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Chinese Twitter Propaganda and Account Coordination During the George Floyd Protests

The British handover of Hong Kong to China in 1997 was meant to result in a high-level of autonomy for the region under the Basic Law. However, beginning in the summer of 2003, following widespread protests, Beijing reversed its noninterventionist policies under the framework of “one country, two systems,” prematurely enacting policies to incorporate Hong Kong into the Chinese system (Fong 526). By 2020, Hong Kong’s anti-government protests have heightened in intensity as Beijing has begun to impose national security measures on the region. In the United States, with increased anti-China sentiment under the administration of President Donald Trump, these events have led to sanctions on Chinese and Hongkongese officials who violate Hong Kong’s autonomy, as well as the termination of a series of trade agreements that treat Hong Kong as separate from China. This has transferred the US’ economic sanctions against China onto Hong Kong.

This series of events has paralleled the Chinese Communist Party’s (CCP) growing utilization of foreign social media platforms, such as Twitter and Facebook, for external propaganda. Some Chinese officials and entities – mainly foreign diplomats, embassies, and state-affiliated media – have begun to join these platforms in large numbers in an attempt to influence foreign affairs to the benefit of the CCP’s policy objectives (Serrato and Schafer 3). Twitter and Facebook have been banned in mainland China, so any official use of the platforms must be under the direction and permission of the CCP. These official accounts spread positive

messages about the CCP, buoyed by large, coordinated networks of low-profile accounts (Serrato and Schafer; Wallis). The global spread of COVID-19 from Wuhan has provided a major opportunity for the CCP to experiment with its online propaganda (Wallis 4). While this latter campaign has been well observed, there is another less studied domain on which the campaign has focused. The recent pro-democracy protests and policy changes with regards to Hong Kong have paralleled some of the largest and most sustained protests in the history of the US, beginning with the death of George Floyd in Minneapolis at the hands of police in May of 2020, and have continued even until today. Many of the CCP's online influencers have taken advantage of these events in their attempts to shape US foreign policy towards Hong Kong and China, although with clearly minimal results (Wallis 14).

In this paper, I analyze the CCP's Twitter presence with regards to the George Floyd protests in the US and the concurrent events in Hong Kong. Unlike most research into the CCP's Twitter presence, my focus is on the behavior of official CCP-affiliated accounts in order to potentially understand some of the internal structure of CCP diplomacy and external propaganda. My findings ultimately show that the CCP's online diplomats are not merely officials attempting to achieve benefits to their careers with the appearance of prolific but ultimately incompetent propaganda. Rather, they are part of a complex, two-pronged, centrally coordinated propaganda structure made up of a network of white propaganda entities and a network of astroturfing accounts. These transparently CCP-affiliated accounts take the lead in the CCP's propaganda campaign, molding narratives to current political events as it fits the CCP's policy objectives.

The Evolution of CCP's Twitter Propaganda

It has long been a central tactic of the CCP to utilize external propaganda in order to achieve policy aims. Since 2003, the CCP has openly built its media presence in order to

maintain “the capacity to ‘nudge’ foreign government and other entities into policies or stances favorable to the party” (Molter 3). The proliferation of social media websites has opened up a new means for the CCP to relay its propaganda to a foreign audience. In 2009, following domestic protests, the CCP banned Chinese citizens from accessing Twitter and Facebook, but the platforms have only gained popularity around the world since. Recently, a prominent Chinese think tank, the Chinese Academy of Social Sciences, has offered several strategies for the CCP to respond to Western criticism of its handling of the COVID-19 pandemic and activities in Hong Kong (Wallis 5). Among these strategies is the targeting of specific audiences in response to foreign media reports, including the use of “white propaganda” on Twitter and Facebook (Molter 2). White propaganda is a form of political messaging in which the attribution is transparent. Therefore, over the course of the last several years – and now at an increasing rate – CCP officials and state-affiliated media have created accounts on Twitter and Facebook under their own names.

Social media provides governments cheap and easy access to attentive audiences. For this reason, Twitter was one of the platforms by which the Russian government, via its Internet Research Agency (IRA), attempted to influence the outcome of the 2016 presidential election (Stewart 1; Bail 243). Although there are disagreements over the effectiveness of the IRA’s campaign (Molter 3; Bail 243), the CCP has nonetheless borrowed these tactics and built on them in its own attempts to influence the policies of foreign states to its benefit (Brandt and Schafer). Notably, the CCP is bolder than Russia in its influence tactics, using the accounts of foreign ambassadors and spokespeople to spread conspiracy theories and directly target foreign officials’ Twitter accounts (Brandt and Schafer).

The CCP's use of Twitter for propaganda most obviously began in 2018 in an attempt to exacerbate divisions and polarization in Hong Kong over the pro-democracy protests. Most of the accounts had a low profile and were found to have been attempting to cast the protests as "a willfully destructive mob pushing for regime change in Hong Kong" (Wood). Twitter deleted 936 accounts in 2019 suspected of taking part in this campaign (Wood). However, Twitter's efforts to intervene in suspicious political campaigns have not ended the CCP's attempts to affect the direction of the protests in Hong Kong and the US' increasingly combative policies. With the George Floyd and Black Lives Matter protests over the spring and summer of 2020, which were often met by police violence, CCP-affiliated accounts on Twitter began to try drawing a parallel between these protests and those in Hong Kong, accusing the US of upholding a "double standard" (Brandt; Serrato).

There is significant evidence that the CCP's activity on Twitter is buoyed by coordinated, low-profile accounts. While the use of paid astroturfing accounts has been documented on Chinese domestic social media platforms like Weibo (King 484), it is less clear what the CCP's methods are of coordination on Twitter. Investigations by ProPublica have linked a large number of Twitter accounts to OneSight Technology Ltd., a Beijing-based media advertising company which they found was hired to boost the following of the CCP-affiliated media companies China News Network, China Daily, CGTN, Xinhua News, and People's Daily (Kao). ProPublica has found that anonymous Twitter accounts sometimes offer to pay foreign Chinese-speakers with large followings to post obvious CCP propaganda (Kao) Twitter also suspended over 200,000 accounts suspected of taking part in the CCP's coordinated account network in June of 2020 (Twitter). Given that it is not possible to know the true ownership of most accounts, and there are

no prerequisites to create an account, despite Twitter's efforts to remove suspicious accounts coordinated networks can continue to spread propaganda so long as the platform exists.

While coordinated networks utilized for political astroturfing for the CCP tend to be decentralized by outsourcing to private firms that use a combination of automated, hacked, manually controlled, and bribed accounts (Kao), it is less apparent how official CCP-affiliated Twitter accounts are coordinated. Even if verified CCP-affiliated accounts are not run by their purported owners, they must be run by CCP officials with career incentives. Many studies have investigated strategies for identifying member accounts of Twitter astroturfing networks. Although I utilize some of these strategies in my own research, this is not the main purpose of this paper, since transparent CCP-affiliated accounts do not serve the same aims as astroturfing networks. Rather, I am interested in the relationship between transparent CCP-affiliated accounts and CCP astroturfing networks.

We already know that CCP officials have a career incentive to appear to uphold the objectives of the CCP. With the passing of the Hong Kong Autonomy Act, which imposes sanctions on officials in Hong Kong and China who are deemed to violate Hong Kong's autonomy, and the Executive Order on Hong Kong Normalization, which orders US government agencies to treat Hong Kong as it would China, especially with respect to trade, the CCP has been put in a tight corner. Individuals and entities with significant overseas investments who support the further incorporation of Hong Kong into the Chinese system are at risk of losing those investments, and Hongkongese businesses that once benefited from a special trade status with the US can no longer benefit from that status. This is certainly unlikely to hinder the violation of Hong Kong's autonomy by the CCP, but it also has not been welcomed. China's ministry of foreign affairs has called these actions an interference in China's domestic affairs

(Davidson). It has therefore been in the CCP's interest to have these actions reversed by the US, and CCP-affiliated Twitter accounts have responded accordingly.

One strategy by which the CCP can reverse the US' policies towards Hong Kong is persuading Americans to want to improve US relations with China. However, persuasion is not so easy. If the objective of propaganda is too apparent, the propaganda is less likely to be effective. When the objective of propaganda is apparent, only those who already sympathize with that goal would buy into it. However, as the Pew Research Center has found, only about 22 percent of Americans have a favorable view of China, far from enough to rely on for enacting meaningful change (Silver). In order to achieve its aims, the CCP must therefore portray its messaging as sincere. That is, its messaging should conform to preexisting beliefs of its target audience, which, given that the US is democratically controlled, must include those without preexisting sympathies for the CCP's policy objectives. This is possible even while utilizing white propaganda.

Following the death of George Floyd on May 25, 2020, the CCP was provided a new avenue for its propaganda with respect to its policy objectives in Hong Kong. The sudden and large protests in the US seeking justice for Floyd saw an outpouring of support online. World leaders, including President Recep Erdogan of Turkey, Ayatollah Ali Khamenei of Iran, and former President Mahmoud Ahmadinejad all expressed outrage over the killing and support for the protests on Twitter (Fig. 21). Although the sincerity of their statements is also unknown, the CCP's Twitter accounts took advantage of the opportunity. Many of their tweets simply expressed support for the protests. However, others drew a direct parallel between the George Floyd protests in the US and the pro-democracy protests in Hong Kong. For example, Hua Chunying quote-tweeted "I can't breathe" in response to a tweet by a US State Department

official condemning the CCP's violation of Hong Kong autonomy (Fig. 20). The aim of this messaging was "to encourage among the target audiences the perception of moral equivalence between the US government's response to its own domestic protests and the suppression of protest in Hong Kong" (Wallis 12). The US citizens who were sympathetic towards the response of the US government to its domestic protests but not otherwise towards the goals of the CCP, the CCP might have believed, could be persuaded via this messaging to also support the CCP's behavior in Hong Kong.

