved from seven Sina Weibo accounts from July 23 to August 1 of 2011. During the immediate aftermath of the collision, a featured special page was constructed by Sina as an open platform to share updated information. Five accounts were pinpointed from that feature page due to their crucial status as information sources. Two accounts belong to individual users, one account is associated with a news organization, and another two accounts have government affiliations. Between those two individual users, one sent out the very first report of this accident through her Weibo account, the other posted the first piece of information requesting help from the public after the accident. Both users have gained fame for their Weibo exchanges related to this train accident. Two additional accounts – one initiated by a journalist and the other founded by the prominent newspaper for which the journalist worked -- were recommended by Sina via its special coverage of the July 23rd railway collision, based on this reporter's manuscript page and the newspaper coverage itself, both of which were known for their in-depth news coverage. In total, some 598 micro-blog exchanges and 201 news reports were collected as the sample for this study.

Coding Scheme Development

The unit of analysis is each single micro-blog post or news article. Two variables were recorded in the coding scheme. One variable is the topic of message, adopted from Qu et al. (2010) in their Yushu earthquake case study. Each segment of micro-blog post or news article was categorized into one of the four topics: 1) information, 2) action, 3) opinion and 4) emotion-related remark. The second variable is the type of message. We coded the message as 1) accident, 2) victim, 3) government response, 4) consequence, 5) interaction, 6) salvage, 7) moaning and blessing, 8) help, 9) investigation and 10) others. The coding scheme reflects the absence or presence of each coding category, where "absence" was coded as "0" and "presence" was "1."

Analysis

In order to systematically evaluate the relationship between

micro-blog and media agendas, a time-series analysis using an autoregressive integrated moving average (ARIMA) model cross-correlational test (McCleary & Hay, 1980) was conducted. ARIMA modeling has been employed to successfully identify, estimate, and diagnose each of the temporal patterns in media coverage in previous studies (e.g., Gonzenbach, 1992).

To explore the potential correlations involving agenda setting between micro-blog and traditional newspapers, a significant correlation between micro-blogging messages of the accident on July 23 (T) and newspaper reports on day T + 1 or T + 2 will be used to measure the presence of a micro-blog agenda-setting effect. A significant correlation will also suggest the precise time lag for micro-blog agenda-setting effects. To further examine the time lag, a significant correlation between micro-blogging about the accident at time T and media reports of that issue at time T + 3 would indicate that micro-blogging influences media coverage of that issue three days later.

Results

Research questions 1 and 2 asked whether micro-blogs have the agenda setting power, hence prompting the print newspapers to follow their agenda. Results from the ARIMA analysis provide a confirmatory answer (Figure 1). The three trend-lines illustrate the daily number of reports on Weibo, China Youth Daily and Xinjing Newspapers. On day 1 (July 23), 23 reports were identified on Weibo. Due to the periodical nature of the print medium, both newspapers had no report of the crash accident (which happened around 8:30pm). A peak in posting frequency was witnessed on day 2 in Weibo, as the news was quickly diffused throughout the Weibo community to attract widespread attention. Youth Daily and Xinjing started to respond to this accident, featuring 3 and 4 reports, respectively. Starting from day 3 on, as both newspapers caught on to the story's momentum, the number of reports increased significantly. By contrast, the number of reports in Weibo decreased significantly. As the investigation of the accident went on, both Weibo and print newspaper reports experienced a relatively stable period from day 4 (July 26) to day 6 (July 28).

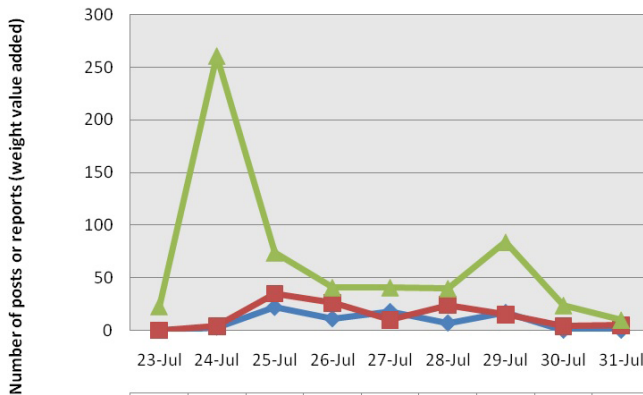
On day 7, a secondary peak of reports was witnessed (July 29), but the number of reports on Weibo decreased significantly on day 8 (July 30) and 9 (July 31). The decreasing trend of newspaper reports

started from day 6 (July 28) until it reached a minimum on day 9 (July 31) — 0 for Youth Daily and 5 for Xinjing.

