

Does Authoritarian Propaganda Ever Respond to Public Opinion?

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Abstract

Does authoritarian propaganda ever respond to public opinion? Facing counterarguments and criticism from the public, do authoritarian regimes ever change their own discourse and respond to public opinion? These questions are understudied in the literature on authoritarian propaganda, which focuses on whether authoritarian regimes still have the capacity to carry out propaganda; what purposes propaganda serves; and how effective propaganda is in affecting public opinion. Through analyzing the Chinese state media's reporting on the human genome editing technology, this study shows that authoritarian propaganda can respond to public opinion. This study applies text analysis specifically sentiment analysis of news articles from the Chinese state media People's Daily, articles written by citizens on the social media platform of WeChat, and news articles from western media. People's Daily's report on human genome editing had been positive and rarely mentioned ethics since the technology was developed in 2015, however, after experienced the harsh criticism from the public on the birth of the genetically edited babies in 2018, the Chinese state media changed its tone to negative when reporting human genome editing technology and introduced discussions on ethics and legal regulations. This finding of the responsive propaganda is consistent with the responsive authoritarianism literature.

Does authoritarian propaganda ever respond to public opinion? Facing counterarguments and criticism from the public, do authoritarian regimes ever change their own discourse and respond to public opinion? These questions are understudied in the authoritarian propaganda literature, which focuses on what purposes propaganda serves, how effective propaganda is in indoctrination, how capable authoritarian regimes are carrying out propaganda... This study examines the propaganda in the authoritarian regime of China to explore whether propaganda could be responsive to public opinion. Consistent with recent findings on responsive authoritarianism, this study shows that propaganda could also respond to public opinion.

Through examining the Chinese state media's reporting on the gene-editing technology, this study shows that the Chinese state media People's Daily consciously responded to public opinion. The People's Daily has always reported the gene-editing technology as scientific advancement. When the first genetically edited twins were born in China, the People's Daily initially reported the news as a great scientific breakthrough and innovation by a Chinese scientist. Facing harsh criticism from the public and Chinese scientists on social media, the People's Daily deleted the original positive report and followed up with reports echoing the public mood. The People's Daily made quick responses through its official accounts on social media. These findings are consistent with both the literature on responsive authoritarianism and the studies showing that the Internet has strengthened authoritarian rule by promptly monitoring and guiding public opinion.

The case of the gene-edited babies is a convenient test of the hypothesis that authoritarian propaganda could respond to public opinion. The news story was not a particularly sensitive political issue. The target of the public criticism was a scientist, but not the government or government officials. It might be easier for the state media to respond to public opinion. Three

conditions potentially facilitated the Chinese government to change its own discourse on this case. First, it is not a political issue. Second, it triggers public panic and threatens social stability. Third, it is a rapidly developing new issue and the scientists declared a clear position and lead the public opinion. The conditions for responsive authoritarian propaganda identified in this study needs to be further tested against political news and in other authoritarian regimes.

Propaganda in Authoritarian Regimes

Propaganda is defined by (Kenez 1985) as “the attempt to transmit social and political values in the hope of affecting people’s thinking, emotions, and behavior.” Propaganda in today’s world is not necessarily old-style propaganda of a Leninist state: which is obsessively ideological, boring, or unrealistic. More common propaganda today is subtle and sophisticated propaganda similar to government public relations in democracies. Huang (2015) called this type of subtle propaganda “soft propaganda” contrasting the old-style “hard propaganda”. Although its style is less propagandistic, “soft propaganda” still aims to guide public opinion and promote regime legitimacy. In the case study of China for this research, the political messages from the Chinese government attempting to promote pro-regime values and attitudes among the public are considered propaganda.

This study aims to examine whether propaganda in authoritarian regimes ever respond to public opinion during what scholars call a “public opinion crisis,” referring to situations where there is a mismatch between the position of the state and public opinion on a particular issue (Stockmann 2010). This question is understudied in the existing literature of authoritarian propaganda, which can be summarized into three big questions: 1. whether authoritarian regimes still have the capacity to carry out propaganda or how propaganda works in today’s authoritarian

regimes (Tong 2005; Brady 2009; Creemers 2017); 2. what purposes propaganda serves (Huang 2015, 2018); and 3. how effective propaganda is in affecting public opinion (X. Chen and Shi 2001; Stockmann 2010; Stockmann and Gallagher 2011).

On the first question, scholars agree that authoritarian regimes especially China still enjoys a strong capacity to carry out propaganda and information control. Brady (2009) systematically examined how propaganda works in a commercialized and marketized economic system. Even after China goes through economic reform and the media industry goes through commercialization, the Chinese government still has a strong capacity to carry out propaganda and thought work, which are in fact the very life blood of the party-state, one of the key means for guaranteeing the Chinese Communist Party (CCP)'s ongoing legitimacy and hold on power. Creemers (2017) recorded how the Chinese government has upgraded propaganda adapting to technology in the digital era.

As to the purposes of today's propaganda, Huang (2015, 2018) has quite insightful observations. He argued that besides the common understanding of political propaganda as a means to indoctrinate the masses with pro-regime values and attitudes, propaganda especially pretentious hard propaganda is often used to signal the government's strength in maintaining social control and intimidate citizens from challenging the regime.

In terms of the standard indoctrination function of propaganda, the exiting scholarship focuses on the effectiveness of propaganda: can propaganda convince people, change their opinions and imbue them with attitudes favorable to the government, can citizens resist propaganda, and who can resist propaganda. In terms of effectiveness, there are arguments on both sides. On the one hand, Chen and Shi (2001) show that media exposure has negative effects on people's attitudes toward the government using a 1993-1994 national survey in China.

Studying the case of the Anti-Falungong campaign, Tong (2005) shows that the propaganda machinery still possesses formidable institutional capacity to quickly produce a large amount of propaganda articles and books assaulting the regime's challengers, however, such publications have only limited circulation. Using a survey of Chinese college students, Huang (2015) finds that ideological and political education does not increase government satisfaction. Huang (2018) further shows that hard propaganda is not only ineffective but often backfires and worsens citizens' opinion of the state.

