

Talking About and Beyond Censorship: Mapping Topic Clusters in the Chinese Twitter Sphere

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As a social media platform officially blocked in mainland China, Chinese Twitter has turned into an alternative and transnational digital space. Through the perspective of alternative spaces, this study explores the views and attitudes of Chinese Twitter users toward Internet censorship and how Chinese Twitter is generated and maintained as an alternative digital space. We applied latent Dirichlet allocation and identified 5 distinctive thematic clusters characterizing this alternative space, which spanned three types of activities: sharing technical knowledge, expressing political opinions, and disseminating alternative news items. Users employed spatial markers in their discussions to distinguish the Chinese Twitter sphere from other spaces. To maintain Chinese Twitter as an alternative digital space, sharing technical knowledge and information is as important as political resistance. Although it is a transnational digital space, the Chinese Twitter sphere is influenced by Chinese culture and takes advantage of it.

Keywords: Chinese Twitter, alternative space, Internet censorship, topic modeling

As part of China's Internet governance system, the Great Firewall (GFW) of China monitors, filters, and blocks content and prevents mainland Chinese Internet users from normal access to banned foreign websites and applications such as Facebook, Twitter, and Google. While many empirical studies in recent years have explored the structure of and patterns in the Internet censorship mechanism in China (Bamman, O'Connor, & Smith, 2012; King, Pan, & Roberts, 2014), the research remains relatively scant in terms of how Chinese Internet users experience and view state-imposed censorship. Users' perspectives are essential for a thorough understanding of the consequences of Internet censorship because they complement the structural perspective by showing how ordinary users view and negotiate censorship in their daily experience. Prior research has shown that Chinese netizens rely on technological tools such as virtual personal networks (VPNs) to access the global Internet (e.g., Mou, Wu, & Atkin, 2016). Furthermore, recent surveys from nondemocratic contexts such as Russia and Turkey found unexpectedly high levels of support for state-led

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Internet censorship (Nisbet, 2015; Yesil, 2015), indicating that users' views toward Internet censorship were diverse and sensitive to the social context.

Our exploratory study aims to contribute to this line of research by considering how Chinese Internet users discussed the issue of Internet censorship on Twitter. Twitter has been blocked and unavailable since the second half of 2009 (Chen, 2014; Sullivan, 2012) in mainland China, leading it to become an uncensored space instead of being characterized by self-censorship. In China's censored Internet space, Internet censorship cannot be openly discussed. However, there are many posts discussing Internet censorship on Chinese Twitter, which are likely to be closer to the real thoughts of users. Therefore, this article explores the views and attitudes of Chinese Twitter users toward Internet censorship by investigating how users discuss issues pertaining to Internet censorship in that context. Furthermore, based on Chinese Twitter users' discussions on Internet censorship, this article explores how Chinese Twitter is generated and maintained as an alternative digital space.

We applied topic modeling, an unsupervised machine learning algorithm, to a sample of Chinese tweets on the issue of Internet censorship to study the thematic structure characterizing this alternative space. We identified five distinctive thematic clusters that spanned three types of activities: sharing technical knowledge, expressing political opinions, and disseminating alternative news items. Within each cluster, we examined the key constructs that framed the discussions. The article is organized as follows: First, we review the relevant literature on Chinese Internet censorship and highlight the significance of the experience and perspectives of Internet users. Next, we explain the theoretical perspective and our methodology and data. The following sections present in-depth analyses of each cluster, and the article concludes with reflections on the broader implications of the findings.

Internet Censorship in China and Users' Perspectives

As one of the most contested issues regarding the Chinese Internet, censorship has attracted widespread academic attention in recent years. Some researchers focus on top-down, state-driven censoring practices by investigating patterns in content filtering across different online platforms (Bamman et al., 2012; Esarey & Xiao, 2008; Fu, Chan, & Chau, 2013; MacKinnon, 2009). These studies have generally found that the chief purpose of Internet censorship is to suppress criticism of the government, policies, and leaders (Bamman et al., 2012). Recent studies also suggest that messages related to collective actions are more likely to be censored (King, Pan, & Roberts, 2013; King et al., 2014). Furthermore, the technical architecture of the censorship mechanism is surprisingly decentralized and dispersed (Weaver, Sommer, & Paxson, 2009; Xu, Mao, & Halderman, 2011). Nonstate actors also play a coordinating role (Hu, 2011; Jiang, 2012; MacKinnon, 2008, 2009; G. Yang, 2012b). For instance, private corporations such as social media companies and Internet service providers complement the state-driven regulatory regime by practicing proactive self-censorship (Jiang, 2012; MacKinnon, 2008). They seem to enjoy a certain leeway in devising and implementing their own agendas (MacKinnon, 2008, 2009; Miller, 2019), and there is considerable variation in their censoring practices depending on factors such as business models, corporate cultures, and relationships with the government (Jiang, 2012; G. Yang, 2012b). Chu (2017) suggested that economic protectionism could be an alternative lens through which to interpret Chinese Internet policies, and the development of domestic Internet companies and platforms provides the basis for censorship.

In mainland China, users choose to bypass censorship in strategic and nonpublic ways to engage in private resistance to Internet censorship (G. Yang & Jiang, 2015). Examples of such resistance include communicating in machine unreadable ways (Kou, Kow, & Gui, 2017), creating coded languages to express politically sensitive opinions (Xiao, 2011; F. Yang, 2016), engaging in online political satire (Esarey & Xiao, 2008; S. Y. Lee, 2016; Meng, 2011; Nordin & Richaud, 2014; G. Yang & Jiang, 2015), and employing Internet memes (Mina, 2014). Some netizens use VPNs to bypass the GFW to visit foreign websites and resist online censorship (MacKinnon, 2011). To scale the GFW, users may seek to conduct subversive behaviors (Morozov, 2011).

Although the literature on Chinese Internet censorship has detailed the regularities, intentions, and technical architecture of the mechanism as well as the roles of different actors, an important question has, to a certain extent, been neglected: How do Chinese Internet users experience Internet censorship in their daily lives? The understanding of the social consequences of Internet censorship is incomplete without knowledge about users' lived experiences. There are two major lines of research on Internet censorship from the perspective of users. The first shows that systematic content filtering affects Internet users' motivations and browsing behaviors. A study by Mou et al. (2016) found that the use of circumvention tools was driven by pragmatic rather than ideological motivations. Another study found that Internet users tended to continue visiting websites that bear a linguistic and geographical affinity with the cultural communities to which they belong (Taneja & Wu, 2014). In other words, cultural affinity shapes Chinese Internet users' browsing preferences as much as it does users in other countries, and in comparison, the effect of Internet censorship does not seem to be significant.

The second line of inquiry considers public opinion toward Internet censorship in nondemocratic contexts. For instance, a recent study found that only 11% of Russians believe that the Internet should be completely free from any form of censorship, and 54% of the public thinks of governmental institutions as the most trustworthy regulator of the Internet, much higher than nongovernment entities (Nisbet, 2015). A similar study from Turkey found that just 40% of Turkish citizens believe that the Internet should be free from censorship. The level of support varies depending on people's Internet usage and political affiliation (Yesil, 2015). A general observation from these surveys is that the public does not unanimously oppose Internet censorship or the government's role as the regulator of the Internet. Although factors such as Internet usage appear to be an important variable that explains variations in the level of support toward censorship, cultural and social contexts also shape people's attitudes toward this issue (Asmolov, 2015).