Focusing on larger trends, the histograms reveal a rather skewed (leptokurtic) kurtosis for Weibo post frequencies, which spiked on the day following the wreck. This coincided with a period of great uncertainty, one later characterized as the time when loved-ones were trying to find out information about crash victims. This stands in marked contrast to the relatively flat reporting trend-lines for the mainstream Xinjing and China Youth Daily outlets. Although the two curves converge during the middle part of the week following the crash, an increase in Weibo reporting coincides with a drop in coverage from the two print outlets from day 6 to day 7. These trend-lines converge again during days 8 and 9 as reporting on the crisis subsides.

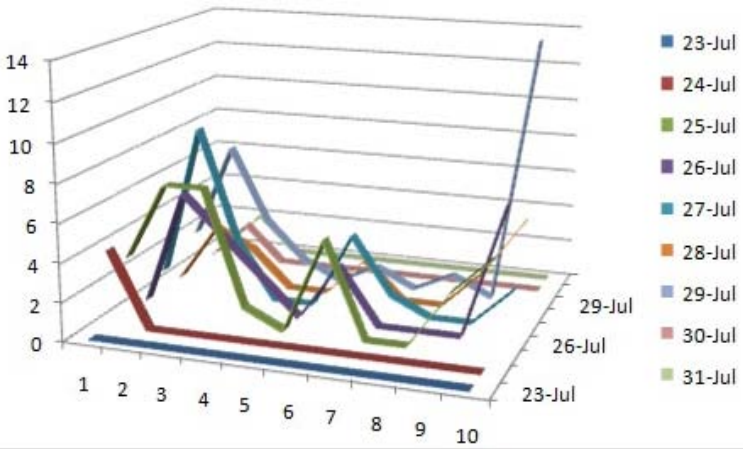
Overall, Sina Weibo, as the only source on the collision at the early stage of the accident, established its agenda setting power during this event. Also, through a comparison of the three time series, a one-day delay was identified between Sina Weibo and the newspapers

Comparison: CYD, Xinjing and Weibo

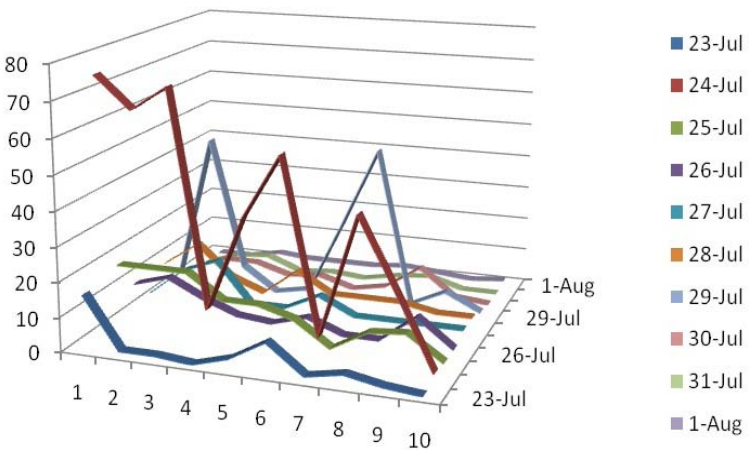


	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul	28-Jul	29-Jul	30-Jul	31-Jul
Number of reports from China Youth Daily	0	3	22	11	18	7	17	0	0
Number of reports from Xinjing Newspaper	0	4	35	26	10	24	15	4	5
Number of posts from Sina Weibo	23	261	74	41	41	40	84	24	10

Figure 1. Daily counts for each of the time series from July 23 to July 31



China Youth Daily and Xinjing (Scheme 1)



Weibo (Scheme 1)

Figure 2. Train accident news reporting frequencies: Print media v. Weibo

immediately. In answer to RQ3, then, the time lag between Weibo and newspapers is one day.

RQ4 and RQ5 probe the question on the preferred types of reports in Weibo and newspapers. Figure 2 provides a distribution of each type of report in Weibo, Youth Daily and Xinjing. We can find

that newspaper reports are more information and opinion-related, while Weibo posts are more balanced among the four categories of reports. Per Research Question 4, the data suggests that informational and opinion-related Sina micro-blogging messages are the most influential resources for China Youth Daily and Xinjing Newspaper reports. From Scheme 2, we find that issues such as accident, victim and investigation are the common focus of both traditional newspapers and Sina Weibo, which shows that Weibo is more influential in agenda setting on those agendas (per Research Question 5).

