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Online Climate Change Discourse: Evidence From Facebook in Taiwan

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1   Introduction

The emergence of online social media has opened up for a new dynamic of how people communicate, interact, spread, and exchange information. It also provides an alternative communication landscape for political scientists to explore public engagement with various topics. In the field of environmental and climate change research, scholars have been examining the dynamics of climate change discourse, framing and debates through analyzing the online communication data (Sullivan & Xie 2009, Koteyko et al. 2017, Schäfer 2012, Liu & Zhao 2016, Liu & Leiserowitz 2010, Kay et al. 2015, Cody et al. 2015, Tandoc Jr & Eng 2017, O'Neill et al. 2015, Auer et al. 2014, Segerberg & Bennett 2011).

One of the major focuses of recent research is on the role of different stakeholders in shaping online climate change discourse. As it is a contested area characterized by competitions among different political ideologies, economic interests, and societal values, climate change is not just a scientific fact but a debate ground where stakeholders compete with their particular agendas (Koteyko et al. 2017, Schäfer 2012). What kind of stakeholders are successful in setting and framing climate discourse according to their interests differ in areas and regions. Drawing evidence from existing literature, Schäfer (2012) argues that scientists and scientific institutions play a limited role in online climate communication, nongovernmental organizations (NGOs), on the other hand, are much more successful in exerting influence on social media platforms. By analyzing Twitter

tweets, Cody et al. (2015) suggest that climate change activists are the predominate actors when it comes to climate change-related discourse, and Twitter is a robust platform to boost climate awareness. However, in light of the air pollution in China, Kay et al. (2015) points out that Sina Weibo is less a tool that engages the public in environmental and climate issues, but a platform for companies profiting from air pollution in China. Through analyzing the Weibo post, Liu & Zhao (2016) also note that climate change discussion in China is mainly dominated by the state media and international actors, while Chinese NGOs and epistemic groups are nearly absent from the platform.

The current established literature of online climate change discourse, however, is predominately centering around the three major geographical areas, the United States, European and Chinese societies, and analyzing mainly two platforms - Twitter and Sina Weibo. The climate change discourse in other countries or on other social media platforms remains unknown. Therefore, with the attempt to uncover the missing puzzle in online climate change discourse, this paper presents the first in-depth analysis of climate change discourse on Taiwan's social media, with a particular focus on Facebook. The paper aims to explore the online climate change discourse in Taiwan and drawing evidence from the most widely used social media platform in the country - Facebook. The paper discusses the online climate change discourse from three aspects; 1) who talk about climate change? 2) how influential is the climate change discourse? 3) what type of framing attracts the most attention?

Overall, the paper shows that epistemic groups and environmental NGOs are the major actors in spreading, shaping, and framing online climate change discourse. However, their influence is minimal comparing to political parties, politicians, and news media. Since the timeframe of this paper is focusing on the Paris Climate Summit, a large proportion of posts concentrate on the Summit, other types of framings also include weather events, Taiwan's climate policy, agriculture policy, fossil fuel phase-out, air pollution, and renewable energy. However, there is no significant difference between focuses other than the Paris Climate Summit.

