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Yeheng Pan, Michaël Opgenhaffen, Baldwin Van Gorp

Institutions: Katholieke Universiteit Leuven

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Negotiating Climate Change: A Frame Analysis of COP21 in British, American and Chinese News Media

Yeheng Pan, Michaël Opgenhaffen, Baldwin Van Gorp

University of Leuven, Institute for Media Studies

Abstract

Climate negotiations have increasingly resonated with global governance and world power relations. However, media studies of climate change have paid relatively less attention to media frames of the problem-solving. This study addresses this issue by examining the media coverage of COP21 from three countries that have considerable influence on climate politics: the U.K., the U.S. and China. By applying an inductive frame analysis, the study identified ten media frames embedded in the discussions on climate negotiations. A deductive analysis further assessed the prevalence of these frames. The findings suggest that the frames were significantly influenced by the values of the established and emerging powers in the international policy area. The British and American media upheld the underlying norms that have long underpinned the existing Western-led order, while Chinese media coverage manifested a rising power in need of world recognition.

Keywords:

climate negotiations, COP21, climate politics, frame analysis, media frames

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Introduction

This study aims to clarify systematically how news media represent the debate on climate change, through investigating the news coverage of the 2015 UN climate change conference (COP21). It extends the current media studies of climate change by inductively developing a range of frames across climate negotiation discourses that can serve as the basis of cross-cultural evaluations of climate arguments. Furthermore, the comparative analysis of frame application among three countries provides insights into the emerging global climate change regime. The findings of this study contribute to an in-depth understanding of the global climate change debate from a media perspective.

The specific research focus was motivated in three folds. First, numerous studies have focused on media representations of climate change (for an overview see Schäfer and Schlichting, 2014). The focus of mainstream research remains mainly on the nature and causes of climate change, perceiving it as an environmental science issue with serious consequences (Feldman et al., 2017). Yet, since climate change as a scientific fact has almost become a consensus, the focus of discussion has moved from defining and diagnosing problems to making judgments and suggesting solutions (as argued in Zamith, Pinto, & Villar, 2013). Moreover, this century has witnessed climate change become an important global governance issue (Deere-Birkbeck, 2009). The starting point of the present study is different from previous studies on climate change. We put emphasis on climate solutions, especially on the current debates on policy-making, which is more relevant to today's climate discussion. This study takes COP21 as a case in point. The significance of COP21 is not only because it is a landmark in global climate change negotiations, but it also signalled an emerging climate change diplomacy against the background of redefinitions of power relations in global climate politics (Belis et al., 2015).

Second, climate change, which used to be a Western issue, has witnessed fast-growing developing countries striving to be rule-makers in the past decade (Belis et al., 2015). The ambivalent status of these emerging economies have blurred the prevailing developed-developing divide on which the Kyoto Protocol was based, bringing more dynamics to climate negotiations (Hochstetler and Milkoreit, 2015). Therefore, media coverage from three countries will be analyzed: the United Kingdom, the United States, and China. The former two countries represent established powers, and China is selected for its growing influence as a big rising country. As far as we know, the present study is one of the first cross-national comparative studies that shed light on Chinese media in term of climate reporting. To overcome a limitation of previous studies where Chinese news samples have been often confined to English-language sources (e.g. Pandey & Kurian, 2017), this study selects a mixture of five news outlets that better reflect the media landscape of China. All outlets are published in Mandarin Chinese, except *China Daily*, an English-language state-run newspaper.

Third, this study will take a framing approach. In the literature, there is a diversity of approaches and accordingly results of frame analyses of climate change. To avoid divorcing frames from their contexts (Carragee and Roefs, 2004), we followed an inductive approach that results in an exhaustive typology of frames that is widely applicable to effectively capture a complex debate. Further, the proposed deductive framing analysis can be used to examine in more detail the extent to which the frames are effectively used.

Literature review

The politicized climate change

In many ways, climate change is one of the most prominent and politicized scientific issues (Baker, 2014). The most highlighted climate discussions take place at the UN climate change conferences, so-called “the ultimate battlefield of climate change” (Nuccitelli, 2015). The negotiations at COPs are embedded in global diplomacy and international politics with nation-states as the primary players (Singh, 2015). The climate discussions have been accompanied by political controversy and gridlock (Pielke, 2007). Contrarians are not just against scientific consensus, but also against policy-making (Brüggemann and Engesser, 2017).

Some scholars were concerned that political ideology would deflect discussion from scientific underpinnings, thus compromising problem-solving (Baker, 2014; Gough, 2013). However, given the multifaceted nature of climate negotiations (Bagozzi, 2015), endorsing scientific knowledge cannot resolve and can even hide many important issues in pragmatic policy discussions, such as the protection for poor and vulnerable countries (Forsyth, 2012). It seems that as climate change enters politics, it becomes an issue of “ongoing contestation” instead of “a problem that can be solved” (Brown, 2015: 4). Forsyth (2012: 20) thus pointed out that “politicizing science does not simply mean mobilizing science for political objectives, but also seeing how political perspectives reinforce partial knowledge and vice versa”.