These findings show that public opinion toward Internet censorship as well as governmental intervention is more heterogeneous and contextually dependent than expected. They accentuate the importance of researching users' perspectives and experiences. In the absence of representative survey data from China, we considered the Chinese Twitter sphere, an uncensored digital space, to be an ideal discursive space to explore the structure of opinions regarding the issue of Internet censorship. Therefore, this article focused on how users viewed and discussed Internet censorship from their usage and experience on Chinese Twitter.

The Chinese Twitter Sphere as an Alternative Digital Space

An alternative space is separate from the mainstream space or other spaces—for instance, the Internet compared with traditional media (Gersch, 1998; Meng, 2011; Rahimi, 2011). As for Lievrouw (2011), the word “alternative” is closely related to “activist,” “marginal” and “radical.” Therefore, alternative spaces are often resistance spaces. For example, transcultural translation can constitute such an alternative space for political action (Baker, 2013). In practice, alternative spaces emphasize their differences to a large extent. To maintain their differences, alternative spaces call for an “alternative imagined community” (Meng, 2011, p. 46) and adopt some techniques and strategies (Cao, 2017; Lievrouw, 2011).

Alternative spaces are related to the public sphere (Habermas, 1962) and the counterpublic sphere (Jackson & Foucault, 2015). However, they are different from the counterpublic space. The idea of a counterpublic sphere emphasizes adversarial discourse and the relationship between the dominant public sphere and itself, whereas the notion of an alternative space focuses on differences rather than adversarial discourse. Therefore, we employed the concept of alternative spaces in this article.

Because of the absence of censorship, Chinese Twitter has become a special case and has attracted researchers’ attention. What kind of space is the Chinese Twitter sphere? The question has not yet been answered definitively. Some researchers believe that Chinese Twitter is a public sphere platform (Chen, Tu, & Zheng, 2017). However, some researchers have asserted that Chinese Twitter is not a free space for exchanging information because some bots post anti-Chinese-state messages to attract potential users from around the world (Bolsover & Howard, 2018).

From the perspective of usage, Chinese Twitter is an alternative digital space. First, Chinese Twitter is a subversive space for discussing sensitive issues by connecting with different news sources and attracting a range of activists (Benney, 2011; Ji, 2017; Sullivan, 2012). To a great extent, Chinese Twitter is a highly politicized online community, which marks a sharp contrast to Sina Weibo, the Chinese counterpart of Twitter, which is largely dominated by nonpolitical content such as entertainment, sports, and advertising (Sullivan, 2012). Second, the Twitter community in Chinese represents a deliberate “international space” (Jiang, 2010), and it can be compared domestically and internationally.

Additionally, the Chinese Twitter sphere can be considered a virtual border zone. As G. Yang (2012a) observed, the varied distribution of state power in digital space produced virtual border zones where state regulations had become diluted, diffused, and less commanding. Depending on the type of power and how it is distributed, virtual border zones take various forms in the context of the Chinese Internet. Commercial websites are a case of virtual border zones compared with political websites as they are less subject to the direct regulatory power of the state, which grants them greater leverage for negotiation. Similarly, online self-media outlets are virtual border zones in relation to state-owned or commercial online news portals. Relatively less pressure from censorship and profits gives them greater freedom to devise their own agendas.

As for Chinese Twitter, users’ access from mainland China is not guaranteed because of the GFW. Accessing Twitter from mainland China requires knowledge about circumvention technologies. At the same

time, the blurred nature of virtual border zones also means that the power of the state is less commanding, which creates opportunities for transgression. Therefore, Twitter also serves as a case of a forbidden virtual border zone to investigate the dynamics between state power and civic activism in digital space.

To our knowledge, there is little literature discussing how the Chinese Twitter space is generated and maintained from the user's perspective. Some studies have provided an explanation from the perspective of political resistance (e.g., G. Yang, 2012a), while other factors are ignored. This study raises the following question: From users' discussions on Internet censorship, how is Chinese Twitter generated and maintained as an alternative digital space?

Methods and Data

Topic modeling is a family of exploratory machine learning algorithms designed to uncover the hidden thematic structure from a large corpus of documents. In this study, we used an unsupervised topic model referred to as latent Dirichlet allocation (LDA; Blei, Ng, & Jordan, 2003). LDA assumes that a textual document can be represented as a distinctive distribution of topics that appear together more often than expected. Similarly, each topic can be represented by a unique distribution of words. With a sample of documents, this method allows us to estimate these two distributions and to generate a set of interpretable topics. With this information, researchers are able to examine the distribution of topics within any given document. They can also identify the conceptual building blocks that characterize each topic by examining the most popular terms.

LDA was originally developed by computer scientists to facilitate the automatic classification of large textual corpora. DiMaggio, Nag, and Blei (2013) underscore the affinities between "topics"—empirical clusters of terms—and a set of conceptual tools that social scientists commonly use to study textual data. In particular, they suggest that a topic cluster can be interpreted as a cultural frame, which is "a set of discursive cues (words, image, narrative) that suggest a particular association of a person, event, organization, practice, condition, or situation" (DiMaggio et al., 2013, p. 593). As a meaning-generating device, frames hold together diverse symbols and make them coherent. This method is useful for revealing hidden themes in textual data, especially when the volume of data is overwhelming for hand coding. LDA has been applied in the analysis of various textual data, such as news articles (DiMaggio et al., 2013) and abstracts (Kaplan & Vakili, 2015). LDA has also been used recently to explore the hidden structure within large volumes of relatively short texts, such as tweets (Hong & Davison, 2010; Ramage, Dumais, & Liebling, 2010; Weng, Lim, Jiang, & He, 2010).

In the context of this study, we consider topic clusters as conceptual frameworks within which Internet censorship can be discussed. Words and phrases specific to each cluster are discursive cues that constitute the key constructs of a specific frame. To identify a corpus of censorship-related tweets, we used a combination of relevant terms and hashtags, including "firewall" ("防火墙"), "scale the wall" ("翻墙," a popular euphemism for circumventing the GFW), "scientific use of the Internet" ("科学上网," another popular euphemism for circumventing the GFW), "#fuckGFW," and "#greatfirewall." With these search terms, we randomly selected a day, September 1, 2015 (between July 1, 2015 and December 31, 2015) and retrieved a total of 162,720 tweets. We then deleted non-Chinese tweets as well as those that were not retweeted to

focus on a subgroup of tweets that are relatively more influential within the corpus. After the cleaning procedure, the total number of remaining tweets in the sample was 30,896. Next, we removed textual features that were not relevant to our research questions, including emoticons, numbers, dates, hashtags, and mentions. We also removed duplicate and repeated tweets to avoid biased word frequency estimates. In the end, the sample contained 6,432 tweets for this study.

