Brüggemann, Michael; Engesser, Sven (2017): Beyond false balance. How interpretive journalism shapes media coverage of climate change. In *Global Environmental Change* 42, pp. 58-67. DOI: 10.1016/j.gloenvcha.2016.11.004.

[Final accepted manuscript]

Beyond false balance:

How interpretive journalism shapes media coverage of climate change

Abstract:

This study explores two pre-eminent features of transnational media coverage of climate change: The framing of climate change as a harmful, human-induced risk and the way that reporting handles contrarian voices in the climate debate. The analysis shows how journalists, and their interpretations and professional norms, shape media debates about climate change. The study links an analysis of media content to a survey of the authors of the respective articles. It covers leading print and online news outlets in Germany, India, the United Kingdom, the United States, and Switzerland. It finds that climate journalism has moved beyond the norm of balance towards a more interpretive pattern of journalism. Quoting contrarian voices still is part of transnational climate coverage, but these quotes are contextualized with a dismissal of climate change denial. Yet niches of denial persist in certain contexts, and much journalistic attention is focused on the narrative of 'warners vs. deniers,' and overlooks the more relevant debates about climate change.

Keywords:

Climate change; journalism; skeptics; denial; journalistic norms; balance

1. Introduction

While scientific consensus on anthropogenic climate change has been growing in recent decades (Anderegg et al., 2010; Cook et al., 2013; Oreskes, 2004), public opinion has also become increasingly uncertain about the urgency of climate change as a problem (Patt and Weber, 2014; Ratter et al., 2012). Citizens of the biggest carbon emitters of the world (the United States and China) are even less concerned about climate change than people from other countries (PEW, 2015). Outright denial of climate change persists among salient minorities in the United States, United Kingdom, and Australia, and in small niche publics in other countries (Capstick and Pidgeon, 2014; European Commission, 2014; Leiserowitz et al., 2013, 2013; Whitmarsh, 2011). One reason for this *entrenched denialism* in public opinion may be the way the media portray the scientific consensus on climate change as represented by the reports of the Intergovernmental Panel on Climate Change (IPCC). By providing a forum for contrarian views, the media "perpetuate the myth of a lack of international scientific consensus on anthropogenic climate change—and thereby succeed in maintaining public confusion" (Antilla, 2005: 350). Various studies have shown the detrimental effects of 'balanced' media coverage that depict climate change as an open debate between 'skeptics' and 'warners' (with regards to public debates about vaccines, see: Dixon and Clarke, 2013; Lewandowsky et al., 2013). Thus, the study of media content and its influencing factors is not only relevant for scholars of journalism, but also for everyone seeking to understand how societies struggle to deal with the challenge of climate change.

Our study tackles this challenge by analyzing how the IPCC stance on climate change and its challengers are covered in different journalistic media. We seek to explain different patterns of media content by taking into account the influence of different editorial and national contexts. The study contributes to our understanding of how and why contrarian views remain salient in media debates. It is based on a content analysis of articles (N = 936) published in four different types of leading news outlets (left-leaning, right-leaning, regional, online) in five countries (Germany, India, Switzerland, United Kingdom, United States), and is complemented by a survey of the authors of these articles. We argue that a common explanation for the presence of climate change denial in media coverage – adherence to the journalistic norm of balance (Boykoff and Boykoff, 2004) – can no longer be regarded as the most powerful driver of climate coverage. Instead we find a transnational pattern of interpretive journalism that puts the denial of anthropogenic climate change into context.

2. Analytical framework and state of research: journalists' role in the climate debate

To assess how journalists report on climate change and how they deal with its denial, it is first necessary to describe what we call the *climate change frame* or *IPCC view,* as well as the *contrarian* voices in public debates. The climate change frame or consensus as presented in IPCC reports and in scientific journals may be summarized in four statements (Brüggemann and Engesser, 2014; Shehata and Hopmann, 2012): (1) Global warming represents an extraordinary rise in average global temperatures since the industrial revolution. (2) It is mainly caused by human-induced emissions of CO_2 and other greenhouse gases. (3) It creates problems for both ecosystems and humanity. (4) Emissions need to be reduced to avoid future damage. These statements allow us to identify four types of contrarianism or challenges to the climate change frame; they focus on doubting: the trend (climate change), the attribution (anthropogenic), the impact (risks, severe problems), and the treatment (reducing emissions) (see Rahmstorf (2004) for the first three types of contrarianism). This framework does not capture all variants of contrarian claims (Capstick and Pidgeon, 2014); it focuses on the challenges that attack the core of the consensus among the world's leading climate scientists.

We call actors who challenge the climate change frame in public debates 'contrarians' rather than 'skeptics' or 'deniers,' following a suggestion by McCright (2007) and O'Neill and Boykoff (2010). There are few climate scientists among the contrarians; the group is comprised of people from different backgrounds, many of whom are closely connected to professional lobbyists and the 'denial machine' (Dunlap and McCright, 2011) – i.e., their professional activities are part of a strategy to prevent pro-active climate policy-making (Boussalis and Coan, 2016). Contrarians as visible speakers in public debates need to be distinguished from both individual citizens who may have doubts about climate change and from actors who challenge more specific claims in the climate debate that are *not* part of the basic consensus outlined above.

The journalistic practices of (1) giving disproportionate voice to contrarians and (2) challenging the climate change consensus will be the focus of our study. The two practices are interrelated but do not necessarily go together as the empirical analysis will show. First, we will briefly sketch a conceptual framework of important factors that shape media content. Three levels of influence can be distinguished: individual (journalist), organizational (newsroom), and external (e.g. social institutions and culture) (cf. Shoemaker and Reese, 2014). In different contexts, the 'discretionary power' (Semetko et al., 1991) of individual journalists varies: They are provided with more or less leverage to set the frames of their coverage (Brüggemann, 2014). On all three levels of influence, two main forces leave their imprint on media coverage: *ideological biases* and *structural media logics* (Schulz, 2011: 68). Biases are preferences or inclinations to treat a topic in a certain way (Lee and Grimmer, 2008) that stem from individual journalists, editors, external actors, and the wider cultural context. 'Media logic(s)' include the professional norms and routines of journalists and newsrooms, which Altheide (2004, p. 294) defines as "assumptions and processes for constructing messages within a particular medium." The most powerful media logics are news factors such as novelty, elite actors, or proximity: editors look for these attributes when deciding which stories to run, and journalists emphasize them in their coverage (Galtung and Ruge, 1965).

Past studies have found evidence that the power of bias and media logics at different levels of influence explains the role of contrarians in climate coverage. Depending on ideological bias, climate change is depicted as more or less uncertain, and climate policy is described as more or less costly, depending on the policies of the respective national government (Grundmann, 2007). Below the national level that introduces this kind of political/cultural bias, newsroom policies affect climate coverage; right-leaning media are more likely to cite contrarian views (Carvalho, 2007; Feldman et al., 2015; Feldman et al., 2011). There is also evidence that the ideological stance of the individual author matters: right-wing columnists in the United States cultivate hard-core denialism of climate change in their columns (Elsasser and Dunlap, 2013). Hence, different interpretations of climate change, which are often strongly related to political ideology, influence the coverage of this issue.

Explanations drawing on media logics – particularly the professional norms of journalism – are strongly connected to the work of Boykoff and Boykoff (2004) who emphasize the professional *norm of balance* as an important influencing factor: "[...] journalists present competing points of views on a scientific question as though they had equal scientific weight, when actually they do not'' (127). The norm of balance is part of the broader concept of objectivity (Westerstahl, 1983), which calls on journalists to provide a 'neutral' account by giving equal voice to both sides in a conflict (Hopmann et al., 2012). Journalists follow this practice as it allows them to demonstrate their professional objectivity and to fend off accusations of one-sided coverage (Gans, 1979; Tuchman, 1972). Balance also serves as a "surrogate for validity checks" (Dunwoody and Peters, 1992: 129) if journalists lack the time or expertise to assess the validity of conflicting statements from different sources. Earlier research on environmental and science journalists in the United States cited evidence of their lack of knowledge about what climate experts consider to be basic common in climate

research (Wilson, 2000). The norm of balance is particularly powerful in cases of contested knowledge claims and a lack of expertise among the journalists who cover the respective issue. Finally, conflicts create news value and thus stories that grasp audience attention. The presence of contrarians in media coverage may therefore be explained by either bias (ideological fit) as outlined above or as part of journalistic norms (objectivity/balance) and routines (news values). Yet applying the norm of balance amplifies the views of contrarians (which may attract audience attention) and distorts coverage of the issue. By quoting contrarian voices out of context, journalists give them legitimacy and 'media standing' that might also translate into political power (Gamson and Wolfsfeld, 1993).

Boykoff and Boykoff (2004) examined the coverage of climate change in US newspapers from 1988 to 2002, and found that half of the articles presented a balanced account of the issue; slightly more than half of the television newscasts analyzed during that time did so (Boykoff, 2008). A replication of the study found the share of balanced coverage reduced from more than a third of all articles in 2003 to about three percent in 2006 in US newspapers (Boykoff, 2007). Thus, balanced reporting may be retreating, but contrarians have not necessarily vanished from the media. Painter and Gavin (2016) find that the British press quoted contrarians in every fifth article during the years 2007 to 2011. Schmid-Petri et al. (2015) find that almost a third of articles in the US press contain contrarian voices. Have journalists therefore moved on to a one-sided promotion of denial of climate change, which would be proof of ideological bias, rather than adhere to professional logics such as the norm of balanced coverage?