2 Data and Research Method

Introduced in Taiwan for more than a decade, Facebook has the highest penetration rate (the proportion of internet users with Facebook accounts) than anywhere else in the world. The statistic suggests that 80% of the Taiwanese population were active social media users as of the third quarter of 2017. Facebook has a 77% penetration rate in Taiwan, comparing to 72.4% in North America, 57.3% in Latin America/Caribbean, 48.1% in Oceana/Australia, 41.7% in Europe, 13.8% in Asia and 12.7% in Africa. In comparison to the other major social media platforms in Taiwan that provide similar functions in terms of posting, liking and sharing, Instagram has a 35% penetration rate, Twitter has 21% percent. and Weibo has 16% percent (Figure 1). In light of its highest percentage of penetration rate and its popularity among other social media, I target at Facebook as the only platform to uncover Taiwan's online climate change discourse.
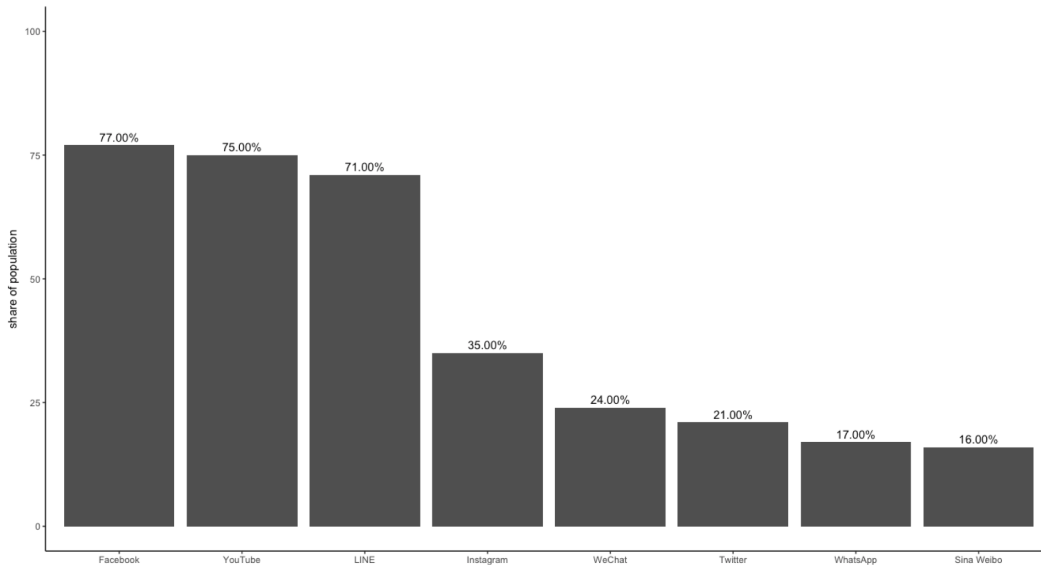

Figure 1: Penetration rate of social media in Taiwan

Due to the limitations imposed by Facebook, searching individual and private pages with a string or hashtags (#) is no longer possible. I therefore first identify the public Facebook pages that might be relevant to the climate change discussion in Taiwan by searching public Facebook posts that contain climate change-related keywords, including "climate change" and "global warming." I then

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compile a list of Facebook public pages and categorize them into epistemic groups and environmental NGOs. The purpose is to examine the role of climate change-related stakeholders in shaping the online discourse. On the other hand, with the aim to observe the climate change discourse in general, I also collect a list of Facebook pages that contains stakeholders from political realm (with major political parties and politicians) and news media. Therefore, I come to have 5 different types - 39 Facebook pages in total - 1) the top twelves most read news media on Facebook, including traditional and online news media's official pages, 2) five political parties - Kuomintang (KMT), Democratic Progressive Party (DPP), People First Party (PFP), Taiwan Solidarity Union (TSU), Green Party Taiwan, 3) three 2016 presidential candidates' - Tsai Ing-wen (DPP), Eric Chu (KMT), James Song (PFP) official pages, 4) seven environmental non-governmental organizations (NGOs), and 5) epistemic community - seven think tanks and groups that are engaged in climate change governance at different degrees.

I scraps all the 39 selected pages including their ID names, total "likes" and "followers" numbers. Then I collected all the posts (3,897 posts) from these selected pages with the timeframe from the 1st November to 31st December, 2015 - before, during and after the COP21 Paris Climate Summit (the 30th November - the 12th December). The purpose is to capture the posts that are related to the climate change negotiation. After obtaining the posts, including information such as the content, posted date and time, the number of likes, comments, and shares, I filter out the total 367 posts that mention "climate change" (*qi hou bian qian* in Chinese) in the content during this selected timeframe.

It is worth noting that this dataset is based entirely on what the Facebook algorithm provides. There is little information about whether posts are being censored or deleted by Facebook. There is no evidence suggests that climate change is treated as a sensitive topic that Facebook would censor it. In addition, during the process of collecting Facebook posts, the program does not make a distinction on sentiments of each post - it does not make a distinction on whether the posts are positive toward the Climate Summit nor identify whether the posts

are climate-skeptic.