Clearly, the success of this specific strategy has been minimal. Since the beginning of the messaging tactic on May 25, the US' stance against the CCP's policy objectives in Hong Kong has only hardened. Although *The New York Times* published an opinion article in October 2020 in support of the incorporation of Hong Kong into the Chinese system (Ip), the US media has also remained far from sympathetic to the CCP. Furthermore, as the Pew survey found, popular opinion about China has only declined (Silver). Nonetheless, this recent messaging campaign might offer a small window into the workings of China's diplomatic system. Given the wider objectives of the CCP, individual officials with career incentives might be expected to mold their behavior to appear to be furthering those goals. With its many forms of measurement, social media activity can serve as a method for officials to signal their efforts to CCP leaders in the hopes of promotions. As authoritarian propaganda has been theorized to primarily "signal the government's strength in maintaining social control and political order" regardless of its direct effectiveness (Huang 420), it is possible that CCP-affiliated Twitter accounts are utilized primarily to signal officials' party loyalty and efforts rather than to achieve specific propaganda objectives. However, it is also possible that this behavior is directly coordinated according to a

coherent propaganda strategy. Investigating this particular messaging tactic best affords the possibility of understanding the nature of the coordination of CCP-affiliated Twitter accounts.

Theoretical Background and Predictions

Given the obvious messaging coordination of official CCP Twitter accounts with regard to the George Floyd protests, the question is whether this coordination has been explicitly directed or is the result of implicit incentive structures. Keller et al. have used principal-agent theory to devise a set of tests to assess the level of coordination of a collection of Twitter accounts. The theory is applied to situations in which “there is information asymmetry between the principal, a project owner, and the agent, who undertakes a task on the principal’s behalf” (Keller 5). Accordingly, there is a misalignment of goals between the principal and agent since “the principal does not know how well the agent executes the task unless the latter is constantly monitored” (Keller 5). If accounts are part of a coordinated campaign, principal-agent theory predicts that they will “propagate uniform or at least similar messages over a specific time span” and “will also simultaneously start and stop tweeting about similar topics, because participants of the campaign receive central instructions about the content and timing of their tweets (Keller 5). If coordination is too apparent, the effectiveness of the campaign can be limited, but staggering the messages and adding too much irrelevant information can also drown out the propaganda (Keller 5). Furthermore, the principal could encourage agents to put increased energy into making accounts appear to be sincere personas, but because agents are mainly interested in external rewards they will put in only the bare minimum effort (Keller 6). Therefore, regardless of the effectiveness of a propaganda campaign, directly supervised coordination will present more recognizable patterns than implicitly incentivized messaging.

Most research into coordinated networks on Twitter focuses on political astroturfing. White propaganda, while benefiting from political astroturfing, may demonstrate patterns similar to astroturfing campaigns if it is coordinated. Transparent CCP-affiliated Twitter accounts will not take measures to hide their attribution, although the proliferation of their messaging can benefit from astroturfing networks that will likely make attempts to hide their own attribution. If astroturfing networks are coordinated by white propaganda entities themselves, there may also be unusual interactions between the groups, although this is not necessary. Generally, rather than portraying popularity for a set of views like astroturfing networks, white propaganda accounts will focus on setting narrative agendas. For instance, white propaganda accounts can authoritatively change the narrative of a particular propaganda campaign in order that astroturfing accounts can follow and appear more genuine than if the astroturfing accounts originated that messaging shift themselves. When astroturfing accounts originate shifts in the messaging of a propaganda campaign, given agents' tendency to put in minimal effort, duplicated tweets from separate accounts can be common and easily spottable. Regular users rarely if ever tweet identical content as other accounts.

By utilizing a combination of white propaganda and political astroturfing, the CCP propaganda campaign is able to surpass the limitations of other campaigns, such as that run by Russia's IRA. As research into the IRA's behavior has shown, Russia's online propaganda campaign was focused on feeding into and exacerbating preexisting polarization with low-profile accounts (Stewart; Bail). This prevented the IRA from creating original narratives that might have better conformed to Russia's policy objectives. Being tied to existing narratives, the success of the IRA's efforts was limited (Bail), whereas the messaging freedom garnered by an online

propaganda strategy made up of a *two-pronged structure* (astroturfing accounts led by white propaganda accounts) has the potential to effectively achieve policy objectives.

If a two-pronged structure is the propaganda strategy that the CCP is using, CCP-affiliated Twitter accounts would demonstrate nearly identical patterns predicted by principal-agent theory as applied to astroturfing networks. As applied to astroturfing networks on Twitter, the predicted patterns of coordination are (1) retweeting, (2) co-retweeting, (3) co-tweeting, all within a close period of time (Keller 5). Other studies have also proposed, and (4) co-mentioning (Vargas 5) – all within a close timeframe – and (6) image sharing (Pacheco 5). These strategies work as follows:

- (1) **Retweeting:** When an account retweets another's message, the tweet is shared to that account's followers. This increases the reach of the message, especially when the two (or more) accounts involved have different sets of followers but are in the same community (Keller 5; Vargas 5).
- (2) **Co-retweeting:** This involves a set of accounts retweeting the same message from a third-party that can but does not necessarily belong to the same community.

Co-retweeting both increases the reach of the message and increases the number of messages the network has proliferated that fit the goals of its campaign (Keller 5; Vargas 5).
- (3) **Co-tweeting:** Coordinated accounts can tweet the same or a very similar message apparently independently. Co-tweeting signals coordination since normal users are unlikely to post the same message as other accounts at a similar time (Keller 5).
- (4) **Co-mentioning:** Similarly to co-tweeting, when multiple accounts mention or reply to the same user(s) within a similar period of time, it can signal coordination (Vargas 5).

(5) **Image sharing:** In order to make it easier to coordinate messaging, similarly to co-tweeting, networks can reshare the same or similar images. This is an especially clear signal of coordination (Pacheco 5).

The closer the interval of time in which these patterns are observed, the more likely the coordination was directed by a principal. Co-tweeting and image sharing, when the tweets or images are the same, is the strongest evidence of an explicitly coordinated network.

When it comes to white propaganda on Twitter, only co-tweeting and image sharing would demonstrate coordination. Unlike co-retweeting, retweeting, and co-mentioning, image sharing and co-tweeting within a certain period of time by white propaganda accounts would hinder the effectiveness of a two-pronged online propaganda structure. Retweeting, co-retweeting, and co-mentioning, on the other hand – even if coordinated – will appear to be the result of sincere beliefs by the agents, since their supposedly identical sympathies are already transparent, and all of these behaviors would be logical extensions of those preexisting individual sympathies. Image sharing and co-tweeting, however, are obvious patterns that can only be the result of directed coordination. A two-pronged propaganda structure is only viable because of the apparent sincerity of the messaging by the white propaganda accounts; violating the facade of sincerity can only harm the success of the campaign in achieving its aims. There is a contradictory pressure for white propaganda accounts in such a two-pronged approach to coordinate messaging. Similar to issues faced by astroturfing networks, staggering propaganda messages from separate accounts can camouflage coordination but also drowns out the propaganda (Keller 5). Still, unlike with astroturfing networks, white propaganda accounts that are part of a two-pronged approach require a high profile in order that, when they shift their messaging, a corresponding shift by astroturfing networks appear to be the natural response of a

large group of preexisting, genuine followers. This means that white propaganda accounts that are part of a two-pronged approach can be expected to avoid co-tweeting and image sharing to the greatest degree possible. On the other hand, if the white propaganda accounts exist only for the purpose of officials' personal gain – meaning they are not coordinated – more image sharing and co-tweeting would be predictable, given that no principal is enforcing certain tweeting behaviors. In order to understand the level of coordination of CCP-affiliated accounts, I will be testing for instances of these patterns among CCP-affiliated Twitter accounts.

Methodology

In order to investigate the complete breadth of the CCP's messaging on Twitter that took rhetorical advantage of the George Floyd and Black Lives Matter protests in the US, I analyzed a collection of tweets and users drawn using the Twitter Developer API and analyzed in R. Given the limitations of the Twitter API, I first created a list of accounts known to belong to CCP officials and state-affiliated media. My list was made in combination with one created by the Alliance for Securing Democracy's project Hamilton 2.0 (Hamilton), and three Twitter lists created by Yuan Yi Zhu, Jerker Hellstrom, and News Asia 24, respectively. After combining these three lists, I removed any duplicated accounts and any accounts without any tweets in their timeline. I also manually removed any tourism promotion accounts. This left me with a list of 260 accounts (Fig. 15). Using the Twitter API, I then collected all of the tweets from between March 31, 2019 and November 25, 2020 from all of the accounts in my list, totaling 213,565 tweets. The significance of March 31, 2019 is that it is the date of mass protests in Hong Kong against a proposed amendment to an extradition bill between China and the region. Using the Google Cloud API, I translated all tweets and hashtags written in Chinese into English, discarding all other tweets initially written in languages other than Chinese or English. I further

filtered this collection of tweets by those that mention both Hong Kong and the US, both Black Lives Matter and the US, both Hong Kong and Black Lives Matter, or just Black Lives Matter (Fig. 14). This resulted in a collection of 3,061 tweets from the 132 unique CCP-affiliated accounts (Fig. 16). Lastly, using the Twitter API, I collected information about up to 100 random retweets of each tweet by CCP-affiliated accounts, leaving me with a collection of 20,141 retweets. I utilized a combination of R and Gephi for creating and analyzing the retweet networks. More specific methods are described where applicable.