Approaching international climate change negotiations

The history of international climate change negotiations is rife with tensions. Literature devoted to the interpretation of political controversies revealed many factors leading countries to choose “irreconcilable negotiation positions” (Bailer et al., 2015), e.g., asymmetrical world power relations (Singh, 2015), egocentrism (Kopec, 2017) and democratic status (Bailer et al., 2015). The key problem lies in the burden-sharing feature of negotiations, asking countries to take on potentially costly actions to resolve the global problem (Hochstetler and Milkoreit, 2015).

Arguments regarding addressing climate change are usually anchored in two approaches (Hochstetler and Milkoreit, 2015), first, rational and material considerations, and second, principles and norms concerns. The former presumes that negotiation happens among rational actors pursuing personal preferences or interests. As such, the negotiations are perceived as a competitive interaction between nation-actors (Kopec, 2017). By contrast, the normative approach concerns equality and justice in the distribution of responsibilities. For example, surrounding climate ethics there are debates about principles of “polluter pays” and “ability to pay” (Caney, 2010; Knight, 2011).

In the burden-sharing context, climate negotiations have suffered from the division of developing and developed countries (Van der Gaast, 2017). However, since the failure to reach

agreement in Copenhagen, several things have changed. One important aspect is the increasing acceptance of low-emission growth. People gradually realize the possibility of economic development and emission mitigation at the same time (Van der Gaast, 2017). This could alleviate the burden-sharing pressure in climate negotiations. Another significant change is the growing involvement of large developing countries in global climate politics (Hallding et al., 2013). With increasing economic and political capabilities, these rising powers are expected to assume due obligations, bringing new dynamics to climate negotiations (Hochstetler and Milkoreit, 2015). As a consequence, COP21 was seen indicative of an emerging new climate governance regime where China, as a leading rising power, was one of the most powerful and influential actors (Belis et al., 2015). When we look into current climate politics, it is necessary to take into account the emerging players, for how they interpret or endorse certain way of problem-solving is gaining importance.

Framing climate change vs. climate change negotiations

Goffman (1986: 21) introduced the concept of frames as the “frameworks or schemata of interpretation”. Tuchman (1978) brought framing into communication studies as the news media play a powerful role in organizing meaning. Reese et al. (2001: 11) defined frames as “organizing principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world”. Media are arguably the nexus of policies and the public. Media representation of climate change through different frames could affect people’s awareness of responsibility and support for certain climate policies (Hart, 2011).

Extensive frame analyses of media representation of climate change have provided considerable insights into the issue. They were diverse in approaches and focuses. Some (e.g. Pandey and Kurian, 2017) applied policy news frames from Semetko and Valkenburg (2000), namely attribution of responsibility, conflict, human interest, economic consequences, and morality. Some (Nisbet, 2009) summarized frames that recurred across science-related policy debates like nuclear energy and biotechnology, such as social progress, economic development and competitiveness, scientific and technical uncertainty. Specific dimensions of climate change have also been examined, for example, apocalyptic and tragedy (Foust and Murphy, 2009), loss and damage (Manzo and Padfield, 2016), and public health (Weathers and Kendall, 2016). Notably, studies into the attribution of responsibility (Liang et al., 2014) and ethical framing of climate change (Laksa, 2014) have departed from defining what climate change is, and put more emphasis on the reasons and associated solution claims used in the climate change debate in the media.

Still, climate change *negotiations* need more exploration. The emphasis of negotiations has moved beyond the factual, evidence-based or *scientific* consensus on climate change. As explored by Wessler et al. (2016), negotiation discourses are loaded with issues concerning ‘clean energy’, ‘national interest’, ‘new treaty’ and ‘financial help’, clearly distinguished from discourses concerning ‘extreme weather’ or ‘melting ice’. This indicates that climate negotiations are essentially more associated with economy, politics and nations than with science. Further, cross-national studies (e.g. Han et al., 2017; Midttun et al., 2015; Pandey and Kurian, 2017) revealed that media coverage of climate change varies across the developed and

developing world, shaped by local geopolitical and economic contexts. For example, Chinese media have long been treating climate change as a policy issue rather than an intrinsically important topic (Jia, 2017). News reports mainly serve for the government's mission to improve communication on China's contributions to climate change mitigation (Jia, 2017). Therefore, we could expect the diversity of frame of climate change negotiations in countries with different negotiation positions.

