Discussing Environmental Issues in Chinese Social Media: An Analysis of Greenpeace China's Weibo Posts and Audience Responses

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Despite growing interest in citizens' use of social media for environmental purposes, the way in which environmental non-Governmental organizations (ENGOs) employ social media has been largely neglected. Drawing on environmental communication and message framing scholarship, this content analysis of a year's worth of Greenpeace China's Weibo posts and user comments explores a) how a leading ENGO discusses environmental issues on social media, and b) how users react to various environmental topics and framing strategies in terms of liking, sharing, and commenting. Results suggested that Greenpeace China adopted the responsibility frame heavily in messages and focused largely on pollution-related topics. Users reacted the most to food and agriculture-related posts. The conflict frame was related to more emotional comments, and the presence of a responsibility frame was related to more likes and reposts. Implications for framing studies on social media and environmental communication are discussed.

Keywords: advocacy, environment, framing, social media, China, content analysis

The rise of social media provides powerful tools for individuals and organizations to disseminate messages, share public opinions, and organize collective action, as evidenced by the Arab Spring, the Occupy Wall Street protests, or the recent Black Lives Matter movement (Chokshi, 2016; DeLuca, Lawson, & Sun, 2012; Hamdy & Gomaa, 2012). Such social media-centric bouts of activism also have been employed in the environmental protection realm, such as with the anti-PX (para-xylene; a toxic chemical product) protests in China (Lee & Ho, 2014), the anti-Lynas campaign in Malaysia (Kaur, 2015), the "oil complex" discussion in Nigeria (Uzoechi, 2014), and the anti-Keystone XL pipeline activism in the U.S. (Hodges &

Stocking, 2016). Research into these environmental campaigns suggests that social media can be used to increase awareness effectively, generate discussion, and even prompt behavioral changes, all of which can influence environmental policy.

While a growing body of research examines how citizens use social media to disseminate information and promote activism in both political and environmental contexts (Gazali, 2014; Kang, 2012; Obar, 2014), fewer studies have examined how non-governmental organizations, in particular environmental non-governmental organizations (ENGOs), are using social media for advocacy. Understanding the strategies ENGOs adopt in their social media practices is pivotal to the success of environmental protection oriented actions considering that many large-scale environmental campaigns are led not by citizens, but by ENGOs because of their relatively abundant resources and expert knowledge on specific environmental issues (Hodges & Galen Stocking, 2016; Kaur, 2015; Terracina-Hartman, Bienkowski, Myers, & Kanthawala, 2013). Thus, by examining how the ENGO Greenpeace China frames environmental messages on social media, and how audiences react to those messages, this study extends existing scholarship and offers practical insights useful for ENGOs conducting social media campaigns.

Further, much of the existing empirical studies on the role of social media in activism primarily focus on the information that is sent from or articulated by the source (Bortree, Ahern, Smith, & Dou, 2013; Campbell, 2013; García, 2011; Tong, 2014), rather than the way in which the audiences react to the information. Considering that users' ability to react and respond to messages via commenting, liking, and reposting exerts tremendous impact on the virality of an issue and the subsequent discussions and behavioral change among users (Holton, Lee & Coleman, 2014; Terracina-Hartman et al., 2013; Wang & Liu, 2016), an investigation into how users react to messages from ENGOs on social media is warranted.

Against this background, this research examines a) how the ENGO Greenpeace China used social media to disseminate environmental messages, and b) how social media users reacted to different framing strategies in terms of liking, sharing, and commenting. Ultimately, this study adds to the burgeoning body of literature that seeks to understand how ENGOs use social media to present environmental messages, and extends the existing literature of framing on environmental issues by offering a unique perspective

regarding online audiences' reactions toward different environmental issues and framing techniques on social media.

To achieve these goals and to avoid contextual differences across countries, we purposefully situate our research in a case study of Greenpeace China—the largest ENGO in the nation. Specifically, we conducted a systematic content analysis of Greenpeace China's Weibo[1] (a mainstream Chinese microblogging service) posts, as well as the organization's social media followers' reactions to those posts, over the course of a year. By examining online audiences' reactions, this study sheds light on how ENGOs might be able to frame messages that prompt action. As previous studies indicate that emotion is essential for prompting attitudinal and behavioral change (Gross & D'Ambrosio, 2004; Nabi, 2003; Van Stekelenburg & Klandermans, 2013; Van Zomeren, 2013), analyzing online audiences' reactions on social media is particularly meaningful for potentially raising public awareness on and involvement with environmental issues, and informing environmental activist organizations interested in moving online action offline.