3   Who talks about climate change?

With the posts from the five identified groups - news media, political parties, politicians, environmental NGOs, and epistemic groups - the first step of the analysis is to examine how much contribution did the groups make to the climate change discussion on Facebook during the Paris Climate Summit. To uncover the question, I focus on the number of posts from each page and then aggregate the total number of climate-related posts by groups.

The result shows that the epistemic groups contribute the most to the climate change discussion on Facebook, followed by the environmental NGOs, news media, political parties, and politicians. In the dataset, 259 out of 929 posts from the epistemic groups are about climate change, 42 out of 368 posts for environmental NGOs, 30 out of 1569 for the news media, 3 out of 596 posts for political parties, 3 out of 435 for politicians. Figure 2 shows the number of posts on climate change with relation to when the Paris Climate Summit took place - the start and end dates of the Paris Climate Summit are marked with black dash lines - by groups. To some extent, the intensity of climate change discussion on Facebook follows the real-time event. However, the discussion of climate change and the Paris Climate Summit is very concentrated within environmental and epistemic groups, which are the ones that contributed the most posts on Facebook. In contrast to the intensive discussion about the Paris Summit and Agreement at the international level, there is little attention paid to the process of climate negotiation on the Taiwanese Facebook platform. There are only half of the selected news media platforms, two politicians and one political party contributed one or two posts on climate change during this period.

Based on the intensity of discussion on Taiwanese Facebook, climate change is not a politically charged topic that 2/3 of presidential candidates did not address or respond to during the Paris Climate Summit, nor do the political parties post anything extensively related to climate change. The same phenomenon can
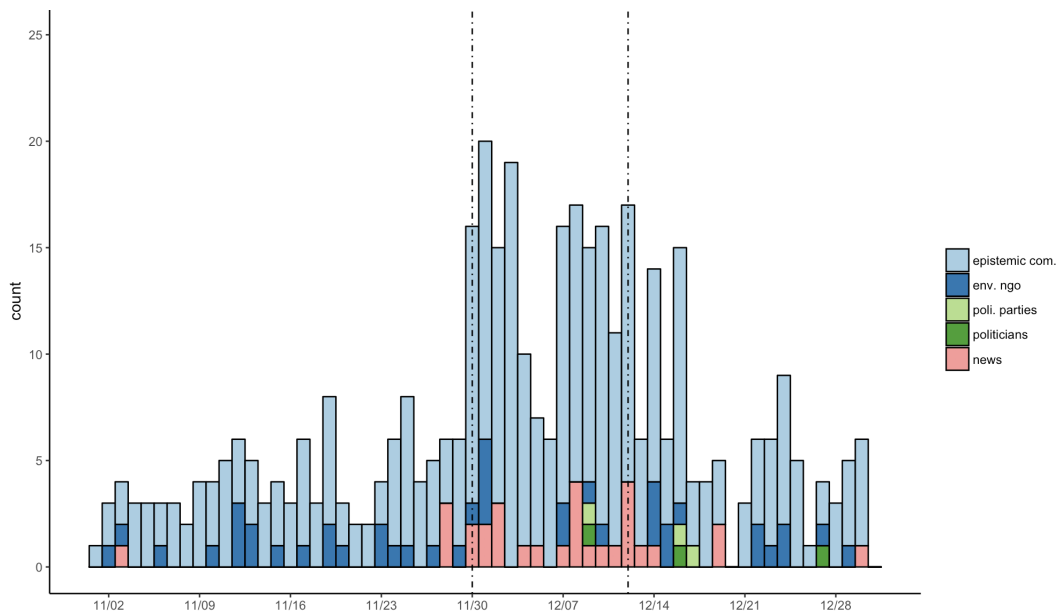
Figure 2: Number of posts on climate change from Nov 01 to Dec 31

also be observed from the discussion on the news media; the traditional news media pages had zero post on climate change during the period, and the climate change-related posts can only be found on a smaller scale and online news media.