On the other hand, Stockmann and Gallagher (2011) find that Chinese media's sophisticated propaganda of citizens' positive experiences in the legal system successfully promotes the image of a pro-worker bias of the law and encourages aggrieved citizens to use the law, therefore contributing to regime legitimacy. Stockmann (2010, 2012) further shows that the Chinese government's ability to influence public opinion through the news media is strengthened after commercialization, as citizens perceive the commercialized media as credible information sources. Kennedy (2009) using the 2000 World Value Survey, shows that media exposure increases satisfaction with the national leadership among Chinese citizens. Similarly, Yang and Tang (2010) find that media exposure increases administrative trust and social trust in China using a 2004 national survey.

Some other studies have shown that the impact of authoritarian propaganda varies by political awareness, education, or anti-regime predispositions. Geddes and Zaller (1989) find that politically aware citizens are more exposed to but also better at resisting propaganda. Kennedy (2009) shows that Chinese who have completed no more than compulsory education respond to political news positively and display high levels of political support, while people who have

education beyond the compulsory level are more resistant to political messages and tend to have lower levels of support.

What's not explored in this literature is whether authoritarian propaganda ever responds to public opinion by changing its own discourse when propaganda is not effective and fails to convince or persuade citizens. Stockmann (2010) believes that during public opinion crisis, the Chinese government is able to persuade citizens and guide public opinion and showed that during the 2005 anti-Japanese protests the Chinese government was able to calm down the angry protesters through propaganda. However, the recent decade has seen a rising public opinion in authoritarian regimes especially over the Internet (G. Yang 2011). Popular nationalism online sometimes affects courts' decisions (Lagerkvist 2005) and online public opinion sets agenda for the traditional media (Luo 2014). Facing the rising public opinion, the authoritarian regimes can not win every time on the battlefield of public discourse (Qiang 2011). When citizens hold an opinion contradicting the government's position and propaganda fails to persuade people, does propaganda ever respond to public opinion by changing its own position and following the public's opinion? This study explores this question with a case study of China.

Responsive Authoritarianism in China?

Responsive authoritarianism – authoritarian regimes responding to the needs and demands of citizens, although seems inconceivable, is well documented in the literature of China studies (Reilly 2013; J. Chen, Pan, and Xu 2016; Heurlin 2016; Tang 2016). Tang (2016) even calls the Chinese regime hyper-responsive to collective actions. The responsiveness most scholars have examined is the responsiveness in terms of government policies to collective actions (Perry 2002; Bernstein and Lü 2003; O'Brien and Li 2006; P. L. Lorentzen 2013; Y. Li 2014). Heurlin

(2016) showed that the Chinese government substantially reformed land taking and demolitions policies in response to a series of protests against rural land takings and urban demolitions. With the standard definition of responsiveness in terms of policy congruence, Truex (2014) shows that proposals put forth by members of the China's National People's Congress (NPC) represents citizens' policy preferences. Meng, Pan, and Yang (2014) show that Chinese officials are willing to incorporate suggestions of citizens into policy. Measuring responsiveness in terms of answering citizens' inquiries, Chen et al. (2016) finds that local Chinese governments respond to threats of collective action and upper-level government supervision.

Given this responsiveness of the Chinese government in policies, we might expect the government to be also responsive to public opinion in terms of propaganda. However, on the battle between propaganda and the rising online public opinion, the existing scholarship depicts a very different picture from responsiveness: a story of repression and party control. Scholars have examined three strategies of authoritarian regimes in dealing with rising public opinions online: censorship (King, Pan, and Roberts 2013, 2014; P. Lorentzen 2014; Cairns and Carlson 2016), opinion management (Han 2015; King, Pan, and Roberts 2017; G. Yang 2017; J. Meng 2019), and upgrading propaganda (Schlaeger and Jiang 2014; Creemers 2017).

Censorship is the most heard story when it comes to information control in authoritarian regimes. Headlines such as "Chinese Social Media Stunned as Nearly 10,000 Accounts Shut Down" (Zhuang 2018) and "China Rips into Tencent's News Service, Killing 9,300 Mobile APPs" (Bloomberg 2019) appear often in the news. The pattern of censorship in China discovered by scholars is never "deleting everything", but quite strategic and selective, allowing some content but not others. King et al. (2013, 2014) find that the Chinese government censors online posts with collective action potentials, but not posts criticizing government or leaders.

Lorentzen (2014) shows that the Chinese government permits investigative reporting on lower-level officials to obtain feedback and improve governance. Cairns and Carlson (2016) find that during the anti-Japan protests in 2012, the Chinese government chose not to employ heavy censorship when netizens' anger peaked. Out of concerns such as "audience costs" (Weeks 2008) and "safety valve" – through which public anger could be vented and not develop into greater social instability, the censorship program by the Chinese government is not as strict or absolute as in an totalitarian regime, however it still has a strong flavor of repression, heavy surveillance and close monitoring of citizen activities. The studies on censorship and public opinion monitoring have never recorded responsiveness to public opinion in government propaganda.

Another strategy by authoritarian regimes that goes with censorship is opinion management. Studies examining opinion management shows that the Chinese government's strategy is not to engage in arguments with criticism of the party and the government, and to not even discuss controversial issues, but to distract the public and cheer for the regime (King, Pan, and Roberts 2017). Yang (2017, p.1946) also shows that the Chinese government "no longer use only coercive methods to block and filter content or to harass dissidents, but they have also embraced proactive and preventive methods to inhibit critical speech and actively produce 'positive energy' online, that is, speech supportive of government agendas." By avoiding arguing with criticism and inhibiting negative comments, the Chinese government resists to acknowledge the very existence of dissent opinions, let alone to respond to it or follow it.

Besides censorship and opinion management, the Chinese government also adapts to the digital era by using the technology to upgrade its own propaganda. One vivid example is the "Learning Xi Jinping" (学习强国) app as one of the most downloaded applications on App Store. Every party member needs to learn Xi Jinping Thoughts through this app every day, take

tests and get high rankings among colleagues and friends. This mobile application has made propaganda more efficient and its network feature has turned receiving propaganda into a contest, as the more time you spend on learning, a higher score you get, also individual scores and rankings are public information. This “Learning Xi Jinping” app is the Mao’s red book in a world with smart phones and the Internet.