A recent survey of journalists covering climate change in different countries found that most of them strongly agreed with the climate change consensus (Brüggemann and Engesser, 2014). Therefore, it seems that they quote contrarians despite being aware that their claims defy the findings of climate science. A much earlier US study identified a journalistic tendency to amplify outlier views and give 'mavericks' a forum: Dearing (1995) analyzed US newspaper coverage of three maverick science stories (e.g., propagating an alternative theory on the cause of AIDS). Our study follows his model of analyzing the content of coverage and then conducting a survey of the authors of the articles. Dearing found that the surveyed journalists were aware that the 'maverick scientists' did not represent credible science, yet the articles' neutral coverage of their views gave the mavericks credibility. Dearing explained this with news values such as conflict that attract larger audiences as well as a general sympathy for mavericks in US public culture, which values individualism expressed through outlier views (also see Gans (1979)).

Another trend in journalism should be considered for making sense of the finding that balanced coverage may be gone, but not so, the quoting of contrarian voices. Studies find a trend towards interpretive reporting among online science journalists (Fahy and Nisbet, 2011) and in political journalism in different Western countries (Esser and Umbricht, 2014). Hiles and Hinnant (2014) found a radically redefined understanding of objectivity among experienced climate journalists that goes beyond 'balanced coverage.' They found that while these specialist journalists still attempted to refrain from letting their biases influence their coverage, they followed "weight-of-evidence reporting" (Dunwoody, 2005) in which stories reflect scientific consensus and are "written with authority" (Hiles and Hinnant, 2014: 15), thereby distinguishing between views that represent valid, peer-reviewed science and those that represent outliers with no backing from scientific evidence or peers (Boykoff, 2011). Another qualitative interview study with science journalists in the United States confirms this trend: journalists claim that they want to go "beyond balance" and even ignore contrarian voices (Gibson et al., 2016).

Yet, whether these approaches are put into practice has not been comprehensively investigated with regards to different media types in different cultural contexts. Most studies focus on the US and British contexts or on the coverage of upmarket newspapers (Schäfer and Schlichting, 2014). Grundmann and Scott (2014) also include France and Germany from 2000 to 2010 and a great number of newspapers using corpus linguistic methods. Their study shows that, overall, contrarians are much less prominent in media discourses than speakers who support the climate change consensus. They also show that countries consistently diverge on the salience of contrarians, with a much stronger entrenchment of contrarian voices in the United States. This is in line with findings from Painter and Ashe (2012), who also included quality papers from Brazil, China, France, and India in their analysis. They compared the coverage in 2007 and 2009/2010 during the UN Climate summit in Copenhagen and, at the same time, 'Climategate' (the pseudo scandal constructed around personal e-mails between climate researchers that were published by contrarian bloggers in order to discredit climate research, Holliman (2011)). Overall, these findings show that there is no linear decline in contrarianism in the news, but rather that specific events (or staged pseudo events like Climategate) provide 'media opportunity structures' (Adam et al., 2003) for contrarians to become salient voices in media coverage. This explains why Shehata and Hopmann (2012), who focused on media coverage between 1997 and 2007, did *not* find contrarians in the news. They studied UN climate conferences, where contrarians have not managed to play a significant political role. This was radically different in the context of the Climategate campaign: the content analysis of Painter and Ashe (2012) found that contrarian views occurred in every third article in the United States, followed by the United Kingdom, while contrarians played only a negligible role in all other countries.

Painter and Ashe also found that roughly the same number of articles raised doubts about climate change in right-leaning and left-leaning papers. The only difference was that right-leaning papers hosted contrarianism in their commentary pages, while these sources were *quoted* in the left-leaning newspapers. This confirms the influence of editorial bias on climate coverage: in right-leaning papers, it is part of the editorial opinion; in left-leaning papers, contrarianism is raised by external voices. Thus, past research has identified the salience of contrarianism and the evaluation of contrarians as an important case for studying the influence of both ideological biases (along the left-right spectrum) and journalistic norms (e.g., balance, news values). While the studies mentioned above have pushed the research in this area ahead, there are three main gaps in the literature.

The first concerns the role of contrarianism in post-Climategate coverage, after 2010. Climategate was an extraordinary moment of success of political spin, but it remains to be seen whether climate change denial retained a voice in transnational journalism afterwards. Grundmann and Stock (2014) extended their analysis to 2010 and show that after the peak of attention to contrarians, the levels declined, but remained somewhat higher than during earlier times. In Britain, the level of contrarianism in media coverage remained high in 2011 (Painter and Gavin, 2016).

Second, Painter and Ashe's finding that contrarians were equally prominent in right- and left-leaning papers raises the question whether (and how) these quotes were evaluated in the coverage. For example, it is not clear whether contrarians were mentioned in the context of how they continue to make unsubstantiated claims with no backing in climate science, whether they were balanced with other voices (as originally posited in the Boykoff and Boykoff study from 2004), or whether unbalanced contrarianism is occurring (as Painter and Gavin (2016) show for parts of the right-leaning press in Britain). In this regard, the study by Grundmann and Stock (2012) provides a first hint, as the term Climategate in their co-location analysis linked with the terms 'stolen' and 'hacked' in the US media, while the British media preferred 'leaked,' which indicates that journalists in different countries framed Climategate quite differently. This shows that analysis of the frequency of

reporting contrarian viewpoints needs to also include whether and how they were evaluated in the articles.

Third, it is unclear whether the quoting of contrarians is motivated by media logic through adherence to journalistic norms (such as balance or news values) or by ideological biases (such as genuine questioning of the validity of climate science). This can best be explored by connecting content analysis data with survey data (following the model introduced in Dearing (1995)).

This leads us to posit three *research questions*:

1. To what degree is the *climate change frame* challenged in international media coverage by expressing contrarian *viewpoints*?

2. How do journalists treat contrarians as *voices* in journalistic coverage (quotes and evaluations)?

3. How can (a) different degrees of challenging the climate change consensus and (b) ways of dealing with contrarians in journalistic coverage be explained?

3. Methods

This study pursues a *comprehensive* approach to analyzing climate-related content in the leading news media. It uses a comparative design that varies the contexts' content production and surveys the authors of the articles analyzed. The study includes all types of content (straight news reporting as well as other types of articles), looks at all kinds of contributors of news content (specialized science reporters as well as other authors), and examines articles published in both online and paper formats.

3.1 Case selection and sampling

Due to the global scope of climate change and our interest in transnational patterns of climate coverage, we included journalists and their news stories from Germany, India, Switzerland, the United Kingdom, and the United States in our study. All five countries have high amounts of CO_2 emissions (either total or per capita), and are thus likely to feature vivid debates on climate change. Climate change reporting in the industrialized countries features varying degrees of contrarianism: it is relatively high in the United States, medium in the United Kingdom, and low in Germany, Switzerland, and India (Grundmann and Scott, 2014; Painter and Ashe, 2012). India is included as an exemplary emerging economy that debates climate change not in terms of contrarians vs. climate science but as a conflict between traditional CO_2 emitters and the emerging economies (Billett, 2010; Painter, 2011). We selected leading news outlets from different sectors of the media landscape in each country: two upmarket newspapers (preferably one right leaning and one left leaning), one mass-market or mid-market newspaper, one regional newspaper from a complementary metropolitan area, and one major online news outlet (Online Appendix Table A1 further explains the case selection). Our selection of news outlets was inspired by previous studies (Boykoff et al., 2016; Schmidt et al., 2013). Both print and online editions were included.

In order to match authors and their articles, the sampling started by identifying the authors of articles on climate change, including specialized journalists and those who occasionally wrote about the topic. Furthermore, the study focused not only on coverage centered around certain key events like Copenhagen and 'Climate Gate', but started later and spanned the time of routine coverage after these events (1 January 2011 – 31 December 2012). We used Google and the search string 'climate change' OR 'global warming' OR 'greenhouse effect' (and the equivalents in German). These search strings have been validated in previous studies (e.g. Schmidt et al., 2013). We

complemented the web search by including the print versions of the respective news outlets drawn from databases (LexisNexis and Factiva).

From this sample, we manually selected all articles that focused on climate change and disclosed author names or abbreviations. From the resulting list of names, we excluded all people who published less than two pertinent articles in order to eliminate those who only coincidentally mentioned climate change in one article. We tested the reliability of this author search procedure on a sub-sample consisting of the articles from one news outlet. Two student coders achieved a satisfactory agreement of 89%. The search generated a survey population of 170 climate journalists, who we invited by e-mail to participate in our bilingual (English and German) online survey (27 September – 10 October 2012). After several reminders by e-mail and phone, a sample of 62 journalists completed the questionnaire. The response rate of 36% can be considered satisfactory for a cross-national online survey of journalists. We matched the survey respondents with their articles (maximum of 30 articles per journalist), which resulted in a *core sample* of 747 articles.

From some outlets, no (or very few) journalists responded to the survey. For those news organizations, the sample was extended so that at least 30 articles from each outlet could be included in the analysis. In this way, an *extended sample* of 936 articles was generated that reflected the diversity of the journalistic output in 25 different news outlets in five countries. This sample will be used to describe and compare patterns of news content. The explanatory part connecting interviews and survey responses will have to be restricted to the core sample of the articles of journalists who had responded (N = 747) in the survey. In order to test whether there is a bias in the core sample, we compared the percentages for the key variable *IPCC index* that indicates a journalist's agreement with the climate change consensus and found no statistically significant difference between the smaller and the extended samples (index value of $M = 0.62$ in the core sample, compared to $M = 0.57$ in the extended sample).