This study includes the U.K., the U.S., and China to study their media representation of COP21. The U.K. and the U.S. are the traditional powers in global climate politics and their news media have global influence. China represents the emerging countries that exert increasing impact on global climate politics, as aforementioned. Especially at recent COPs, China together with the U.S. became the focus of climate negotiations (Van der Gaast, 2017). The investigation into these three countries helps achieve a more diverse and complex understanding of climate reporting as well as the current climate politics (Olausson and Berglez, 2014). Therefore, the research questions are formulated as follows:

RQ1: What frames concerning the climate negotiations did news media from the U.K., the U.S. and China apply in their COP21 news coverage?

RQ2: What characteristics in terms of frame application can be found in the three countries' COP21 news coverage?

Methodology

Sample

Five news outlets were selected from the U.K., the U.S. and China: three newspapers, one magazine and one television channel respectively as shown in Table 1. The selected news outlets are leading professional ones in each country's media landscape. For the newspapers, we selected two upmarket newspapers and one midmarket one from the U.K. and the U.S.. Considering China's special media system, we selected two state-run newspapers and one market-oriented one.

Table 1 Sample of news outlets from the U.K., the U.S. and China ($N = 761$)

The U.K. ($N = 363$)		The U.S. ($N = 244$)		China ($N = 154$)	
Media	%	Media	%	Media	%
<i>The Guardian</i>	65	<i>The New York Times</i>	26.6	<i>People's Daily</i>	37
<i>The Daily Telegraph</i>	10.5	<i>The Washington Post</i>	26.2	<i>China Daily</i>	30.5

<i>Daily Mail</i>	6.6	<i>USA Today</i>	9	<i>Southern Metropolis Daily</i>	10.4
<i>The Economist</i>	9.9	<i>Newsweek</i>	23	<i>Chinese Newsweek</i>	1.3
BBC	8	NBC	15.2	CCTV	20.8

News pieces were gathered from 28 November to 15 December 2015. This time period covered the whole process of COP21. Data from U.K. and U.S. newspapers, magazines and Chinese newspaper *China Daily* were first collected from database ProQuest by searching the keywords ‘climate change’ or ‘climate conference’ or ‘COP21’. Subsequently, all sample newspaper and magazine’s websites were searched to include online climate change and COP21 coverage during the targeted time period. On the occasions when online and database versions differed, we included both versions. For television data, videos were gathered from websites: the COP21 special coverage webpages of the BBC¹, Chinese Central Television (CCTV)² and MSNBC’s Greenhouse channel³. In the last step, all the data from multiple sources were manually checked to filter out irrelevant and duplicate items. In total, a sample containing 761 news pieces was generated.

Inductive frame analysis

To answer the first research question, the analysis adopted an inductive, systematic, and open-ended approach. We followed the conceptualization that a frame can be represented by a frame package: a cluster of logically organized framing and reasoning devices that function as an identity kit for a frame (Van Gorp, 2007). Thematic coding aimed to identify all framing devices and reasoning devices in the news reports that related to climate change negotiations.

Framing devices are the ‘tangible’ elements in a text that can activate cognitive schemata (Gamson and Modigliani, 1989). Through close reading in Nvivo, researchers coded for the following framing devices: catchphrases (e.g., “Prince urges world leaders: Think of your grandchildren”), metaphors (e.g., “This week’s Paris conference, I observed, seems like a giant Weight Watchers meeting”), hyperbole (e.g., “the world’s last, best hope of striking a deal that would begin to avert the most devastating effects of a warming planet”), depictions (e.g., “I just don’t see a World War II-style mobilization happening for anything other than a world war”) and visuals such as a dynamic simulation of how seven Chinese coastal cities would be flooded as a result of 2 to 4 degrees Celsius temperature rise (Watkins, 2015).

The definition of the issue of climate negotiations and the logical reasoning that results from it are called *reasoning devices*, which include causes, consequences, solutions and moral evaluations (Entman, 1993). Unlike the framing devices, reasoning devices need not be explicitly included in a text, because they are the result of the audience’s interpretation. These elements were coded, as far as they referred to a specific problem definition (Why is implementing climate

change policy a problem for our country?), and its adherent causes, consequences, solutions and moral evaluations.

The aim of the axial coding procedure was to categorize codes identified in the thematic coding procedure, bringing them to a limited number of coherent frame packages. Different packages were supposed to have a distinctive logical chain of the issue. Simply put, the axial coding was about re-structuring and reduction of fractured data. This procedure continued until the researchers noticed there were no more new codes scattering outside the existing packages. Finally, a frame matrix consisting of 10 frames was created (see Supplementary Appendix). Each package was named by a culturally-embedded, metaphorical, archetypal or value-based idea with cultural meaning and a moral basis, which represented the whole frame package.