Next, we used the *textmineR* package (Version 3.0.3) to perform the LDA analysis. We fit the LDA model to the sample. Because the tweets are short and most contain only one topic, we chose the topic with the largest probability value. It is worth noting that researchers must determine the number of topics before running the model. However, this prerequisite does not mean that model selection is an arbitrary procedure. In particular, interpretability and analytic utility constitute the most critical considerations when making decisions among different models (DiMaggio et al., 2013). In addition, familiarity with the context and domain-specific knowledge are also important, as they complement the heuristic lens provided by topic modeling (Grimmer & Stewart, 2013). When fitting the model to the corpus of tweets, we attempted different solutions with numbers of topics ranging from two to 12. We ran each model multiple times with varying model parameters to check the robustness. Two authors individually and independently labeled the clusters, and then we convened to compare results and resolve disagreements through discussion. We carefully compared and evaluated each solution with the following questions in mind: (1) How interpretable are the clusters of words generated by a model solution? (2) Does a thematic interpretation derived from a topic cluster resonate with the actual content of the tweets? (3) How well does a solution balance interpretability and succinctness? After this process, we settled on a five-topic solution that offered a reasonable degree of interpretability and robustness.

Findings

Our first research question pertains to the structure of the Chinese Twitter sphere. Because some tweets may contain more than one topic, we considered a tweet with more than 50% of its words assigned to a certain topic as a typical case of that topic. Table 1 shows the distribution of the five thematic clusters among the typical tweets.

Table 1. Top Words in the Topic Cluster "Technical Knowledge Sharing," by Relevancy.

Term		Relevancy	Term		Relevancy
软件	(software)	0.11	Surge	(Surge)	0.03
VPN	(VPN)	0.08	Shadowsocks	(Shadowsocks)	0.03
服务	(service)	0.07	app	(app)	0.02
Google	(Google)	0.06	iOS	(iOS)	0.02
手机	(cell phone)	0.06	地址	(address)	0.02
下载	(download)	0.05	路由器	(router)	0.02
代理	(proxy)	0.05	安装	(install)	0.02
用户	(user)	0.04	发现	(discover)	0.02
工具	(tool)	0.04	Twitter	(Twitter)	0.02
服务器	(server)	0.04	不用	(no need)	0.02

免费	(free)	0.04	系统	(system)	0.02
SS	(SS)	0.03	提供	(provide)	0.02
流量	(Web traffic)	0.03	国内	(domestic)	0.02
苹果	(Apple Inc.)	0.03	访问	(visit)	0.02
IP	(IP)	0.03	电脑	(computer)	0.02

As Figure 1 shows, the topic cluster “technological knowledge sharing” is the most prevalent, featured in 28% of the tweets. The next three, “general censorship,” “Internet censorship,” and “miscellaneous news sources” are similar in terms of sharing, each accounting for approximately 15% of typical tweets. To facilitate the analysis, we further grouped these topic clusters based on the nature of the content. The most common tweets in the first cluster are informative; the second and third clusters are characterized by personal opinions and expressions; the last two clusters mainly consist of news items with brief news titles and links to external websites.

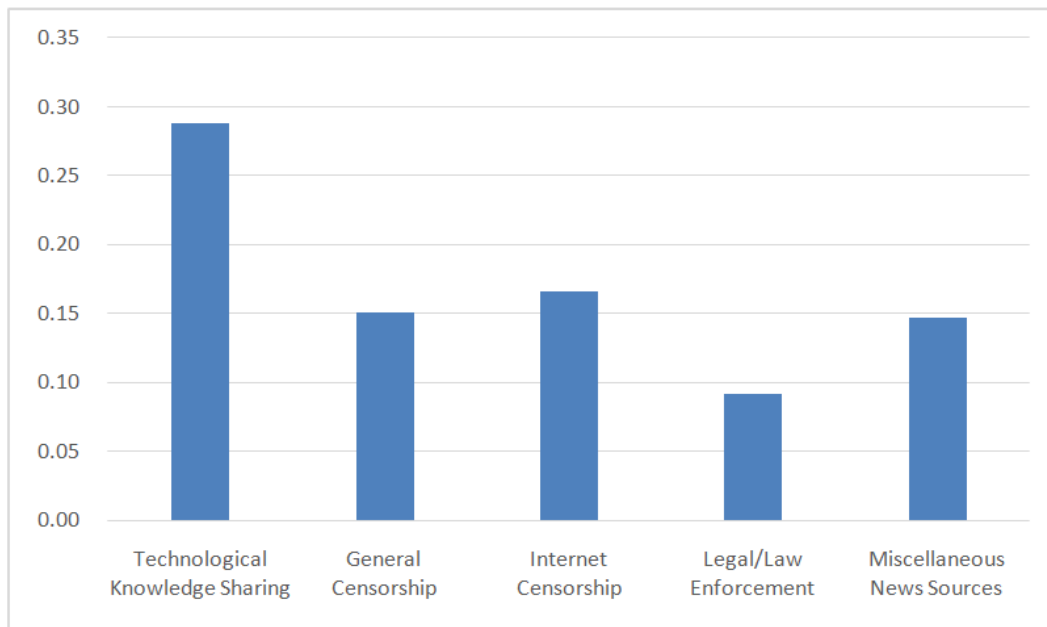


Figure 1. Distribution of tweets across topics.

For each of the clusters, we ranked the 30 most distinctive terms based on a measure of relevancy (Blei et al., 2003). These terms are significant because they constitute the fundamental conceptual building block of a specific topic cluster. At the same time, we also closely read the most typical tweets, specifically, those with more than 90% of their words assigned to the same topic.

Sharing Technical Knowledge

We label the first topic cluster “technical knowledge sharing” because the majority of the tweets in this cluster are facts, especially knowledge about circumvention technologies. Web-related technical terms are shown in Table 1.

Some words refer to the circumvention tools widely used among Internet users who regularly bypass the GFW, such as “Shadowsocks” (an open-source circumvention tool), “SS” (a popular circumvention client), “Surge” (a popular circumvention tool), and “VPN.” Another group of popular words relates to Internet or computer-specific terminology, including “server,” “system,” “iOS,” “IP,” “Web traffic,” and “router.”

As these terms suggest, a popular theme in this cluster is the exchange of technical knowledge and information related to circumvention. For instance, in the following example, the author reports his personal observation about the blocking patterns of the GFW and shares tips about how to optimize the performance of circumvention tools accordingly. Knowledge and wisdom about the use of technology are shared, which helps build the identity of the Chinese Twitter community.

Example 1:

根据我的观察，如果想要更稳定地科学上网，不管用什么工具，都需要每隔一小时更换一下本地的上网IP地址，特别是遇到大流量传输的情况。如果是局域网无法更换本地IP，那只能多备几个服务器帐号，定时更换代理服务器IP地址。

Based on my observations, if you want to stably circumvent the Great Firewall, you have to change your local IP address every other hour, no matter which tool you use, especially when the traffic is heavy. If you use a local network that cannot change the IP address, you have to prepare several server accounts and change the IP of the proxy servers from time to time.

For users, censorship is a concrete obstacle, not an abstract one or simply a metaphor. Tweets such as this are instrumental because the Internet censorship regime changes periodically in response to various factors, such as updates to the technological infrastructure and outbreaks of major social events (Bamman et al., 2012; Fu et al., 2013). For instance, in early 2015, the Chinese government tightened its control over domestic VPN services, leading to frequent disconnections with blocked sites through VPNs from mainland China (Russell, 2015). The tweets in this cluster function as a real-time barometer, offering updates about the censoring behaviors of the GFW, which allows users to make informed choices among the available technical options and stay connected with the global Internet. This finding is in agreement with the literature that highlights the role of social media as an information reservoir in the context of online social movements (Bennett, Breunig, & Givens, 2008; Vasi, 2006).

