

Meta-Information Censorship and the Creation of the Chinanet Bubble

Abstract

The question of who controls meta-information online has become a hot-button issue with profound political implications. The present article explores how state-led online censorship in the People's Republic of China can create information bubbles, and how it is possible to analyze them. The article is based on a systematic comparison between 3000 Google.com and Baidu.com image search results on a series of selected, potentially sensitive, keywords. This allows us to discern how censorship and information bubbles are connected, and how it is possible to detect and analyze them. To facilitate this, we offer a typology for conceptualizing the different dimensions of internet censorship. Our analysis points to the importance of censorship on meta-information and suggests that generally censored internet contents can also spill over to a liberal context through the Sinophone internet.

Keywords: censorship theory, images, information bubbles, meta-information, Baidu, Google, China, internet, search engine

Introduction: Information Bubbles as Threats to Democracy

Who controls meta-information online? This important question that concerns possible ‘information bubbles’ created by search engines has recently become a hotly debated topic in media studies and political science (see e.g. Pariser 2011; Dillahunt et al. 2015; Epstein and Robertson 2015; Dutton et al. 2017; Diamond 2019; Nechushtai and Lewis 2019). Thus far, the debates have concentrated mostly on US-based internet companies, such as Google, Facebook and Twitter, and how their personalized search functions and newsfeeds may lead to unwelcome outcomes, by creating what Eli Pariser (2011, 9) calls ‘unique universes of information’ for each user. In the present article, we expand this discussion to the leading Chinese search engine, Baidu. As we argue below, the Chinese case demonstrates how online censorship can create deliberative information bubbles.

The key concepts in our study are *filter bubbles* and *censorship*. A filter bubble is essentially a variation of an information bubble, which Nguyen (2018) defines as ‘a social epistemic structure in which other relevant voices have been left out, perhaps accidentally.’ An information bubble may emerge, e.g., when search engines’ search algorithms guide users exclusively to information that they feel ‘comfortable and ideologically aligned with’ (Deibert 2019, 32). However, we argue that censorship is also able to form information bubbles, and may even aim at creating them. Further, the classical way to approach censorship is to take it as an authoritative third-party intervention into communication (Müller 2004). As we will show below, this definition of censorship is too narrow when it comes to how online contents can be controlled. Accordingly, we provide a more nuanced framework for analyzing online censorship.

The irony is that, at least in the liberal-democratic ‘West’, search engine filtering—often dubbed as ‘personalization’—is ostensibly there to serve users. Indeed, as Courtois et al. (2018, 2006) point out, the sheer amount of online information requires search engine companies to somehow deal with the information overload that is the internet. Therefore, filtering algorithms try to ‘guess’ what would be most relevant pieces of information for each user based on what search engine companies know about them – and at the same time companies collect this user data to extract profit from it by reselling it (Zuboff 2019). Yet, as with all ranking and ordering of information, there is the risk that people are given access to biased and one-sided content, which often just conforms with and enforces their earlier beliefs and values (Sunstein 2018), or, even worse, is used to modify users’ behavior proactively (Zuboff 2019).

Such risks show how data and information are interwoven with political and social beliefs, biases, and ideologies, as soon as contents are identified, translated, and categorized for analysis (Kaufmann and Jeandesboz 2017). This tendency becomes even more striking when we investigate the deliberate overt and covert manipulation of online contents in the form of censorship, and the spreading of disinformation in the form of propaganda, or ‘positive censorship’, as it is also called. At the same time, studying such activities provides for opportunities to explore the belief systems, ideologies, logics, and rationalities that guide both censorship and propaganda work, and eventually to discover visions of the political that the deployment of technologies and techniques produce (Huysmans 2006; Vuori 2014).