Discussion

Study findings document anecdotal reports that micro-blogging could be the main information source immediately following a national accident. Findings show the traditional media's agenda setting power is no longer universal nor singular within micro-blogging outlets. Instead, traditional media, once the monolithic establishment, are now just one of the role players among many competing influences. This raises the question of whether micro-blogging can ever take the place of traditional media as the major news source in the long run. Shall we look on micro-blog as an individual news-media platform that is open to the public or it is a collective news media platform for like-minded citizens, or both? To what degree can individual micro-blogging influence traditional media agendas?

Thus, while only a generation ago most of the world's population could only passively receive information from state-owned post and telegraph systems, broadcast outlets and papers, today's citizen-audiences can choose from an array of telematic channels in order to act as senders or receivers of news and information (e.g., Jeffres & Atkin, 1996). Study results here suggest that, in the immediate aftermath of a catastrophic train wreck, alternative online media played a decisive role in setting mainstream media agendas and providing a citizen forum on a sensitive issue that their conventional counterparts downplayed, ignored, or missed altogether. In that regard, findings confirm those of other studies underscoring the important role of social media in providing first-person citizen reporting about earlier crises like the Mumbai, India terrorist attack (Shachtman, 2008). Here as in India, Twitter played a critical role in providing timely, clear and reliable citizen reporting, with one commentator concluding that it's a "perfect tool" for such crises (Global Voices, 2011). In that regard,

this new open-access information environment allows average citizens to enjoy unprecedented levels of input on public affairs (Clark & Auferheide, 2009).

The very popularity of Twitter in this context was likely bolstered by the rather closed nature of the mainstream Chinese media system (see, e.g. Anowkwa, Lin, & Salwen, 2004; Mou et al., 2011, 2013). This appeal may be explained, in part, by the larger advantages that social media offer in allowing individuals to construct a public profile, identify a list of citizen-users “with whom they can share a connection,” and navigate their list of connections (Boyd & Ellison, 2008, p. 210). In the citizen-journalist context, the present findings underscore the social force of social media to reflect “the wisdom of the crowds” (Surowiecki, 2004, p. 1). Importantly, in a relatively closed media system like China’s, these emerging outlets also present audiences with an important modality for fact-checking (McKenna, 2007) and to speak “truth to power” (Jenkins & Thorburn, 2003, p. 2).

Another study implication involves the impact of editorial censorship on the news reporting. On the night of July 29, an order from the Propaganda Division of the central government reached all newspapers to cease further “negative” reporting on this accident (Qi, 2011). On July 30 and 31, China Youth Daily provided no report on this accident at all; and Xinjing also dropped their reports from 15 (July 29) to 4 (July 30) and 5 (July 31). This “Silence order” also greatly effected Sina Weibo as well, since the number of reports decreased from 84 (July 29) to 24 (July 30) and 10 (July 31). The facilities and reach of social media thus enable the dissemination of crisis reporting from citizen-publics and enable them to bypass censored content in real time.

State intervention to control news flows is not an uncommon practice by the Chinese government; but what is interesting here is the reactions of those three sources. China Youth Daily, as a “mouth-piece” in line with the Party line, took a swift action upon the regulation by dropping any report on this accident starting July 30, 2011. In contrast, Xinjing, which reflects a more grassroots ideological approach, responded in a fashion that could best be characterized as lukewarm. Weibo, however, seemed to have the most immunity from the government censorship. Although we did not differentiate the types of seven micro-blog users, they overall share a consistent pattern. This dynamic echoes the argument that social media are indeed

the first “people media” (Lin, 2011).

However, there are certain limitations associated with this study, given the infeasibility of capturing a panoramic view of such a significant national accident with enormous impacts. Two newspapers and seven micro-blog accounts were purposefully chosen to retrieve the sample data. This snapshot can by no means represent all reports regarding that accident. Secondly, the time series do not have enough time points. For the above-mentioned reasons, the series were more powerfully mediated by an external force (in this case, a governmental regulation). Ideally, data collection could have continued across a longer time sequence; however, owing to the imposed “silence order”, the newspaper coverage was cut down almost zero, and Weibo posts were negatively influenced significantly as well.

Later work could profitably investigate the impact of micro-blog agenda setting by tracking their influence on reader agendas and political involvement as well as activity. This watchdog function for citizen-bloggers will be particularly important in cases where governments—be they open or closed—try to manage the flow of information regarding threats to the public health, safety or welfare (e.g., food safety information, disease outbreaks). Drawing from recent headlines in North Africa, it will be interesting to assess the degree to which social media facilitate the dissemination of more open governance structures around the globe.

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