LITERATURE REVIEW
Environmental Communication in Social Media

A growing body of literature suggests a positive correlation between online social media use and political participation, be it voting or protesting (Anduiza, Cristancho & Sabucedo, 2013; Bennett & Segerberg, 2012; Harlow, 2012). While some scholars question activists' use of capitalist, corporate platforms (Askanius & Gustafsson, 2010) that are linked to government and corporate surveillance and repression (Morozov, 2011), researchers generally contend that social media represents a way that citizens can cheaply, quickly, and easily disseminate the messages of their choosing without the traditional limits of time and space (Juris, 2005; Weeks & Holbert, 2013).

Studies suggest that social media and other digital tools have become just as important as traditional activism tactics (Costanza-Chock, 2014; Harlow & Harp, 2012). Environmental activists around the globe also rely on social media. For instance, Uzoechi

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[1] *Weibo* (or 微博) means "microblog" in Chinese. To be fair, there are numerous microblogging platforms in China. Among them, Sina™ Weibo is the largest and most influential (Ji, 2016; Zhang & Negro, 2013). For that reason, the term Weibo is used in referring to the specific microblogging service provided by Sina Corp.

(2014) suggested that citizens and ENGOs' active use of social media, particularly blogs, brought pluralistic views on the discussion of oil drilling in the Nigeria delta. Similarly, in the case of anti-Lynas, a protest against an Australian mining company which intended to open a refinery in Malaysia, Kaur (2015) noted how ENGOs' strategic use of social media played a vital role in creating awareness and informing the public about the hazardous rare earths mining, which led to a thorough investigation of Lynas' activities. The author further argued that social media is "a great leveler and a democratic force that has opened up a new realm for wider public participation on social issues, especially in countries where traditional media is controlled by the ruling establishment" (Kaur, 2015, p. 311).

Hodges and Stocking's (2016) analysis of tweets concerning the proposed Keystone XL pipeline project found that the anti-Keystone XL group not only actively engaged with supporters through links and retweets, but also heavily (re)tweeted action and identity reinforcing-oriented content. Moreover, the pro-Keystone group relied on Twitter as much as the anti-Keystone group did (Hodges & Stocking, 2016), illustrating the role of social media in campaigns that are not necessarily pro-environment. While these studies indicate the ability of social media to prompt discourse and strengthen identity, Merry (2014) found that during the Gulf of Mexico oil spill in 2010, the majority of tweets sent by environmental groups were non-interactive in nature, and the limited interactivity on Twitter did not lead to effective results. Still, jointly, these studies highlight the importance of social media activities, be it sharing, liking, or commenting, in contemporary environmental communication.

Social media also have come to play an important role in Chinese environmental activism (DeLuca, Brunner, & Sun, 2016). For example, in 2007, after the local government of the city of Xiamen approved construction of a multi-billion dollar paraxylene (PX, a toxic chemical product) project, citizens used social media (i.e., online forums) to organize a protest that brought 15,000 demonstrators to the streets. The protests helped lead to the eventual suspension of the PX project (Liu, 2013; Li, Liu, & Li, 2012). To date, this protest remains one of the few that successfully led to policy changes in China (Liu, 2013; Xiao, 2011). Similarly, in 2013, citizens used Weibo to petition for air quality transparency (Atkin, 2014; Kay, Zhao, & Sui, 2015).

Message Framing

Increasingly, scholarship investigates news/message framing in the field of environmental communication. Message framing suggests that the ways media adopt certain techniques to depict (or frame) certain issues influence audiences' perceptions of those issues (Entman, 1993). Framing typically is achieved by invoking interpretive cues that correspond to individuals' pre-existing schema (Scheufele, 2000). As a result, audiences often adopt the framed information in their construction of meaning and reality, which influences decision-making and behavior (Entman, 2004).

Framing research is rather popular among mass media researchers: Matthes (2009) identified more than 130 framing studies in communication journals from 1995 to 2005. In the area of environmental communication, framing theory is commonly adopted in two strands of studies. One is media framing, which concerns how media outlets cover environmental issues. For instance, García's (2011) investigation of how U.S. newspapers framed an environmental dispute between British Petroleum and Greenpeace identified six major types of frames and attributes: credibility, power, hero/villain frames, causal attribution, and social responsibility attribution. In a non-Western context, Tong (2014) studied ten major Chinese newspapers' framing of environmental problems and revealed that the newspapers often challenged the current institutional discourse of economic development. Of course, framing research is not limited to newspapers. For example, Campbell's (2013) framing study of environmental risks and natural disasters in U.S. infotainment television programs suggested those programs often frame environmental risks as voyeuristic spectacles for entertainment. The importance of media framing research, as Bortree and colleagues (2013) suggested, is that certain framing strategies indicated potential to motivate attitudinal and behavioral change.