Indeed, as for example Hildebrand (2016) and Kaufmann et al. (2019) point out, bias is always present in algorithms that produce decisions or suggestions based on large quantities of data, and the real question is therefore not the existence of this effect as such, but the social outcomes that such selection produces. As such, the problem that information bubbles pose for democracy is easy to see on the theoretical level. Empirically, however, results have been inconclusive at best in regard to whether search engine bubbles actually exist. Indeed, some empirical studies suggest that the fear of filter bubbles created by personalized searches in Google, Bing, and other search engines, may not be entirely warranted (Dutton et al. 2017; Courtois et al. 2018; Nechushtai and Lewis 2019), while others see real risks in them (Geschke et al. 2019; Kelly and François 2018; Epstein and Robertson 2015).

Therefore, while liberal democracies do face challenges with possible filter bubbles, things could be even worse. How much worse? This is what we show in this study when we turn to discuss the issue of online censorship in the context of authoritarian political orders, specifically China. We begin the article by first discussing the insights that censorship theory offers here. We then shortly describe Chinese internet censorship practices and our method of analysis and the data used in our study, followed by the analysis itself. We end the article with our conclusions regarding the ‘Chinonet’ (Economy 2018) information bubble.

Online Censorship and Information Bubbles

A classical way to define censorship is to consider it as ‘an authoritarian intervention by a third party into an act of communication between the sender of a message (the author) and its

receiver (the reader)—a message intended for the public, but prevented from ever reaching it’ (Müller 2004, 11). According to this view, censorship is essentially about outside intervention in free communication, and censorship’s nature is therefore always ‘external, coercive, and repressive’ (Bunn 2015, 30). Perhaps the reason for leaving censorship largely out of the filter bubble discussion is that there is no apparent coercion or repression present in the process. However, we argue that also filter bubbles in a liberal-democratic context come about through what essentially is a censorious process. Furthermore, censorship theory offers a way to conceptualize the mechanisms of filter bubbles, both in authoritarian and liberal contexts.

To understand this connection better, and to realize how online censorship works, we need to expand and deepen the previous definition of censorship. For this purpose, we propose five kinds of adjustments to it. First, we need to broaden the definition in order to include more nuances into the types of censorious interventions. Using Piotr Kuhiwczak’s (2011) notion that censorship resembles translation, we argue that censorship should be understood as a conscious and purposeful act on information, whereby the amount of information is reduced from the original for the purpose of manipulation. Censorship can be understood as a specific kind of act of translating information into politically acceptable language—which may also mean total silence. The purposefulness of censorious acts is important; translation as such never increases the information content of a message. Instead, something can be lost in translation. It is important to note though, that this can be due to incommensurability in natural languages, and is not always a form of purposeful alteration of the message, unlike with censorship (about translation and censorship see e.g. Guessabi 2019).

Our broadened definition of censorship does not demand that messages are prevented entirely, or that it only concerns third-party interventions. Accordingly, our second adjustment here is that an act of censorship can take place when the message is sent (self-censorship), during its transmission by a third party (classical negative censorship), and/or when it is received (auto-censorship). In auto-censorship individuals act as their own censor and selectively expose themselves only to messages they themselves prefer, while rejecting others. Such messages may conform to their previously held ideas and attitudes, something that is posited by the theory of cognitive dissonance in political communication studies (Festinger 1957). While empirical evidence here is inconclusive as to how selectively people actually choose their information sources in everyday life (Knobloch-Westerwick and Meng 2009; Sude et al. 2019), theoretically speaking, auto-censorship is nevertheless important for understanding how information bubbles may emerge in an online environment. There is the risk that learning search algorithms become censors because they imitate users, who auto-censor themselves—just like in the well-known case where Microsoft’s AI Tay became an online Nazi after learning from and imitating other Twitter users. However, it is also easy to see that a third party can create information bubbles by programming search engine algorithms to search and present only certain kinds of results.

Information bubbles need contents, otherwise they implode. Therefore, a third adjustment needs to be made between *negative* and *positive* censorship. Negative censorship works through telling people what *not* to say or think, while positive forms tell them what *to* say or think instead. Indeed, in censorship studies, the latter function is sometimes assigned to propaganda (Baets 2011; Bunn 2015). For political analysis, a key question is who controls this type of censorship. Who has the power in society to deny topics from public discourse and to offer other ones in their stead? In China, the answer is easy. China as a party-state has

specialized bureaucracies to carry out both types of censorship through direct censorship activities and propaganda, which are the two sides of the same coin of ‘public opinion management’ (Schneider 2018; Creemers 2017; Xiao 2019). Therefore, especially in authoritarian settings, censorship and propaganda should not be studied on their own, but always as parts of a whole.