Results

Size of the narrative:

Out of the 213,565 tweets from CCP-affiliated accounts during the time interval, 80.3% were in English and 19.7% were in Chinese. Of the tweets in English, 712 mentioned both Hong Kong and the US, 805 mentioned Black Lives Matter, but only 13 mentioned both Hong Kong and Black Lives Matter. For an example of the latter group, see Fig. 17. Of the tweets in Chinese, 1,142 mentioned both Hong Kong and the US, 55 mentioned BLM, and only one mentioned both Hong Kong and Black Lives Matter. For an example of the latter group, see Fig. 18. The use of references to Black Lives Matter, compared to wider messaging from CCP-affiliated accounts, was obviously limited. Interestingly, the target audience of the Black Lives Matter narrative was not only English speakers but also Chinese speakers. As the one tweet that mentioned both Hong Kong and Black Lives Matter reveals – given that it is written in Cantonese – Hongkongese were also a target audience of this messaging. But as would be expected, and as Fig. 9 illustrates, the rate of messaging that referenced Hong Kong and/or Black Lives Matter increased dramatically after Floyd's death and changes in US policy towards Hong Kong.

Sentiment Analysis:

Analysis of the messaging by the CCP-affiliated accounts demonstrates that their activity reacted to changes in the political scene and differed by the target audience. I performed sentiment analysis on the messaging by removing the keywords by which I filtered the tweets and then using the “bing” lexicon library to calculate sentiment scores. Fig. 5 reveals that messaging in Chinese targeted a different audience than messaging in English. Tweets in Chinese since March 31, 2019 mostly condemned supposedly violent protesting by civilians as well as US interference and opposition to the CCP’s policy objectives in Hong Kong, while praising China’s strength, success, and prosperity. During the same timeframe, tweets in English mostly condemned the poor handling of the pandemic, police brutality, and structural racism in the US, but focused much less on praising China in comparison. Figs. 6 and 7 show that this messaging also conformed to current events. Before Floyd’s death, messaging in both languages mostly focused on the pandemic, whereas after his death, tweets in English mostly referenced protests in the US while tweets in Chinese focused more on US interference in the CCP’s policy objectives in Hong Kong. Notably, Fig. 8 shows that before and after Floyd’s death, most tweets from CCP-affiliated accounts were more positive than negative, given the fact that the messaging usually made sure to praise China even if it condemned events in Hong Kong or the US. This makes it clear that messaging by all CCP-affiliated accounts changed according to current political events.

Co-mentioning:

CCP-affiliated accounts tended to mention or reply to each other, but there was also a set of third-party accounts, which changed with current political events, that were often directly targeted by their messages. According to Fig. 10, before Floyd’s death, given that there were

relatively few tweets mentioning Hong Kong and/or Black Lives Matter, of this small number of tweets by CCP-affiliated accounts that were replies to other accounts, the tweets tended to be replies to other CCP-affiliated accounts. However, a small handful of tweets mentioning Hong Kong were replies in English to Donald Trump, Fox News, the US Ambassador to the UN, and a few other politically powerful Americans. After Floyd's death, CCP-affiliated accounts replied much more often to high-profile Americans – but mostly in English – as shown by Fig. 11.

Among the most common receivers were US Secretary of State Mike Pompeo, the US Ambassador to the UN, the US State Department, and CNN. This pattern was also reflected almost identically in accounts that were mentioned by CCP-affiliated accounts, as illustrated by Figs. 12 and 13. Replying to or mentioning high-profile accounts is one strategy to increase the potential impact of political messaging since Twitter often notifies the recipient of the reply or mention in order that they can view the message. However, despite the attempts, US news media never changed its narratives about Hong Kong, remaining generally negative about the CCP's encroachment on Hong Kong's autonomy, and the US government continued its attempts to punish the CCP for its behavior. Still, this is evidence that CCP-affiliated accounts tried various strategies to expand the impact of their propaganda.

Retweeting:

In order to observe the patterns of retweeting and co-retweeting among the core accounts, I “constructed a bipartite network between retweeting accounts and retweeted messages, excluding self-retweets” (Pacheco 7). I then grouped accounts using the Louvain algorithm (Cherepnalkoski 351). The size of a node is determined by its relative betweenness-centrality, which in this context is a measurement of how many times it has retweeted and/or been retweeted relative to other accounts, with a larger node meaning it has retweeted and/or been

retweeted relatively more. Fig. 1 was created by excluding all non-core retweeting accounts and including only retweeted messages that mention Black Lives Matter. As can be seen, retweeting of the reference increases dramatically among CCP-affiliated accounts after Floyd's death. Furthermore, manual examination of the retweets from before Floyd's death are all in reference to anti-Asian racism sparked by the COVID-19 pandemic, whereas almost all of the retweets after his death are in reference to Black Lives Matter. Almost all of the retweets with references to Black Lives Matter before and after Floyd's death were in English (100% and 99.5%, respectively). After Floyd's death, Fig. 1 shows that @zlj517 (Lijian Zhao, CCP spokesman) was central to the co-retweeting of this narrative. Meanwhile, Fig. 2 was created by excluding all non-core retweeting accounts and including only retweeted messages that mention Hong Kong. Similar to references to Black Lives Matter, references to Hong Kong in retweets by and of CCP accounts dramatically increased after Floyd's death. Furthermore, manual examination shows that before Floyd's death, 82.7% of the retweets were in English whereas after his death 69.2% of the retweets were in English. Notably, only 3.81% of the retweets after Floyd's death that mention Hong Kong also mention Black Lives Matter, and this only represents retweets of one tweet by Hu Xijin, Editor-in-chief of the CCP-affiliated Global Times (Fig. 19). Clearly, the use of the Black Lives Matter narrative by CCP-affiliated accounts was limited but mainly targeted at English speakers.

Co-retweeting:

Despite the small size of CCP-affiliated accounts' efforts in drawing a parallel between the Black Lives Matter and Hong Kong protests, a large network of astroturfing accounts buoyed the reach of the narrative. Fig 3. was created using all retweeting accounts and including only retweeted messages that mention Black Lives Matter after Floyd's death. As can be seen, most of

the communities found using the Louvain algorithm are centered exclusively around a CCP-affiliated account. The accounts @MFA_China (CCP spokesperson's office), @zlj517, and @cgtnamerica (CCP state-affiliated media, CGTNA America), respectively, were the most influential in the spread of the Black Lives Matter narrative. Their retweeting habits spread the messaging beyond the followers of any individual CCP-affiliated account. This random sample of retweets shows that the coordination of the CCP-affiliated accounts was able to spread this message to, at a minimum, 1,952 unique accounts. Each of these unique accounts, by retweeting the messages, would have also spread the messaging to their unique followers. Meanwhile, Fig. 4 was created using all retweeting accounts and including only retweeted messages that mention Hong Kong after Floyd's death. The graph follows a similar pattern to Fig. 3. The accounts @zlj517, @Chinamission2un, @ChinaAmbUN, and @CHN_UN_NY, followed by @zhang_heqing, respectively, were the most influential in the spread of the messaging that mentioned Hong Kong. At a minimum, this messaging by CCP-affiliated accounts was retweeted by, at a minimum, 5,030 unique accounts which would have also spread the messaging to their unique followers who could have also spread the messaging to their unique followers, and so on. Further analysis of the retweeting accounts could reveal to what extent CCP messaging was buoyed by astroturfing. Crucially, despite the small size of the CCP-affiliated accounts' efforts in their messaging about Black Lives Matter and Hong Kong, the narrative would have been viewed by a wide audience.

Image sharing and Co-tweeting:

According to an investigation by The New York Times, over time the CCP's online propaganda has become more complex, managing to avoid obvious signals of coordination such as image sharing (Zhong). Following the methodology from Pacheco et al., I focused on the

tweets from CCP-affiliated accounts which included images. Accordingly, I “represent[ed] each image by its RGB color histogram, binn[ed] each channel into 128 intervals... resulting in a 384-dimensional vector” (Pacheco 5). I then checked for identical vectors, which would signal similar or identical images. Notably, there were no duplicates. Using a similar strategy, I also found there were no identical tweets by CCP-affiliated accounts. This means that either the principal directing the coordination took the effort to dissuade CCP diplomats from revealing obvious patterns of coordination, and/or CCP diplomats had the explicit incentive to put in the time to make their messages appear minimally unique.

Conclusion

Despite the relatively small amount of effort put in by CCP-affiliated accounts drawing a parallel between the pro-democracy protests in Hong Kong and the George Floyd protests in the US, astroturfing accounts visibly took up the messaging and spread it considerably. More research could be put into the exact breadth of the astroturfing accounts. However, CCP-affiliated accounts displayed patterns of behavior identifiable as direct coordination. As predicted, these accounts, given their status as white propaganda entities, avoided the behaviors of co-tweeting and image sharing that would have otherwise hindered the wider propaganda strategy, but maintained patterns of retweeting, co-retweeting, and co-mentioning. Although this does not reveal to what extent CCP-affiliated Twitter accounts are coordinated, it does reveal that their behavior is coordinated by a principal. Further “on the ground” investigations could reveal the exact structure of the propaganda network that involves CCP-affiliated Twitter accounts run by foreign diplomats and state-affiliated media outlets.