To better understand the motivation and behaviors of users who are active in technical knowledge sharing, we considered a form of digital activism referred to as “alternative computing,” in which activists with technical expertise “design, build, and ‘hack’ or reconfigure systems with the purpose

of resisting political, commercial, and state restraints on open access to information and the use of information technologies" (Lievrouw, 2011, p. 98). Moreover, alternative computing is becoming "a genre of new media activism" (Lievrouw, 2011, p. 117). What makes it different from other forms of online activism is "a shared ethical and political commitment to information access" (Lievrouw, 2011, p. 99), which is believed to serve as a critical precondition for emancipatory politics. As G. Yang (2006) underscores, information access and information technologies are the central stakes and arenas of political struggles in the Chinese digital sphere. From this perspective, technical tools and knowledge that enable global Internet access not only serve as a pragmatic solution to escape censorship but also as a political statement that challenges the ideology underlying the GFW.

From the perspective of technology and its usage, there is a dynamic interaction between censorship and anticensorship. On the one hand, the GFW continues to update and improve its filtering capabilities. On the other hand, to ensure consistent access to the global Internet, Chinese netizens must be aware of changes, innovate effective counterstrategies, and circulate this knowledge in the Chinese Twitter sphere. The practice of jumping the wall by Chinese Twitter users promotes the fight against censorship and the evolution of censorship itself, which is a process of "mutual promotion." However, it is worrisome because newcomers are faced with an already elevated level of censorship.

Expressing Political Opinions

The tweets in the second and third topic clusters that address "Internet censorship" and "general censorship" mainly consist of personal opinions and comments on the state's censoring practices. The discussions on "Internet censorship" specifically focus on censoring practices in cyberspace. Several highly ranked terms include specific social media platforms such as "microblog," "Twitter," "WeChat," "Twitter friends," "tweeting," "account," and "circle of friends" (see Table 2), which suggest the prominence of social media as the digital context that are prominent in Chinese netizens' lived experience with Internet censorship.

Table 2. Top Words in the Topic Cluster "Internet Censorship," by Relevancy.

Term		Relevancy	Term		Relevancy
微博	(microblog)	0.08	新浪	(Sina)	0.02
推特	(Twitter)	0.05	朋友圈	(circle of friends)	0.02
微信	(WeChat)	0.04	信息	(information)	0.02
五毛	(fifty-cent army)	0.03	墙内	(inside the wall)	0.02
发现	(discover)	0.03	真的	(really)	0.02
发明	(invent)	0.03	生活	(life)	0.01
不用	(no need)	0.03	世界	(world)	0.01
屏蔽	(block)	0.02	喜欢	(like)	0.01
网友	(netizen)	0.02	朋友	(friend)	0.01
账号	(account)	0.02	推友	(Twitter friend)	0.01
东西	(East/West)	0.02	事情	(incident)	0.01

感觉	(feel)	0.02	国内	(domestic)	0.01
肉身	(flesh body)	0.02	英文	(English)	0.01
上推	(visit Twitter)	0.02	洗脑	(brainwash)	0.01
Twitter	(Twitter)	0.02	一条	(one piece)	0.01

One of the most common topics in this cluster is the sudden removal of textual content such as comments, news items, and articles from popular social media platforms without prior notice. For instance, the following tweeter recounts a case of how new posts were deleted on Sina Weibo during the military parade.

Example 2:

推上看到的都是墙外的关于阅兵的评论和意见，想看看墙内都怎么说，于是就到微博上搜“阅兵”……翻了好几页全都是大V的赞美……上面偶然出现“有105条新微博”，我点开它告诉我“抱歉，未找到‘阅兵’相关结果”……

I saw on Twitter various comments and opinions on the military parade. I was curious about what the people inside the wall had to say, so I searched “military parade” on Sina Weibo. . . . The first few pages were loaded with the endorsements from “Big Vs” (influential accounts). . . . Suddenly there was a message saying “there are 105 new posts.” After I clicked the message, I was told that “Sorry, there is no search results related to ‘military parade. . . .’”

A common thread throughout these examples is a compartmentalized image of the digital space based on the presence or absence of Internet censorship. This thread is indicated through the use of spatial markers that define boundaries. In Example 3, “the world outside” refers to digital space free from censorship, which suggests that the GFW is perceived as a technical infrastructure that separates digital space in a manner similar to physical walls.

Here, the spatial markers qualitatively delineate different spaces based on the existence or absence of Internet censorship. These two information ecologies are believed to carry drastically different implications: uncensored space means being open-minded and having an eagerness to embrace diversity; censored space, however, creates an information enclosure that is a catalyst for nationalism and localism in the younger generation. Additionally, as Table 2 shows, several spatial markers rank high among the most popular terms in this cluster, including “inside the wall,” “East/West,” “domestic,” and “flesh body” (meaning the person is physically located outside mainland China, which negates the need to circumvent), showing that the image of a compartmentalized digital space prevails and shapes discussions on Internet censorship.

Example 3:

限网最大的恶果是，时至今日，很多年轻人都不知道这世界还有Facebook、Youtube、Twitter和很多很多东西了。他们不知道外面的世界什么样子，当然不会渴求翻墙。我们筑起的墙，在物理上隔断的是网络连接，从心理上隔断的是对这个世界全部的理解和渴求。这才是最可悲的东西。

The worst consequence of Internet censorship is that many young people didn't even know until today that there is Facebook, YouTube, Twitter, and many other things in the world. They have no idea about what the world outside looks like and therefore no desire to scale the wall. Physically, the wall we built has blocked Internet access, and psychologically, it has blocked our understanding and eagerness toward the world. That's the saddest thing.

Circumventing the GFW means more than broader information access, and it is regarded as a privilege that should be cherished and used with great care. In Example 4, the author contrasts the media landscapes within and beyond the GFW. Similarly, the author refers to the wall as if it were a physical structure that divides space. Moreover, the GFW climbers sometimes have more moral superiority in a cultural sense, which distinguishes different classes on the Chinese Internet.

In the third topic cluster, "general censorship," the term "censorship" remains essential. However, its scope has been extended to include censoring practices across various domains, such as film production, book publishing, and journalism. The state is often mentioned as being responsible for these censoring practices, as several popular terms point to the state apparatus and political infrastructure, such as "authority," "state," "Chinese government," and "system" (see Table 3).

Table 3. Top Words in the Topic Cluster "General Censorship," by Relevancy.