The second strand of framing studies in environmental communication tests audiences' responses to framed environmental information in various media platforms. Typically this type of research involves experiments. For instance, by operationalizing framing in terms of the problem (gain and loss), target (current and future), and recommended activities (taking less and doing more), Davis (1995) found that environmental ads that discussed losses for current generations led to the strongest intention to participate in environmentally responsible behavior among college students.

Other studies also implicitly link message framing and behavioral intention. As an example, Terracina-Hartman and colleagues (2014) investigated how people react to information-based and fear-based environmental videos on YouTube, and found that the perception of fear negatively related to behavioral intention to take actions to stop coal use.

Despite the growing interest in message framing in the field of environmental communication research, few studies have examined how NGOs frame environmental issues on social media, which exerts "strong influence on the mobilization of movement resources and the construction of collective identities" (Sullivan & Xie, 2009, p. 426). Thus, this study contributes to the existing literature by examining framing of environmental issues on social media in China, a country where, despite censorship of the Internet, social media remain a space for citizens to inform themselves and mobilize (Junor, 2014).

Framing theorists have also outlined emotion as key to evoking behavioral change (Gross & D'Ambrosio, 2004; Nabi, 2003). This is particularly true in environmental framing contexts. Emotion affects people's cognitive processing of information, and thus impacts decision-making and judgments (Nabi, 2003). For instance, if audience members felt strong anger resulting from the media portrayal of an environmental issue that caused substantial damage, they were more likely to call for punishment of or protest against the responsible actor. In contrast, if audience members perceived the damage as not salient and nobody was held accountable in the media's framing of a particular case, audience members were more likely to experience nothing emotionally, and thus the intention of adopting certain behavior was lower (Nabi, 2003). Similarly, the literature on media psychology contributes to our understanding of how emotion can be used to promote pro-environmental attitudes and behaviors. Early studies revealed that negative emotion increased the likelihood of assessing risks of environmental problems (e.g., Johnson & Tversky, 1983). On the other hand, positive emotions also affect how people think and react. For instance, Searles (2010) found that enthusiastic appeals in environmental PSAs have a strong positive effect on pro-environment attitudes. Thus, many environmental practitioners and scholars have stressed the importance of crafting environmental messages that easily provoke emotional reactions and thus are more likely to influence attitudes and behaviors (e.g., Hipolito, 2011). Due to this consideration, we were also

interested in how many emotional comments each post generated, in addition to the number of likes, shares, and comments.

Internet Censorship and Weibo

To understand the role of social media in China's environmental communication, it is necessary to highlight the general media environment in China. Most scholars agree that the Chinese government exerts powerful influences on the daily practices of Chinese media. Traditional media (such as newspapers and television stations) are exclusively owned and operated by the State and are considered the mouthpiece of the Communist Party (Rawnsley & Ming-yeh, 2015; Weber & Fan, 2016). As such, these media are obligated to serve the mission of propaganda on a policy level. Although the rise of the Internet and social media in the early 21st century challenged the dominant role of government in social and political discourse, the Chinese central government quickly adapted to the changes by passing a series of strict cyberspace regulations and incorporating online censorship technologies. To date, China's Internet surveillance and censorship systems are considered the most sophisticated and extensive across the world (e.g., King, Pan, & Roberts, 2013; see Ji, 2016, for a quick review of Internet censorship in China).

Despite the heavy censorship, numerous domestic-grown social media platforms such as Weibo and WeChat have decentralized the flow of information and served as a space for public discourse and dissent (DeLuca, Brunner, & Sun, 2016; Herold & Marolt, 2013). In particular, Weibo—a hybrid Twitter- and Facebook-like microblog service with more than 3 million monthly active users—carries a heavy weight in influencing public opinion in China (e.g., Cui, Fei, & Liu, 2014; Hook, 2013; Lee & Ho, 2014; Wang & Liu, 2016). As such, many scholars consider Weibo a platform that "fosters civic engagement to achieve just outcomes" (Zhang & Negro, 2013, p. 202).

Environmental Issues and ENGOs in China

China for years has been hailed for its economic successes and possibilities. Recently, however, the negative impact of unregulated economic development on the environment has started to attract media coverage and public awareness. Repeated

coverage in national and international media of issues such as water pollution, food safety, toxic chemical waste, and smog have led to a perception of environmental crisis (Shapiro, 2013). This perception, coupled with the growth of the Chinese middle class and an increasing concern about environmental and health issues, has helped prompt numerous bouts of collective action related to environmental causes (Shapiro, 2013; Tilt, 2006). These collective actions are particularly noteworthy considering the Chinese regime's rigorous restrictions on protests and social movements (Xiao, 2011).