To understand the nature of search engine information bubbles better, we also need to make an adjustment that concerns the nature of censored information. The internet not only allows for access to a wide range of contents, but also to information *about* information. Search engines’ business models are based on almost instant access into their own indexes of meta-information about ‘what is out there’. Indeed, search engine result pages are excerpts from the indices of webpages and other types of information available online that are kept and constantly updated in databases owned by search engine companies (Jiang 2014). Decisions on secrecy and selections made by archivists regarding which archives are made publicly available are a form of censorship (Baets 2011, 59), and arguably, particularly in authoritarian online contexts the importance of who controls meta-information is as important as who controls contents. Indeed, information bubbles can form when only selective meta-information on what is available online is released.

Our final adjustment to the definition concerns the ability of censorship to hide itself. Hidden censorship can be a very effective way to control public opinion. As Baets argues (2011, 54): ‘[t]he less visible the censorship, the more effective it is.’ One way for a ‘total information bubble’ to form is that users are not aware that the registers they use to find information are being censored. We term this *covert meta-level censorship*. Indeed, in its ideal form,

censorship is totally covert, and can make thoughts unthinkable, not just incommunicable. This is what the ‘Ministry of Truth’ is there for in George Orwell’s novel *1984*. Covert censorship is connected to what Rouvrou and Berns (2013) call ‘algorithmic governmentality’, and Zuboff (2019) ‘instrumentarianism’. In it, individuals’ online and increasingly offline (or their amalgamation into what Rouvrou and Berns call ‘onlife’) actions are no longer governed directly, but rather through the pre-emptive alteration of user environments without them noticing it. The idea is the same as in Foucault’s concept of security practices trying to ensure ‘good’ circulations in society, just taken online (Vuori 2014; Vuori and Paltmaa 2015; Jiang 2014, 226). In the Chinese case, it has been noted how internet censorship may have shaped users’ browsing preferences, without them noticing it (Taneja and Wu 2014).

Internet Censorship in China

As this article is being written, there is increasing anxiety among researchers and political commentators about the internet becoming a challenge for, or even a threat to liberal democracy (Sunstein 2018; Zuboff 2019). To add insult to injury, examples abound of authoritarian governments exercising online censorship and taking advantage of the internet for their authoritarian purposes around the globe (Akbari and Gabdulhakov 2019). The original assumption that the internet is essentially a ‘liberation technology’ has thus far proven to be false, or at least too simplistic (Diamond 2019). Indeed, as Göbel (2013) points out, ICT can help both to undermine and to sustain autocratic rule.

China is no exception to this (Paltemaa and Vuori 2009). The Chinese government sees that public opinion, both off- and online, is malleable and can, and should, be ‘managed’ (*guanli*) by the government through, e.g., the selected disclosure of information and use of propaganda (Heilmann 2018, 312). The Chinese government also regards the internet as an essentially national construct, although one with international connections. Chinese research on online security sees that the internet is one of the main battlegrounds of great power rivalry (Li 2018). When online censorship is discussed in this literature at all, it takes place within the discursive realms of ‘cyber’ and ‘national security’ (e.g. Zhao and Yu 2018).

Accordingly, the Party General Secretary Xi Jinping has put forward the concept of ‘internet sovereignty’ (*wangluo zhuquan*) (Xi 2014). As defined in the National Cyberspace Strategy, this notion asserts that each country should be allowed to configure its cyberspace in accordance with its own preferences, without any outside interference (*Guojia Wangluo kongjian anquan zhanlüe* 2016). In China, this means strict legal and technological controls of online environments and contents, where Chinese authorities are regarded as having become increasingly skillful over time. (Li 2018; Creemers 2017.)