Term	Relevancy	Term	Relevancy
审查 (censorship)	0.2	维基百科 (Wikipedia)	0.02
中国 (China)	0.08	中国政府 (Chinese government)	0.02
美国 (America)	0.05	研究 (research)	0.02
网络 (Web)	0.03	难民 (refugee)	0.02
互联网 (Internet)	0.03	外国 (foreign country)	0.02
当局 (authority)	0.03	长城 (Great Wall)	0.02
媒体 (media)	0.02	自由 (freedom)	0.01
自我 (self)	0.02	大陆 (mainland China)	0.01
国家 (state)	0.02	台湾 (Taiwan)	0.01
公司 (company)	0.02	制度 (system)	0.01
朝鲜 (North Korea)	0.02	政治 (politics)	0.01
香港 (Hong Kong)	0.02	中共 (Chinese Communist Party)	0.01
新闻 (news)	0.02	全世界 (world)	0.01
封锁 (block)	0.02	影响 (influence)	0.01
谷歌 (Google)	0.02	人士 (person)	0.01

Example 4: 翻出墙来，应该多看，少闷着头发牢骚自己一个人自言自语。如果你翻出来只是为了发牢骚不被删贴的话，倒不如自己关上门趴在炕上用笔在纸上写完自己看，也没人删。与其在推特上无聊无耻无能无得的华语圈报团依旧延续墙内闭塞思维方式，不如多收听些海外中立媒体听听他们的声音和思考角度。

If you manage to climb over the wall, you should look around rather than talk to yourself or complain. If the purpose of jumping the wall is merely to complain without being censored, you should just close the door, stay in bed, and put your words down on paper. Rather than limiting yourself to the boring, shameless, and incompetent Chinese newspaper groups on Twitter and being close-minded, you should be open to the voices and perspectives from the neutral foreign media outlets.

For instance, Example 5 tells the story of Gao Xingjian, a Nobel laureate who was not able to publish his own work in mainland China because of the stringent censorship on publishing.

Example 5: 第一位获得诺贝尔文学奖的中国大陆人，生于1940年江西赣州人，87年移居法国，2000年就已获得诺奖。著作有《灵山》《一个人的圣经》《逃亡》，但大陆禁止出版。文革时，他被迫烧掉了整整一箱子手稿，包括自己的日记。他说：作家不能屈服于审查。还说：自己想家却苦于无法回到祖国。他是高行健

The first Chinese mainland recipient of the Nobel Prize for Literature was born in Ganzhou, Jiangxi, in 1940. He moved to France in 1987 and received the Prize in 2000. His major works include *Soul Mountain*, *One Man's Bible*, and *Escape*, all banned from publication in mainland China. During the Cultural Revolution, he had to burn a suitcase of manuscripts, including his diaries. He said, "A writer cannot succumb to censorship." He also said, "I am homesick, but I cannot return to my homeland." He is Gao Xingjian.

Interestingly, spatial markers also rank high among the most relevant terms in this cluster (see Table 3). Different from the previous cluster, however, they no longer divide space based on Internet censorship, but rather on the type of social and political system. There are countries or regions such as "China," "mainland," and "North Korea," where media are intensively regulated by the state. At the same time, there are examples such as "America," "foreign country," and "Hong Kong," where freedom of speech is highly valued and protected by law. Understandably, a popular theme in this cluster is found in comparisons of the censoring practices between democratic and nondemocratic contexts. For instance, Example 6 refers to a research report on countries with the most extensive media censorship, including China.

Example 6: 【全球十大新闻审查国家 中国榜上有名】保护记者委员会最新报告评选出全球十大媒体审查国家，厄立特里亚、朝鲜和沙特分列前三，中国名列第八，此外名单中包括埃塞俄比亚、阿塞拜疆、越南、伊朗、缅甸和古巴。报告同时指中国是全球囚禁记者最多的国家。

The Committee to Protect Journalists has recently published a report about the 10 countries with the most stringent media censorship. Eritrea, North Korea, and Saudi Arabia are the top three. China ranks as No. 8. Other countries include Ethiopia, Azerbaijan, Vietnam, Iran, Myanmar, and Cuba. China is also the world's largest prison for journalists.

The "Internet censorship" and "general censorship" clusters contain the most politically driven discussions. They demonstrate the empowering potential of forbidden virtual border zones, such as the Chinese Twitter sphere, where politically motivated netizens are able to discuss, debate, and deliberate on issues related to censorship. It is helpful to construct the Chinese Twitter community's identity. However, this phenomenon does not mean that the impact of the state has disappeared entirely. According to Mann (1984), an important source of the power of the state originates in its capacity to create and sustain geographical boundaries. If territorialization is a defining feature and the manifestation of the state's power at work, we may regard artificial information barriers such as the GFW as an instance of the state's border-drawing technology operating in cyberspace. These technologies are met with resistance from netizens, either in the form of circumvention technologies or criticisms on Twitter. However, the presence of spatial markers indicates the widespread perception that technical infrastructures such as the GFW create and sustain national boundaries in a similar fashion to physical borders, thereby contributing to a compartmentalized image about the Internet.

Further analysis of these discussions on Chinese Twitter reveal the influence of Chinese language and culture. Because of its 140-character limit, Twitter may not be the best avenue for in-depth discussions and conversations about politics. Tweets function more as endorsements rather than as explications of ideas. However, the Chinese Twitter sphere represents a somewhat different case. Although a single Chinese character occupies the same space as a Latin letter, the former is often much more informative (Benney, 2011). For instance, whereas the English word "good-bye" consists of seven characters, its Chinese equivalent ("再见") contains only two. The relative efficiency of Chinese characters in the default encoding scheme, together with the absence of state-imposed censorship, makes Twitter a potent communicative device for in-depth political discussions.

Disseminating Alternative News Items

Whereas the previous three clusters mainly consist of original tweets, the last two topic clusters often contain news headlines. Many contain URLs directing readers to external websites. As Table 4 shows, the central theme of the first news cluster is legal issues and law enforcement characterized by the

appearance of legal terms such as "lawyer," "law," "procurator," "case," "guilt," "crime," and "accuse." In addition, other popular words refer to state institutions, including "police," "state," and "government."

Table 4. Top Words in the Topic Cluster "Legal/Law Enforcement," by Relevancy.

Term		Relevancy	Term		Relevancy
审查	(investigate)	0.07	犯罪	(crime)	0.02
律师	(lawyer)	0.05	煽动	(provoke)	0.02
政府	(government)	0.04	审查起诉	(investigate and accuse)	0.02
公民	(citizen)	0.02	年月日	(year, month, day)	0.02
检察院	(procuratorate)	0.02	颠覆	(subversion)	0.02
法律	(law)	0.02	百姓	(people)	0.01
案件	(case)	0.02	联合国	(United Nations)	0.01
国家	(state)	0.02	公安	(public security official)	0.01
外楼	(buildings outside)	0.02	人权	(human rights)	0.01
官员	(government official)	0.02	组织	(organize)	0.01
涉嫌	(suspect)	0.02	真理	(truth)	0.01
罪名	(guilt)	0.02	泰国	(Thailand)	0.01
警察	(police)	0.02	党国	(party state)	0.01
立案	(filing a criminal case)	0.02	起诉	(accuse)	0.01
一封	(one)	0.02	权力	(power)	0.01

Legal activities involving state officials emerge as a recurring topic among the most typical tweets. Two major themes are especially notable: The first theme concerns legal conflicts between human rights activists and the state. For instance, several tweets mention Zhiqiang Pu, a human rights activist who was accused of obtaining citizens' personal information and was sentenced to jail by the state court. The second theme focuses on the state or local governments' legal conduct, such as investigations into high-profile government officials suspected of corruption, which is likely to be censored. For instance, Example 7 comes from a user who self-identifies as human rights activist.