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Appendix

CCP-Affiliated Account Retweet Networks of References to BLM

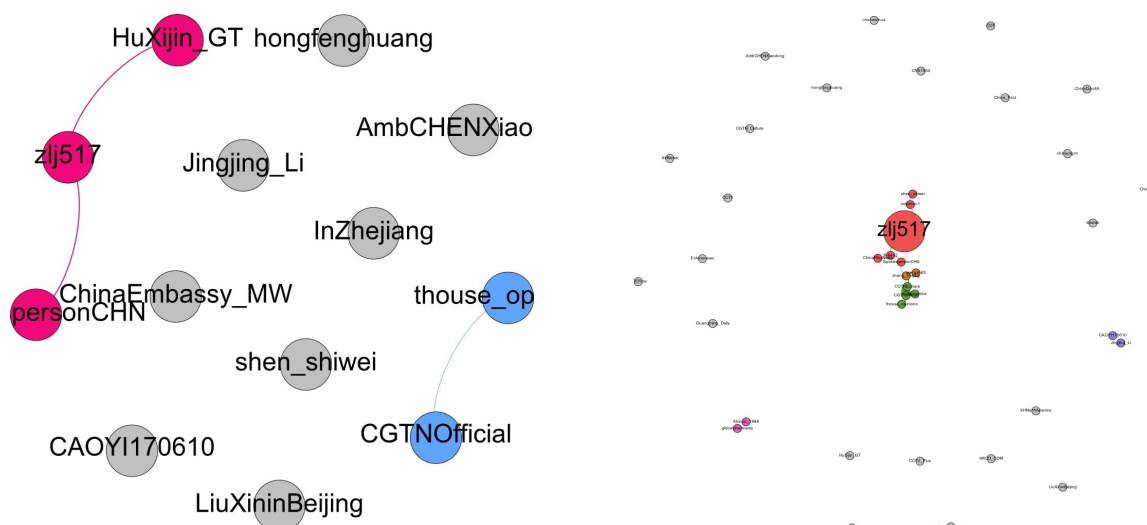


Figure 1: On the left is the retweet network of retweeting CCP-affiliated accounts before Floyd's death (May 25, 2020), including only retweets of messages that reference the Black Lives Matter protests. On the right is the retweet network of retweeting CCP-affiliated accounts after Floyd's death, including only retweets of messages that reference the Black Lives Matter protests. Node size is determined by betweenness-centrality, and node color is determined by communities found by the Louvain algorithm, excluding the weakest communities. The two networks are not scaled.

CCP-Affiliated Account Retweet Networks of References to Hong Kong

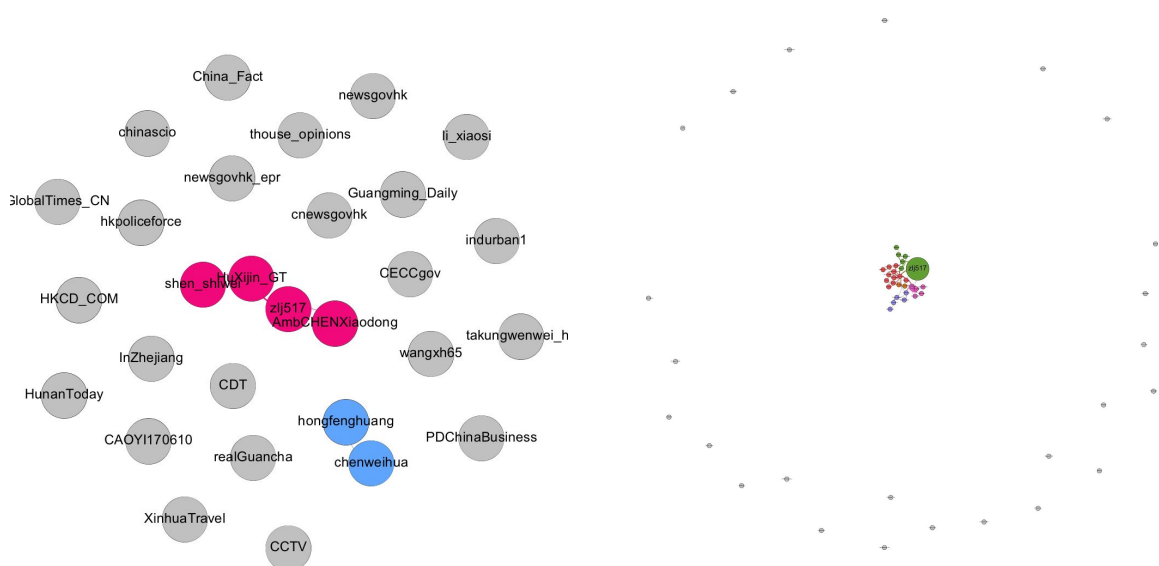


Figure 2: On the left is the retweet network of retweeting CCP-affiliated accounts before Floyd's death (May 25, 2020), including only retweets of messages that reference Hong Kong. On the right is the retweet network of retweeting CCP-affiliated accounts after Floyd's death, including only retweets of messages that reference Hong Kong. Node size is determined by betweenness-centrality, and node color is determined by communities found by the Louvain algorithm, excluding the weakest communities. The two networks are not scaled.

Complete Retweet Network of References to BLM, After May 25, 2020

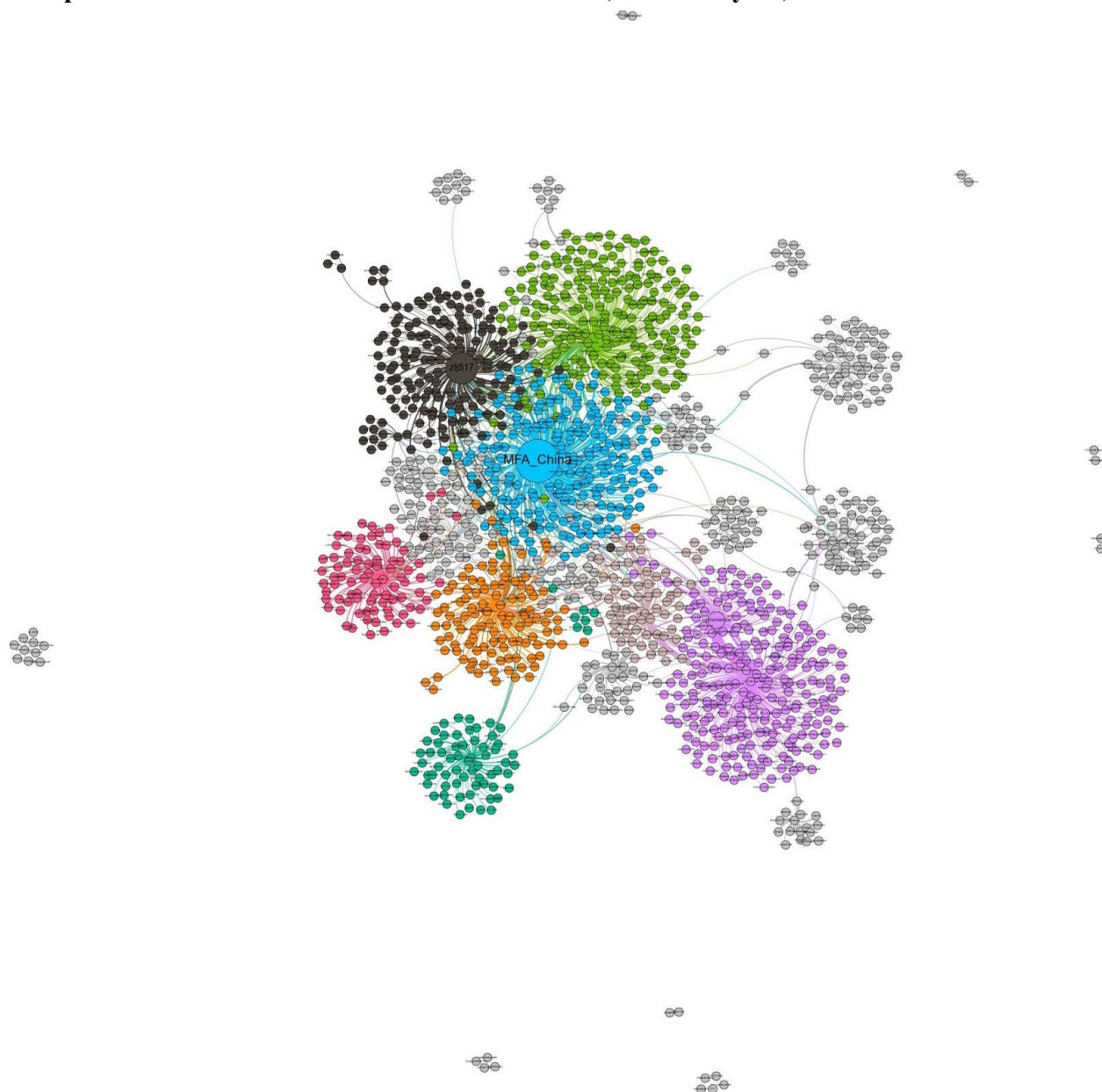


Figure 3: This network graph contains all retweeters of all messages by CCP-affiliated accounts that mentioned the Black Lives Matter protests after Floyd's death. Node size is determined by

betweenness centrality, and node color is determined by the Louvain algorithm, excluding the weakest communities.

Complete Retweet Network of References to Hong Kong, After May 25, 2020



Figure 4: This network graph contains all retweeters of all messages by CCP-affiliated accounts that mentioned Hong Kong after Floyd's death. Node size is determined by betweenness centrality, and node color is determined by the Louvain algorithm, excluding the weakest communities.