To validate the frames, researchers interviewed six experts: a global governance researcher (Chinese), a mass communication researcher (Chinese), a COP21 journalist (Chinese), a NGO professional (Chinese), and two climate policy researchers (one English and one Belgian). These experts were asked to respond spontaneously to each frame and to think of additional interpretations. In the end, researchers adjusted the frame matrix according to the obtained feedback.

Deductive frame analysis

To answer the second research question, which aimed at exploring the characteristics of the frame application in three countries' news media, this study employed a deductive approach using the identified frame typology. The first author and an additional independent coder, both fluent in English and Chinese, were responsible for the coding, with the former coding the entire sample and the later double coding a random subsample of 77 news pieces (10%).

Based on the frame matrix, coders checked the existence of each frame in every single news piece. The two coders discussed the application context of each frame and reached the consensus on criteria. For example, when talking about the money issue, if the news emphasized the contest among blocs of negotiation, the *Zero-sum game* frame was counted; whereas, if the news put focus on the demand for compensation from vulnerable and poor countries, then it used the *Fairness-seeking* frame.

To assess inter-coder reliability, the researchers used Cohen's Kappa. The coefficients for all ten frames exceeded the minimum acceptable level of .70: *Apocalypse* .787; *Waiting list* .850; *Fiction* .861; *Zero-sum game* .776; *Empty promise* .890; *Fairness seeking* .810; *In it together* .912; *Sustainability* .815; *Vanguard* .832; *Laggard* .815.

Results

Ten frames identified in the COP21 news coverage

Ten frames were identified, as outlined in Table 2. The first three frames are more about meaning construction of climate change, and the following ones focus primarily on the negotiation process.

Table 2 Overview of frames on climate change negotiations

	Frame	Counter-frame
Starting point:	F1 Apocalypse	F2 Waiting list
Climate change		F3 Fiction
Process:	F4 Zero-sum game	F6 Fairness seeking
Solving climate change	F5 Empty promise	F7 In it together
		F8 Sustainability
	F9 Vanguard	F10 Laggard

The *Apocalypse* frame defines climate change as a scientifically founded, man-made problem, which is extremely urgent and, if not quickly tackled, could lead to a series of disastrous consequences. For the sake of human safety, it calls for immediate actions, in all related areas, to tightly control human's carbon emission. Words and phrases such as "catastrophe", "unabated and wreak havoc" were used by journalists when stressing the potential consequence of climate change. Images and videos were particularly effective at triggering this frame. One instance is a piece of BBC video introducing the history of climate conference (Morelle, 2015). It started with a full screen of a melting ice-made statue of number two with the ticking sound of a clock. Then a voice-over entered: "Some say that the climate meeting in Paris is our last hope." The ticking sound plus the tense music and the ever-faster melting ice statue enhanced the tension.

The second frame, *Waiting list*, and the third one, *Fiction*, present the opposite of the *Apocalypse* frame. The *Waiting list* frame admits that climate change is a problem, but not a priority to solve. In the U.S. for instance, Republicans criticized Obama's climate policy, arguing that government should focus on issues people care most: "There is disagreement with the president on this issue — not about the fact that the climate is changing, but about the priority that is being placed on it" (Herszenhorn, 2015). Whereas for developing countries, such as India and Indonesia, one concern was the urgency of *economic* development, as India's minister of finance Arun Jaitley (2015) wrote for the *Daily Telegraph*, acknowledging that the eradication of poverty remains Indian's priority. Another concern is the current lack of capacity: "If we are to replace coal, we need access to cleaner energy sources and technology at a viable cost" (Jaitley, 2015).

The *Fiction* frame criticizes climate change as a purposeful construction of evil-minded politicians, scientists and others. The scientific consensus on climate change is rejected. "The concept of global warming was created by and for the Chinese in order to make U.S.

manufacturing non-competitive” (Kaplan, 2015). This comment from the then U.S. election front-runner Donald Trump cited by the *New York Times* portrayed climate change as a mere narrative constructed by enemy countries. Actions aiming to climate change control were thus considered meaningless and even harmful. Rather than a serious effort to climate control, COP21 was just a “big party” (Chan and Eddy, 2015).

Regarding problem solving, the fourth frame, *Zero-sum game*, conceptualizes the climate negotiation as a situation where one’s gain is the others’ lose. It presents climate control as one story of sacrifice and loss. Moreover, it points out the competitive facet of the climate negotiation and assumes each part as interest-seeker. In a situation that one’s own interest is at stake, it advocates protecting the interests of its own country against other “greedy” countries. For instance, by using the metaphor of a “carbon pie” the journalist showed readers a competitive situation. “The problem is that about two-thirds of the pie has already been eaten by a handful of rich countries, plus China... the big emitting countries insist on laying claim to most of the rest of the pie” (Gillis, 2015). Also, on the eve of COP21, some Republican senators criticized Obama with a zero-sum frame, for pledges that would “strengthen foreign economies at the expense of American workers” (Davenport, 2015a).