Research on Chinese online censorship has reported instances of all the forms of censorship discussed above. In the case of overt content censorship, for example Bamman et al. (2012) found that the Sina Weibo microblog service deleted messages containing politically sensitive words, while King et al. (2013) found that the blogs, which contained contents with ‘collective action potential’, were the main target of overt content censorship. Knockel et al. (2015) found that a Chinese social video platform censored messages with keywords about gambling, narcotics, pornography, the Communist Party, religious movements, ethnic

minorities, terrorism, and dissidents. Similarly, Ruan et al. (2016) found that censored keywords at WeChat included, e.g., words related to Falun Gong and June 4 (i.e. the Tiananmen incident of 1989). Meta-information is also censored. Vuori and Paltemaa (2015) found that the Sina Weibo search engine was much more likely to overtly censor search results related to the Communist Party than any other category used in their study. In effect, the Party tries to manage public debates on itself. As for covert censorship, there are some indications that Chinese online censorship is moving towards more covert modes (Ruan et al. 2016; 2017). Nevertheless, covert meta-level censorship is still largely unstudied, and accordingly, we focus on it in more detail below.

The studies discussed above corroborate the Chinese government's own announcements about its online censorship policies. The Chinese State Council's *White Paper on the Internet* (Information Office 2012, 243–244) states that internet censorship is conducted in order to 'curb dissemination of illegal information online', and that such illegal information includes information which is:

'against the cardinal principles¹ set forth in the Constitution, endangering state security, divulging state secrets, subverting state power and jeopardizing national unification, damaging state honor and interests, instigating ethnic hatred or discrimination, and jeopardizing ethnic unity; jeopardizing state religious policy, propagating heretical or superstitious ideas; spreading rumors, disrupting social order and stability; disseminating obscenity, pornography, gambling, violence, brutality and terror or abetting crime.'

¹ These are upholding the socialist path, people's democratic dictatorship, Marxist-Leninism-Mao Zedong Thought, and the leadership of the CCP.

Similar categories can also be found in article 12 of the 2016 Cyber Security Law, and for example in the 2019 ‘Guidelines for the Management of Online Ecology’ by the Central Cyberspace Affairs Commission, which also lays out instructions for positive censorship for online content providers. These include propagating Xi Jinping Thought, the Party’s ideological line and important decisions by the Party Center, as well as the ‘bright points of economic and social development’ (*Guojia hulianwang xinxi bangongshi* 2019). In our analysis below, we have used these categories, as stated by the Chinese government, to select the online materials for closer scrutiny.

Materials and Methods for Analyzing Filter Bubbles

In this article, we compare the two leading search engines in their respective areas: the largest Chinese search engine Baidu.com and the largest US-based search engine Google.com. We conducted the study as a comparative experimental test by using image search results from both search engines on a selected group of keywords both in English and in Chinese. After retrieving and archiving images for each of the five keywords (Tiananmen, Uyghurs, South China Sea, Taiwan and Tibet), members of a three-person expert panel (the first three authors) individually coded the images into the categories of ‘politically sensitive’, ‘neutral’, and ‘pro-regime’ based on the image contents free from any textual ‘anchors’². The coding was based on pre-set rules³ for each keyword. The validity of the method was based on the panelists’ expertise on contemporary China, consisting of over 60 years of combined professional academic China-watching. The study focused on images for a number of

² This means that the pages where the images were retrieved from were not analyzed. Text was analyzed only in cases where the text was embedded in the image as such.

³ Available from the authors.

reasons: Images have discursive power of their own, they can evoke emotions and raise interest in watchers and convey political symbols quicker than text (Vuori and Andersen 2018) and, arguably, in online context they form a major part of the contents. Often, users browse only for images. Little studied as such, the image search function of both search engines opens up an unexplored access to covert meta-level censorship, as explained here.

To control the reliability of coding, we calculated both the Spearman's rank correlation and Cohen's Kappa for the results. The pairwise Spearman's rank correlation varied between (Coder1:Coder2) 0.847, (Coder1:Coder3) 0.859 and (Coder2:Coder3) 0.806, which indicates a strong correlation between each coders' results. The Cohen's Kappa values were (Coder1:Coder2) 0.825, (Coder1:Coder3) 0.846 and (Coder2:Coder3) 0.787 respectively, indicating almost perfect agreement in the first two cases, and substantial agreement in the third case (Landis and Koch 1977). The divergence was mainly due to differences in whether images of international military exercises in the South China Sea were considered sensitive or not.