Sentiment of English and Chinese Tweets by CCP-Affiliated Accounts Since March 31, 2019

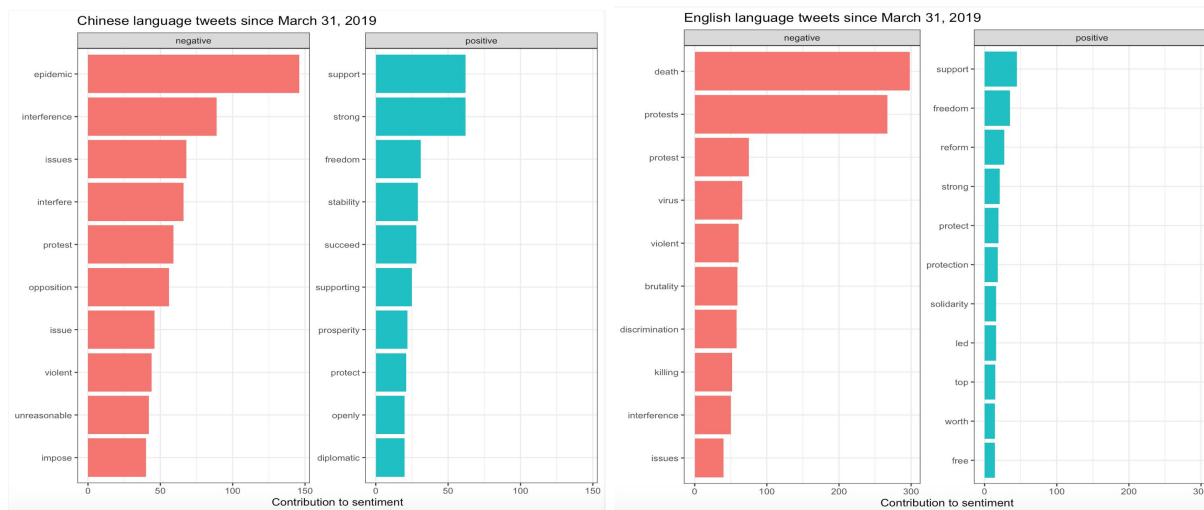


Figure 5: These graphs represent the top ten most used negative and positive words out of all tweets by CCP-affiliated accounts since March 31, 2019 that reference Hong Kong and/or the Black Lives Matter protests, written originally in Chinese and English. The sentiment of words is determined using the “bing” library.

Sentiment of English and Chinese Tweets by CCP-Affiliated Accounts Before May 25, 2020

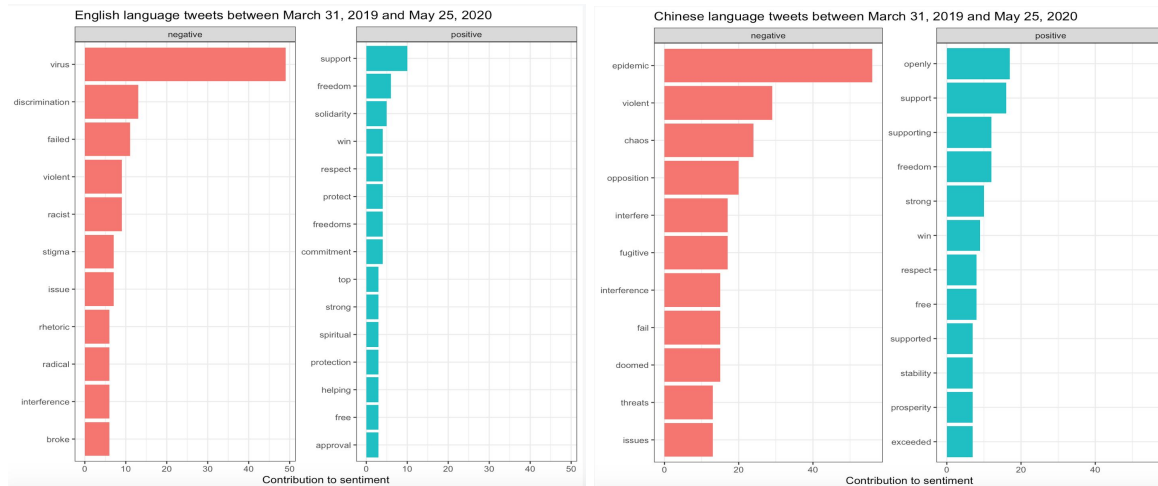


Figure 6: These graphs represent the top ten most used negative and positive words out of all tweets by CCP-affiliated accounts before May 25, 2020 that reference Hong Kong and/or the Black Lives Matter protests, written originally in Chinese and English. The sentiment of words is determined using the “bing” library.

Sentiment of English and Chinese Tweets by CCP-Affiliated Accounts Since May 25, 2020

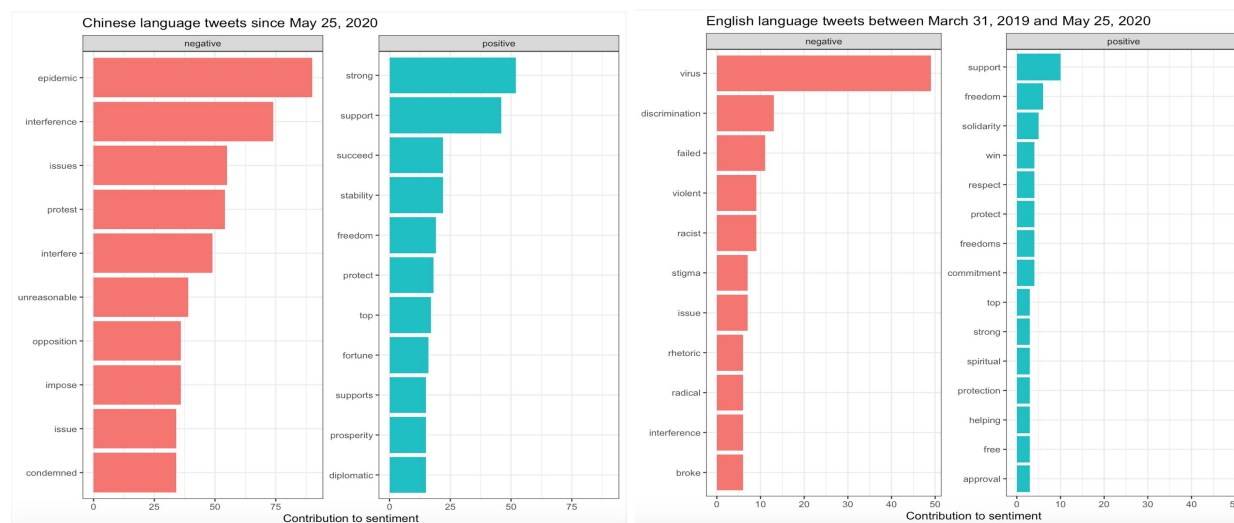


Figure 7: These graphs represent the top ten most used negative and positive words out of all tweets by CCP-affiliated accounts since May 25, 2020 that reference Hong Kong and/or the Black Lives Matter protests, written originally in Chinese and English. The sentiment of words is determined using the “bing” library.

Sentiment Scores of Tweets by CCP-Affiliated Accounts, Before and After May 25, 2020

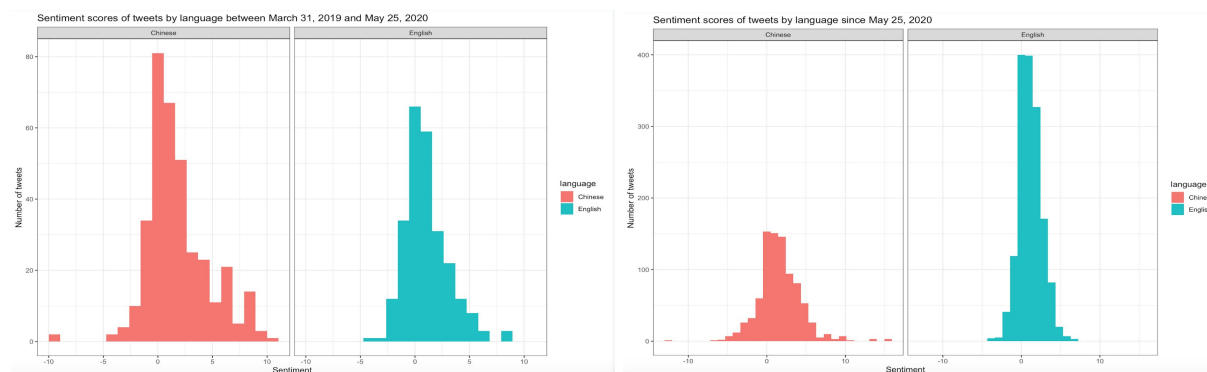


Figure 8: These graphs represent the overall sentiment score of every tweet that mentions Hong Kong and/or the Black Lives Matter protests by CCP-affiliated accounts, written originally in Chinese or English, before and after Floyd’s death. Sentiment is calculated using the “bing” library. Each word in a tweet is assigned a +1 if it is positive, a -1 if it is negative, and 0 if it is neutral, then all sentiment scores in the tweet are summed. An overall score of zero means either that the tweet contained as many negative as positive words, or that it contained only neutral words.