De Burgh and Rong (2012) identified four major groups that play a role in China's green movement: journalists/media, grassroots citizens, government, and ENGOs. Because traditional media like newspapers and television by law fall under government control in China, citizens and ENGOs actually constitute a relatively independent power in comparison with the strictly censored media. However, due to the dependency on government support and/or the lack of sufficient funding, most domestic Chinese ENGOs only have limited capability, whereas international ENGOs—including Greenpeace, World Wildlife Fund, Natural Resources Defense Council, and the World Resources Institute— become the information hub and actual leaders of several influential green movements in China (Shapiro, 2013), further justifying the importance of understanding the messages Greenpeace China disseminates via social media.

Research Questions

Based on the preceding literature regarding message framing and the role of social media in environmental communication, this study analyzes how leading ENGO Greenpeace China framed various environmental issues on social media and how users reacted to these frames in terms of likes, shares, and comments on Weibo. The first set of research questions examines what kinds of environmental issues are being disseminated by Greenpeace China, and what types of framing techniques were adopted in those messages:

RQ1: What are the main environmental topics of Greenpeace China's Weibo posts?

RQ2: How does Greenpeace China utilize different frames to discuss different environmental topics on Weibo?

In addition, we were interested in how Weibo users reacted to those messages posted by Greenpeace China. This question is addressed by interrogating how many times users shared, liked, and commented on different types of environmental issues and framing techniques employed in Greenpeace China's posts:

RQ3: How do Greenpeace China's Weibo followers react (in terms of liking, reposting/sharing, commenting, and expressing emotion) to the different types of environmental topics?

RQ4: How does the presence (or absence) of specific frames affect the ways in which Greenpeace China's Weibo followers react to the message?

METHODS

Data and Procedure

This study adopted a hybrid method of computational and manual content analysis to analyze social media posts and audience responses (Lewis, Zamith, & Hermida, 2013). The combination of these two methods allows for being systematic, objective, and efficient, as well as facilitates accuracy.

We collected Greenpeace China's Weibo posts and users' comments published from October 2013 through September 2014. Similar sampling techniques were used in prior content analyses of social media posts in environmental contexts (e.g., Hodges & Galen Stocking, 2016; Kay, Zhao, & Sui, 2015). Greenpeace China was selected for the present research for three main reasons: First, Greenpeace China is one of the oldest officially registered environmental groups in mainland China. Second, Greenpeace China has more than 125,000 followers on Weibo by the time this study was administered, making it one of the most-followed ENGOs in China. Third, Greenpeace China's active involvement in several environmental issues during the past few years has attracted broad attention from the public (Cui et al., 2014). This resulted in a total of 509 posts and 19,530 comments that accompanied those posts. For each post from Greenpeace China, the corresponding numbers of likes, comments, and reposts were captured.

Manual Coding Instrument

Framing categories were conceptualized based on media and collective action frames (Benford & Snow, 2000; Semetko & Valkenburg, 2000). Specifically, coders judged each Greenpeace China's post on six frames:

(1) responsibility: whether the post held someone or a certain group responsible for the environmental issue (e.g., "About the world cup, many international brands, including Adidas, were found manufacturing toxic clothes. Please repost this message and let your friends know!");

(2) human-interest: whether the post attempted to emotionalize the environmental issue (e.g., "It's heartbreaking to look at the eyes of those polar bears, who are losing their homes because of climate change...");

(3) conflict: whether the post addressed different views/positions between different actors or reflected disagreement (e.g., "Have you ever heard that 'pirates' will protest on drilling platforms for the protection of environment in the Arctic pole? However, the Russian government arrested those activists and charged them with 'piracy' last week. Please join us and support those activists!");

(4) morality: whether the post approached the environmental issue from a moral or religious perspective (e.g., "It is simply immoral to conduct coal mining like that in the Tibet plateau");

(5) consequence: whether the environmental issue would likely cause negative consequences, like health and economic problems (e.g., "@Adidas China, aren't you shamed that your products are causing people to have reproductive issues?"); and

(6) action: whether the post called on people to take action regarding the discussed environmental issue (e.g., "Please ACT! Taking action is the only meaningful way to protect the rain forest!"). Since framing techniques were seldom employed separately, coding categories were not mutually exclusive. As a result, 53.8% of our sample data was coded using more than one frames.

Note that the first five frames were drawn from Semetko and Valkenburg's (2000) generic frames, which are widely adopted in framing research across different media platforms, including social media (Hamdy & Gomaa, 2012). Further, to expand the scope

of the frames on social media, we borrowed the agency/action frame outlined in the collective action literature (Benford & Snow, 2000; Harlow, 2012).