Technology is the key of the CCP’s information control, surveillance and monitoring systems as well as propaganda (Creemers 2017). Almost all local governments have official social media accounts (Noesselt 2013). These official accounts often attract a large number of followers since local governments use them to make announcements, publish local news, and provide policy information and instructions. Therefore, followers tend to perceive these accounts as credible information sources. It is quite convenient for local governments to use social media for propaganda by constantly publishing posts cheerleading for the regime and the leaders. The social media platforms are also used by the government to reach the young generations (W. Zheng 2019). The Internet and social media have strengthened the abilities of the regime to carry out propaganda (MacKinnon 2011). It would be interesting to examine if this upgraded propaganda system is more effective in indoctrination than traditional media.

The literature on censorship, opinion management and propaganda seem to have established that authoritarian regimes such as China has tight and effective control of information and close monitoring of public opinion, quite the opposite of the conclusions from the responsive authoritarianism literature. Given the massive censorship and tight information control, is it too optimistic to expect authoritarian propaganda to respond to the public by following the public’s opinion even only very occasionally?

It is expected that propaganda discourse is harder to change and respond to public opinion than policies. History has witnessed a lot of episodes where authoritarian regimes adjusted their policies to public demands but insisted on keeping the same ideological propaganda. One vivid example is how China has gone through four decades of economic reform and has established an economic system of a quite typical state capitalism, but still prohibited using the term of “capitalism” to describe its economy. Another example is according to the propaganda, the official goal of the CCP is still to achieve communism in China regardless of how many people including government officials actually believe that.

However hard to change, it is still possible for propaganda discourse to adapt to changing social circumstances (Noesselt 2013). One reason for official discourse to change is that the public exposes injustice, wrongdoings and corruption of government officials. We can imagine when corruption of particular officials is revealed online and angry netizens are easily mobilized, the government will quickly respond to public opinion pressure and denounce the particular leaders no matter how much these leaders were praised in the past. Another reason to expect propaganda to change is on apolitical issues, the cost of responding is low before these issues are somehow turned into anger toward the government. Seemingly apolitical issues could also trigger Internet incidents (G. Yang 2014) and netizens invariably turn them into political discussions, the authoritarian governments have incentives to respond and might even change its own discourse to prevent an apolitical issue turning into a political incident. A third possibility for authoritarian rhetoric to adjust to public opinion is on newly emerging issues or issues that are quickly developing such as LGBT issues, the public and government might negotiate social norms and public discourse (C. Li and Liang 2018). Following these theoretical possibilities, I

find a case where the official propaganda responded to public opinion by changing its own discourse.

Responsive Propaganda in China: the case of the genetically edited babies

The one case I found where the authoritarian propaganda changed its own rhetoric responding to public criticism is the internet incident about the birth of the gene-edited babies in China in 2018. On November 26th, 2018 (BJT), a Chinese scientist, He Jiankui announced that he helped make the world's first genetically edited babies – twin girls were born in China, whose DNA was altered when they were just a single cell. This gene surgery, He claimed, will protect the girls from possible future infection with HIV, the AIDS virus. The case was controversial where some see a new form of medicine that eliminates genetic disease, others see a slippery slope to enhancements, designer babies, and a new form of eugenics. The technology of human embryo editing is also ethically charged because changes to an embryo would be inherited by future generations and could eventually affect the entire gene pool of the human race. Therefore, human embryo genome editing is banned in the United States and many other countries.

He Jiankui made his announcement through a YouTube video and an interview with the Associated Press. The following Table 1 records the timeline of the initial media coverage on the story of the gene-edited babies. The story was first published by MIT Technology Review with a negative tone and the Associated Press with a balanced report, then the story was published by the People's Daily online (Renmin.com) at 10:51am on November 26th, 2018 with a very positive tone praising it a stunning medical achievement, scientific breakthrough and an exciting world's first. The People's Daily article was then forwarded by many Chinese media outlets such as Sina and ChinaNews.

However, by late afternoon on November 26th, many articles and postings appeared on social media harshly criticizing the scientist He Jiankui and denouncing his experiment as not a scientific breakthrough but irresponsible human experimentation. The criticism includes the unknown health risks to the twin girls, the huge ethical charge of altering the DNA of the entire human race, and the questionable necessity of editing otherwise healthy embryos. At 17:20, 120 Chinese scientists published a letter through the Weibo account “Intellectuals” condemning He’s experiment as “crazy” and “unethical”. The letter stated that "The gene-editing technique used in the experiment is nothing new, but scientists across the world won't, or would not dare to, do it because of the off-target risks and the social impact it could have." The scientists also stated that “the biomedical ethics review for this so-called research exists in name only.” “This is a huge blow to the global reputation and development of Chinese science, especially in the field of biomedical research. It is extremely unfair to most scholars in China who are diligent in research and innovation.”

As negative comments and posts flooded the major social media platforms, the People’s Daily deleted its original positive article, then at 19:00 the People’s Daily’s Weibo account published a post claiming that the research was privately conducted and funded by the researcher He Jiankui while on sabbatical, so his university and the relevant regulatory department were both unaware of his experiment, and the government would launch an investigation. The People’s Daily then published a longer article through its WeChat account criticizing He’s research for leaving ethics behind, and followed up with more negative posts on Weibo.

From the original positive article at 10:51am to the first negative post through Weibo at 19:00, the People’s Daily had made a quick response to the public’s criticism and a 180-degree turn on the gene-edited babies story. In order to make sure this change in discourse on the

People’s Daily is a conscious response to the public opinion by the CCP’s mouthpiece, not just one editor made a mistake, I collected all articles on genetic editing from People’s Daily’s website and its Weibo and WeChat accounts to show the official discourse on human genome editing indeed changed because of the gene-edited babies episode.