Number of Tweets per Day by CCP-Affiliated Accounts, by Language, since March 31, 2020

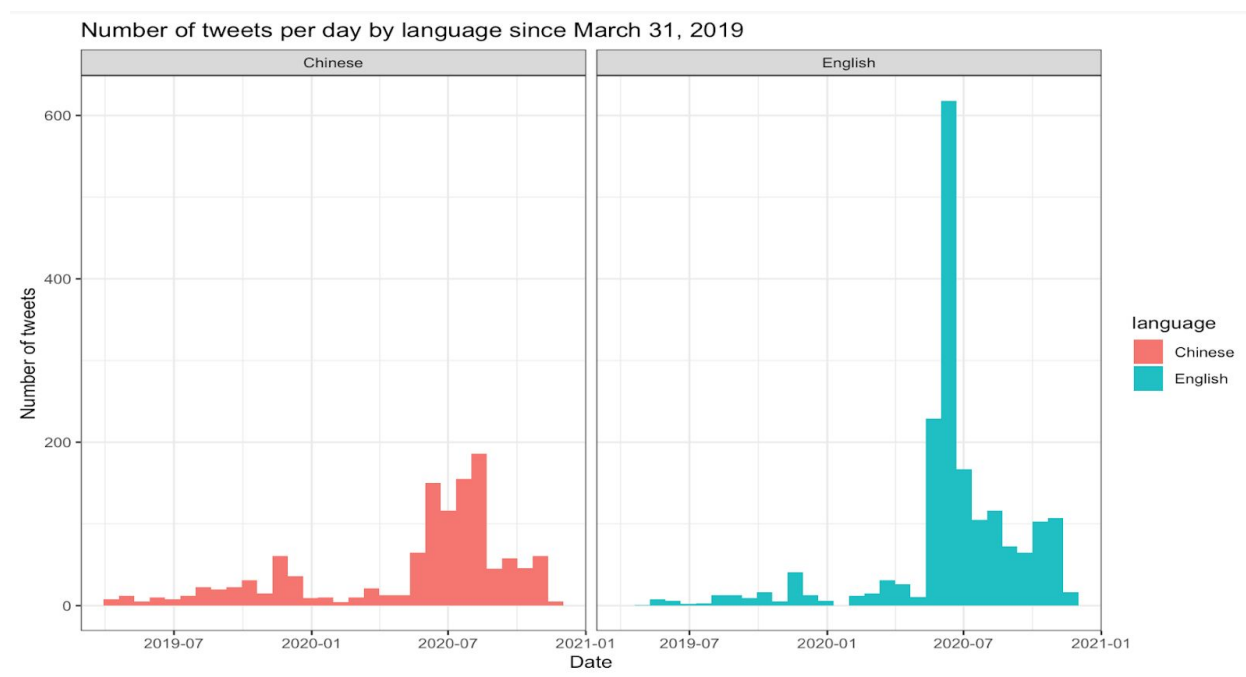


Figure 9: The tweets used in this graph reference Hong Kong and/or the Black Lives Matter protests. The date is in the form of “year-month.”

Top Unique Replies Receivers, in English and Chinese Tweets, before May 25, 2020

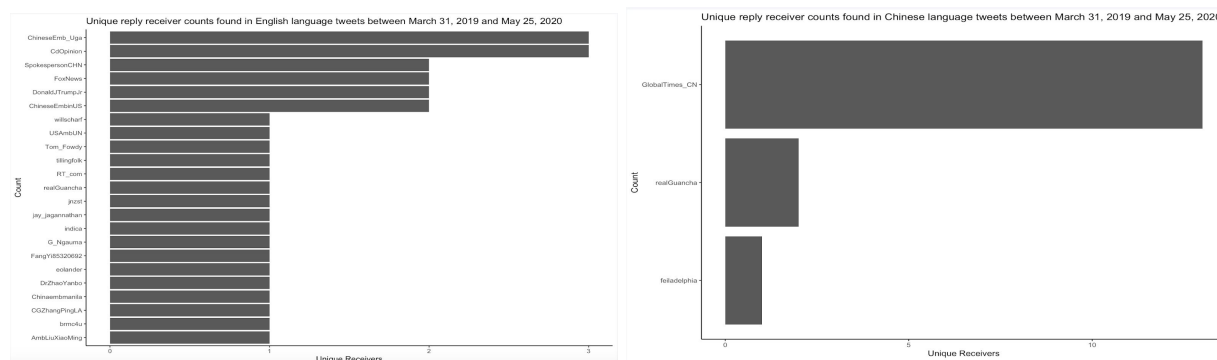


Figure 10: The tweets used in this graph were sent by CCP-affiliated accounts, and all mention Hong Kong and/or the Black Lives Matter protests.

Top Unique Replies Receivers, in English and Chinese Tweets, Since May 25, 2020

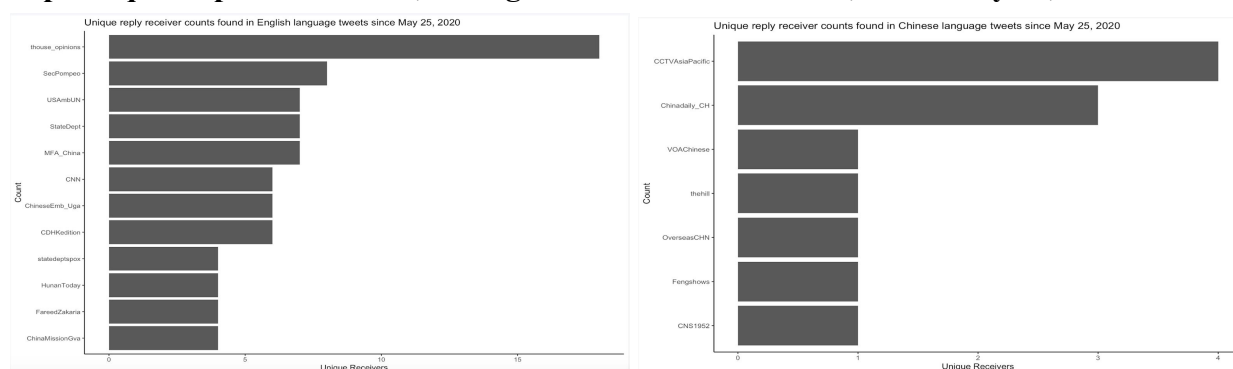


Figure 11: The tweets used in this graph were sent by CCP-affiliated accounts, and all mention Hong Kong and/or the Black Lives Matter protests.

Top Unique Mentions, in English and Chinese Tweets, Before May 25, 2020

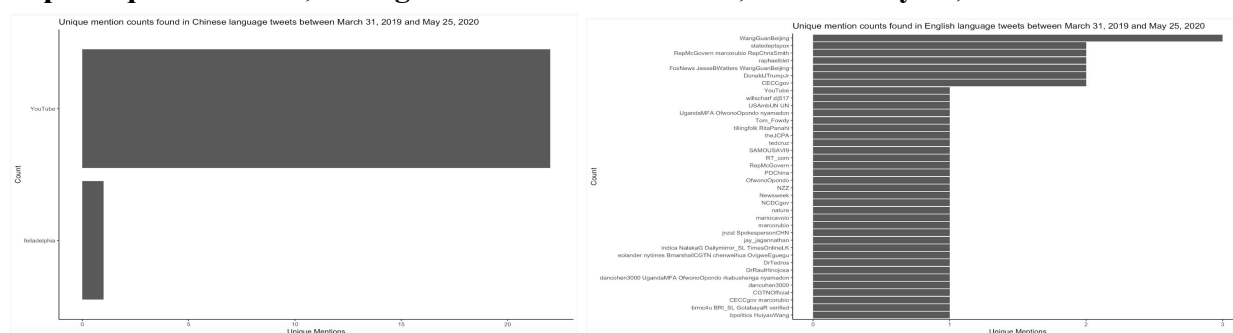


Figure 12: The tweets used in this graph were sent by CCP-affiliated accounts, and all mention Hong Kong and/or the Black Lives Matter protests.

Top Unique Mentions, in English and Chinese Tweets, Since May 25, 2020

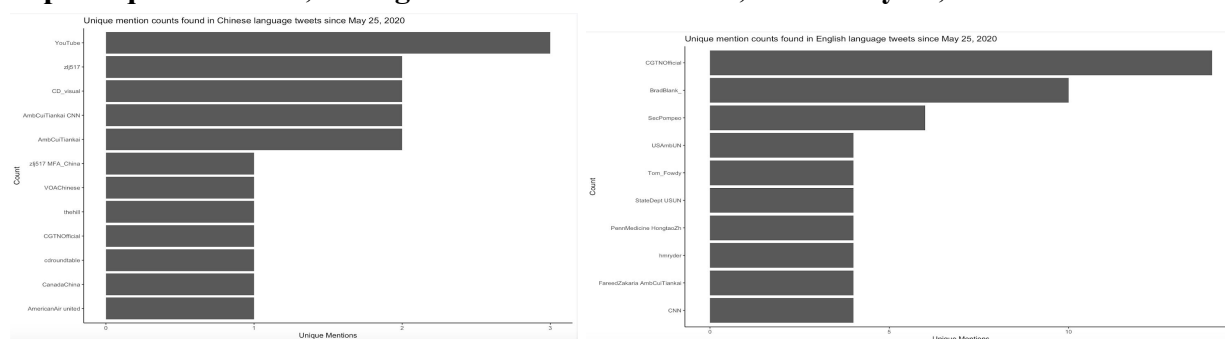


Figure 13: The tweets used in this graph were sent by CCP-affiliated accounts, and all mention Hong Kong and/or the Black Lives Matter protests.

Character Strings Used to Filter Tweets from CCP-Affiliated Accounts

Keyword Topic	Chinese Tweets	English Tweets
US	US, U.S., United States, America, Washington	US, U.S., United States, America, Washington
BLM	racism, George Floyd	Black Lives, BLM, black lives, racism, George Floyd
Hong Kong	Hong Kong, HKSAR	Hong Kong, HKSAR

Hashtag Topic	Chinese Tweets	English Tweets
US	US, America, UnitedStates, Washington	US, America, UnitedStates, Washington
BLM	BlackLivesMatter, George, Floyd	BlackLivesMatter, BLM, racism, Racism, George, ICantBreathe, Floyd
Hong Kong	HK, HongKong	HK, HongKong, hk
Other		DoubleStandard, doublestandard

Figure 14: These character strings were used in R to filter the tweets collected from CCP-affiliated accounts. Strings were determined by manually examining tweet content. Strings were case sensitive. If, for example, a tweet included a hashtag with the string “HKSAR,” filtering tweets by hashtags using the string “HK” would have also selected that tweet. As described, filtering was done using combinations of these strings, also making sure that the final dataset removed all duplicated tweets.