Seen through the prism of the fifth frame, *Empty promise*, COP21 was a global stage where stakeholders came to show off their good will without true commitments. Some critics claimed that then UK Prime Minister David Cameron’s speech was in contradiction to his weak domestic climate policy (Cohen, 2015). Critics also pointed out corporations’ ill-intentioned green washing during COP21. The frame tended to appear in discussions about the “nationally determined contributions” (NDCs) and the binding enforcement mechanism of the Paris Agreement (Gosden, 2015). The developed countries blamed developing countries for violating the emission mitigation they promised before, while the later blamed the former for not realizing promise of financial and technological assistance (Davenport, 2015b).

The following three frames acts as counter-frames to the last two problematizing frames—the *Zero-sum game* and the *Empty promise*. The sixth frame *Fairness seeking* depicts a situation where all parties come to realize a just, fair, balanced solution to climate change. It explicitly or implicitly inferred the unfair responsibility-accessing system. The United Nations Framework Convention on Climate Change (UNFCCC)’s principle of common but differentiated responsibility and respective capabilities usually was the reference. It points out that fairness of negotiation should be reflected in protecting poor and vulnerable countries that usually contributed least to the problem but suffered most. The frame was present in small island countries’ demand for the “loss and compensation” and the developed countries’ pledges about moral obligation, among other appeals such as human rights and gender equality. Fairness-related arguments responded to attributions of blame with a *Zero-sum game* frame.

The seventh frame, *In it together*, demonstrates that climate change in essence is a global issue, as its causes and consequences cut across national borders. Accordingly, the climate control is a collective aim, which needs all parties to overcome prejudice and distrust, taking shared responsibilities and actions. Phrases such as “human civilization”, “global community of nations”, “a collective responsibility” are framing devices. Moreover, because of the timing of the Paris conference—just after the Paris terrorist attack and during anti-globalization voices spread—the Paris conference was given the meanings of protecting global cooperation in a

broader sense. As *China Daily* put it, “Dealing with global warming is a chance for them to demonstrate solidarity in their willingness and ability to protect the global village” (Fu, 2015).

The eighth frame is *Sustainability*. In its definition, the climate change issue first deals with the relationship between the present and the future. For the sake of future generations, people should abandon development that relies on fossil fuels and pursue sustainable progress: “We should ask what will we say to our grandchildren if we fail. Instead of making excuses tomorrow, let’s take action today” (Cohen, 2015). Moreover, addressing climate change is seen as an opportunity for long-term development, for the solutions would promote technological innovation, renewable energy, contributing to the shift from a high-carbon economy to a more sustainable one. Therefore, the frame rejects the idea that solving climate change means loss and sacrifice.

The last two frames, *Vanguard* and *Laggard*, appeared in the news coverage as particular countries or other stakeholders were depicted as playing a positive or negative role in dealing with climate change or during the negotiations. Given the efforts needed for addressing climate change, it needs leadership to boost wider participation. Some parties were praised for assuming such a leadership role. For instance, the *Telegraph* expected Cameron to demonstrate that “the (Paris) deal must also support adaption projects in developing countries. The UK has led by example, spending 50 per cent of our climate finance to improve climate resilience” (Riley-Smith, 2015). When the Paris Agreement was finally adopted, *People’s Daily* praised China for having made an irreplaceable contribution to the Paris Agreement. And then US president Barack Obama attributed the Paris Agreement to “a product of American leadership” (Davis, 2015). By contrast, some parties were blamed for blocking the negotiation or failing to take responsibilities in addressing climate change. The *Guardian* said that China was to blame for the failure of the 2009 Copenhagen meeting, while in Paris Saudi Arabia and India became the target (Taylor, 2015).

Frame use by U.K., U.S. and Chinese news media

As shown in Table 3, a total of 761 news pieces were analyzed. The aggregate figures show that U.K. news media primarily used the *Apocalypse* frame (47.4%), followed by *Sustainability* (45.2%) and *Laggard* (34.4%). For U.S., *Sustainability* (48.4%), *Apocalypse* (47.1%) and *In it together* (36.9%) were the three most frequently used frames. Chinese media tended to use *Vanguard* (58.4%), *In it together* (58.4%) and *Sustainability* (50.6%) most often. Similar among the three countries is that *Waiting list* (U.K. 4.1%; U.S. 6.1%; and China 0.6%) and *Fiction* (U.K. 3.9%; U.S. 15.2%; and China 0.0%) were the two least used frames.