Table 1 Timeline of the initial reports on the genetically edited babies

No	Date	Time	Title	Source	Sentiment
1	11/25/2018	GMT/EST? (before the AP article)	EXCLUSIVE: Chinese scientists are creating CRISPR babies	MIT Technology Review	negative
2	11/26/2018	Morning BJT	AP Exclusive: First gene-edited babies claimed in China	AP	balanced
3	11/26/2018	10:51 BJT	First gene-edited babies protected from HIV born in China	Renmin.com	positive
4	11/26/2018	Afternoon	Articles on WeChat		negative
5	11/26/2018	17:20 BJT	120 scientists’ statement	Weibo account: Intellectuals	negative
6	11/26/2018	19:00 BJT	SUST unaware of the gene-edited babies Shenzhen Health Commission launches investigation	People’s Daily Weibo	negative
7	11/26/2018	Evening BJT	Other western media followed up with the AP article as the source		
8	11/26/2018	21:38 BJT	Gene-edited babies incident questioned by academia: do you dare to drive a car with no brakes?	People’s Daily Weibo	negative
9	11/26/2018		Human gene editing: scientific development should not leave ethics behind	People’s Daily WeChat	negative
10	11/26/2018	22:24 BJT	People’s Daily WeChat comments: do not open Pandora’s box	People’s Daily Weibo	negative
11	11/26/2018	22:40 BJT	National Health Commission responds to gene-edited baby incident: immediate investigation, will be addressed according to law	People’s Daily Weibo	negative
12	11/26/2018	23:39 BJT	Gene-edited baby incident provokes outcry	People’s Daily Weibo	negative

Data and Measurements

I collected three datasets to examine the responsiveness of the People’s Daily to public opinion on the case of genetically edited babies. The first dataset includes all articles about gene-editing from People’s Daily online, and its Weibo and WeChat accounts. With the keyword

“gene-editing” (基因编辑), the search on People’s Daily’s different platforms resulted 304 unique articles by March 21st, 2019. The first article on genome editing technology appeared on the People Daily in April 2013. Reading through each one of the 304 articles, I further differentiated the articles into three topics: human genome editing, animal genome editing, and genome editing technology in general. Sentiment analysis of these 304 articles will show how the rhetoric changed because of the He Jiankui incident.

The second dataset includes all articles on the incident of genetically edited babies from WeChat’s public accounts (公众号), which are different from individual accounts. I chose the social media platform of WeChat over Weibo to capture public opinion because WeChat’s public accounts publish long original articles with fully elaborated opinions while Weibo posts tend to be short and retweets. The keyword search with “gene-edited babies”¹, also “He Jiankui” resulted 691 different articles from WeChat’s 340 public accounts by April 12th, 2019. The 340 public accounts are further classified into 55 official accounts, which are accounts of official media and government departments², and 285 true public accounts, which are accounts operated by individuals or companies. Sentiment analysis of the 691 articles will show the public mood on the incident of the gene-edited babies also whether official accounts differ from public accounts on the issue.

¹ Multiple Chinese terms have the same meaning of “gene-edited babies”. The Chinese keywords tried are “基因编辑婴儿”, “基因改变婴儿”, “修改婴儿基因”, and “贺建奎”, also the traditional Chinese characters of these terms, as articles published by public accounts in Hong Kong, Taiwan or overseas use traditional Chinese characters.

² The coding rules are if an account is one of the Party media (see the list on <http://cpc.people.com.cn/GB/64162/116900/index.html>), radio station, TV station, different levels of governments, and government departments, it is coded as official account; if it is a media account but not on the Party media list, then check the media on the website <http://www.gapp.gov.cn/zongshu/paper.shtml> for its supervisor and operator, if it is supervised or operated by a Party or government organization, the account is also coded as official. For example, the WeChat account “China Youth Daily” is not a Party newspaper, but its supervisor is the National Youth League, a party organization, then it is coded as official. The rest are true public accounts.

The third dataset is the collection of all articles from western media on the gene-edited babies story. The key word search with the terms “gene edited babies” and “He Jiankui” was done in the Nexis Uni database (formerly LexisNexis). The total number of articles collected by March 15th, 2019 was 419 from 154 different media outlets in 28 countries. Sentiment analysis of the 419 articles will show the global attitudes toward the story of the gene-edited babies.

The focus of this research is sentiment analysis of articles. For the 304 articles from the People’s Daily, I use three measures of sentiment: human coding, keyword dictionary sentiment measure, and the sentiment measure of Boson natural language processing (NLP) platform (which is used in S. Zheng et al. 2019). For the 691 articles from WeChat, I did not read through each one of them so do not have the luxury of human coding, but only the keyword dictionary sentiment measure and the Boston NLP measure. For articles in English, I use two measures: the sentiment measure and the subjectivity measure by the Python package of “TextBlob”.

The human coding was done by two individuals independently. Reading through each article from the People’s Daily, the two researchers coded the articles into “positive”, “neutral” or “negative” toward gene-editing technology in general, animal gene-editing or human gene-editing. The inter-coder reliability rate is 82%. The biggest disagreement between the two coders is between a subtle positive tone and neutral. When the two coders are forced to pick between “positive” and “negative”, without the “neutral” category, the inter-coder reliability rate is 99%.

The keyword dictionary sentiment measure is based on two dictionaries, one containing positive terms and phrases and other one negative. I define these two dictionaries based on extensive reading of articles from the People’s Daily and WeChat. The keywords include both

general positive or negative terms³ and also terms specific to gene-editing⁴. The positive dictionary includes 147 entries and the negative dictionary includes 148 entries (see Appendix for the complete lists). For each article, I extract the first 200 TFIDF keywords with their corresponding weights (see Appendix for the keyword weight calculation) and compare the 200 keywords to the two dictionaries and get the number of positive and negative keywords and their weights. The keyword sentiment measure is the weights of positive keywords minus the weights of negative keywords. A positive value indicates positive sentiment and a negative value means negative sentiment.

The Boson NLP sentiment measure is obtained from the Boson platform, a machine-trained sentiment analysis algorithm from computational linguistics. The training text for the People's Daily articles are news, and for the WeChat articles are posts from Weibo since the Boson platform does not have WeChat articles as training data. The output from Boson for each article is a probability for that article to be positive. A value bigger than 0.5 indicates positive sentiment. I centralized the probability by subtracting 0.5 so that a positive value indicates positive sentiment and negative value negative sentiment, consistent with the dictionary measure.