The extended sample of the content analysis (N = 936) covered the years 2011 and 2012, which represents a period of modest and routine coverage of climate change. This time frame featured two UN climate summits, COP (Conference of the Parties of the UN Framework Convention on Climate Change) 17 and COP 18, two special IPCC reports, a couple of extreme weather events, such as a hot summer in the United States in 2011 and a hot spring in Europe in 2011, as well as hurricanes Irene and Katia. While the COPs received a substantial amount of coverage in our sample (18%), the special IPCC reports were largely ignored (1%), and weather events comprised 6% of the coverage. Among the most important news pegs were the publication of scientific studies (32%) and the actions of domestic governments (16%).

3.2 Measures and coding

The IPCC view: The survey measures challenges to the climate change consensus by asking journalists about the scientific validity of the following statements (on a scale from 1 = "scientifically untenable" to 5 = "scientifically well founded"):

1. Global warming: The average global temperature has been rising for about 150 years.

2. Anthropogenity: Global warming has been largely caused by humans through CO_2 emissions and other greenhouse gases.

3. Risks: The impact of global warming will most likely create major problems for our global ecosystem.

4. Emission reduction: Humankind must strongly reduce CO_2 emissions in order to limit future global warming.

In the content analysis, we coded whether any of these statements was explicitly 'challenged' (= -1), 'balanced/not mentioned' (= 0), or 'mentioned/supported' (= 1). Mentioning 'global warming' without any challenges or further qualification was coded as support for the claim that the earth is warming. However, 'balanced' was almost never coded, as less than a handful of articles openly debated these statements. The four items were averaged into a formative index (*IPCC index*).

Journalistic treatment of contrarians: Journalists may ignore, mention, quote, or evaluate contrarian voices in their coverage. Evaluative contextualization could, for example, call into question or affirm the scientific expertise and authority of contrarians. These different journalistic treatments of contrarians were measured in both the survey and content analysis. The survey asked whether voices that challenge the four statements from the IPCC view should be ignored or given equal voice with other actors in the climate debate. The content analysis coded whether contrarian voices ('skeptics') were mentioned and/or quoted, and whether they were contextualized positively, negatively, or in a 'balanced' way.

The coding was conducted by a team of six coders. The reliability test was based on a randomized sample of 57 articles using the standardized Lotus reliability coefficient, which is adjusted by chance (for a discussion of the merits of this measure as compared to other coefficients, see Fretwurst, 2015). After a first reliability test failed to generate satisfactory results, the codebook was further simplified and elaborated, and the coders were trained for three additional weeks. The second test (with new articles) provided satisfactory results (see Online Appendix Table A2).

4. Findings

4.1 Challenges to the anthropogenic climate change frame

The IPCC view (climate change consensus) is widely shared across countries and different kinds of media outlets. Figure 1 shows that the four statements that constitute our operationalization of the IPCC view are rarely challenged: in only 2–4% of the articles. Yet, often they are not explicitly mentioned – except for the process of warming, which is already indicated in the term 'global warming.' The strongly overlapping confidence intervals in Figure 1 indicate that there is no significant difference between the degrees to which the different statements are challenged, and hence between the different kinds of contrarianism. Transnational climate coverage clearly conveys the climate change consensus. Climate change denial occurs only in niches that will be explored below in more detail.

[Insert Figure 1 here].

4.2 Contextualization of contrarians

The paradox of climate coverage is that although climate change denial has almost vanished from the coverage of most leading news outlets, contrarians are still being mentioned or quoted in almost every fifth article (see Figure 2) – which is significantly more often than the IPCC is quoted. Yet, the contextualization of contrarians and the IPCC differs: while the IPCC is mentioned or quoted in a neutral tone (57 percent of articles in which it is mentioned or quoted, see Figure 3), more than 69% of the articles that mention or quote contrarians also contextualize them in a negative way.

[Insert Figure 2 and 3 here].

The negative evaluation of contrarians co-occurs with quoting them: Three-fourths of the articles that contained a negative evaluation of contrarians also quoted them (see Figure 4). Yet almost three-fourths of the very few articles (N = 11) that positively depicted the contrarians did not

include a quotation. This means that journalists do not necessarily quote contrarians to legitimize them or provide them with a public platform; they often do so to debunk contrarians. This strategy may be called *dismissive quotation.* Journalists who support the contrarians tend to refrain from quoting them. We suggest to label this practice *protective omission*. To provide an illustrative example of a dismissive quotation, we might cite a *Guardian Blog* post (from May 2, 2012) that provides a direct quote from a contrarian after explaining that 600 MPs had voted for a climate-related bill, against three opponents: "Conservative MP Peter Lilley, one of the lonely trio who voted against the climate change act, told the audience: 'I am the token denialist, a suitable case for treatment for deviating from the Stalinist line.'" Further down, the article explains: "The sceptics are a fringe within a fringe. Another sceptic, Stuart Wheeler, stood up to say there had been no warming for 15 years (yawn) and that the costs of climate action were too high and then walked out, uninterested in further debate."[1]

[Insert Figure 4 here].

These broader transnational patterns may cloud important differences among climate journalists that can be explained by national, organizational (media outlet), or individual (climate contrarian attitude) contexts. Identifying content differences that run along contextual differences helps us identify the circumstances under which the IPCC view is challenged and contrarians are quoted.

4.3 National bias

The analysis reveals that the British media outlets are significantly more contrarian than those from all other countries in the sample (Figures 5 and 6). Probably in the context of the debate about the 'hiatus,' even the most basic statement (that it is indeed getting warmer) is contested in 16% of all British articles in the sample. Coverage in the leading news outlets selected for our analysis does not simply mirror the degree of public contrarianism as measured in surveys for the respective countries: the US media in our sample are not significantly more contrarian than media outlets from India, Switzerland, and Germany. As expected based on the findings from other studies (Billett, 2010; Painter, 2011), the Indian media stand out due to a total lack of challenge of the four IPCC statements. The question of whether anthropogenic climate change is a serious risk seems to be uncontested in India. In our data, this results in low values on challenges, as well as a comparatively low *IPCC index* value, as there is also a lack of explicit support for the four IPCC consensus statements as well.

[Insert Figure 5 and 6 here].

Of the countries studied, the British and US media most heavily quote contrarian voices (in 25% of the British and 17% of the US articles), and these are clearly negatively evaluated. The standard deviation of the IPCC index values is considerably higher for the data from Britain than for the other countries, which indicates a polarized debate with different kinds of coverage by different news outlets and journalists.

4.4 Organizational bias

These findings about country differences need to be refined by looking at the level of media outlets and even individual journalists: a single columnist for the *Daily Telegraph* (Christopher Booker) wrote 48% of the 77 UK articles that challenged the basic assumptions of anthropogenic climate change.

[1] URL: https://www.theguardian.com/environment/damian-carrington-blog/2012/may/02/climate-change-sceptic-right-wing (last accessed: 17.11.2016)

Other individuals in our sample consistently doubt aspects of the climate change consensus, such as the Danish economist Bjørn Lomborg and the former German politician Fritz Vahrenholt. They were allowed to raise their doubts in guest contributions to the *Wall Street Journal* and the German tabloid *BILD Zeitung*, respectively. Yet, in contrast to Booker, they are not regular columnists of these outlets. Apart from the *Daily Telegraph*, the *Wall Street Journal*, and the *BILD Zeitung*, only the *SUN* and the *Berner Zeitung* feature more than 10% of climate-related articles that challenge the climate change consensus. It should also be mentioned that almost all of the popular and regional newspapers have only very scarce coverage of climate change: a total of about a dozen articles published over the course of roughly 18 months. Organizational factors thus not only impact bias but, perhaps most importantly, the degree of attention that is paid to climate change.

Almost all of the outlets with a substantial share of contrarianism (e.g., *Daily Telegraph*, *Wall Street Journal*) have a right-leaning editorial policy. In order to further substantiate this finding, we explicitly compared left-leaning and right-leaning upmarket newspapers (Figures 7 and 8). The analysis confirms the pattern found above: right-leaning papers challenge climate change significantly more often, but left-leaning papers quote contrarians more often, and clearly evaluate them negatively.

[Insert Figure 7 and 8 here].

4.5 Individual bias

Finally, the case of Christopher Booker illustrates the influence of individual authors and their subjective interpretations of climate change. Brüggemann and Engesser (2014) have shown that there is a core of what they call 'prolific writers' that contributes two-thirds of the climate coverage across different kinds of outlets, while the rest of the coverage is produced by a multitude of journalists who all write only occasionally on this topic. Other studies have also shown that expert science writers have a particularly high degree of individual editorial freedom (Dunwoody, 1980). In the case of Booker from the *Daily Telegraph*, he does not enjoy particular freedom due to his expertise on the science beat, but instead as a well-known columnist who caters to a valuable audience of like-minded right-leaning readers. In order to test whether journalists' personal preferences translate into individual patterns of writing about climate change, we correlated their interpretations (as articulated in the survey) with the aggregate bias of their articles. Table 1 shows that this is clearly the case: there are strong and statistically significant correlations between the *IPCC index* as drawn from the survey for each journalist and the index drawn from their writing. The survey statement "climate skeptics are important voices in the debate" also translates into a greater tendency to positively evaluate contrarian speakers.

[Insert Table 1 here].

It is interesting to note that statements about whether contrarians should be excluded or have equal voice do *not* translate into more or less quoting of contrarians. Journalists who agree with the statement that contrarians should *not* be given the chance to voice their opinions seem even more inclined to quote them, while journalists who demand equal voice for contrarians do *not* quote them more often. While neither correlation is statistically significant, they are still highly plausible in light of the journalistic practices identified above: journalists with a negative attitude towards climate contrarians quote them in their articles, but only in order to dismiss them (dismissive quotation), while journalists who think favorably of climate contrarians support their arguments but avoid quoting them (protective omission).

5. Discussion

These findings produce a nuanced picture of how journalistic norms and biases interact in producing climate coverage. Our findings advance the state of research in four ways.