A chi-square test indicates that significant differences existed among three countries’ news media in using seven frames: *Apocalypse*, *Waiting list*, *Fiction*, *Zero-sum game*, *In it together*, *Vanguard* and *Laggard*. There are no statistically significant differences in using the *Empty promise*, *Fairness seeking* and *Sustainability* frames. To investigate the differences among counties, a logistic regression was employed.

Table 3 Frame use by U.K., U.S., and Chinese media (N = 761)

Frame	U.K. (N = 363)	U.S. (N = 244)	China (N = 154)	Total (N = 761)	X ² (2, N = 761)	p
Sustainability	45.2	48.8	50.6	47.4	1.554	.460
Apocalypse	47.4	47.1	11.7	40.1	64.803	< .001***
In it together	22.9	36.9	58.4	34.6	61.372	< .001***
Laggard	34.4	36.5	13.0	30.7	28.890	< .001***
Vanguard	19.3	25.4	58.4	29.2	82.702	< .001***
Zero-sum game	25.1	34.0	20.8	27.1	9.787	.007**
Fairness seeking	24.2	26.6	29.2	26.0	1.464	.481
Empty promise	19.8	16.4	14.3	17.6	2.660	.264
Fiction	3.9	15.2	0.0	6.7	43.706	< .001***
Waiting list	4.1	6.1	0.6	4.1	7.310	.026*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$, two-tailed.

To illustrate the characteristics of each country in using frames, the news coverage of the adoption of the Paris Agreement is taken as a case. All three countries frequently used the *Sustainability* frame. On the Paris Agreement, *USA Today* reported then Secretary of State John Kerry's comment: "It sends a very powerful message to the global marketplace. (...) There are jobs to be created, money to be made" (Zoroya, 2015). The *Southern Metropolis Daily* interpreted the implication of the Paris Agreement with a headline "The prospect of new energy: a cake worth trillions of dollars".

Comparatively, the U.K. and U.S. media find more similarities to each other than to Chinese media. Both of them were more likely to use the *Apocalypse* (US to China: $p < .001$, $\exp(b) = 6.736$; UK to China: $p < .001$, $\exp(b) = 6.804$) and *Laggard* (US to China: $p < .001$, $\exp(b) = 3.847$; UK to China: $p < .001$, $\exp(b) = 3.519$) frames compared to Chinese media, while no significant difference was found between U.K. and U.S.. The *Guardian* used the *Apocalypse* frame to emphasize the weakness of the Paris Agreement in protecting vulnerable countries: "For vulnerable countries, the high ambition of the 1.5C goal was offset by the weakening of the agreement when it came to dealing with irreparable damage of climate change" (Goldenberg et al., 2015). China was depicted as *Laggard*: "All the countries agreed on demands from the US

and European Union for five-year reviews of their emissions reductions – an exercise that had been resisted by China” (Goldenberg et al., 2015).

By contrast, Chinese media differed significantly from their foreign counterparts in that they used more frequently *In it together* (China to US: $p < .001$, $\exp(b) = 2.406$; China to UK: $p < .001$, $\exp(b) = 4.744$) and *Vanguard* (China to US: $p < .001$, $\exp(b) = 4.128$; China to UK: $p < .001$, $\exp(b) = 5.886$) frames. As expressed by a commentary from *People's Daily*: “The Chinese team has participated in the negotiations in a responsible, cooperative and constructive manner... This fully demonstrated China’s response to climate change as a big responsible country” (Pei et al., 2015), the Chinese top party newspaper praised China’s efforts in solving impasses of negotiation and contributing to the cooperation with others.

Noticeable was the absence of the *Fiction* frame in Chinese news media, while it appeared in two other countries with significantly greater frequency in U.S. news media than the U.K. (US to UK: $p < .001$, $\exp(b) = 4.456$). Denying the scientific fact, the commentary from *The Daily Telegraph* compared abandoning fossil fuels to “committing economic suicide” (Booker, 2015). While in U.S. media, appearing as the sponsor of the Fiction frame was Republican Ted Cruz: “Ted Cruz, who seems enthralled with the idea of a climate-science conspiracy, said last week, ‘Climate change is the perfect pseudoscientific theory for a big-government politician who wants more power’” (The NYT Editorial Board, 2015).

Discussion

This study examined the media coverage of COP21 from the U.S., the U.K. and China, three stakeholders with considerable influence on current global climate politics. By investigating the climate negotiations, we identified ten frames and typified the use of these frames in the news media from three countries.