For English articles from the western media, I use the Python package of "TextBlob" to get two measures for each article: the sentiment measure ranging from -1 to 1 with positive values indicating positive sentiment and vice versa, and the subjectivity measure meaning whether the article is dominated by subjective sentences which refer to personal opinion, emotion or judgment, or dominated by objective sentences referring to factual information. The subjectivity

³ Examples of general positive terms include "excellent" (优秀), "great achievement" (功成名就) and general negative terms such as "serious consequences" (严重后果) and "public anger" (众怒).

⁴ Issue specific terms include phrases such as "naturally protected" (天然免疫), "completed cured" (彻底治疗) and "dare to be the first" (敢为天下先) that are positive and "off-target" (脱靶), "great risks" (巨大风险) and "the devil first" (始作俑者) that are negative.

measure ranges from -0.5 to 0.5 with positive values meaning subjective and negative values objective.

Results

The following Table 2 reports the agreement rates between the multiple measures of the People’s Daily articles. The keyword measure performs very well as it has quite high (over 90 per cent) agreement rates with both human coders, especially considering the human coding has three categories “positive”, “neutral” and “negative” while the keyword measure only has “positive” and “negative”. Therefore, I focus on interpreting the results of the keyword dictionary measure.

Table 2 Agreement between the multiple measures of the People’s Daily articles

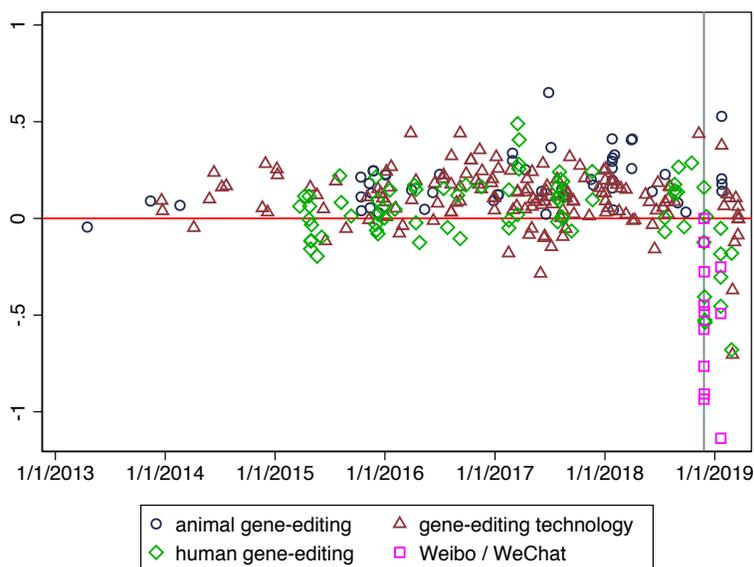
Measure one	Measure two	Agreement rate
Human coder 1	Human coder 2	82%
Keyword	Human coder 1	92%
Keyword	Human coder 2	91%
Boson NLP	Human coder 1	78%
Boson NLP	Human coder 2	81%
Keyword	Boson NLP	74%

Figure 1 shows the keyword dictionary sentiment results of all articles from People’s Daily online, and its Weibo and WeChat accounts. The articles are differentiated to four groups: the social media articles (purple square in Figure 1), articles about gene-editing technology in general (brown triangle), articles about animal gene-editing (navy circle) and articles about human gene-editing (green diamond). The x-axis is date with the vertical line on the date of the

gene-edited babies incident November 26th, 2018 and the y-axis is the keyword sentiment measure with positive values indicating positive sentiment.

Figure 1 clearly shows the pattern of the change in the sentiment of these articles. Report by the People’s Daily on gene-editing no matter the subtopic has been overall positive up until the incident on November 26th, when the rhetoric suddenly turned negative. If we take a closer look at the subgroups, we can see the most significant sentiment change happen on human gene-editing. Before the incident of the genetically altered twin babies, the reports on human gene-editing have been overall positive, but after the incident, all articles about human gene-editing are negative. The reports on animal gene-editing however are not affected by the incident and are still quite positive. The articles from the People’s Daily’s social media accounts were all responding to the gene-edited babies incident because they all appeared on November 26th and after, and these posts are noticeably more negative than the rest non-social media articles, which might be interpreted as evidence of the People’s Daily trying to be congruent with the public anger on social media.

Figure 1 Keyword sentiment measure of the People’s Daily Articles



Besides the quantitative sentiment analysis, a quick browse of the article titles over time from the People's Daily can also capture the change in its rhetoric. Before the gene-edited babies incident, titles of reports on human gene-editing read like "CRISPR technology⁵ is effective and safe", "Human genome editing accepted by the public", "gene-editing will make you healthy and smart"... while after the incident the titles changed into "gene-edited babies: do you dare to drive a car with no brakes", "Human gene editing: scientific development should not leave ethics behind" and "Punish science adventurers with law"...