First, the analysis shows that the interpretive community of climate journalists in different countries found in a prior survey of journalists (Brüggemann and Engesser, 2014) clearly also shapes the coverage across different news outlets and national contexts. The climate change consensus is the established master frame in the climate debate as represented in leading media outlets in different countries. 'Climategate' and the failure to reach a global climate agreement in Copenhagen have not led to climate coverage that continuously doubts the existence of anthropogenic climate change, or the risks associated with it and the need to reduce emissions. Rather, the failure of Copenhagen – combined, probably, with the effects of cuts in the number of science journalists – has led to reduced coverage after 2010, as the continuous monitoring of climate coverage shows (Boykoff et al., 2016). Our study has focused on this period of routine, low-profile coverage of climate change, mostly provided by expert climate, science or environment writers. The coverage clearly illustrates the scientific consensus surrounding the basic understanding of climate change. This is also likely to reflect a learning process among climate journalists after (at the time of the data collection in 2011 and 2012) 15 UN climate summits and four rounds of IPCC reports. In contrast to earlier studies (Wilson, 2000), most journalists are aware of the broad consensus about the basics of climate change as represented in our operationalization of the climate change consensus.

Second, this study refines our understanding of how contrarians get into the news despite this consensus that is shared by both journalists and scientists. Our findings indicate that the norm of balance can no longer be regarded as the prime explanation of the salience of contrarians in media coverage. We find that contrarians are still, considering their fringe position in scientific discourse, overrepresented in media coverage, particularly in the United States and Britain. Yet, this is not a sign of adherence to the norm of balance. Balanced coverage of a 'he said/she said' style has been replaced by an active contextualization and evaluation of contrarian voices, e.g., by pointing out their lack of expertise in climate science. Quotes of contrarians are paired with a dismissal of their stance on climate change. This explains why recent studies (e.g. Painter and Ashe, 2012) have found equal levels of salience of contrarians mentioned in left- and right-leaning papers. We confirm this finding and expand on its explanation: journalists who are themselves contrarian do not quote contrarians as 'opportune witnesses' (Hagen, 1993) in order to hide their own opinions. Past theorizing would also assume that journalists legitimize certain actors by quoting them (Gamson and Wolfsfeld, 1993). With regards to contrarians, we instead find *dismissive quotes* and *protective omissions* – two variants of the repository of journalistic practices that have been neglected in past theorizing.

Comparing our findings to the earlier studies by Boykoff and others leads us to posit a shift in journalistic norms from 'objective/balanced' journalism towards interpretive journalism. Evidence of this trend has also been provided for political reporting in different Western countries (Esser and Umbricht, 2014). Brüggemann and Engesser's (2014) survey also found that 70% of climate journalists said they did not want to ignore contrarian voices but to critically contextualize them. By connecting survey and content analysis, our study shows that these intentions articulated in surveys and interviews are put into practice.

The negative contextualization of contrarians, particularly in outlets like the *Huffington Post* and the *Guardian*, takes the form of a news narrative about climate change deniers who are part of a professionally organized lobbying effort ('denial machine' (Dunlap and MacCright, 2010)) that is ultimately directed against any restrictive regulations or laws to fight climate change. This narrative can be seen as a product of interpretive journalism, but it can also be explained by news value theory: the story provides conflict and negativity, and thereby attracts attention. Media logics such

as the rise of interpretive journalism and the continuing adherence to news values thus converge to explain the enduring salience of contrarians in coverage by journalists who are fully aware of the basic scientific agreement concerning anthropogenic climate change.

Third, niches of denial persist. By comparing the national, organizational, and individual levels, we can show in which contexts the continuous denial of anthropogenic climate change is institutionalized. It is *not only* a certain national-political context that matters; otherwise, we would have found more contrarianism in the leading US print and online news outlets. Nor is it only the editorial line of right-leaning news outlets; otherwise there would be more denial in right-leaning papers like the German *FAZ*. It is also *not only* the contrarian attitude of a small number of journalists. Our study finds evidence of the explanatory power of all three levels, but they only become fully effective when combined in a certain way to provide the necessary and sufficient conditions for publishing denial: contrarian authors, in a right-leaning medium, in a country with elite voices, and lobbyists who back the denial of climate change. This *constellation of conditions* is an important explanation of the unique volume of contrarianism published in the British *Daily Telegraph* by a single columnist. We show that a single journalist can make a difference, *if* he or she works in a certain editorial and national context providing the discursive opportunity for denial. This case also illustrates how ideological bias at different levels of influence shapes the news: a writer with personal doubts about climate change, in a newsroom with a certain ideological leaning, and a wider discourse culture in which denial of climate change is part of the repertoire. It is also interesting that the news outlets from India in the sample contained no challenges to the IPCC view; the debate there seems to focus on completely different issues, which deserves further analysis.

Finally, there is a specific pattern of polarized debate in the Anglo-Saxon countries that is, in our sample, most clearly shown in the British media outlets analyzed. One British media outlet (the *Daily Telegraph*, led by a single columnist) seems to be the stronghold of climate denial. However, another British media outlet, the *Guardian*, features frequent dismissive quoting of contrarians. The BBC does not challenge the IPCC view, and rarely quotes contrarian voices. Thus the private media in Britain engage in an ever more polarized debate, while the public news outlet tries to defend its neutrality by abstaining from this part of the debate.

6. Conclusion

Our study has contributed to both climate communication and journalism studies as the first to combine a survey of climate journalists from different media and national backgrounds with an analysis of their articles. Its descriptive section has shown that a transnational interpretive community among climate journalists along the lines of climate change consensus translates into media coverage, but that journalists still give substantial media attention to contrarians. We explain this paradox using a model of interacting media logics and biases at the individual author, news outlet, and country levels. We have found that journalistic practices as part of media logic are evolving from objective/balanced towards more interpretive journalism. The power of news values such as conflict to shape climate coverage remains the same.

The implications of the resulting patterns of media coverage with regards to contributing to a democratic public sphere – and thus a constructive debate on climate change – are unclear. Democratic theory calls for a journalistic watchdog, and complex issues like climate change call for more contextualization than is provided in the traditional model of objective, balanced journalism. Interpretive journalism may thus be welcomed from this normative perspective, because it provides a better base for creating public understanding of complex issues like climate change and climate politics. It can be viewed as part of the professional duty of journalists to provide “weight-of-evidence reporting” (Dunwoody, 2005) and therefore contextualize contrarian voices. The good news

arising from this study is that *contextualized reporting* is moving closer to what is widely understood as a consensus around the basics of climate change: journalism can be blamed less for confusing the public.

Yet, the fixation on the clash between contrarians and climate science may crowd out more relevant debates related to climate change policy-making and climate science. This narrative may entertain partisan audiences on both sides of the political spectrum, but it also polarizes the debate. A more constructive turn would be to ignore the contrarians and look for new narratives: for example, journalists could hold politicians accountable to their public pledges given at the recent climate summit (COP-21) in Paris by investigating the national implementation of promises to reduce CO_2 emissions. It is a challenge for journalists to search for new ways to frame climate change, and a challenge for researchers to detect these new emerging narratives in order to provide a more nuanced analysis of climate debates. Both journalists and media scholars need to look for new dimensions in the debate. One step in this direction is the framework offered by Corry and Jorgensen, who map the climate policy debate by taking into account the perception of the climate problem as more or less "wicked" and the preferred solutions that can rely on a more individualist or holistic framework (Corry and Jørgensen, 2015).

Further implications for future research stem from both the findings and the limits of our study. Content analyses need to go beyond counting who gets a voice to focus on how (e.g., contrarian) voices are contextualized. Future content analysis also needs to go beyond coding positive/negative evaluations as we do: this may even be done through automated content analysis. Yet, the results need to be complemented by deeper qualitative analyses that identify how exactly different voices are contextualized. Our findings also emphasize the importance of editorial policies, and thus of studying more than one news outlet per country and making a more conscious choice of which media outlets to study. Even though our study has gone beyond focusing on upmarket newspapers, it has still neglected outlets like Fox News (Feldman et al., 2011) or US talk radio stations, which are likely to host more denialism than those included here. This is why the US media, in our sample, seems less contrarian than British media. Our study may inspire future research that combines content analyses with interviews of the authors of the articles. Yet, the current study also reveals a limitation of this approach: journalists' willingness to participate in a survey. Finally, analytically, our results remind us that individual, organizational, and national influences on media content should not be regarded as mutually exclusive. Also, biases and professional logics are not alternative explanations for journalistic practices. These different factors interact and complement each other to explain the practices observed in climate journalism.

References

Adam S, Berkel B and Pfetsch B (2003) *Media opportunity structures–A brake block of the Europeanisation of public spheres. WP 1 in: The Transformation of Political Mobilisation and Communication in European Public Spheres.* Available at: http://europub.wz-berlin.de/Default.htm.

Altheide DL (2004) Media Logic and Political Communication. *Political Communication* 21(3): 293–296.

Anderegg W, Prall JW, Harold J and Schneider SH (2010) Expert credibility in climate change. *Proceedings of the National Academy of Sciences* 107(27): 12107–12109.

Antilla L (2005) Climate of scepticism: US newspaper coverage of the science of climate change. *Global Environmental Change* 15(4): 338–352.

Billett S (2010) Dividing climate change: global warming in the Indian mass media. *Climatic Change* 99(1): 1–16.

Boussalis C and Coan TG (2016) Text-mining the signals of climate change doubt. *Global Environmental Change* 36: 89–100.

Boykoff M and Boykoff J (2004) Balance as bias: Global warming and the US prestige press. *Global Environmental Change* 14(2): 125–136.