To further investigate the phenomenon, I identify the top 12 most active Facebook pages that posted about climate change during the timeframe (Figure 3) and with their total page likes. The most active stakeholder in the climate change discussion is Taiwan Youth Climate Coalition, which is the first Taiwanese youth founded group aiming to increase climate awareness in Taiwan. Followed by the weather anchor Peng Chi-ming's fan page. He is one of the very few weather anchors that combines climate change awareness and weather events in Taiwan. The other active pages are mainly think tanks and environmental-related blogs. Among the most active pages, Greenpeace Taiwan is the only stakeholder that could be considered as an International actor, while the other pages are operated by Taiwanese domestic actors. There is a stark contrast of the total page likes between the Greenpeace Taiwan (with 486,928 likes) and the rest of the pages. The contrast may signal the relative weak voice of domestic epistemic groups in Taiwanese climate change discourse.

User name (Chinese)	User name	Type	Posts	Likes count
台灣青年氣候聯盟	Taiwan Youth Climate Coalition	epistemic com.	84	13908
氣象達人彭啟明	Weather anchor Peng Chi-ming	epistemic com.	51	174482
CSRone 永續觀點	CSRone Sustainable Perspective	epistemic com.	34	7401
台灣永續能源聯盟	Taiwan Renewable Energy Alliance	epistemic com.	33	3775
低碳生活部落格	Low Carbon Life Blog	epistemic com.	29	18828
台灣地球日	Earth Day Taiwan	epistemic com.	27	37804
環境資訊中心	Environmental Information Center	epistemic com.	24	52340
共築方舟氣候變遷調適	Taiwan Climate Adaptation Platform	epistemic com.	15	1274
綠色和平 (台灣網站)	Greenpeace Taiwan	env. ngo	15	485928
台大風險政策中心	Risk Society and Policy Research Center	epistemic com.	12	4083
帥帥倫粉絲團	Professor Ling Tze-leun	epistemic com.	10	1438
遠見雜誌	Global Views Monthly	news	10	1364675

Figure 3: Profile of the top 12 most posted pages

4 How influential is the climate change discourse?

After mapping out the intensity of climate discourse within each group, I explore the potential influence when climate change discourse is carried out by different groups on Facebook during the selected period. Figure 4 shows the number of posts on climate change in relation to the number of 'like'. The color of dots represents the five different groups, and the size of dots represents the number of total 'like' of each page. Here in this context, the more 'like' a page has, the more influential the page is. The data suggests that the epistemic groups (brown color dot) have the highest number of posts on climate change, but their total pages 'like' are the lowest among the groups, with only one page passing the 50,000 'like' threshold (the grey dash-line).

The environmental NGOs posted less on climate change but had more 'like' than the epistemic groups. The most influential stakeholders, including the ones from presidential candidates and news media - with more than 2,000,000 likes on Facebook - have zero post on climate change.
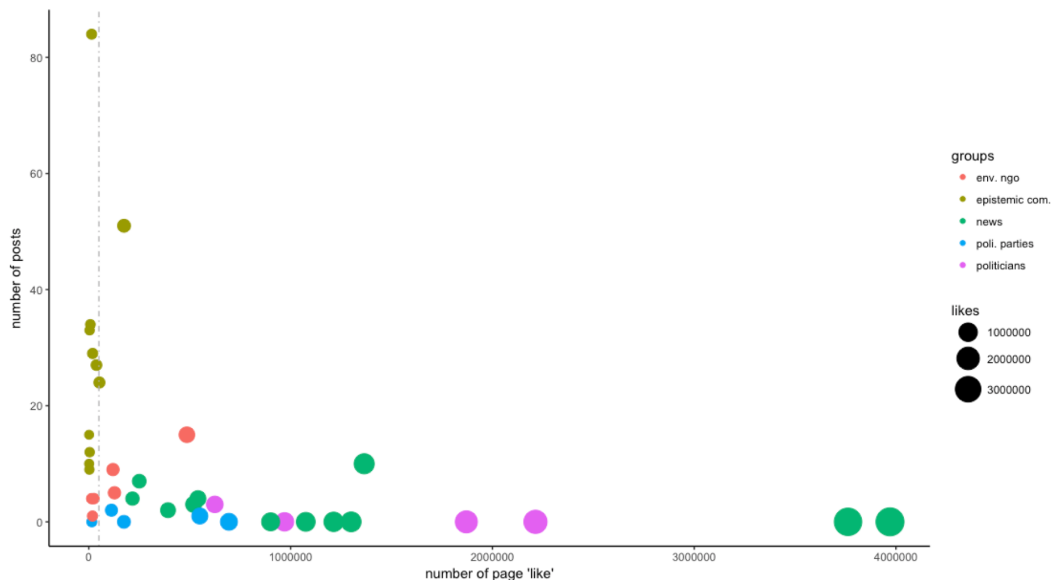
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Figure 4: Number of posts on climate change vs. total page 'like' from Nov 01 to Dec 31