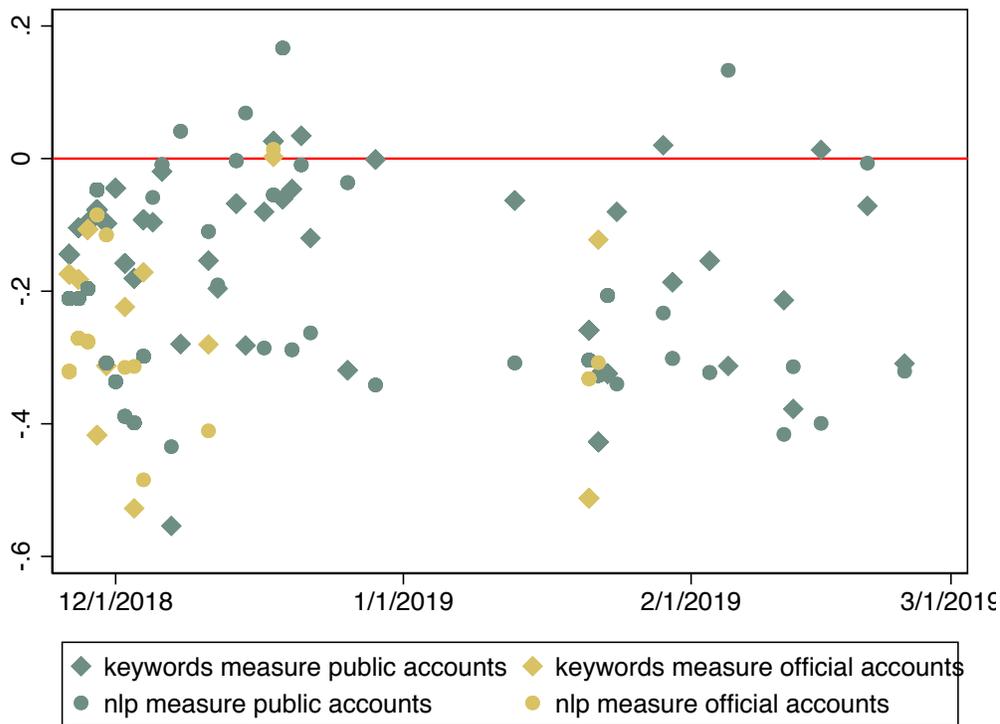
The contrast between the articles before and after the incident on the discussion of research ethics is most astounding. The articles on human genome editing before the incident rarely mentioned ethics but focused on how China should catch up with other countries and even bypass other countries in the international competition of developing and applying human genome editing technology. When ethics was mentioned, the discussions were about how ethics was an unnecessary obstacle for scientists in other countries. In an article when praising the fast development of China in the gene-editing field, the editor's comments read "American scientists can only be bystanders because of religious and ethical obstacles"⁶. Another article with the title "South Korea gives up gene-editing technology because of ethics" talked about how much Korean scientists envy the research environment enjoyed by Chinese scientists because of South Korea's strict ethics regulations. This positive rhetoric on gene-editing is consistent with the broader pro-regime propaganda by the CCP. However, this rhetoric significantly changed after the incident of the gene-edited babies because of the public anger.

⁵ The CRISPR technology is a powerful gene-editing tool that He Jiankui used to make the genetically modified twin babies.

⁶ People's Daily online, "More, Safer, Efficient, Human Embryo Gene-editing in US Started to Show", July 28th, 2017, 7:59 AM.

The sentiment analysis of the articles from WeChat shows this negative public mood. Figure 2 shows the results of the keyword sentiment measure and Boson NLP measure of the median article on every day (not all articles to show a clean picture). The two colors indicate the two types of accounts: official accounts (brown) and true public accounts (teal), and the two shapes mean the two sentiment measures (diamond – keyword measure, circle – Boson measure). The starting point of x-axis is November 26th, 2018. Figure 2 shows a clear picture of negative sentiment on the incident of the genetically edited babies, and the articles from official accounts are not noticeably different from the true public accounts in terms of the negative sentiment. The two measurements also agree with each other on the public anger over the incident.

Figure 2 Keyword and Boson NLP sentiment measures of the WeChat articles (daily median)



I picked five of the most popular articles on the incident from WeChat on November 26th to check the measurements. The Table 3 shows the information and the two measures as well as my own coding of the five most popular articles, which are read by over 100,000 people. The three measures agree with each other on each article, showing a quite negative public mood on the story of the gene-edited babies.

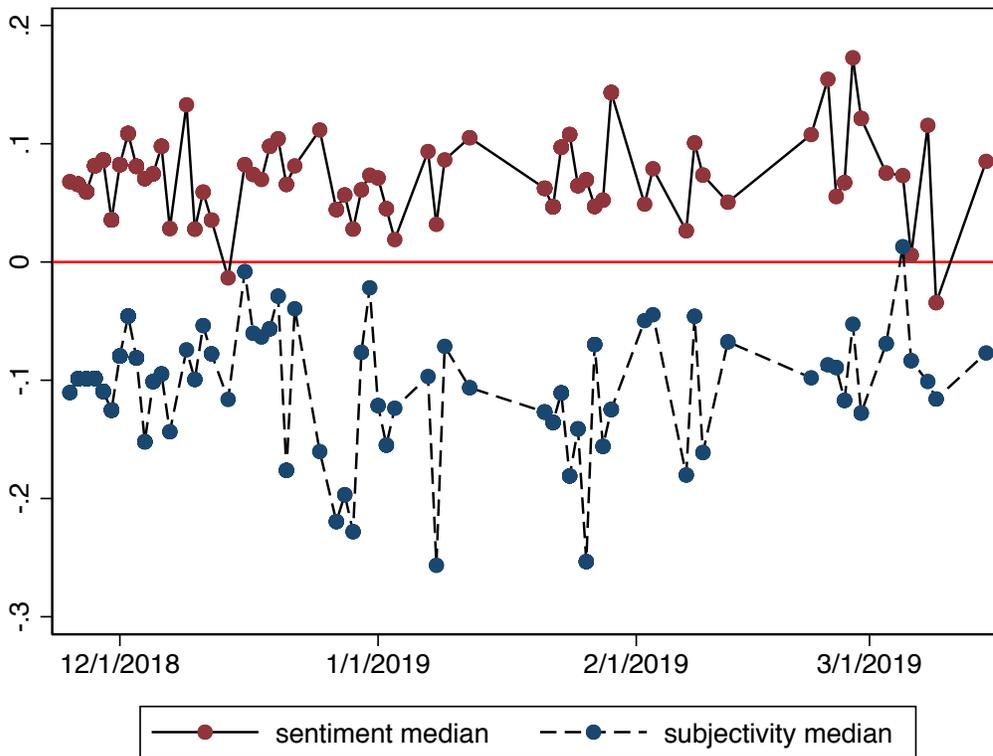
Table 3 The most popular articles from true public accounts on WeChat on 11/26/2018 about the Gene-edited Babies (read by over 100,000 people)