Boykoff M, Daly M, Gifford L, Luedecke G, McAllister L, Nacu-Schmidt A, et al. (2016) *World newspaper coverage of climate change or global warming, 2004-2016*. Available at: http://sciencepolicy.colorado.edu/media_coverage.

Boykoff MT (2007) Flogging a dead norm? Newspaper coverage of anthropogenic climate change in the United States and United Kingdom from 2003 to 2006. *Area* 39(4): 470–481.

Boykoff MT (2008) Lost in translation?: United States television news coverage of anthropogenic climate change, 1995-2004. *Climate Change* 86: 1–11.

Boykoff MT (2011) *Who speaks for the climate?: Making sense of media reporting on climate change*. Cambridge: Cambridge University Press.

Brüggemann M (2014) Between Frame Setting and Frame Sending: How Journalists Contribute to News Frames. *Communication Theory* 24(1): 61–82.

Brüggemann M and Engesser S (2014) Between Consensus and Denial: Climate Journalists as Interpretive Community. *Science Communication* 36(4): 399–427.

Capstick SB and Pidgeon NF (2014) What is climate change scepticism?: Examination of the concept using a mixed methods study of the UK public. *Global Environmental Change* 24: 389–401.

Carvalho A (2007) Ideological cultures and media discourses on scientific knowledge: re-reading news on climate change. *Public Understanding of Science* 16(2): 223–243.

Cook J, Nuccitelli D, Green S, Richardson M, Winkler B, Painting R, et al. (2013) Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters* 8(2): 24024.

Corry O and Jørgensen D (2015) Beyond 'deniers' and 'believers': Towards a map of the politics of climate change. *Global Environmental Change* 32: 165–174.

Dearing JW (1995) Newspaper coverage of maverick science: creating controversy through balancing. *Public Understanding of Science* 4(4): 341–361.

Dixon GN and Clarke CE (2013) Heightening Uncertainty Around Certain Science: Media Coverage, False Balance, and the Autism-Vaccine Controversy. *Science Communication* 35(3): 358–382.

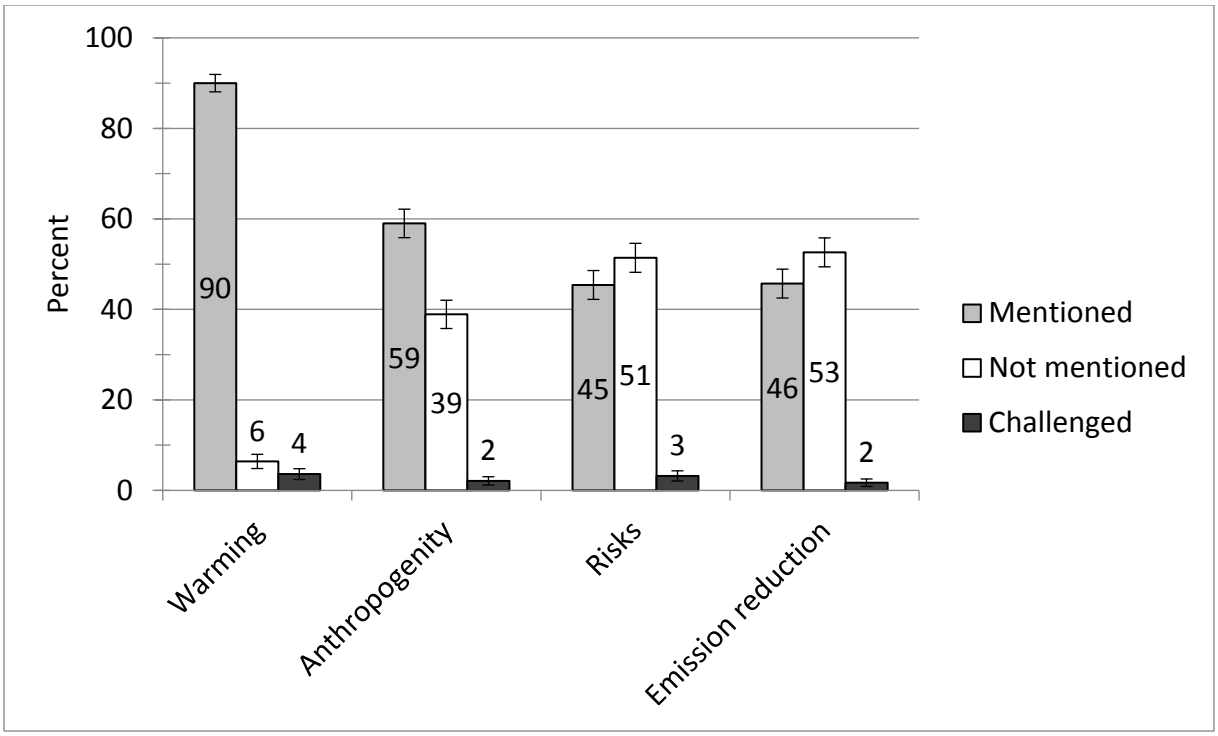
Dunlap RE and McCright AM (2010) Climate change denial: sources, actors and strategies. In: Lever-Tracy C (ed.) *Routledge Handbook of Climate Change and Society*. New York: Routledge, pp. 240–260.

590 Dunlap RE and McCright AM (2011) Organized Climate Change Denial. In: Dryzek JS, Norgaard RB and
591 Schlosberg D (eds) *Oxford handbook of climate change and society*. Oxford, New York: Oxford
592 University Press, pp. 144–160.
593 Dunwoody S (1980) The Science Writing Inner Club: A Communication Link between Science and the
594 Lay Public. *Science, Technology, & Human Values* 5(30): 14–22.
595 Dunwoody S (2005) *Weight-of-Evidence Reporting: What Is It? Why Use It?* Available at:
596 http://www.nieman.harvard.edu/reports/article/100595/Weight-of-Evidence-Reporting-What-Is-
597 It-Why-Use-It.aspx.
598 Dunwoody S and Peters HP (1992) Mass media coverage of technological and environmental risks: a
599 survey of research in the United States and Germany. *Public Understanding of Science* 1: 199–
600 230.
601 Elsasser SW and Dunlap RE (2013) Leading voices in the denier choir: Conservative columnists'
602 dismissal of global warming and denigration of climate science. *American Behavioral Scientist*
603 57(6): 754–776.
604 Esser F and Umbricht A (2014) The Evolution of Objective and Interpretative Journalism in the
605 Western Press: Comparing Six News Systems since the 1960s. *Journalism & Mass Communication*
606 *Quarterly* 91(2): 229–249.
607 European Commission (2014) *Special Eurobarometer 409*. Available at:
608 http://ec.europa.eu/public_opinion/index_en.htm.
609 Fahy D and Nisbet MC (2011) The science journalist online: Shifting roles and emerging practices.
610 *Journalism* 12(7): 778–793.
611 Feldman L, Hart PS and Milosevic T (2015) Polarizing news? Representations of threat and efficacy in
612 leading US newspapers' coverage of climate change. *Public Understanding of Science*.
613 Feldman L, Maibach EW, Roser-Renouf C and Leiserowitz A (2011) Climate on Cable: The Nature and
614 Impact of Global Warming Coverage on Fox News, CNN, and MSNBC. *The International Journal of*
615 *Press/Politics* 17(1): 3–31.
616 Fretwurst B (2015) *Reliability and accuracy with Lotus: With commentary on calculating Lotus with*
617 *SPSS. Paper presented at the Annual Conference of the International Communication Association,*
618 *San Juan, Puerto Rico*. Available at: www.iakom.ch/Lotus/LotusManualEng.pdf.
619 Galtung J and Ruge MH (1965) The Structure of Foreign News. The Presentation of the Congo, Cuba
620 and Cyprus Crisis in Four Norwegian Newspapers. *Journal of Peace Research* 2: 64–91.
621 Gamson WA and Wolfsfeld G (1993) Movements and Media as Interacting Systems. *The ANNALS of*
622 *the American Academy of Political and Social Science* 528: 114–125.
623 Gans HJ (1979) *Deciding what's news: A study of CBS Evening News, NBC Nightly News, Newsweek,*
624 *and Time*. New York: Pantheon Books.
625 Gibson TA, Craig RT, Harper AC and Alpert JM (2016) Covering global warming in dubious times:
626 Environmental reporters in the new media ecosystem. *Journalism* 17(4): 417–434.
627 Grundmann R (2007) Climate Change and Knowledge Politics. *Environmental Politics* 16(3): 414–432.
628 Grundmann R and Scott M (2014) Disputed climate science in the media: Do countries matter? *Public*
629 *Understanding of Science* 23(2): 220–235.
630 Hagen LM (1993) Opportune Witnesses: An Analysis of Balance in the Selection of Sources and
631 Arguments in the Leading German Newspapers' Coverage of the Census Issue. *European Journal*
632 *of Communication* 8(3): 317–343.
633 Holliman R (2011) Advocacy in the tail: Exploring the implications of 'climategate' for science
634 journalism and public debate in the digital age. *Journalism* 12(7): 832–846.
635 Hopmann DN, van Aelst P and Legnante G (2012) Political balance in the news: A review of concepts,
636 operationalizations and key findings. *Journalism* 13(2): 240–257.