Posts also were coded for environmental issues. Based on the mission statement on Greenpeace China's official website, the topic of environmental issues discussed in each post was coded into one of six mutually exclusive categories: (1) ocean protection, (2) pollution, (3) forest protection, (4) food and agriculture, (5) climate change, and (6) coal mining.[2] In the case where a topic was not among the six main categories, the post was coded as (7) "other" on its topic. The scope of the issue also was coded as (1) international, (2) domestic, or (3) global, which gauged whether the issue was a concern to multiple countries in the region, China itself, or all countries around the world.

Reliability

The 509 Greenpeace China posts were coded by three trained coders. Coders first had an extensive discussion about the coding instrument, and then independently coded all Greenpeace China's updates and users' comments posted from August 2014 to September 2014 (16.7% of the total sample). Krippendorff's alpha was used to assess inter-coder reliability because it does not limit sample sizes, number of coders, types and levels of measurement as well as missing data (Hayes & Krippendorff, 2007). Most variables yielded acceptable inter-coder reliabilities (Krippendorff's α > .7)[3], except the responsibility frame (α = .58) and the morality frame (α = .46). The coders then discussed and reconciled all the disagreements from the September sample, and then coded the August sample separately. Results indicated good reliabilities for all individual variables (ranging from 0.7 to 0.85).

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[2] Although these categories are not necessarily mutually exclusive (i.e., forest protection is conceptually related to climate change), coders were instructed to judge the topic of each post by its most prominent issue.

[3] Note that although many researchers recommend 0.80 or higher values of Krippendorff's α to be considered satisfactory, an α value of 0.7 and higher can be considered acceptable, if the tentative judgments are deemed acceptable (Krippendorff, 2004). In addition, given that Krippendorff's α is less inflated compared with other inter-coder reliability indices, a cut point of 0.7 was considered satisfactory in this study.

Computerized Coding

As discussed earlier, in order to gauge the audience's reactions to the posts by Greenpeace China, the number of likes, reposts, and comments on each main post was recorded. In addition, we were also interested in the sentiment of comments, as previous research shows that emotion is a key factor that explains the connection between exposure to specific environmental massages and subsequent attitudinal and behavioral changes (Gross & D'Ambrosio, 2004; Nabi, 2003; Searles, 2010; Terracina-Hartman et al., 2013).

Although emotion is an individual and subjective feeling, the concept itself has been defined as a set of discrete and measurable classifications (Ekman, 1992). Scholarship suggests six basic types of emotions exist in all cultures: anger, disgust, fear, happiness, sadness, and surprise (Ekman, 1992). Computational tools are built upon words or word stems that fall under each of these emotional categories. Content analyses of microblog posts' sentiment are often done by examining use of these emotional words (e.g., Shi, Wang, & He, 2013). However, since Chinese words and expressions differ from those in English, the traditional English lexicon cannot be directly applied to this analysis of emotion in Chinese microblog posts. Thus, this study used the emotion lexicon from DUTIR (available at: http://ir.dlut.edu.cn/), which includes the six emotions outlined above and a total of 10,259 Chinese emotional words (see Xu, Lin, Pan, Hui, & Chen, 2008 for details). This enabled us to identify emotional comments with the assistance of cloud-based computer software (http://discovertext.com/). Finally, we counted the number of emotional comments for each of the main posts. Note that we were interested in the number of emotional comments each post generated, as opposed to the specific valence indicated in each comment.

Statistical Strategies

A range of statistical techniques were considered to address our research questions. Specifically, descriptive statistics were employed to answer RQ1. RQ2 was examined via a combination of descriptive statistics and chi-square tests. Finally, RQ 3 and RQ4 were answered by a series of one-way ANOVAs and multiple regressions, respectively.

RESULTS

In general, Greenpeace China posted to Weibo sporadically throughout the 12 months analyzed. As shown in figure 1, pollution issues topped Greenpeace China's posts almost all the time, and the volume of pollution relevant posts was particularly high from October to December. In terms of the scope of issues, most posts (76%) were related to domestic environmental issues. About 15% concerned international environmental issues, and only about 9% were about global environmental issues.