Example 7: 联合国人权机制审查下次在11月。我曾接受人权组织培训如何使用人权机制。关键在与各国使节直接反应要求。各人权组织都忙不过来，建议能发推的就直接发。我搜到了位于瑞士各国使节的推号（见前几推）。有冤情都去联合国告状！#

The next United Nations' human rights investigation will happen in November. I used to be trained by a human rights organization regarding how to take advantage of the UN's human rights support, and the key is to direct requests to foreign diplomats. Since human rights organizations are extremely busy, I suggest you send the requests yourself. I have collected the Twitter account names of several Swiss diplomats (see previous tweets). Send your grievances to the UN!

We labeled the last cluster “miscellaneous news sources” because the tweets are mainly characterized by shared textual features that are indicative of news sources rather than a coherent theme (see Table 5). For instance, terms such as “Communist Party,” “epoch,” “mainland,” “must see,” and “quit” constitute short catchphrases that serve as source identifiers.

Table 5. Top Words in the Topic Cluster “Miscellaneous News Sources,” by Relevancy.

Term		Relevancy	Term		Relevancy
共产党	(Communist Party)	0.39	每日	(daily)	0.04
退出	(quit)	0.35	纪元	(epoch)	0.03
直连	(direct connection)	0.24	重点	(emphasis)	0.03
保平安	(secure safety)	0.21	读者	(reader)	0.03
大陆	(mainland China)	0.2	三招	(three tricks)	0.03
必看	(must see)	0.19	阅兵	(military parade)	0.03
神韵	(Shen Yun)	0.18	二亿人	(two hundred million people)	0.03
两亿	(two hundred million)	0.17	梳理	(systemize)	0.03
人三退	(three quits)	0.17	科学	(science)	0.03
world	(world)	0.15	上网	(surfing the Web)	0.02
tour	(tour)	0.1	江泽民	(Jiang Zemin)	0.02
三退	(three quits)	0.07	中共	(Chinese Communist Party)	0.02
新闻	(news)	0.06	习近平	(Xi Jinping)	0.02
真理	(truth)	0.04	宣传部	(Propaganda Department)	0.02
中国	(China)	0.04	自救	(save oneself)	0.02

Similar to the “legal/law enforcement” cluster, the news items often contain sensitive content that may trigger censorship and are therefore unlikely to circulate widely within the Chinese Internet. Example 8 concerns another sensitive topic related to political competition among high-level Communist Party leaders.

Example 8: 【10·27翻墙必看】传高层人事变动涉政治局委员 dlvr.it/CYys9C

[Must-See News After Jumping the Wall] Hearsay about personnel changes among Chinese leadership involve Politburo members (website: dlvr.it/CYys9c).

How can one make sense of the prevalence of alternative news items in the Chinese Twitter sphere? The Chinese domestic media system tends to align closely with the agenda of the state, which does not tolerate news or information that poses a challenge to the legitimacy of the state. However,

virtual border zones such as Twitter undermine this power asymmetry with an international political opportunity structure favorable to social activism (G. Yang, 2012a). Of course, there is perhaps yet another fundamental technical precondition: the absence of censorship. Together, this unique opportunity structure enables alternative media outlets to thrive and reach potential Twitter audiences who are receptive to such information. The audience may include Chinese netizens who regularly circumvent the GFW for more diverse digital media diets (Mou et al., 2016; Q. Yang & Liu, 2014) as well as global media professionals who are interested in the voice of Chinese activists (G. Yang, 2012a). However, the GFW limits activists' ability to reach a significant portion of their target audience in mainland China, which puts the Chinese Twitter sphere at risk of marginalization.

Conclusion and Discussion

In this study, we applied a topic model (LDA) to a sample of Chinese tweets centering on the issue of Internet censorship to analyze the thematic structure underlying the discursive space. The five distinctive topic clusters span three major activities: sharing technical knowledge, expressing political opinions, and disseminating alternative news items. Based on users' discussions on Internet censorship and the five thematic clusters, this article found the mechanisms for the formation and maintenance of the Chinese Twitter sphere as an alternative digital space. First, sharing and obtaining updated technical knowledge and information can allow users to continue bypassing technological blocks, such as the GFW. Users in mainland China continue to access Twitter as a prerequisite for Chinese Twitter formation and maintenance. Second, the discussion of sensitive topics and content is the important maintenance mechanism that reflects how Chinese Twitter is an alternative digital space for protest and resistance. Sensitive topics and content meet the expectations of Chinese Twitter users, including activists and those who are interested in obtaining uncensored information. Meanwhile, it distinguishes Chinese Twitter from mainland China's Internet space and maintains the Chinese Twitter community's identity. To highlight that Chinese Twitter is an alternative digital space, users employ many spatial markers to draw boundaries in their discussions, which resist the Chinese government's efforts to demarcate boundaries with the GFW. Third, disseminating alternative news items to attract potential audiences and the international media can help Chinese Twitter gain political opportunities. Regarding the formation and maintenance of the Chinese Twitter sphere, G. Yang (2012a) paid attention to sensitive topics and political opportunities as well as others focusing on political resistance (Sullivan, 2012), but ignored the importance of technology to some extent. When Chinese Twitter is discussed as an alternative space, attention should be paid not only to politics and empowerment but also to technologies.

Although it is a transnational and alternative digital space, the Chinese Twitter space is influenced by Chinese culture and takes advantage of it. For example, within the 140-character limit for tweets, the Chinese Twitter space makes use of Chinese characters to convey richer and more diverse meaning. In this sense, the Chinese Twitter space is culturally sensitive. As noted by Y. O. Lee (2009), Internet use and its effects tend to be content specific rather than universal. This finding reminds us to focus on cultural factors in the transnational alternative space.

Such cultural sensitivity is also reflected in the perception of "jumping the wall" or "climb over the GFW." In the Chinese context, a wall is "a construction of stone and brick to hold up a roof or separate the inside from the outside" (Liu, 2009, p. 461). Some scholars question the empirical accuracy and analytic

utility of “the Great Firewall” as a metaphor for researching the Chinese Internet’s censoring regime and other similar regulatory practices in nondemocratic contexts. Hamdy and Gomaa (2012) underscored the discrepancy between the simplified depiction implied by this term (blocking information from the “outside”) and how Internet censorship operates in reality. Tsui (2007) highlighted the ideological connotations of this term and the ways in which it is integral to the foreign policy campaigns of the West. However, those who argue for the merits of this metaphor suggest that it remains valid as a critical reflection on the current status of Internet governance. For instance, Li (2016) argued that “the existence of the ‘wall,’ as both a technological apparatus and a structural metaphor, is a symptomatic object of the global media network, shattering the myth of borderless global access and foregrounding the regulatory power of the nation-state” (p. 110). Our study suggests that the GFW is more than simply a metaphor: It affects the ways in which Chinese netizens imagine, experience, and discuss Internet censorship, and it is thereby an integral part of users’ lived experiences. From this perspective, the GFW remains useful as a conceptual tool to analyze the impact of Internet censorship on users, despite its inadequacy as an overarching depiction of how the censorship regime operates. In other words, in combination with the Chinese context and Chinese culture, scaling the wall makes the GFW more meaningful and existential (Li, 2016), and at the same time, it makes the power struggle visible. This phenomenon is the users’ perspective contributing to an enriched understanding of the effects of Internet censorship.