The five keywords we used in the test were selected based on their general neutrality, yet with a potential to call up sensitive imagery, which was necessary to tease out covert meta-level censorship. Our reasoning behind this decision was that unlike using, e.g., the names of leading dissidents, especially geographical place names do not *necessarily* imply any prior knowledge of sensitive connotations that they may have. Therefore, they do not automatically trigger overt censorship, yet may unintentionally lead to sensitive contents, something that censors want to prevent. To give an example, a Chinese third grader looking for images of Tiananmen Square may not know anything about what took place there during the Spring of 1989, but in an uncensored search engine environment one search would change all this. The

five keywords we selected for this study were connected to party-state legitimacy, national unity, ethnic tensions, and separatism, yet were all neutral words as such: Tiananmen, Uyghurs, South China Sea, Taiwan and Tibet (we explain each of these in more detail below). We had good reason to assume that the images of these places and an ethnic group would be subject to censorship without a total ban on any of them, which indeed was the case.

For the study, we had to cope with search personification. Google is known to rank search results based on the quality of data on webpages and data it has on the individual user making the searches. For the former, Google uses the PageRank algorithm, which classifies web pages according to their relevance to the search keywords using, among others, the popularity of pages, as judged by the number of links to them, how many times pages are visited by users, information on how often and where those keywords appear on pages, and the language of the pages (Granka 2010). For the personalization of search results, Google uses at least user location, user search history, browser web history, and the user's social networks. However, because the test design we used in this study removes all other personalizing features than location, these are irrelevant for understanding our results.

Baidu and Google are thought to essentially use the same methods in the way they rank their search results (Chu 2018; Pentzek 2017), but there are known differences, too. All guidelines on Baidu search engine optimizing state that Baidu prefers sites that use localized servers and contents that load quickly. This is seen both as a business strategy and a result of the Great Firewall of China (GFW), which can add latency to website-loading outside of China, or to prevent it altogether. (Feng and Guo 2013; Brizzo 2019.) Another big difference is domestic governmental censorship, which Baidu implements on its search engine.

Accordingly, pages containing words blacklisted by the Chinese government will be de-indexed by Baidu, and never show up in its search results (Jones 2014; Brizzo 2019; Jiang 2014). Other known Baidu preferences include factors such as the age of the domain, freshness of its contents, and its overall quality. Baidu is also known to prefer webpages that it owns, such as the Baidu Baike—a censored Chinese equivalent to Wikipedia—and disfavor its competitors’ sites, as has been the case with Google, too (Schneider 2018, 62-63, 67-68).

Baidu and Google search engine performance has been compared in previous research, but the number of such studies is low and they are mostly out of date in a fast-moving digital world. Nevertheless, they all point to a low overlap between Google and Baidu search engine results. The most recent available comparative studies (Jiang 2014; Schneider 2018) affirm these findings. Jiang (2014) further points out that Baidu engages in censorship at an earlier stage than happens with Google searches, and therefore, when used in China, Google is censored by the GFW much more visibly.

Previous studies on search engine filtering (e.g. Courtois et al. 2018) have shown that several factors need to be considered in order to make such comparisons work. The personification of search results needs to be avoided as much as possible in order to maximize the internal validity of the data (Ørmen 2016). Accordingly, the keywords we used in our study were standardized, and we emptied browser caches before each search. We used the same laptop computer for all searches, which were conducted without signing in to any Western or Chinese social media, Google, or Baidu accounts. Indeed, the computer had never been used to sign in to any social media services. The browser we used was Firefox (versions 1.3.1 and older), with Google country settings set to ‘US’. Even such anonymous

and virgin settings did not render the user completely free from tracking, because web services make use of the user-agent string, which reveals the used browser, language, and location of the search engines (Dillahunt et al. 2015, 1852). Nevertheless, this was intentional, since we were testing the effects of location and language on the results we got. The searches were conducted in May 2018, apart from the term Tiananmen, which was first tested in April 2016 as a pilot. We retrieved the results for each keyword in one session, because results change quickly.