Environmental Topics

In answering RQ1, which explored the main environmental issues discussed in Greenpeace China's Weibo posts, results show that of the 509 posts, most (44%) were about pollution. Forest protection was the second-most discussed issue, but only constituted a small proportion (13.6 %) of the overall posts. Other issues addressed in posts included food and agriculture (11.4%), ocean protection (5.3 %), coal mining (4.9 %), and climate change (2 %). About 18.7 % of posts were categorized as "other issues," such as such as job opportunities in Greenpeace, toxic fabric materials, and sand mining.
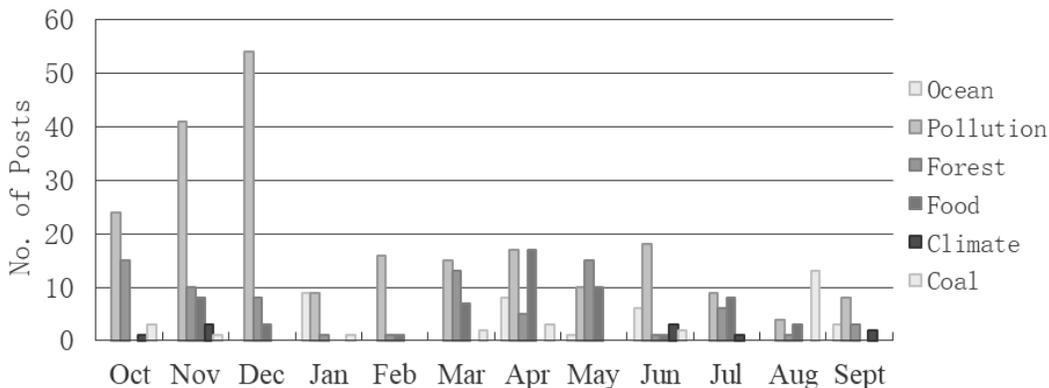

Figure 1. Issue frequencies by month

Framing

Addressing RQ2, about how Greenpeace China used different frames to discuss different environmental issues, results showed that the responsibility frame was used the

most (26.7 %), followed by the human-interest frame (12.3 %), consequence frame (16.9 %), action frame (14.2 %), morality frame (13 %), and conflict frame (11.8 %).

A series of Chi-square tests examined the relationship between each frame used and type of issue (see Table 1). Results showed significant differences between issue type and each of the six frames. In general, each of the six frames was most used for pollution-related posts (responsibility frame: $\chi^2 = 19.54$, $df=5$, $p < .001$; human-interest frame: $\chi^2 = 33.77$, $df=5$, $p < .001$; conflict frame: $\chi^2 = 20.48$, $df=5$, $p < .001$; morality frame: $\chi^2 = 38.66$, $df=5$, $p < .001$; consequence frame: $\chi^2 = 21.8$, $df=5$, $p < .001$; action frame: $\chi^2 = 19.06$, $df=5$, $p < .001$).

Table 1
Percentages of Posts by Frame and Topic

	Topics						
	Pollution (%)	Forest Protection	Food & Agriculture	Ocean Protection	Coal Mining	Climate Change	χ^2 (df)
Responsibility Frame	104 (47.3%)	41 (18.6%)	35 (15.9%)	14 (6.4%)	22 (10.0%)	4 (1.8%)	19.54*(5)
Human-interest frame	66 (55.5%)	31 (26.1%)	2 (1.7%)	5 (4.2%)	9 (7.6%)	6 (5.0%)	33.77**(5)
Conflict Frame	29 (34.5%)	21 (25%)	17 (20.2%)	10 (11.9%)	6 (7.1%)	1 (1.2%)	20.48* (5)
Morality Frame	34 (32.1%)	22 (20.8%)	24 (22.6%)	11 (10.4%)	14 (13.2%)	1 (.9%)	38.66**(5)
Consequence Frame	64 (43.2%)	26 (17.6%)	23 (15.5%)	12 (8.1%)	18 (2.2%)	5 (3.4%)	21.8* (5)
Action Frame	55 (51.9%)	30 (28.3%)	9 (8.5%)	5 (4.7%)	3 (2.8%)	4 (3.8%)	19.06*(5)

Note: * $p < .01$; ** $p < .001$

Audience Reactions

RQ3 asked how Greenpeace China's followers on Weibo reacted (in terms of liking, commenting, reposting, and expressing emotional feelings) to different types of environmental issues (see Table 2). Food and agriculture-related posts prompted the most likes, comments, reposts, and emotional reactions. A one-way ANOVA test suggested the type of issue significantly and positively affected the number of likes ($F(5,408) = 7.23$, $p <$

.001). Post hoc comparisons using the Games-Howell test indicated that the mean number of likes for posts that addressed food and agriculture issues (M = 26.06; SD = 30.31) was significantly more than posts that addressed pollution issues (M = 11.28; SD = 15.00). The number of likes did not yield significant differences for other post issues.