We proposed the dynamic interaction between the state’s Internet regulatory regime and resistance from Chinese netizens. The uncensored Chinese Twitter sphere provides unique opportunities for various forms of networked resistance against the GFW. At the same time, the power of the state, though somewhat diluted and less commanding in the Twitter sphere, still manifests its impact through the GFW. This constantly evolving censoring mechanism requires users to update correspondingly the technological means of resistance; the GFW projects the off-line sovereign boundary into the digital realm by cultivating in the minds of netizens an image of a compartmentalized digital space; the GFW also polices the virtual border by restricting the penetration of alternative news sources among domestic audiences, thereby reinforcing the asymmetry of power between Chinese media outlets and social activists. Our study has revealed the symbiotic relation of power enforcement and transgression taking place within virtual border zones, such as the Chinese Twitter sphere. To a certain extent, the acts of transgression themselves also serve as a testimony of the diminished yet persistent power of the state’s border-drawing technology.

Our study has demonstrated the potential of exploratory computational methods such as LDA to investigate and understand the patterns and regularities underlying large textual corpora. This approach is particularly instrumental when it is difficult to develop presupposed assumptions based on the data or when hand coding is not practical because of the size of the data set. In the context of our research, LDA effectively reduced the complexity of the discursive corpora and revealed unexpected yet theoretically meaningful patterns. Furthermore, recent efforts have begun to explore the connections between the empirical findings of topic models and well-established theoretical concepts in social science (e.g., DiMaggio et al., 2013). This line of inquiry may allow researchers to produce theoretically informed interpretations from model outputs and to advance current knowledge about the culture of online communities through empirically rigorous methods.

References

- Asmolov, G. (2015, February). Welcoming the dragon: The role of public opinion in Russian Internet regulation. *Internet Policy Observatory*. Retrieved from <http://repository.upenn.edu/internetpolicyobservatory/8>
- Baker, M. (2013). Translation as an alternative space for political action. *Social Movement Studies, 12*(1), 23–47. doi:10.1080/14742837.2012.685624
- Bamman, D., O'Connor, B., & Smith, N. A. (2012). Censorship and deletion practices in Chinese social media. *First Monday, 17*(3). doi:10.5210/fm.v17i3.3943
- Bennett, W. L., Breunig, C., & Givens, T. (2008). Communication and political mobilization: Digital media and the organization of anti-Iraq war demonstrations in the U.S. *Political Communication, 25*(3), 269–289. doi:10.1080/10584600802197434
- Benney, J. (2011). Twitter and legal activism in China. *Communication, Politics & Culture, 44*(1), 5–20.
- Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent Dirichlet allocation. *Journal of Machine Learning Research, 3*, 993–1022.
- Bolsover, G., & Howard, P. (2018). Chinese computational propaganda: Automation, algorithms and the manipulation of information about Chinese politics on Twitter and Weibo. *Information, Communication & Society, 1*–18. Advance online publication. doi:10.1080/1369118X.2018.1476576
- Cao, H. (2017). A noneventful social movement: The Occupy Wall Street movement's struggle over privately owned public space. *International Journal of Communication, 11*, 3162–3181.
- Chen, W. (2014). Taking stock, moving forward: The Internet, social networks and civic engagement in Chinese societies. *Information, Communication & Society, 17*(1), 1–6. doi:10.1080/1369118X.2013.857425
- Chen, W., Tu, F., & Zheng, P. (2017). A transnational networked public sphere of air pollution: Analysis of a Twitter network of PM2.5 from the risk society perspective. *Information, Communication & Society, 20*, 1005–1023. doi:10.1080/1369118X.2017.1303076
- Chu, C. W. (2017). Censorship or protectionism? Reassessing China's regulation of Internet industry. *International Journal of Social Science and Humanity, 7*(1), 28–32. doi:10.18178/ijssh.2017.7.1.790

- DiMaggio, P., Nag, M., & Blei, D. (2013). Exploiting affinities between topic modeling and the sociological perspective on culture: Application to newspaper coverage of U.S. government arts funding. *Poetics*, 41(6), 570–606. doi:10.1016/j.poetic.2013.08.004
- Esarey, A., & Xiao, Q. (2008). Political expression in the Chinese blogosphere: Below the radar. *Asian Survey*, 48, 752–772. doi:10.1525/AS.2008.48.5.752
- Fu, K.-W., Chan, C.-H., & Chau, M. (2013). Assessing censorship on microblogs in China: Discriminatory keyword analysis and the real-name registration policy. *Internet Computing, Institute of Electrical and Electronics Engineers*, 17(3), 42–50. doi:10.1109/MIC.2013.28
- Gersch, B. (1998). Gender at the crossroads: The Internet as cultural text. *Journal of Communication Inquiry*, 22, 306–321. doi:10.1177/0196859998022003005
- Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political Analysis*, 21(3), 267–297. doi:10.1093/pan/mps028
- Habermas, J. (1962). *The structural transformation of the public sphere*. Cambridge, MA: MIT Press.
- Hamdy, N., & Gomaa, E. H. (2012). Framing the Egyptian uprising in Arabic language newspapers and social media. *Journal of Communication*, 62(2), 195–211. doi:10.1111/j.1460-2466.2012.01637.x
- Hong, L., & Davison, B. D. (2010). Empirical study of topic modeling in Twitter. *Proceedings of the First Workshop on Social Media Analytics* (pp. 80–88). New York, NY: ACM. doi:10.1145/1964858.1964870
- Hu, H. L. (2011). The political economy of governing ISPs in China: Perspectives of net neutrality and vertical integration. *The China Quarterly*, 207, 523–540. doi:10.1017/S0305741011000634
- Jackson, S. J., & Foucault, W. B. (2015). Hijacking #myNYPD: Social media dissent and networked counter publics. *Journal of Communication*, 65(6), 932–952. doi:10.1111/jcom.12185
- Ji, Q. (2017). A comparative view of censored and uncensored political discussion: The case of Chinese social media users. In M. Adria & Y. Mao (Eds.), *Handbook of research on citizen engagement and public participation in the era of new media* (pp. 269–282). Hershey, PA: Information Science Reference.
- Jiang, M. (2010). Spaces of authoritarian deliberation: Online public deliberation in China. In E. Leib & B.G. He (Eds.), *The Search for Deliberative Democracy in China* (2nd ed.) (pp. 261–287). New York, NY: Palgrave.