With regard to the frame typology, this study does not claim its conclusiveness, but provides an option for future frame analysis of climate negotiations. Scholars who conduct a deductive frame analysis of climate change often need to adjust the already-established typology to suit the material (e.g. Pandey and Kurian, 2017). The typology of this study resulting from in-depth analysis has a clear empirical basis. In respect to existing typologies, this one has the potential to integrate or re-position frames in previous literature. For instance, Nisbet (2009)’s “economic development and competitiveness” plus Wessler et al. (2016)’s “the sustainable energy” could be incorporated in this typology into the *Sustainability* frame. Further, the deductive analysis of the news coverage from three countries proved that the typology could be effectively applied. They can clearly structure the disparate arguments in the climate negotiations.

By exploring and examining characteristics of the three countries in reporting COP21, this study finds promising prospects for global climate policy-making. Media overall supported discourses in favor of solving climate change. The *Apocalypse* frame did not merely appeal to fear, but also served as an alarm to stress the urgency of action. It could be a meaningful sign that *Sustainability* became one of the most salient discourses in the discussion. The frame treated

the climate issue in tandem with addressing other needs, such as poverty alleviation and technological progress. It could shift climate politics from the “burden assignment” (Hochstetler and Milkoreit, 2015) to a win-win situation, thus boosting the chances for climate policy success (Midttun et al., 2015). The *Fiction* frame did come up in the analysis, but it was marginalized in the news outlets examined. It was limited in quantity overall and also rarely dominated in the news. In the U.S. coverage where the frame was most likely to appear, it was often attached to quotes from Republicans but soon rejected by other counter-frames. Only a few commentaries, mostly from the *Telegraph* and *Daily Mail*, bluntly denied the scientific consensus on climate change (e.g. Booker, 2015). Of particular interest are Chinese media, whose coverage confirmed the ambition of China in global climate governance (Belis et al., 2015). Dominantly using the *Vanguard* frame, Chinese media sent two key messages: China contributed to the success of COP21 and played a proactive role in climate control.

Another finding is that British and American news media shared more similarities with each other than with their Chinese counterpart. Essentially, they differed in suggesting what climate change negotiation is about. For the British and American news media, COP21 dealt with the way that the world could reach a rules-based order to solve the problem. The order, emission reduction review for instance, was welcomed to be transparent, universal and binding. News media upheld these underlying norms, rules and practices, much of which have long been embedded in the existing Western-led order (Newman and Zala, 2018). Those who disrupted the order were thus criticized as laggards: climate change deniers or dissenting countries, such as China, India and Saudi Arabia. In contrast, for Chinese news media, the climate negotiation was not merely a problem-solving event. It was about defining China’s relationship to the world. Media cared about the relevance of COP21 to China’s position on the global stage and how the world viewed China’s effort with regard to climate policy. The media coverage reflected a rising power in need of world recognition.

Hence, it can be expected that the news frames identified in the case of COP21 would find resonance in the media coverage of other global debates. Frames on climate negotiation are deeply linked to the context of world politics. Given that the North-South divide and the changing power relations are affecting many other areas of global governance (Nayyar, 2016), news media are likely to use similar frames to make sense of other issues. For example, when reporting the China-initiated Asian Infrastructure Investment Bank (AIIB), with a *Laggard* frame, *Forbes* claimed that there was “Controversy, over fears that China would use the bank to undermine global standards for good governance and environmental protection” (Babones, 2018). It is likely that the frame matrix of this study could serve as a reference for other studies in related fields.

Two critical points on the climate negotiations should be noted. First, the study confirmed that the debates on climate science comprise only one dimension of the entire climate discussion (Brüggemann and Engesser, 2017). Contrarian discourses with a *Waiting list* or *Zero-sum game* frame had little to do with whether climate change was a scientific fact or not. These frames reflected real challenges in climate negotiations that are associated with long-held worldviews and values, like primacy of national interests. Second, this study suggests that solutions to climate change cannot be reduced to ones which are simplistic or one-size-fits-all. Many topics during COP21 were attached to different frames across stakeholders. For example, the ‘loss and damage’ issue for developing or vulnerable countries was a topic for seeking

fairness while for some developed countries it was a zero-sum game. It is foreseeable that the divergences in negotiating positions persist in future negotiations, which entails a nuanced understanding about each controversy.

The last point worth mentioning is the merit of the inductive-deductive approach of frame analysis. It is an effective method for analyzing complex multilateral issues, those usually having heterogeneous stakeholders involved. Starting with an inductive analysis, researchers can capture the contours of diverse interpretations. The controversy then is broken down to a series of frames, each consisting a specific logical chain of elements that define the issue. The following deductive analysis in turn helps to identify differences in frame use. It sheds light on frames that are dominantly applied in certain social, political or historical contexts. Nowadays, there are increasing complex issues that need global cooperation. Climate change is a typical example, perplexing both the developed and developing world. This study indicates that the same issue makes different senses in different contexts. To examine these contextual differences, we propose that the inductive-deductive method could be a useful tool for cross-cultural studies.