As Jiang (2014, 213) points out, search results ranking is critical in determining the relative prominence of webpages for users. Previous research suggests that most search engine users favor the highest-ranked results (Kammerer and Gerjets 2014), and that most individuals use short search terms and seldom click beyond the first page that contains 10 results ('snippets') (Dillahunt et al. 2015, 1852). Yet, browsing images is undoubtedly easier than scrolling through lists of snippets, which is why we included the first 100 images from each keyword in our sample that was gathered both in English and Chinese language searches in Google.com and Baidu.com, and both outside China and in Beijing. This resulted in N = 3000 images, which we then coded as described above. Because the main interest here is how Baidu works, we did not include Google results from within China in our study.

The results: the impact of search engine, location and language

A descriptive statistical analysis reveals large differences between the two search engines. As was to be expected, the biggest differences were between Google searches conducted in English outside China and Baidu searches conducted in Chinese inside China. Yet, also the

differences between Google and Baidu outside China were notable. From the results, Google offers a more balanced set of sensitive, neutral and pro-regime imagery than Baidu, regardless of language or where the searches were conducted.

<FIGURE 1>

A large majority of the results were neutral. This too was to be expected, as geographic terms relate to such topics as travel and sceneries. Notably however, the Baidu searches conducted both in- and outside China revealed almost identical results. This means that Baidu searches do not appear to be location-sensitive, and that Baidu users are therefore sucked into the information bubble that Chinese online censorship creates even if the users are outside mainland China.

The effect of language in search results is interesting and somewhat worrying too. The most diverse search results came about when we used English, irrespective of the search engine. However, this effect is much more pronounced in Google than in Baidu, which means that Baidu is also much less language-sensitive in its searches than Google is. Although the Baidu searches conducted in English outside of China resulted in two times more sensitive results than Chinese-language search results, the share was negligible in both cases. Google search results in English contained about 11.1 times more sensitive images than Baidu English searches inside China. However, English Google search results also contained 3.8 times more sensitive images than Chinese language Google search results. The latter also contained about 2.7 times more pro-regime results than the English language search results. This effect was

especially pronounced with the keyword ‘Tiananmen’. The results show how also Chinese-language Google users may be sucked into the filter bubble that the Chinese internet censorship creates. Meanwhile, Baidu’s insensitivity to language protects the Chinanet Bubble, as using Baidu in English does not help you get out of it.

Results Regarding Single Keywords

When we look more closely at the results on the individual keywords, as presented in Table 1, we can see that Baidu results had much less variation regardless of the keyword, and that neutral results were more dominant in Baidu than in Google, except for ‘Tiananmen’. This neutrality should be understood as a feature of the Chinanet Bubble—neutrality is a way to hide problems and, arguably, if censorship aims to induce ignorance, neutrality may work even better than outright pro-regime propaganda, which the user can recognize to be just that. This kind of tendency of positive censorship to ‘change the subject’ to neutral topics in public online debates, has been reported also in relation to covert ‘neutrolling’ by propaganda officials in Chinese social media (King et al 2017; for a similar strategy in Russia see e.g. Kurowska and Reshetnikov 2018).

<TABLE 1>

The most pronounced differences in search results concerned Tiananmen. Because of this keyword’s direct connection to the Tiananmen Massacre of 1989—or the

‘counterrevolutionary rebellion’ as the Party labels it (Guowuyuan 1989; Vuori 2003)—using the 2012 White Paper classification above, the images of this series of events, or those that somehow represent it, can be classified as being *against the cardinal principles set forth in the Constitution*. Indeed, the sensitive images in the sample were almost all related to the 1989 ‘Beijing Spring’ that preceded the ‘incident’. Tiananmen is on the list of censored keywords/topics in practically all research conducted on Chinese online censorship. This study shows how it is also a prime example of covert meta-level censorship at work, as Baidu users will find only pro-regime imagery about the site of one of the most controversial events in recent Chinese history.