List of CCP-Affiliated Accounts

Account Handle	Owner
@cdopinion	CD Opinion
@zhongbai2020	中国驻白俄罗斯大使馆
@amb_chenxu	Chen Xu
@amb_lisong	Li Song 李松
@amb_yiming	Zhang Yiming
@amb_zhujing	Zhu Jing 朱京

@ambassadechine	Ambassade de Chine en France
@ambassador_liu	Liu Yuxi
@ambassadorhuang	Huang Xingyuan
@ambassadorlei	Lei Kezhong
@ambassadorzhang	Amb. Zhang Lizhong
@ambchanghua	Chang Hua
@ambchenbo	Chen Bo
@ambchenweiqing	Chen Weiqing
@AmbCHENXiaodong	AmbCHENXiaodong
@ambchineburundi	Ambassade de Chine au Burundi
@ambchinecmr	Ambassade de Chine au Cameroun
@ambchineenrdc	Ambassade de Chine en RDC中国驻刚果（金）大使馆
@ambchinetchad	Ambassade de Chine au Tchad
@ambcina	Ambasciata Repubblica Popolare Cinese in Italia
@ambcuitiankai	Cui Tiankai
@AmbDongXiaojun	Dong Xiaojun
@ambliaoliqiang	Liao Liqiang
@ambliuguangyuan	Liu Guangyuan
@ambliuquan	Quan Liu
@ambliuxiaoming	Liu Xiaoming
@ambzhoujian	Zhou Jian
@beltandroaddesk	Belt and Road & Beyond
@CAOYI170610	曹 毅 CAO Yi (أبو وسيم)
@cathaypak	Chinese Emb Pakistan
@cgccusa	China General Chamber of Commerce – USA
@cgchina_cpt	Lin Jing 林静
@CGChinaLiYang	Li Yang
@cgprcindubai	ChinaConsulateDubai

@cgzhangpingla	Zhang Ping
@china_amb_india	Sun Weidong
@china_amb_zim	Chinese Ambassador to Zimbabwe
@china_emb_ng	Chinese Embassy in Nigeria
@china_embajada	Embajada de China en Colombia
@china_lyon	Consulat Général de Chine à Lyon
@china_opcw	Chinese Permanent Mission to the OPCW
@china2asean	Ambassador Deng Xijun
@chinaambbelgium	Cao Zhongming
@chinaambuganda	Zheng ZhuQiang
@chinaambun	Zhang Jun
@chinaandsamoa	中国驻萨摩亚大使馆 Chinese Embassy in Samoa
@chinacgcalgary	Chinese Consulate General in Calgary
@chinaconsulate	Chinese Consulate General in Chicago
@chinaconsulist	Çin Başkonsolosluğu Sözcüsü/中国驻伊斯坦布尔总领馆发言人
@chinaconsydney	Chinese Consulate General in Sydney
@chinaemb_hellas	Chinese Embassy in Greece
@chinaembaddis	Chinese Embassy in Ethiopia
@chinaembajada	Embajada de China en Chile
@chinaembajadard	EmbajadaChinaenRD
@chinaembangola	ChinaEmbAngola
@chinaembarg	Embajada de China en Argentina
@ChinaEmbassy_MW	Chinese Embassy in Malawi
@chinaembassyt	ChinaEmbassy Tirana
@chinaembaustria	Chinesische Botschaft in Österreich
@chinaembcongobz	Ambassade de Chine en République du Congo
@chinaembesp	Embajada de China en España

@chinaembgermany	Chinesische Botschaft in Deutschland
@chinaembgrenada	Chinese Embassy in Grenada
@chinaembingh	中国驻加纳大使馆 Chinese Embassy in Ghana
@chinaembinmr	中国驻毛里塔尼亚使馆 Ambassade de Chine en Mauritanie
@chinaembireland	Chinese Embassy in Ireland
@chinaembkabul	Wang Yu 王愚
@chinaembkazakh	Посольство КНР в Казахстане
@chinaembksa	Embassy of China in KSA سفارة الصين في السعودية
@chinaembmanila	ChineseEmbassyManila
@chinaembnl	Embassy of China in the Netherlands
@chinaembottawa	ChineseEmbassyOttawa
@chinaembperu	Embajada de China en el Perú
@chinaembpoland	Chinese Embassy in Poland
@chinaembsl	Chinese Embassy in Sri Lanka
@chinaembsvk	中国驻斯洛伐克使馆 Čínske veľvyslanectvo na Slovensku
@chinaembturkey	Çin Büyükelçiliği Ankara/中国驻土耳其使馆
@chinaemslovenia	ChineseEmbassySlovenia
@chinaeumission	Mission of China
@chinaindenmark	Kina i Danmark
@chinainlebanon	Wang Kejian
@chinairaq	China Embassy in Iraq
@chinamission2un	Chinese Mission to UN
@chinamissiongva	China Mission Geneva
@chinamissionvie	Permanent Mission of China in Vienna
@chinascio	China SCIO
@chinaspox_india	Ji Rong
@chine_au_mali	中国驻马里大使馆 Ambassade de Chine au Mali

@chine_guinee	中国驻几内亚大使馆 Ambassade de Chine en Guinée
@chineambdjibout	Ambassade de Chine à Djibouti
@chineseemb_png	Chinese Embassy in PNG
@chineseemb_uga	Chinese Embassy in Uganda
@chineseembassy1	chineseembassybangkok
@chineseembassyj	Embassy of the People's Republic of China-Jordan
@chineseembincz	Chinese Embassy in CZ
@chineseembihu	Chinese Embassy in Hungary
@chineseembirrus	Chinese Embassy in Russia 中国驻俄罗斯大使馆
@chineseembinuk	Chinese Embassy in UK
@chineseembinus	Chinese Embassy in US
@chineseembkenya	Chinese Embassy in Kenya
@chineseembtoyem	Chinese Embassy to Yemen
@chineseembtz	Chinese Embassy in Tanzania
@chineseliberia	Chinese Embassy in Liberia
@chinesesomalia	Chinese Embassy in Somalia
@chinesezimbabwe	Chinese Embassy in Zimbabwe
@chn_egy	Spokesperson of the Chinese Embassy in Egypt
@chn_un_ny	Spokesperson of Chinese Mission to UN
@chnconsul_osaka	中華人民共和国駐大阪総領事館
@chnconsulatefuk	中華人民共和国駐福岡総領事館
@chnconsulatejhb	Chinese Consulate General in Johannesburg
@chnconsulatengo	中華人民共和国駐名古屋総領事館
@chnconsulatengt	中華人民共和国駐新潟総領事館の新ちゃん
@chnembassy_jp	中華人民共和国駐日本国大使館
@chnmission	Liu Yuyin 刘玉印

@cidcaofficial	CIDCA
@ciieonline	China International Import Expo
@consulat_de	Consulat général de Chine à Strasbourg
@consulatesan	Chinese Consulate General in San Francisco
@consulchinabcn	Consulado General de China en Barcelona 中国驻巴塞罗那总领馆
@consulchinarj	Consulado-Geral da China no Rio de Janeiro
@dong_zhihua	Dong Zhihua
@dr_zhaoqinghua	Generalkonsul Zhao Qinghua
@drzhaoyanbo	Zhao Yanbo
@drzhaoyongchen	ZHAO Yongchen
@emb_chinaven	Embajada de China en Venezuela
@embaixadachina	Embaixada da China no Brasil
@embajadachinaec	Embajada de la República Popular China en Ecuador
@embajadachinasv	Embajada de la República Popular China en SV
@embassy_chinese	中国驻汤加大使馆
@embchina_rs	Chinese Embassy in Serbia
@embchinacuba	Embajada de la República Popular China en Cuba
@embchinage	Embajada de China Malabo
@embzhangrun	Zhang Run
@fangyi85320692	Fang Yi
@fucong17	Fu Cong 傅聪
@generalkonsuldu	Generalkonsul Du Xiaohui
@indurban1	Feimingxing 费明星
@juliojiangwei	姜伟 Jiang Wei 
@li_baorong	Li Baorong
@li_xiaosi	Li Xiaosi
@libijian2	libijian 李碧建

@LiuChan14790671	刘畅 Liu Chang
@liuhongyang4	Liu_Hongyang
@liyingzhu1	Ambassadeur 朱立英
@luisxu9	Luis Xu Tiefei 徐铁飞
@MahuiChina	MA Hui 马辉
@MFA_china	Spokesperson发言人办公室
@oujianhong	Ou Jianhong
@CHNEmbSuriname	
@ChinaEmbAlgeria	
@zhang_heqing	
@ChinaEmbFinland	
@Chinacgedi	
@china_CCYL	
@YXiusheng	
@spokespersonHZM	
@CGMeifangZhang	
@CNPakWW	
@CCGBelfast	
@ConsuladoCHNSC	
@Chinese_Embassy	
@ZhaLiYou	
@PRCAmbNepal	
@PRCAmbNL	
@jejuZLG	
@SpokespersonCHN	
@hkpoliceforce	
@FAODG	
@Xhinua_1988	