The present study has limitations that motivate future research. First, this work only analyzed the application of frames in the news coverage, not giving much focus on frame sponsors, i.e. people who support specific interpretations. However, during our deductive analysis, we recognized the value of analyzing frame sponsors, for it could provide a systematic picture of climate debates among specific actors. Second, it would be interesting to explore how these news frames evolve over a longer period of time. This calls for future longitudinal quantitative research, which would deepen our understanding of how media contribute to discussions on climate change.

Appendix Frame matrix for climate change negotiations

Frame	Cultural element	Definition	Cause	Consequence	Solution	Moral basis
Starting point: the climate change issue ...						
Apocalypse	An imminent cosmic cataclysm, the total destruction and end of the world.	...is a scientifically founded, urgent, and imminent problem.	Greenhouse gas emission from human activities.	Immediate actions are demanded, otherwise there will be disasters.	Deep de-carbonization.	Protect the planet and human from disasters.
Waiting list	List of persons who are qualified but due to limited positions, they have to wait.	...might be a problem, but at the moment the priority should be given to other urgent issues.	Climate change is not a crisis at this moment; resources are limited, but actions cost.	The problem will be addressed in the future.	Wait for opportunities, i.e. cheap solutions and see whether to put effort.	Always do the most important things; use limited resources smartly.
Fiction	An imaginative creation or a pretense that does not represent actuality.	...is a natural phenomenon, or a social and political construction lacking in scientific evidence.	Natural phenomena beyond human's control; unreliable scientific and political consensus.	Actions aiming to climate change control are meaningless and even harmful.	Do nothing and reject the concept of climate change.	Keep skepticism and the distrust of leaders and the elites because of their evil minds.
Process: solving the climate change issue ...						

Zero-sum game	A situation where a gain by one side is matched with a loss by the other side.	... is a contested site with each party having conflicting concerns and trying to defend own interest.	Dealing with the climate issue is difficult, risky and costly; some pay, but some are free riders.	There will be winners and losers in the negotiations; my own interest is at stake.	It its others' business; if I take part, it is my sacrifice.	Protect own people's interests.
Empty promise	The promise is not necessarily consistent with the actions.	... is a situation where leaders show off good promises, but lack in real actions.	Under global peer pressure to play a good role in making pledges and taking actions.	Ingenious negotiations, cheating, a weak agreement and conference.	Promote trust and transparency during negotiations and acts.	Promises should be fulfilled; liars should be prevented.
Fairness seeking	Seeking being free from self-interest, deception, injustice, or favoritism.	...is a situation where parties seek a just, fair, balanced solution.	The current arrangement already or potentially causes unfairness.	Unfair system, e.g. the poor suffer most from the rich's pollution.	Respect the principle of UNFCCC; find a fair solution, taking each party's voice into account.	End discrimination and be reasonable, right and just.
In it together	A relationship that each part exists as a whole, with shared, mutual and reciprocal interest and fate.	... is a cooperative platform where different parties work together for the common aim of curbing global warming.	Climate change has no boundaries; its causes and consequences cross countries.	All countries are affected by climate change, either directly or indirectly.	Collective aim and actions; multilateral diplomacy; overcome gaps between different stakeholders.	Cooperative spirit

Sustainability	Capable of being continued with minimal long-term effect on the environment.	...concerns future generations and contains opportunities for better development.	Unsustainable development without long-term considerations; limited natural resources and fragile ecological balance.	The current development won't last long; future generations' interests are at stake.	Balance development and environment; emphasize long-term progress; technological progress, economic and political effort.	Keep a harmony of mankind and environment; work for long-term interest and better future.
Vanguard	The troops moving at the head of an army.	... involves a certain actor playing a leading role.	Climate change control is a consuming task.	The issue needs political motivation and countries' leadership.	Do the best, and set model for others.	Do the good thing even have to sacrifice.
Laggard	Someone who lags behind.	...involves a certain unwilling to assume responsibility expected of him/her.	Climate change control is a consuming task.	Someone is unwilling to take fair responsibility.	Put pressure, and shame them into taking positive actions.	Do the good thing even have to sacrifice.

Declaration of conflicting interests

The authors declare that there is no conflict of interest.

Notes

¹BBC special report on COP21: <http://www.bbc.com/news/science-environment-34320399>

²CCTV special report on COP21: <http://news.cntv.cn/special/xjpqhdh/index.shtml>
<http://news.cntv.cn/special/jujiao/2015/109/index.shtml> and <http://tv.cctv.com/lm/xwlb/>

³MSNBC full coverage of Paris climate change summit:
<http://www.msnbc.com/msnbc/watch/christiana-figueres-it-is-about-the-fate-of-humanity-536429635943>

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