No	Title	Publisher	Views	Keyword	Boson	Author
1	Why the big news of CRISPR-baby provokes collective questioning and criticism in the science community?	Xiakedao	191,391	-0.547	-0.396	negative
2	From an unreliable hospital came the first CRISPR-babies: not clear whether healthy, patient consent questionable	Keyanquan	100,000+	-0.002	-0.470	negative
3	Outcry: gene-editing baby provokes common criticism in Biomedical science	Saixiansheng	100,000+	-0.290	-0.395	negative
4	Behind the news of first CRISPR-baby born in China: lots to learn, parties involved shifting blames	Qidian	100,000+	-0.035	-0.172	negative
5	Questioning: First CRISPR-babies protected from HIV born in China	Jieluoxuan	100,000+	-0.254	-0.477	negative

So far, I have shown that the reports from People’s Daily on gene-editing clearly changed from positive to negative after the incident of the gene-edited babies, and the public anger over the incident on social media. Is it possible that the changing propaganda was actually responding to international pressure rather than the domestic public opinion? To explore this possibility, I further analyze the sentiment of the western media articles on the gene-edited babies. The Figure 3 shows the results of the sentiment and subjectivity measures of the western media articles (the daily median not all articles). The starting point of x-axis is November 26th. The results in Figure 3 seem to suggest that the international media did not create a huge pressure on the Chinese government on this particular issue. First, the daily median of the subjectivity measure is overall

negative meaning the western media articles tend to be dominated by objective information rather than subjective judgments. Second, the sentiment measure actually is overall positive rather than negative, probably because reporting the factual information of the story involves using the terms such as “the world’s first”, “breakthrough” and “scientific development”. This analysis of western media articles provides further confidence in the conclusion that the changing rhetoric by the People’s Daily was responding to the domestic public opinion.

Figure 3 Sentiment and subjectivity measures of western media articles (daily median)



Responsiveness in Policies

Consistent with the responsive authoritarianism literature, the Chinese government’s responsiveness on the issue of generic engineering and the relationship between scientific development and research ethics more broadly, is not limited to the reports on the People’s Daily but also in top leaders’ speeches, government documents and policies. Research ethics has

become significantly more important after the incident than before. On August 9th, 2016, the State Council issued the “13th five-year plan for scientific innovation” emphasized that the fields such as gene-editing is going through generational advancement where new technology replacing old ones and Chinese scientists should take this historical opportunity to “catch up with”, “run side by side” and even “lead” the field and win in the international competition. Research ethics was not mentioned at all. Similarly, in a speech by Xi Jinping on May 25th, 2018 in the Chinese Academy of Sciences, he emphasized an urgent need for scientific breakthrough without mentioning ethics.

However, after the incident, Li Keqiang made a speech on January 8th, 2019 in the science awards meeting titled “Let rule of law guide scientific innovation” where he emphasized upholding strict ethics regulations for scientific research. On January 21st, 2019, Xi Jinping made a similar speech to call for legislation to regulate research in fields including gene-editing. In March 2019 ethics in scientific research appeared in annual government report for the very first time. In terms of policies, on February 26th, 2019, the National Health Commission released a draft of new regulations on biomedical technology, specifying more strict review process for research ethics and clear punishment for violations. In this draft of new regulations, gene-editing is classified as “high risk” technology and needs to be reviewed by the State Council.

Possible Reasons for Responsiveness

What makes this case special where the Chinese government responded to public opinion and changed its own discourse also adjusted its policies, while the literature recorded numerous examples of massive censorship, harsh opinion management and even shutting down of the

entire Internet in Xinjiang in 2009? There are several possible reasons for the responsive propaganda revealed by this particular case.

The first reason is public panic and social instability, as observed by many scholars the Chinese government responds to collective action and instability. In a speech by Xi Jinping on March 15th, 2019 titled “be vigilant and effectively manage the serious risks in science”, he said that scientific research is a double-edged sword, can have serious ethical and moral implications on the society, when people are not ready to accept a new technology, the technological advancement can intensify social conflicts. Out of the concern of instability and social conflicts, the government toned down its propaganda on pushing for scientific breakthrough and responded to the public’s worries.

The second reason I suspect for the responsive propaganda is because this generic case is not a political issue. It is relatively easy for the government to change the rhetoric and adjust its policies. During the process of this incident, when the discussions on social media started to point fingers at the government for loose regulations, the government immediately responded by claiming the scientist acted on his own and the government was unaware of his research, in order to prevent the apolitical issue turning into a political incident. Because it is not a political issue the government has the individual scientist to blame, the costs of responding are relatively low. On politically sensitive issues such as the Constitution amendment in 2018 abolishing the two term limits, we can imagine the Chinese government would never change its own discourse no matter how much public anger or panic was expressed.

The possible third reason is that the government is actually convinced by the public’s criticism especially the opinions of the scientists, that we need more discussions on research ethics and scientific research needs to be better regulated. On rapidly developing new issues such

as generic engineering, the government probably is still updating its own stance and policies and is relatively more open to public feedback.

Responsiveness versus Censorship

When there is an Internet incident, meaning large numbers of postings and comments on a social issue appear and circulate online, the most common story we hear is censorship. After all the Chinese government has established a massive censorship organization. Then when the government responds to public opinion, does it also censor postings and comments? The answer is yes. The gene-edited babies incident is one of the most censored topics in 2018 (Cyranski 2019). The WeChatSCOPE project⁷ monitors 4,000 WeChat public accounts and records the censored articles. From their database, I collected 33 censored articles on gene-edited babies. Most of these articles were censored during the week of November 30th to December 4th, 2018, not on November 26th or 27th, when the discussion was most heated. The most common reason for censorship was “violating Internet laws”.

Reading through each censored article, I can not tell why these articles were censored since many similar articles were not censored, except for one probably, which includes a screenshot of the original positive article by the People’s Daily. I compare the keyword sentiment measure of the censored articles and the popular articles, defined by over 10,000 readers, and find no noticeable difference between these two groups of articles (see Appendix for the results). This analysis shows that censoring public opinion and responding to public opinion are not mutually

⁷ <https://wechatscope.jmssc.hku.hk>

exclusive. The Chinese government still censors articles while actively responding to public opinion.