@jenniferqu	
@zlj517	
@Song_Chq	
@caizin_news	
@PDChinaHK	
@DailyBeijing	
@Chinadaily_CH	
@CDHKedition	
@ChinaDaily_Life	
@CD_visual	
@DXinjiang	
@wangxh65	
@PacificDialog	
@Fengshows	
@zhihuapp	
@CGTN_Culture	
@PDChinaSports	
@ChinaScience	
@PDChinaBusiness	
@PDChinaLife	
@BrilliantChina	
@thepapercn	
@HKCD_COM	
@thouse_opinions	
@CCTVAsiaPacific	
@FlyOverChina	
@realGuancha	
@XinhuaTravel	

@YongyuanCui1	
@GlobalTimes_CN	
@ChinaQandA	
@xiwzwb	
@hongfenghuang	
@China_Fact	
@ChinaCulture8	
@CGTNEurope	
@XHNorthAmerica	
@cgtnarabic	
@cgtnenespanol	
@XHscitech	
@XHSports	
@takungwenwei_hk	
@Chinacultureorg	
@CCTV_Plus	
@Beijing2022	
@HuXijin_GT	
@PhoenixTVHK	
@CGTNFrancais	
@CNS1952	
@XinhuaChinese	
@PDChinese	
@ipandacom	
@CGTNOfficial	
@cgtnamerica	
@cgtnafrica	
@Guangming_Daily	

@shen_shiwei	
@PhoenixTVUSA	
@XHNews	
@Jingjing_Li	
@akaDashan	
@Echinanews	
@ChinaDailyEU	
@PDChina	
@qingqingparis	
@cnewsgovhk	
@newsgovhk_epr	
@newsgovhk_cpr	
@newsgovhk	
@chenweihua	
@ChinaDaily	
@CCTV	
@globaltimesnews	
@chinanewsweek	
@LiuXininBeijing	
@ChinaPlusNews	
@shanghaidaily	
@ZouYueTweets	
@HunanToday	
@CCG_org	
@InZhejiang	
@OverseasCHN	
@OliviaSongCNA	
@NLChina	

@CECCgov	
@chinaorgen	
@CDT	
@Hola_Dani	
@weilinkuang	
@MGuoliang	
@ErwenXu	

Figure 15: This is a list of all the Twitter accounts I determined were both active and affiliated with the CCP. The accounts are comprised of diplomats, embassies, journalists, and state-affiliated media. Some of the accounts listed also include the name of the owner.

List of Filtered CCP-Affiliated Twitter Accounts

Handle
@CdOpinion
@AmbassadorHuang
@AmbChangHua
@AmbCHENXiaodong
@AmbLiuXiaoMing
@AmbZhouJian
@BeltandRoadDesk
@CathayPak
@CGCHINA_CPT
@CGChinaLiYang
@CGPRCinDubai
@china_emb_ng
@ChinaAmbUN
@ChinaCGCalgary
@ChinaConsulate

@ChinaConSydney
@ChinaEmbGrenada
@Chinaembmanila
@ChinaEmbSL
@ChinaEUMission
@Chinamission2un
@ChinaMissionGva
@chinascio
@ChineseEmb_Uga
@ChineseEmbinUK
@ChineseEmbinUS
@ChineseZimbabwe
@CHN_UN_NY
@ChnMission
@DrZhaoYanbo
@DrZhaoyongchen
@indurban1
@li_xiaosi
@MFA_China
@ZhaLiyu
@SpokespersonCHN
@Xinhua_1988
@zlj517
@PDChinaHK
@DailyBeijing
@CDHKedition
@wangxh65
@PacificDialog

@CGTN_Culture
@PDChinaBusiness
@thouse_opinions
@realGuancha
@hongfenghuang
@China_Fact
@XHscitech
@Chinacultureorg
@CCTV_Plus
@HuXijin_GT
@Guangming_Daily
@shen_shiwei
@Echinanews
@PDChina
@newsgovhk_epr
@newsgovhk
@chenweihua
@ChinaDaily
@globaltimesnews
@LiuXininBeijing
@ChinaPlusNews
@shanghaidaily
@HunanToday
@CCG_org
@InZhejiang
@CECCgov
@chinaorgcn
@weilinkuang

@China2ASEAN
@XHNews
@qingqingparis
@Amb_Yiming
@ChinaEmbPoland
@ChinainLebanon
@Dong_zhijia
@hkpoliceforce
@CCTVAsiaPacific
@CGTNEurope
@XHNNorthAmerica
@cgtnamerica
@CCTV
@ZouYueTweets
@CDT
@ChnConsulateJhb
@ChinaQandA
@AmbCuiTiankai
@zhang_heqing
@ChineseSomalia
@XinhuaTravel
@Amb_ChenXu
@AmbLiaoLiqiang
@Jingjing_Li
@PDChinaSports
@ciionline
@thepapercn
@AmbLiuGuangYuan

@CGZhangPingLA
@ChinaEmbOttawa
@ChinaSpox_India
@FangYi85320692
@LiuHongyang4
@MahuiChina
@ChinaEmbFinland
@CNPakWW
@PRCAmbNL
@Song_Chq
@Fengshows
@cgtnafrica
@XHSports
@AmbLiuQuan
@China_CCYL
@Chinadaily_CH
@zhihuapp
@HKCD_COM
@GlobalTimes_CN
@takungwenwei_hk
@PhoenixTVHK
@CNS1952
@XinhuaChinese
@PDChinese
@cnewsgovhk
@newsgovhk_cpr
@OverseasCHN
@libijian2

@ChineseEmbinRus
@YongyuanCui1
@PhoenixTVUSA
@xiwzwb

Figure 16: The Twitter accounts listed were filtered from the accounts in Fig. 15 by only selecting the accounts that had tweeted a message of interest to my research.



Figure 17: One of the 13 English tweets that mentioned Hong Kong and Black Lives Matter.



Figure 18: The one Chinese tweets that mentioned both Hong Kong and Black Lives Matter. Notably, this tweet is written in Cantonese and is targeting a Hongkongese audience.



Figure 19: Another example of tweets in English that mention both Hong Kong and Black Lives Matter. This was retweeted a significant number of times.



Figure 20: A tweet by Hua Chunying.

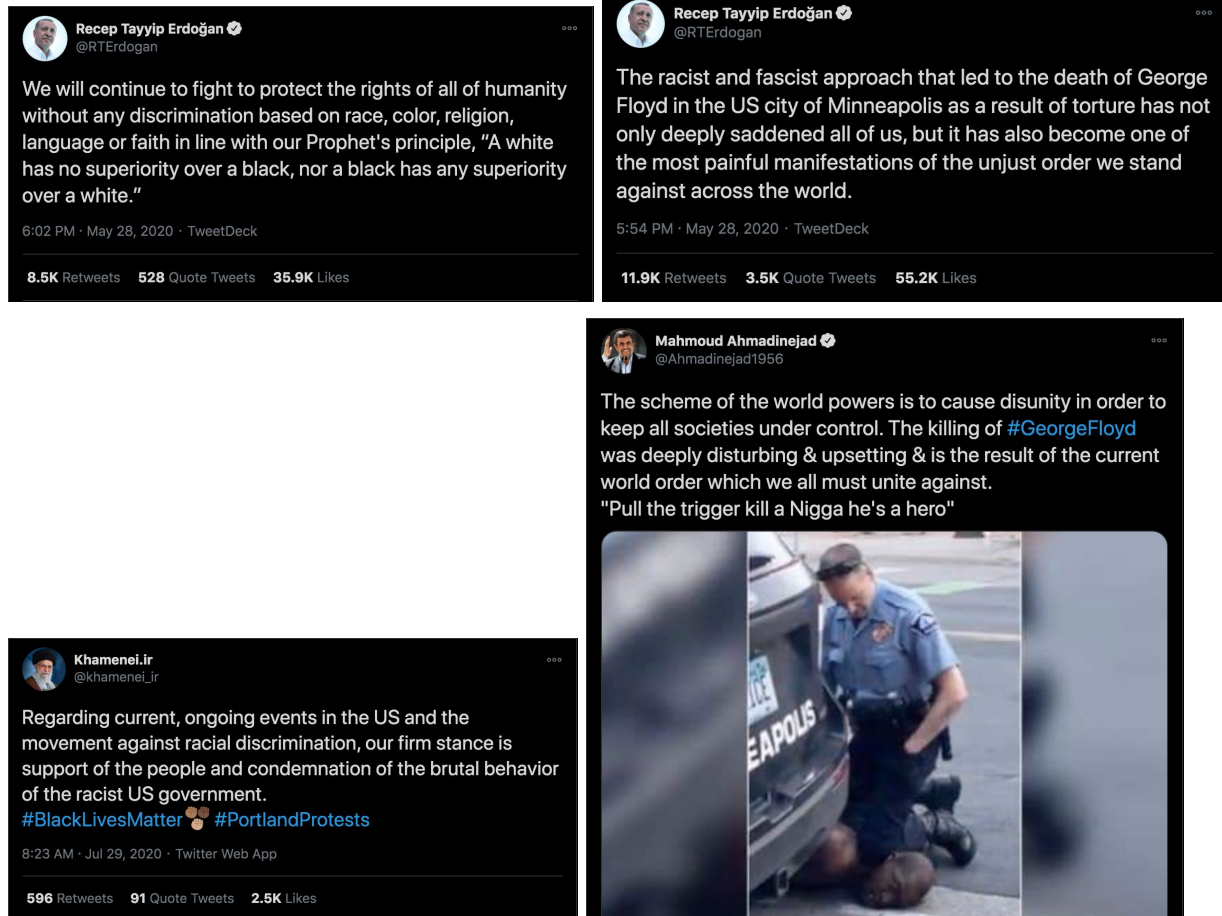


Figure 21: Four examples of tweets of authoritarian world-leaders that mention Black Lives Matter.