For other keywords, one prominent category of sensitive images were maps, particularly for Taiwan, the South China Sea, and to a lesser extent Tibet. China’s central authorities enacted regulations in 2015 to the effect that content ‘that endangers the country’s sovereignty, safety and interests cannot be marked on maps.’ The regulations were announced with explicit reference to Taiwan, the South China Sea, and other disputed territories (Thomas and Martina 2015). As our results here show, Baidu is enforcing this regulation online.

References to Taiwan as a separate political entity from China are sensitive for the Chinese government. In the 2012 White Paper classification Taiwan falls under the category of *jeopardizing national unification*. According to the official PRC view, Taiwan is one of China’s 23 provinces, albeit at the moment ruled by a separatist organization, which calls itself the Republic of China (ROC). Denying the separateness of Taiwan (or the Republic of China) is one of the ‘core interests’ in Chinese foreign policy, and for example maps, which show Taiwan as a separate political entity, are considered to be ‘serious threats to national

security’. Apart from maps, sensitive search results in our sample contained ROC political symbols and references to Taiwanese independence. All in all, in the case of Taiwan, Google results both in English and in Chinese show Taiwanese claims for separateness, while the Baidu bubble silences this view almost completely.

The South China Sea also falls under the category of *jeopardizing national unification*. Here, most of the sensitive results of our search were images of maps that were contrary to the official PRC definitions of China’s international borders—the so called nine-dash line, which encompasses almost the entire sea, and ignores the claims of the six other coastal nations in the region (including the ROC). The few sensitive images that managed to pierce the Baidu bubble were mostly maps that ignored Chinese claims, contained Taiwanese claims as a separate entity from China, and/or ignored China’s claim to the territory.

Tibet is another ‘core interest’ in Chinese foreign policy and it falls under the 2012 White Paper categories of *jeopardizing ethnic unity; instigating ethnic hatred; disrupting social order and stability*. China annexed this previously self-ruling mountain country in 1950. Tibetans have an exile government in India, which China regards as a separatist terrorist organization. We therefore regarded any references to Tibetan independence (including maps, or non-pejorative pictures of the Dalai Lama), symbols of Tibetan resistance, or ethnic unrest to be sensitive. Here the Baidu bubble was almost perfect: apart from one picture of the Dalai Lama, Baidu inside China search results contained no sensitive content, and instead invoked beautiful mountain sceneries.

The last keyword on the list, Uyghurs, refers to the Muslim ethnic minority in China's westernmost region Xinjiang. This keyword falls under the same categories as Tibet, namely *jeopardizing ethnic unity; instigating ethnic hatred; disrupting social order and stability*. As a UN report (2018) has revealed, at least one million Uyghurs have been relocated to re-education camps to clamp down on terrorism and ethnic separatism in the region. Existing research has shown how the Chinese propaganda system emphatically tries to downplay and hide ethnic tensions (Brady 2012). Our Baidu searches corroborate this finding, as they show mostly neutral contents. Strikingly, also our Google searches in Chinese produced only neutral results, mainly images of smiling members of the (presumably) Uyghur minority wearing ethnic clothing, and often dancing. All Chinese language searches therefore upheld Han-Chinese ethnic stereotypes of the Uyghurs, while hiding any signs of ethnic unrest and discontent in the region.

Domain Geolocation and the Chinanet Bubble

Looking into the geolocation of search result domain names, i.e., where domains were registered and therefore under which jurisdiction they fell, reveals one of the key features of how Baidu creates the Chinanet Bubble. To analyze this, we traced each image back to its original website and recorded the site's web address. We then checked the IP-geolocation of each domain (top- and second-level domains). The results are shown in figure 2.