Conclusion

Going back to the question “does authoritarian propaganda ever respond to public opinion”, this study shows that the answer is yes. Responsive propaganda in authoritarian regimes is possible. Through the case of the genetically edited babies, I show that the Chinese government responded to the public opinion by changing its own discourse on human genome editing from positive to negative. The responsiveness also appears in speeches of top leaders, government documents and policies. Social media and the Internet are powerful tools for the authoritarian regime to closely monitor public opinion and make quick adjustments if necessary.

However, this responsiveness is limited. It is not realistic to expect responsive propaganda as a regular phenomenon. There are several possible conditions making it possible for the government to respond and change its own propaganda. First, the gene-editing case is not a political issue, not directly challenging the fundamental ideologies or principles of the communist regime. Second, it creates public panic and threatens social stability, which gets on CCP’s nerves. Third, it’s a newly developing issue on which the government might be more open and willing to listen to the public. Especially the scientists acted as opinion leaders on this issue and the government is probably more willing to listen to the scientists.

This case study also shows that propaganda can respond to public opinion, but still in an authoritarian style. The Chinese government never openly retreated its original positive report of the gene-edited babies on the People’s Daily, instead they quietly deleted that article and pretended that never happened. After the incident, the Chinese government pretended that upholding strict ethical rules on scientific research has been their position all along and

conveniently forgetting their praise of human genome editing and mocking of other countries for their tight regulations on research ethics. In other words, the government did change its own rhetoric but pretended it never did.

The literature on censorship, opinion management and upgraded propaganda already explains very well the strategies of authoritarian regimes facing rising public opinions. My study of the responsive propaganda completes the picture of the relationship between authoritarian government and public in terms of shaping public discourse. On the battlefield of the Internet and social media, public opinion occasionally wins in a sense that the authoritarian government fails to control, guide and inhibit dissent opinions that challenge the government's agenda, and the government even changes its own rhetoric to be consistent with the popular dissent.

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Appendices

Appendix A Dictionaries

Table A1 The dictionary of negative keywords

一己之私	多行不义必自毙	毁灭性	草率	强烈谴责
不人道	始作俑者	沉重	虚假	巨大风险
不可告人	害死	沦丧	讽刺	不确定性
不怀好意	屠杀	沽名钓誉	诅咒	坚决反对
不择手段	崩坏	沾沾自喜	诈骗	令人不安
不良后果	形同虚设	流氓	该死	公然
不计后果	心怀鬼胎	涉嫌犯罪	谋害	不可接受
不负责任	急功近利	滥用	谋杀	严重损害
丑陋	恐怖	潦草	谴责	亵渎
严厉批评	恐慌	灾难	败坏	愤慨
严惩	恶劣	犯罪	败类	不端
严重后果	恶劣影响	狂人	质疑	疯狂
丧尽天良	恶魔	狂妄	贪婪	
丧心病狂	惨无人道	疯子	贸然	
人渣	惩罚	痛苦	走火入魔	
众怒	惶恐不安	瞒天过海	践踏	
伤害	惺惺作态	知法犯法	轩然大波	
伦理	愚蠢	祸害	违规	
伦理道德	愤怒	祸患	追名逐利	
伪造	批判	粗暴	逃避	
作假	批评	罄竹难书	遗祸	
作孽	担忧	罪大恶极	遗臭万年	
冒天下之大不韪	摧残	罪行	遭报应	
利欲熏心	敷衍	罪责	避重就轻	
助纣为虐	旁门左道	罪过	邪恶	
危害	无法接受	肆意妄为	铤而走险	
反人类	无法无天	肆无忌惮	阴谋诡计	
反对	无耻	胆大妄为	隐患	
反面教材	明令禁止	脱靶	骇人听闻	
变态狂	昭然若揭	自以为是	魔鬼	
可怕	有悖	自取灭亡	黑心	
后果	歪门邪道	自掘坟墓	风险	
哗众取宠	残忍	自私自利	祸根	
堕落	毁灭	臭名昭著	为所欲为	

Table A2 The dictionary of positive keywords

优生优育	开拓进取	终生免疫	根治
优秀	感到高兴	终生有效	彻底治疗
伟大	感恩	有效	一等奖
何罪之有	愿景	美好	重大意义
佩服	成功	美好未来	意义重大
先河	成就	自信	亮点
先进	成果	自立自强	前景
创举	成熟技术	自豪	贡献
创新	推崇	自豪感	蓬勃发展
利国利民	支持	荣耀	进展
前途无量	改善	荣誉	卓有成效
功劳	攻克	著名	全新
功成名就	敢为天下先	赞同	优化
勇于	无微不至	赞成	立新功
勇敢	期盼	赞美	惊喜
卓越	杰出成就	赞颂	首次
卧虎藏龙	榜上有名	进化	神奇
叫好	欣赏	进步	振奋人心
合理合法	正确	造福	修复
名垂千古	治愈	造福人类	令人鼓舞
名留千史	流芳百世	青年才俊	重要一步
喜悦	点赞	顶尖	美称
喜爱	热切	顶级	优点
坦荡荡	热烈祝贺	首例	优势
天然免疫	热爱	骄傲	光明
奇迹	珠联璧合	高尚	潜力
奉献	登顶	鼎鼎大名	宝贵
好事	福音	鼓励	高效
好样的	科技成果	褒奖	开创性
安全	称赞	先知先觉	准确
完美	突破	真金不怕火炼	世界首次
实至名归	第一	科学进步	世界第一
尊重	第一个	开诚布公	领先
崇拜	第一步	较真	自主创新
巅峰	第一例	新希望	激动人心
希望	精准	新疗法	曙光
帮助	精细	有望	

Appendix B: The TFIDF keyword weight calculation

TF is the normalized term frequency.

IDF measures how unique the term is.

$$TF_{i,j} = \frac{n_{i,j}}{\sum_k n_{k,j}}$$

$$IDF_i = \log\left(\frac{|D|}{|\{j: t_i \in d_j\}|}\right)$$

$$TFIDF_{i,j} = TF_{i,j} \times IDF_i$$

Appendix C

Figure C1: Keyword sentiment measure of the censored and popular WeChat articles