A significant effect of issue type on comments was also revealed ($F(5,408) = 3.47$, $p < .05$). Post hoc comparisons suggested that the mean number of comments for posts about food and agriculture (M = 90.59; SD = 150.53) was significantly more than posts that concerned forest protection (M = 21.68; SD = 38.29), climate change (M = 11.00; SD = 11.01), and coal mining (M = 24.72; SD = 22.83). The mean number of comments for posts concerning climate change (M = 11.00; SD = 11.05) was significantly less than posts about

Table 2
Mean Reactions Across Issue Types

Type	# of Likes (SD)	# of Comments (SD)	# of Reposts (SD)	# of Emotional comments (SD)
Climate Change	22.8 (22.90)	11 (11.01)	55.8 (53.73)	7.7 (8.56)
Forest Protection	15.55 (20.69)	21.68 (38.29)	89.58 (181.91)	15.35 (32.72)
Coal Mining	21.4 (22.62)	24.72 (22.83)	144.16 (185.80)	20.88 (32.32)
Ocean Protection	25.3 (35.13)	35.74 (29.59)	146.41 (222.15)	27.81 (27.25)
Pollution	11.28 (15.00)	39.89 (114.03)	152.27 (576.69)	22.57 (51.92)
Food and agriculture	26.05 (30.30)	90.59 (150.53)	257.71 (405.45)	82.04 (32.71)

ocean protection (M = 35.74; SD = 29.59) or pollution (M = 39.89; SD = 114.03). The rest of the issues did not show significant differences in terms of number of comments.

Similarly, issue type also was found to significantly affect the number of emotional comments ($F(5, 407) = 7.83$, $p < .001$). Specifically, posts concerning food and agriculture (M = 82.04) generated significantly more emotional comments than other topic issues. The type of issue did not significantly influence the number of reposts ($F(5, 407) = .94$, $p = .458$).

RQ4 questioned how users emotionally reacted to the presence/absence of each frame. Multiple regression analyses were performed to see whether the presence of each

frame predicted audience reactions (see Table 3). Results suggested that the presence of a conflict frame was significantly related to the number of emotional comments (β = .14, $p <$ .01). The presence of a responsibility frame also was significantly associated with the number of likes (β = .12, $p <$ .05) and reposts (β = .13, $p <$ .05).

Table 3
Regression Analyses Using the Presence of Frames to Predict Audience Reactions

	Likes	Comments	Emotion	Reposts
	β	β	β	β
Responsibility Frame	.12*	-.016	-.024	.13*
Human-interest frame	-.004	-.035	-.041	.001
Conflict Frame	.014	.087	.14*	-.031
Morality Frame	.106	.005	.042	-.011
Consequence Frame	.031	-.068	-.032	-.038
Action Frame	.036	-.041	-.035	-.029
R^2	.03	.01	.02	.02

Note. * $p <$ .05

DISCUSSION

The growing prominence of social media is changing not just the media landscape, but also impacting the ways in which ENGOs inform and potentially mobilize the public. A burgeoning body of literature has started to move beyond asking whether social media influence attitude and behavior, to consider how and why and under what circumstances (Valenzuela, 2013). However, to date, little research examines how environmental NGOs use social media and how audiences react to the ENGOs' social media posts. Hence the effectiveness of social media use is largely unknown for these ENGOs, especially those in China. Against this background, this content analysis of a year's worth of Greenpeace China's Weibo posts offers insight into what the organization is posting about, how issues are framed, and how users react to different topics and issue frames. Considering that previous research indicates emotional reactions influence behavior, this study is important for shedding light on what kind of posts NGOs and environmental groups could post on social media to provoke emotions and, perhaps, online and offline action.

This analysis showed that Greenpeace China posted about pollution (44%) far more than any other topic. The emphasis on pollution-related issues is consistent with the organization's primary focus, as Greenpeace China lists pollution as one of its top concerns on its website (greenpeace.org/china). Such a clear preference for addressing pollution-related issues reflects the critical environmental situation in China: according to Chinese officials, nearly 70% of environmental issues in China are caused by industrial pollution (Gao, 2015). Thus, it seems clear that Greenpeace China is purposefully setting an agenda on social media regarding pollution. However, as discussed later, while Greenpeace China's emphasis on pollution was evident, interestingly users seemed less concerned with pollution than they were with food and agricultural issues.

In terms of how different frames were adopted by Greenpeace China to discuss different environmental issues, the responsibility frame was used the most by Greenpeace China, followed by the human-interest frame, consequence frame, action frame, morality frame, and conflict frame. Such findings are crucial for explaining how message framing (whether intentionally or unintentionally) was practiced by a leading international ENGO in China, as message framing is related to audience behavior (Bortree et al., 2013; Terracina-Hartman et al., 2014). Consequently, examining how audiences reacted to posts that utilized the responsibility frame becomes particularly meaningful as frame choice influences mobilization (Benford & Snow, 2000).