To have a more nuanced story behind the influence of climate change discourse, I then identify the top 12 most 'liked' Facebook posts from the dataset (Figure 5). The Figure shows the user name of page, types, like counts for each post, and considering the length of each Facebook post varied - ranging from 130 characters to 389 characters, I only extract the topic of each post instead of demonstrating the whole message. The most liked post is from the then ruling political party, Kuomintang, posting about the Taiwanese agriculture policy under the global climate challenges (with 10,689 likes). Followed by the post from Global Views Magazine reporting about the Paris Climate Agreement and its significance. A presidential candidate James Song from the People First Party ranked third place with his three posts on the 2016 presidential election television debate, agriculture policy and low carbon economy. Greenpeace Taiwan has the 6th - 12th most liked posts, with one post addressing the local air pollution in Taichung and the rest addressing international climate change-related events.

Although the epistemic groups are the most active stakeholders in posting about climate change-related issues, their general outreach is very limited - including both their page likes and post likes. Political parties and politicians, on the other hand, share a more considerable influence in shaping online climate

User name	Type	topic	Likes count
國民黨 Kuomintang	poli. party	Agriculture policy and Taiwan's opportunity	10689
遠見雜誌 GV Magazine	news	Paris Climate Agreement and its importance	9477
宋楚瑜 James Soong	politician	Presidential election and debate	7739
宋楚瑜 James Soong	politician	Agriculture policy and climate change challenges	4666
宋楚瑜 James Soong	politician	Low carbon economy and green energy	2150
Greenpeace Taiwan	env. ego	Say no to fossil fuel	1913
Greenpeace Taiwan	env. ego	Stop deforestation in Indonesia	1532
Greenpeace Taiwan	env. ego	Save the climate and support renewable energy	1452
Greenpeace Taiwan	env. ego	Air pollution in Taichung and end fossil fuel	1423
Greenpeace Taiwan	env. ego	Paris Climate Agreement	1371
Greenpeace Taiwan	env. ego	Taiwan takes part in march for climate	1370
Greenpeace Taiwan	env. ego	Paris Climate Agreement	1341

Figure 5: Profile of the top 12 most 'liked' posts

change discourse, but it does not appear to be a topic that concerns these political stakeholders. Finally, environmental NGOs hold a much more influential position than the epistemic groups, but pay less attention to climate change issues. Greenpeace Taiwan is one of the exceptions that both addresses climate change in an extensive manner and has a significant degree of outreach.