<FIGURE 2>

As Figure 2 shows, the key difference between Google and Baidu search results is where the displayed results' domains were located. As already noted above, the Baidu search engine is known to prioritize servers that are located within Mainland China. Our research confirms this. Indeed, labeling the situation that Baidu creates as the 'Chinanet Bubble' is supported by the results. When a person uses Baidu, they almost certainly will end up with results from within China, regardless of whether they use Baidu in China or abroad, in English or in Chinese. It is also noteworthy that even Baidu results with domains located outside of China often contained positive censorship sites by 'reliable' Chinese media sources, such as the *Global Times*. This is an important finding, because there is a very strong statistical correlation between domain geolocation and the likelihood of each type of search results, as is shown in table 2.

<TABLE 2>

As can be seen in Table 2, there is a very strong negative correlation ($r = -0.77$) between the share of sensitive search results and the share of domain geolocations within China. This means that Chinese domains are almost free of sensitive contents. The shares of neutral and pro-regime search results do not follow the domain location in a statistically significant way. However, because of the dichotomous nature of the variables, the result means that when the shares of neutral and pro-regime images are combined, they correlate with Chinese domains' share of results exactly to the same degree, but in the opposite direction ($r = +0.77$). This underlines how Baidu censorship is not only about the prevention of access to sensitive information, but just as much about positive covert censorship.

One main reason for the negative correlation between contents located in PRC domains and sensitive imagery is the fact that Baidu, unlike Google, often directs its users to various PRC governmental webpages, mainland Chinese media, and services that Baidu itself owns⁴. As shown in Table 2, there is a statistically significant negative correlation ($r = -0.395$) between the amount of such webpages in search results and the number of sensitive search results.

While this finding is not surprising, it does underscore the role of the Chinese online media in keeping the Chinanet Bubble from imploding through positive censorship. At the same time, the results also emphasize the role of commercial Chinese webpages in maintaining the bubble through neutral imagery, since majority of hits were located on commercial pages.

How then is the Baidu bubble created? The bubble is actually a hybrid outcome of three sources of censorship (see also Jiang 2014). First, and probably most importantly, the high preference for domestic domains means that Baidu directs its users to pages that are already under covert and overt self- and third-party censorship by internet service and content providers. Second, foreign domains are beyond the GFW, which undertakes content censorship outside Baidu's control. Taneja and Wu (2014) and Jiang (2014) argue that the GFW plays only a small part in the overall online censorship in China. However, it is probably more important when it comes to searches conducted in other languages than Chinese. Third, the Baidu image crawler will reject images with sensitive ALT tags, which means covert third-party meta-level censorship by Baidu itself. Search engine optimization, i.e., commercial manipulation of top search result positions, was also evident in our sample

⁴ These were the Global Times, Baike, Gov.cn, Chinanews, Xinhua, CGTN, People.cn, China Daily, China Times, CCTV, CNR, CRI, Baidu-associated newsfeed pages, Sohu, and all domains ending with gov.cn.

increasing the amount of neutral images in the top 100 hits. All these factors, taken together, keep search results within the Baidu Bubble highly neutral-to-pro-regime.

Conclusions: Authoritarian Bubbles beyond Borders

We began this article by asking who controls meta-level information online. This is a key question for explaining the emergence of online information bubbles. Indeed, while this question is still being debated in liberal context, our results show how Chinese online censorship tries to create nothing less than a China-wide information bubble that serves the ruling Communist Party by denying the circulation of imagery that does not abide by official lines and narratives. In terms of censorship forms, this represents covert third-party meta-level censorship. While Google fared slightly better in image variety, the results also show how exposure to the Sinophone internet, and domains within China in general, spreads the effect of Chinese online censorship beyond its geographical borders. The Chinese online environment is easy to enter but difficult to exit, which makes the ‘internet sovereignty’ called for by Chinese leaders a fluid concept in the global network space.

In broader terms, such results show how the deliberate manipulation of online content and issuing of ‘positive censorship’ can have productive effects. It should not come as a surprise that while search filtering and personalization has created heated debates and criticism in more liberal political orders, an authoritarian government can find this effect beneficial. It should also not come as a surprise that the order that the Chinese leadership envisages for the

global network is not a liberal one. Threats to online freedom of speech therefore come from many sources, and we should be aware of all of them.

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