637 Lee T-T and Grimmer K (2008) Bias in the News. In: Donsbach W (ed.) *The International Encyclopedia*
638 *of Communication*: Blackwell Reference Online.
639 Leiserowitz AA, Maibach EW, Roser-Renouf C, Smith N and Dawson E (2013) Climategate, Public
640 Opinion, and the Loss of Trust. *American Behavioral Scientist* 57(6): 818–837.
641 Lewandowsky S, Gignac GE and Vaughan S (2013) The pivotal role of perceived scientific consensus in
642 acceptance of science. *Nature Clim. Change* 3(4): 399–404.
643 McCright AM (2007) Dealing with climate change contrarians. In: Moser SC and Dilling L (eds)
644 *Creating a Climate for Change. Communicating Climate Change and Facilitating Social Change*.
645 Cambridge: Cambridge University Press, pp. 200–212.
646 O'Neill SJ and Boykoff M (2010) Climate denier, skeptic, or contrarian? *Proceedings of the National*
647 *Academy of Sciences of the United States of America* 107(39): E151; author reply E152.
648 Oreskes N (2004) Beyond the ivory tower: The Scientific Consensus on Climate Change. *Science* 306:
649 1686.
650 Painter J (2011) *Poles apart: The international reporting of climate scepticism*. Oxford: Reuters
651 Institute for the Study of Journalism.
652 Painter J and Ashe T (2012) Cross-national comparison of the presence of climate scepticism in the
653 print media in six countries, 2007–10. *Environmental Research Letters* 7(4): 44005.
654 Painter J and Gavin NT (2016) Climate Skepticism in British Newspapers, 2007–2011. *Environmental*
655 *communication* 10(4): 432–452.
656 Patt AG and Weber EU (2014) Perceptions and communication strategies for the many uncertainties
657 relevant for climate policy. *Wiley Interdisciplinary Reviews: Climate Change* 5(2): 219–232.
658 PEW (2015) *Global concern about climate change, broad support for limiting emissions*. Available at:
659 http://www.pewglobal.org/2015/11/05/global-concern-about-climate-change-broad-support-
660 for-limiting-emissions/.
661 Rahmstorf S (2004) *The climate skeptics. In Weather catastrophes and climate change - Is there still*
662 *hope for us? Munich Re, Editor. pg-verlag: Munich. p. 76-83.* Available at: http://www.pik-
663 potsdam.de/~stefan/Publications/.
664 Ratter BM, Philipp KH and Storch H von (2012) Between hype and decline: Recent trends in public
665 perception of climate change. *Environmental Science & Policy* 18: 3–8.
666 Schäfer M and Schlichting I (2014) Media Representations of Climate Change: A Meta-Analysis of the
667 Research Field: Environmental Communication. *Environmental communication* 8(2): 142–160.
668 Schmidt A, Ivanova A and Schäfer MS (2013) Media attention for climate change around the world: A
669 comparative analysis of newspaper coverage in 27 countries. *Global Environmental Change* 23(5):
670 1233–1248.
671 Schulz W (2011) *Politische Kommunikation. Theoretische Ansätze und Ergebnisse empirischer*
672 *Forschung (3. überarbeitete Auflage)*. Wiesbaden: VS Verlag.
673 Semetko HA, Blumler JG, Gurevitch M and Weaver D (1991) *The formation of campaign agendas: A*
674 *comparative analysis of party and media roles in recent American and British elections*. Hillsdale,
675 N.J.: Erlbaum.
676 Shehata A and Hopmann DN (2012) Framing Climate Change. *Journalism Studies* 13(2): 175–192.
677 Hiles S and Hinnant A (2014) Climate Change in the Newsroom: Journalists' Evolving Standards of
678 Objectivity When Covering Global Warming. *Science Communication* 36(4): 428–453.
679 Shoemaker PJ and Reese SD (2014) *Mediating the message in the 21st century: A media Sociology*
680 *perspective*. New York: Routledge.
681 Tuchman G (1972) Objectivity as Strategic Ritual: An Examination of Newsmen's Notions of
682 Objectivity. *American Journal of Sociology* 77(4): 660–679.
683 Westerstahl J (1983) Objective news reporting: General premises. *Communication Research* 10(3):
684 403–424.

685 Whitmarsh L (2011) Scepticism and uncertainty about climate change: Dimensions, determinants and
686 change over time. *Global Environmental Change* 21(2): 690–700.
687 Wilson KM (2000) Drought, debate, and uncertainty: Measuring reporters' knowledge and ignorance
688 about climate change. *Public Understanding of Science* 9: 1–13.
689

690 Figure 1: *Agreement with the IPCC View across Countries and News Outlets*



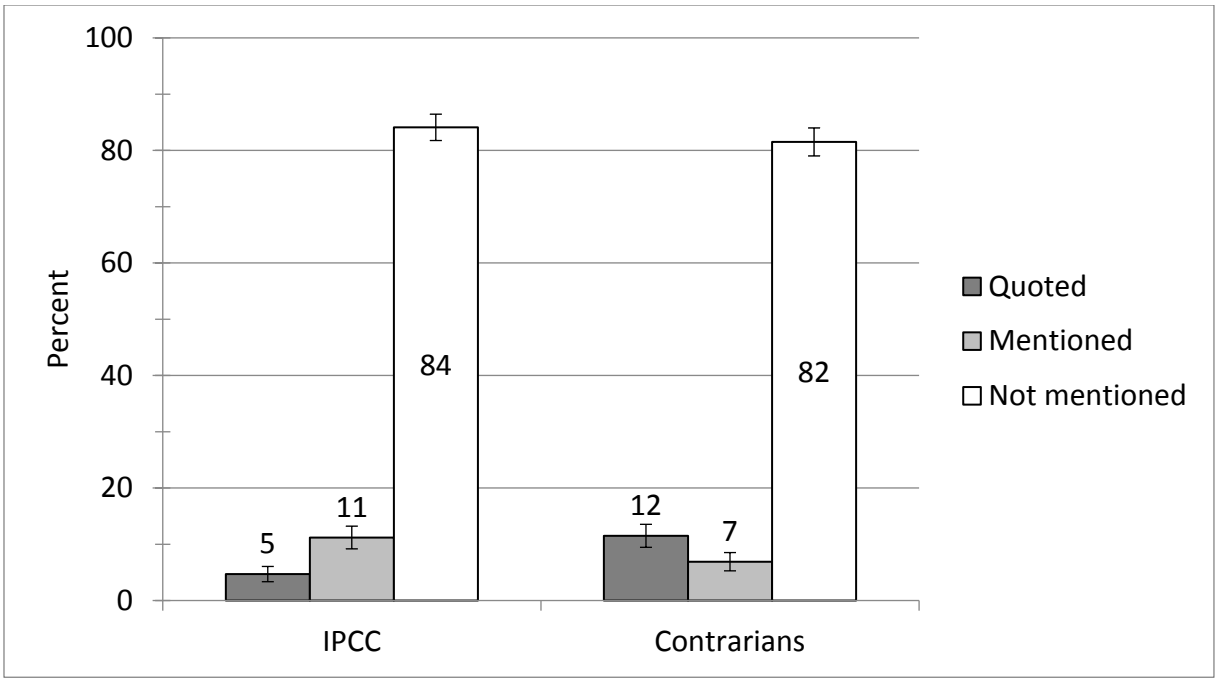
691

692 *Note: N* = 936 articles (CH, D, UK, US, IN; 1 January 2011 – 31 December 2012)

693

694

695 Figure 2: *Salience of the IPCC and Contrarians in Media Coverage*



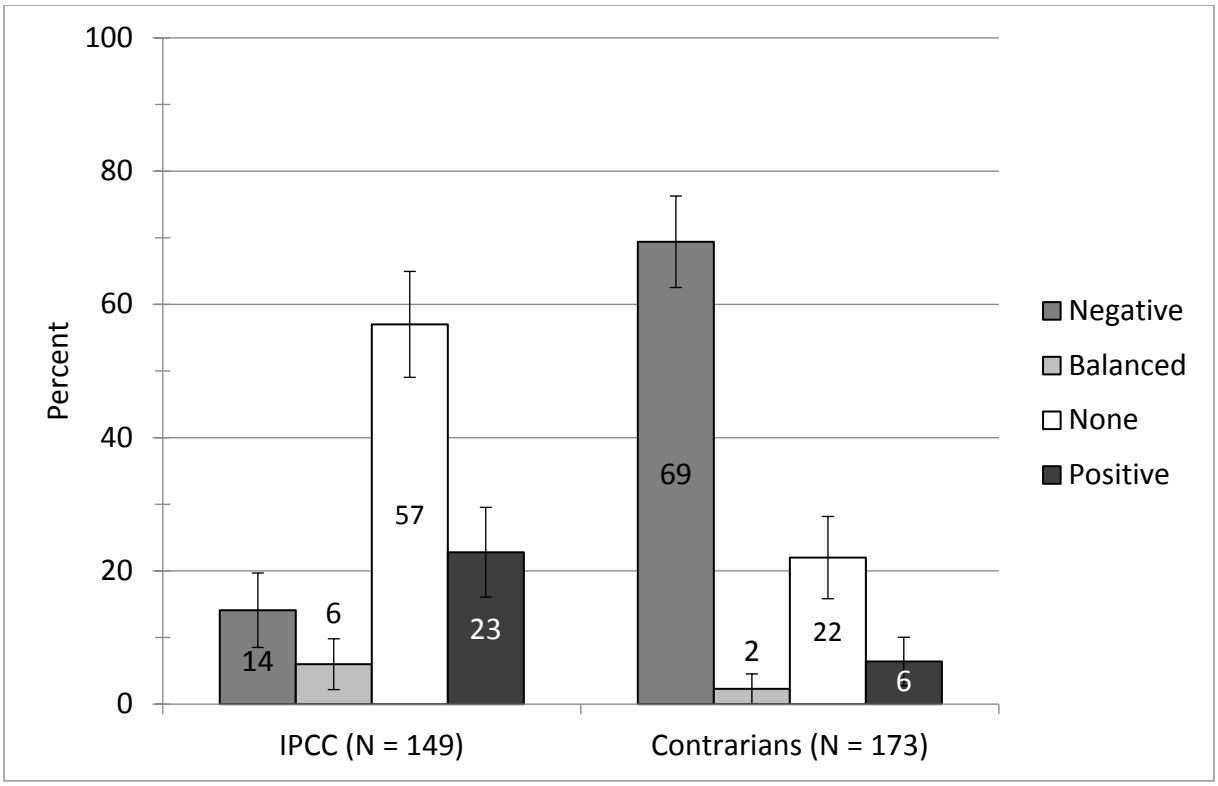
696

697 *Note: N* = 936 articles (CH, D, UK, US, IN; 1 January 2011 – 31 December 2012)