5 What types of framing attracts the most attention?

Online climate change discourse has various framing catering to stakeholders' agendas and interests, or sometimes just reflecting different kinds of focuses without any particular hidden agenda behind the posts. In this section, I analyze the framing of the top 100 most liked posts during the selected timeframe and hand-coded them into seven different framings - the Paris Summit, weather events, Taiwan's climate policy, agriculture, fossil fuel phase-out, air pollution, and renewable energy. These posts comprise almost 30% of the total posts that mention "climate

change" and provide a brief snapshot of the most popular framing regarding online climate change discourse in Taiwan.
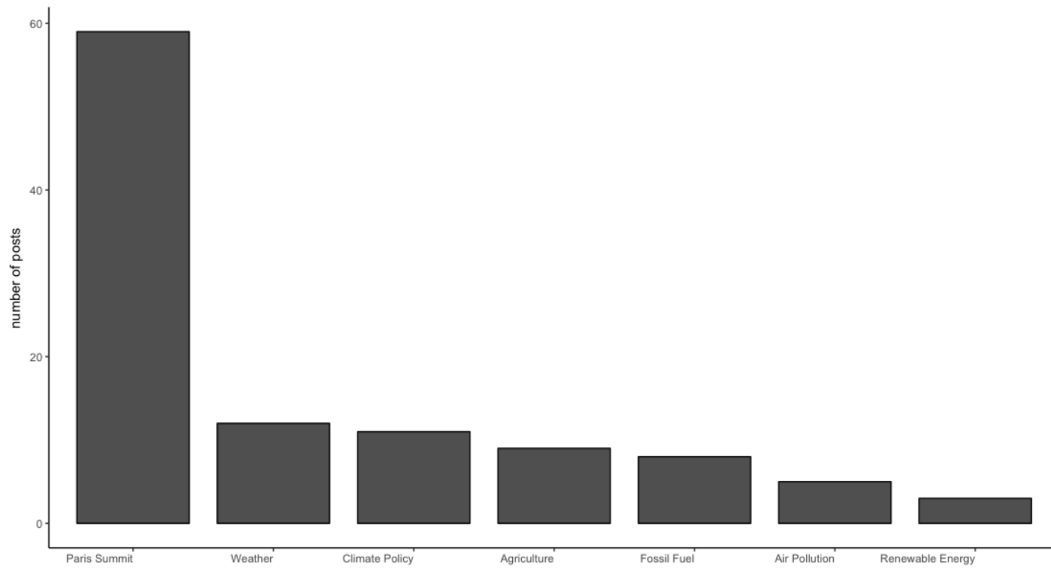

Figure 6: Topics of the top 100 most 'liked' posts

The first type of framing, the Paris Summit, is mainly reporting the event itself, including the negotiation process, the side events, and the latest development of the Paris Agreement. Interestingly, the tone of reporting the Summit is very homogeneous, and all share a fairly positive perspective toward the global climate change action. There is no evidence suggests any climate skeptic framing within the top 100 most liked climate-related posts on Facebook. The second type of framing is about weather events, which surrounding the extreme weather events at the global and the local level, as well as how climate change is impacting the weather in Taiwan. The third type of framing is about the domestic policy specially designed to address climate change and reducing carbon dioxide emissions. The fourth type of framing, agriculture, is centering around the climate change impacts on the agriculture industry - such as the shrinking of crop productions due to extreme weather events - and the potential policy responses to such problems. The fifth type of framing, fossil fuel phase-out, is an agenda mainly advocated by stakeholders that have an international background - including Greenpeace Taiwan and Taiwan Youth Climate Coalition. Domestic epistemic groups and NGOs

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are rarely presented in fossil fuel phase-out discussion. Air pollution is the sixth type of framing, comparing to climate change, it is a problem at the local level that concerns environmental NGOs the most. Air pollution in Taiwan is mainly caused by two main factors: the heavy industries located in southwest Taiwan and the transboundary air pollution (PM2.5) from China. The air pollution has become an increasingly pressing issue due to its severe impacts on health and the living environment. However, there is a huge gap between climate change and air pollution discourses among the public. The seventh framing, renewable energy, includes the development of hydro, solar, wind, and geothermal energy. The Taiwanese government has set the target that 20% of energy would come from a renewable source by 2025. Yet insofar there is a lack of concrete plan to work with the private sector to increase the uptake of solar panels and to create a more robust market for Taiwanese renewables firms.