Beyond looking at topics and frames of posts, this study also explored how audiences reacted to the posts in terms of liking, sharing, and commenting. Results showed that Weibo users liked, reposted, and commented on the food and agriculture-related posts more than any other topic of post. Food and agriculture-related posts also prompted the most emotional comments. For instance, in response to a post regarding children being poisoned after consuming heavy metal polluted rice in Hunan Province, Weibo users wrote "Horrifying!" "Heart-breaking and rage!" "Please help these children, helping them is helping ourselves!" Such findings perhaps can be explained because food and agriculture might be seen as more tangible, close-to-home concerns citizens face, as opposed to pollution, which can seem less concrete of a problem with less clearly defined solutions. For example, in our study, a large proportion of the food and agriculture-related posts were about concerns over genetically modified agriculture products, but the

pollution-related posts addressed a wide variety of issues. In addition, the public concern about food and agriculture-related issues might be explained by issue relevancy, as Lakoff (2010) rightfully noted "food is central to our existence as individuals and the politics of food is central to our existence on the planet" (p. 77). It is important to recognize that users' interest in and emotional reactions to food and agriculture-related posts differed from Greenpeace China's emphasis on pollution, indicating a disconnect between the ENGO and its potential supporters. In practical terms, ENGOs must be aware of the topics their social media followers are most concerned about to ensure their messages are effective.

This study also revealed that the presence of specific frames elicited different forms of reactions, such that the presence of a conflict frame was related to more emotional comments and the presence of a responsibility frame was related to more likes and reposts. These findings make sense, as conflict generates debate (emotional comments) while responsibility, or the assigning of blame, is something users can easily express their support for simply by liking or reposting it. For example, a post that discussed the conflict between Japan and the International Whaling Commission over commercial whaling led to 57 comments, of which 53 were emotional (e.g., "Stop the brutal killing, Japan!"). In contrast, a post in which a user blamed coal, steel, and cement industries for causing smog in Southeast China led to more than 300 reposts. Practically, this evidence suggests that ENGOs can perhaps use different frames strategically to prompt specific reactions on social media, depending on whether they are looking to start a conversation or simply get attention and spread awareness. Moreover, the fact that only conflict frames resulted in more emotional comments could suggest that Greenpeace China's followers are not necessarily identifying with the organization's framing strategies, allowing this study to offer practical insight for ENGOs looking to align their message framing with followers' understandings and expectations. As previous literature suggests, message alignment is key for a social movement's success (Snow, Rochford, Worden, & Benford,1986).

CONCLUSIONS

Although the Internet is still controlled and censored by the government, China's censorship and the public's lack of access to information about environmental issues make

social media an important alternative way of circumventing traditional censorship. Therefore, the contributions of this study to environmental communication are twofold. First, this study acts as a unique case study, offering data on how an internationally recognized ENGO in China operates on social media. This is especially important considering Lee's (2015) finding that while citizens are using the Internet to self-mobilize, social movement organizations (or as in the case of this present study, Greenpeace China) still offer valuable resources and are pivotal for maintaining collective action long-term. The results here provide a meaningful reference for ENGOs in China interested in better engaging Internet users and promoting their own agenda in the era of social media. The ability of ENGOs to use social media to engage users emotionally could be a crucial preliminary step leading to behavioral change and prompting the transition from online action to offline action. Second, for researchers interested in framings of environmental messages, this study provides a systematic analysis of social media posts. It goes beyond traditional content analyses (which focus primarily on environmental information presented at the source end) by extending the scope of analysis to audiences' reactions not only with regard to their comments in general, but also with regard to their likes, reposts, and emotional comments.

This study is limited in that it focuses on just one year of comments of one ENGO, rather than multiple ENGOs from various countries. Thus, this study is not generalizable to ENGOs operating in countries with entirely different media systems than that in China. Moreover, during the coding process coders noticed a considerable number of user comments accusing Greenpeace China of being a "hostile force full of lies." This type of user previously has been identified as a "50 cent commentator," (Sullivan, 2013) hired by the government to disseminate pro-government speech via the Internet. These comments are mostly emotional by nature, and because it is not easy to consistently identify the commentators hired by the government, these comments were included in the analysis. In this sense, the results with regards to audience emotional reactions should be interpreted with caution. Despite these limitations, this study offers valuable insight into ENGOs' use of social media in a regulated media system. Further, this study sheds light on how social media users react emotionally to different kinds of post topics and frames, which could offer insight into how ENGOs can better use social media to evoke emotional responses

that can lead to behavioral change and prompt pro-environmental behaviors. Future studies may consider aggregating various indicators of audience responses (i.e., number of likes, comments, and reposts) and create an index which would enable a more simplistic comparison of users' reactions to different posts.

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