- Jiang, M. (2012). *Internet companies in China: Dancing between the party line and the bottom line*. Rochester, NY: Social Science Research Network.
- Kaplan, S., & Vakili, K. (2015). The double-edged sword of recombination in breakthrough innovation. *Strategic Management Journal*, 36(10), 1435–1457. doi:10.1002/smj.2294
- King, G., Pan, J., & Roberts, M. E. (2013). *A randomized experimental study of censorship in China*. Paper presented at American Political Science Association 2013 annual meeting. Retrieved from <https://ssrn.com/abstract=2299509>
- King, G., Pan, J., & Roberts, M. E. (2014). Reverse-engineering censorship in China: Randomized experimentation and participant observation. *Science*, 345, 1251722. doi:10.1126/science.1251722
- Kou, Y., Kow, Y. M., & Gui, X. (2017). Resisting the censorship infrastructure in China. *Proceedings of the 50th Hawaii International Conference on System Sciences* (pp. 2332–2340). doi:10.24251/HICSS.2017.282
- Lee, S. Y. (2016). Surviving online censorship in China: Three satirical tactics and their impact. *The China Quarterly*, 228, 1061–1080. doi:10.1017/S0305741016001454
- Lee, Y. O. (2009). Internet election 2.0? Culture, institutions, and technology in the Korean presidential elections of 2002 and 2007. *Journal of Information Technology & Politics*, 6, 312–325. doi:10.1080/19331680903050085
- Li, J. (2016). *China: The techno-politics of the wall*. In R. Lobato & J. Meese (Eds.), *Geoblocking and global video culture* (pp. 110–119). Amsterdam, Netherlands: Institute of Network Culture.
- Lievrouw, L. A. (2011). *Alternative and activist new media*. Cambridge, UK: Polity Press.
- Liu, L. P. (2009). *Newly Xinhua dictionary*. Huhehaote, China: Inner Mongolia Peoples Publishing House.
- MacKinnon, R. (2008). Flatter world and thicker walls? Blogs, censorship and civic discourse in China. *Public Choice*, 134, 31–46. doi:10.1007/s11127-007-9199-0
- MacKinnon, R. (2009). China's censorship 2.0: How companies censor bloggers. *First Monday*, 14. Retrieved from <http://www.firstmonday.dk/ojs/index.php/fm/article/view/2378>
- MacKinnon, R. (2011). Liberation technology: China's "networked authoritarianism." *Journal of Democracy*, 22, 32–46. doi:10.1353/jod.2011.0033
- Mann, M. (1984). The autonomous power of the state: Its origins, mechanisms and results. *European Journal of Sociology*, 25, 185–213. doi:10.1017/S0003975600004239

- Meng, B. (2011). From steamed bun to grass mud horse: E Gao as alternative political discourse on the Chinese Internet. *Global Media and Communication*, 7, 33–51. doi:10.1177/1742766510397938
- Miller, B. (2019, January 12). *The limits of commercialized censorship in China*. doi:10.31235/osf.io/wn7pr
- Mina, A. X. (2014). Batman, panda man and the blind man: A case study in social change memes and Internet censorship in China. *Journal of Visual Culture*, 13(3), 359–375. doi:10.1177/1470412914546576
- Morozov, E. (2011). Whither Internet control? *Journal of Democracy*, 22, 62–74. doi:10.1353/jod.2011.0022
- Mou, Y., Wu, K., & Atkin, D. (2016). Understanding the use of circumvention tools to bypass online censorship. *New Media & Society*, 18(5), 837–856. doi:10.1177/1461444814548994
- Nisbet, E. (2015, February). *Benchmarking public demand: Russia's appetite for Internet control*. Retrieved from <https://global.asc.upenn.edu/publications/benchmarking-public-demand-russias-appetite-for-internet-control/>
- Nordin, A., & Richaud, L. (2014). Subverting official language and discourse in China? Type river crab for harmony. *China Information*, 28, 47–67. doi:10.1177/0920203X14524687
- Rahimi, B. (2011). The agonistic social media: Cyberspace in the formation of dissent and consolidation of state power in postelection Iran. *The Communication Review*, 14(3), 158–178. doi:10.1080/10714421.2011.597240
- Ramage, D., Dumais, S. T., & Liebling, D. J. (2010). Characterizing microblogs with topic models. *Proceedings of the Fourth International Conference on Weblogs and Social Media* (pp. 23–26). Retrieved from <https://pdfs.semanticscholar.org/f2fb/090234c24a3b1e0c6178727eddd141af4e30.pdf>
- Russell, J. (2015, September 7). *China continues its crackdown on VPN services*. Retrieved from <http://social.techcrunch.com/2015/09/07/china-continues-its-crackdown-on-vpn-services/>
- Sullivan, J. (2012). A tale of two microblogs in China. *Media, Culture & Society*, 34, 773–783. doi:10.1177/0163443712448951
- Taneja, H., & Wu, A. X. (2014). Does the Great Firewall really isolate the Chinese? Integrating access blockage with cultural factors to explain Web user behavior. *The Information Society*, 30(5), 297–309. doi:10.1080/01972243.2014.944728

- Tsui, L. (2007). An inadequate metaphor: The Great Firewall and Chinese Internet censorship. *Global Dialogue*, 9(1/2), 60–68.
- Vasi, I. B. (2006). The new anti-war protests and miscible mobilizations. *Social Movement Studies*, 5(2), 137–153. doi:10.1080/14742830600807493
- Weaver, N., Sommer, R., & Paxson, V. (2009). Detecting forged TCP reset packets. *Proceedings of the Network and Distributed System Security Symposium*. Retrieved from <http://www.icir.org/vern/papers/reset-injection.ndss09.pdf>
- Weng, J., Lim, E.-P., Jiang, J., & He, Q. (2010). TwitterRank: Finding topic-sensitive influential twitterers. *Proceedings of the Third ACM International Conference on Web Search and Data Mining* (pp. 261–270). doi:10.1145/1718487.1718520
- Xiao, Q. (2011). The battle for the Chinese Internet. *Journal of Democracy*, 22(2), 47–61. doi:10.1353/jod.2011.0020
- Xu, X., Mao, Z. M., & Halderman, J. A. (2011). Internet censorship in China: Where does the filtering occur? In N. Spring & G. F. Riley (Eds.), *Passive and active measurement (PAM2011)* (pp. 133–142). Berlin, Germany: Springer. Retrieved from http://link.springer.com/10.1007%2F978-3-642-19260-9_14
- Yang, F. (2016). Rethinking China's Internet censorship: The practice of recoding and the politics of visibility. *New Media & Society*, 18(7), 1364–1381. doi:10.1177/1461444814555951
- Yang, G. (2006). Activists beyond virtual borders: Internet-mediated networks and informational politics in China. *First Monday*, 7. Retrieved from <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1609/1524>
- Yang, G. (2012a). Power and transgression in the global media age: The strange case of Twitter in China. In M. Kraidy (Ed.), *Communication and power in the global era: Orders and borders* (pp. 166–183). London, UK: Routledge.
- Yang, G. (2012b). Social dynamics in the evolution of China's Internet content control regime. In M. E. Price, S. G. Verhulst, & L. Morgan (Eds.), *Routledge handbook of media law* (pp. 285–302). London, UK: Routledge.
- Yang, G., & Jiang, M. (2015). The networked practice of online political satire in China: Between ritual and resistance. *International Communication Gazette*, 77(3), 215–231. doi:10.1177/1748048514568757

- Yang, Q., & Liu, Y. (2014). What's on the other side of the great firewall? Chinese Web users' motivations for bypassing the Internet censorship. *Computers in Human Behavior, 37*, 249–257.
doi:10.1016/j.chb.2014.04.054
- Yesil, B. (2015, October 27). A reflection on Turkey's contested Internet and public demand for Internet freedom. *Internet Policy Observatory*. Retrieved from <https://global.asc.upenn.edu/a-reflection-on-turkeys-contested-internet-and-public-demand-for-internet-freedom/>