As the data is collected before, during, and after the Paris Climate Summit, it is not surprising that the Paris Summit framing accounts for the majority - about 60% of the top 100 posts. Although the number of examined posts is relatively small and there is no quantitative measurement, Figure 6 shows that other than the Paris Summit, there is no significant difference between other types of framings, with framing on weather events attracts more attention and framing on renewable energy received less attention among the top 100 most liked posts.

6 Discussion

While literature suggests that epistemic groups and environmental NGOs are the major stakeholders in shaping online climate change discourse. Moreover, social media platforms could be a powerful tool in exerting influence for climate activists, drawing implications from Facebook in Taiwan, climate change-related groups share a minimal power of discourse. In the study, epistemic groups and environmental NGOs are the most active users in posting climate change-related content, but they also have very small outreach comparing to other types of stakeholders. Despite there is a very small number of posts, politicians and political parties are

the most influential stakeholders on Facebook climate change discourse. However, due to the relatively small sample size of posts, the analyzing result shows that there is no significant difference in terms of what kind of framing attracts the most attention.

Where does the result lead us regarding the online climate change in Taiwan? Climate change appears to be a topic that is distant from people's daily life on Facebook. Politicians do not treat global climate action and governance as an important niche to gain their political support in Taiwan. The direct linkages between climate change and local weather events, air pollution, and policy-making, remain relatively weak and sometimes missing. That being said, the next step of this study will be focusing on how to strengthen the ties between climate change discourses and local events. Larger sample size and longer timeframe on Facebook posts will be collected, and quantitative text analysis will be carried out. A special focus will be on when politicians and political parties talk about climate change, and what kind of narratives do they adopt and how those narratives attract people's attention.

References

Auer, M. R., Zhang, Y. & Lee, P. (2014), 'The Potential of Microblogs for The Study of Public Perceptions of Climate Change', *Wiley Interdisciplinary Reviews: Climate Change* **5**(3), 291–296.

Cody, E. M., Reagan, A. J., Mitchell, L., Dodds, P. S. & Danforth, C. M. (2015), 'Climate Change Sentiment on Twitter : An Unsolicited Public Opinion Poll', *PLoS One* **10**(8), 1–18.

Kay, S., Zhao, B. & Sui, D. (2015), 'Can Social Media Clear the Air? A Case Study of the Air Pollution Problem in Chinese Cities Problem in Chinese Cities', *The Professional Geographer* **67**(3), 351–363.

Koteyko, N., Nerlich, B. & Hellsten, I. (2017), 'Climate Change Communication and the Internet : Challenges and Opportunities for Research Climate Change

Communication and the Internet : Challenges and Opportunities for Research',
Environmental Communication **9**(2), 149–152.

Liu, J. C.-e. & Leiserowitz, A. A. (2010), 'From Red to Green?', *Environment:
Science and Policy for Sustainable Development* **51**(4), 32–45.

Liu, J. C.-e. & Zhao, B. (2016), 'Who Speaks for Climate Change in China?
Evidence from Weibo', *Climatic Change* (140), 413–422.

O'Neill, S., Williams, H. T., Kurz, T., Wiersma, B. & Boykoff, M. (2015), 'Dominant Frames in Legacy and Social Media Coverage of the IPCC Fifth Assessment
Report', *Nature Climate Change* **5**(4), 380–385.

Schäfer, M. S. (2012), 'Online Communication on Climate Change and Climate
Politics : a Literature Review', *WIREs Clim Change* **3**(December), 527–543.

Segerberg, A. & Bennett, W. L. (2011), 'Social Media and The Organization
of Collective Action: Using Twitter to Explore the Ecologies of Two Climate
Change Protests', *The Communication Review* **14**(3), 197–215.

Sullivan, J. & Xie, L. (2009), 'Environmental Activism, Social Networks and the
Internet', *The China Quarterly* **198**, 422–432.

Tandoc Jr, E. C. & Eng, N. (2017), 'Oxford Research Encyclopedia of Climate
Science Climate Change Communication on Facebook , Twitter , Sina Weibo ,
and Other Social Media Platforms', *Oxforad Research Encyclopedia of Climate
Science* pp. 1–20.