698

699

700 Figure 3: *Evaluation of the IPCC and Contrarians in Media Coverage*



701

702 *Note:* 149 articles mention/quote the IPCC; 173 articles mention/quote contrarians

703

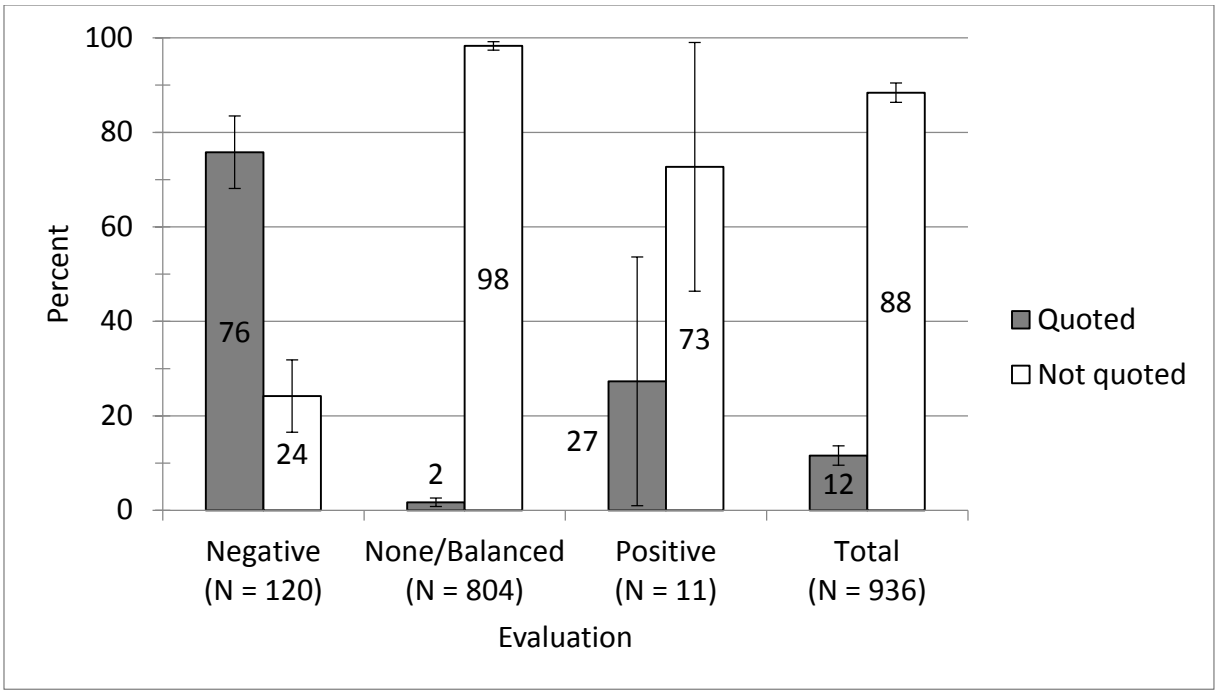
704

705

706

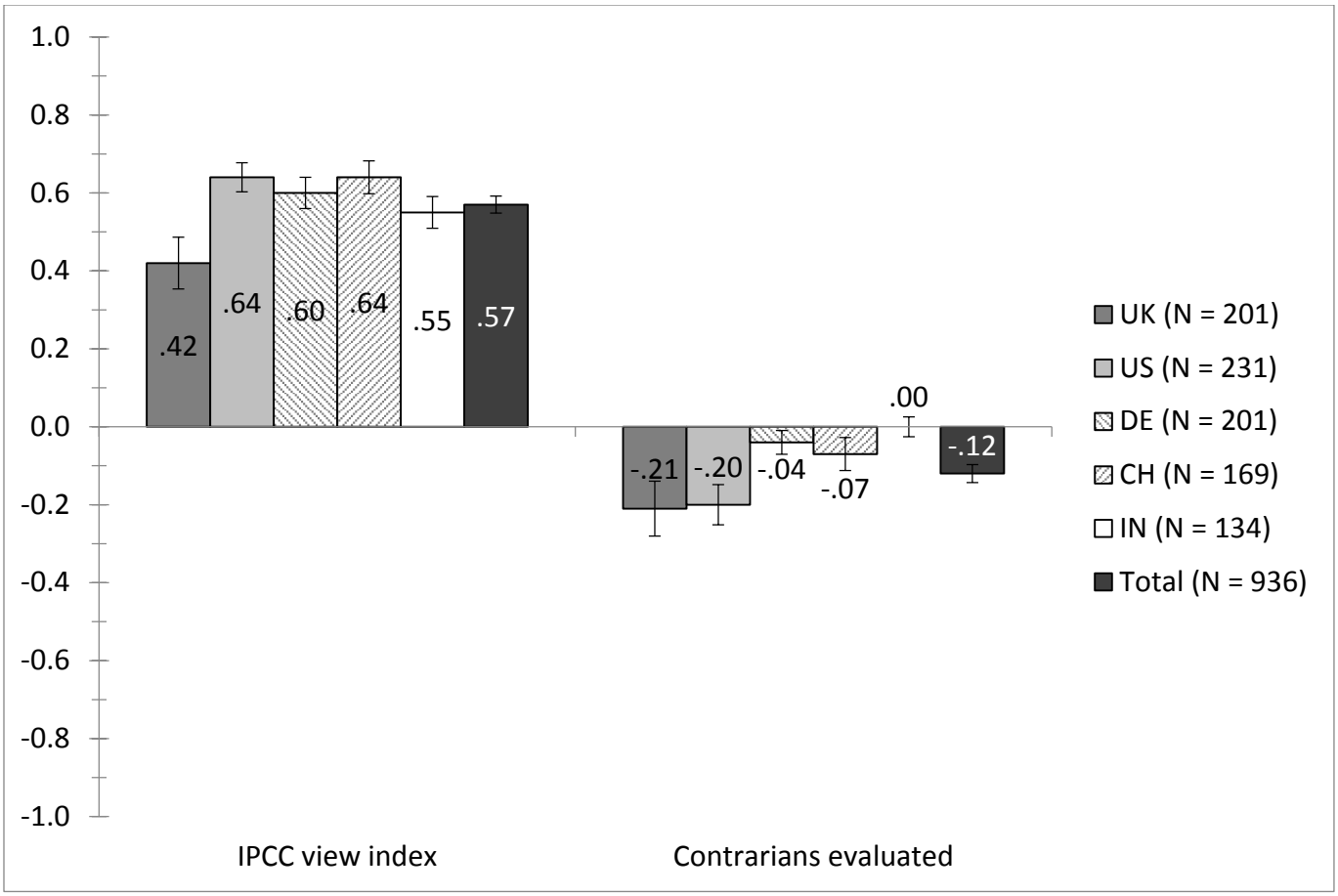
707

708 Figure 4: *Quotation and Evaluation of Contrarians in Media Coverage*



Note: "None/Balanced" includes only four cases of balanced reporting. There is a significant negative relation between quotation and evaluation: $\chi 2$ (2, N = 935) = 563.74, $p < 0.000$

Figure 5: *IPCC view and Evaluation of Contrarians by Country*



Note: IPCC view index: average of the affirmations (1), challenges (-1) and neutral (0) journalistic stances towards the four statements that comprise the climate change frame; Contrarians evaluated: average of the positive (1), negative (-1), or neutral (0) stances towards contrarians.

Figure 6: *Challenges to IPCC view and Quotations of Contrarians by Country*

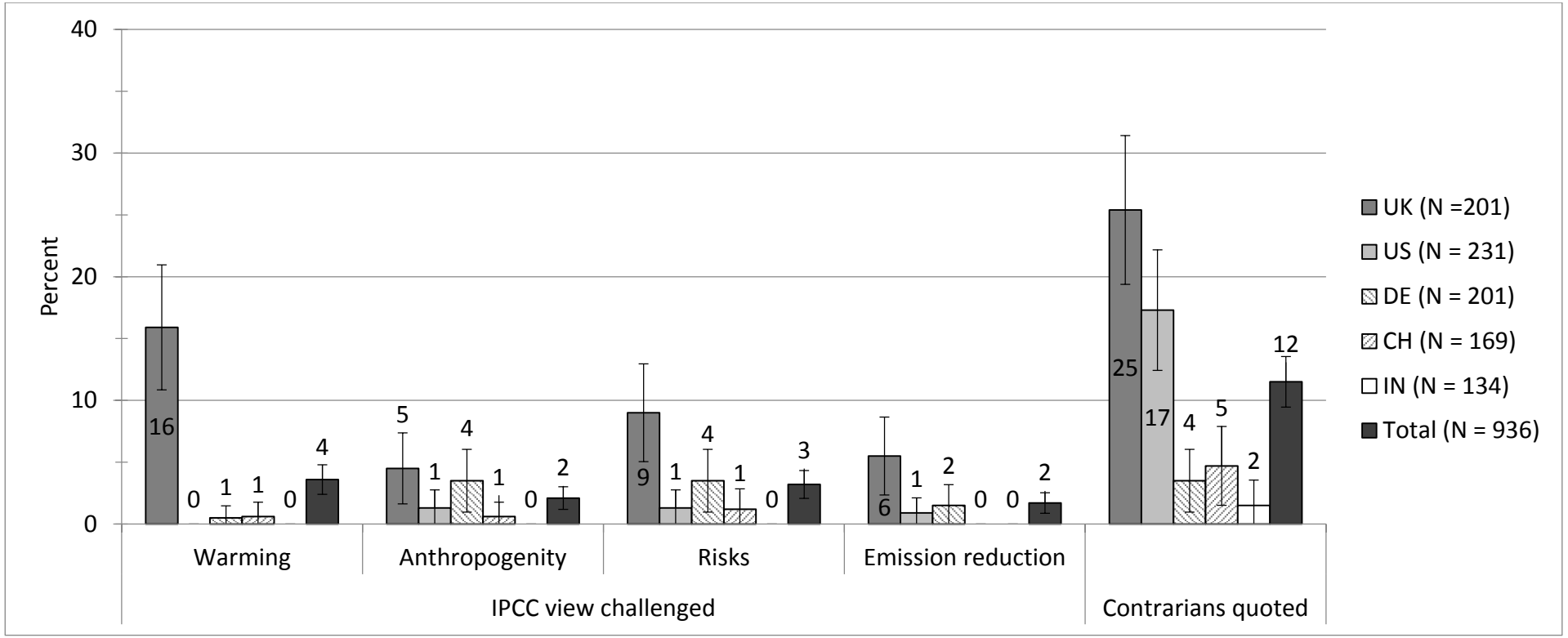
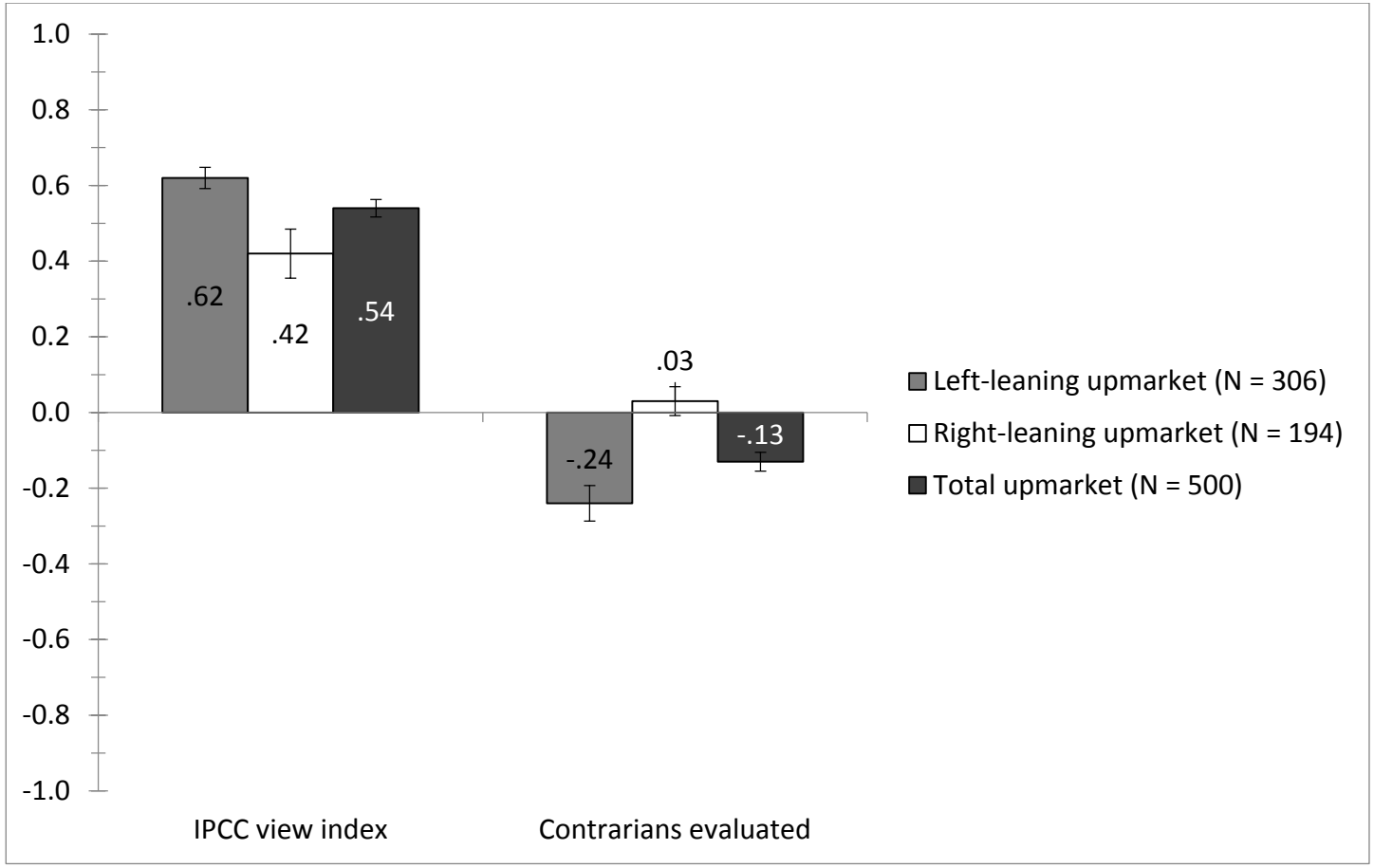
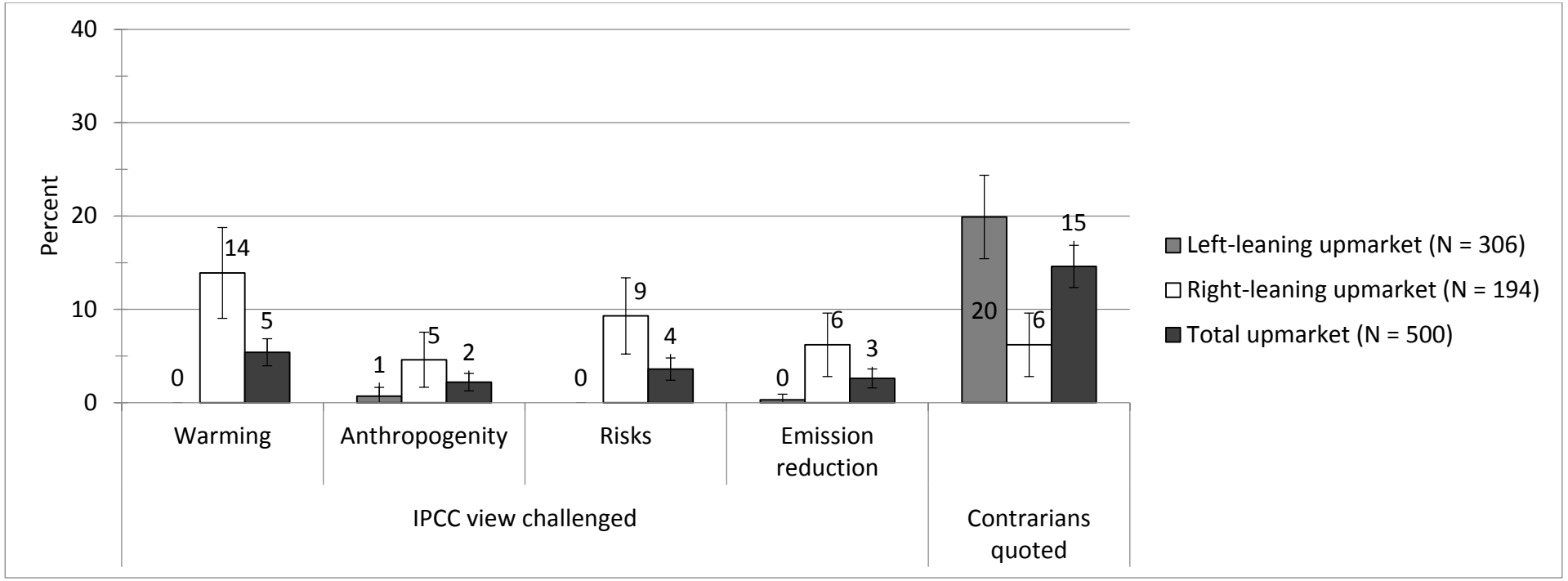


Figure 7: *IPCC view and Evaluation of Contrarians by Political Slant of Upmarket Newspapers*



Note: Left-leaning: *Tages-Anzeiger, SZ, Hindu, Guardian, NYT*; right-leaning: *NZZ, FAZ, Hindustan Times, Daily Telegraph, WSJ*

Figure 8: *Challenges to IPCC view and Quotations of Contrarians by Political Slant of Upmarket Newspapers*



Note: Left-leaning: *Tages-Anzeiger, SZ, Hindu, Guardian, NYT*; right-leaning: *NZZ, FAZ, Hindustan Times, Daily Telegraph, WSJ*

Table 1: *Correlation between Journalists' Attitudes and the Content of their Articles*

Survey responses of journalists	Content analysis of their articles	Pearson's *r*	*p*
IPCC view index			
Agreement with / challenge of four statements: (1) warming, (2) anthropogenity, (3) risks, (4) emission reduction	Agreement with / challenge of four statements: (1) warming, (2) anthropogenity, (3) risks, (4) emission reduction	.49	.000
Evaluation of contrarians			
Agreement with statement ("climate skeptics are important voices in the debate")	Evaluation of contrarians	.26	.042
Journalistic treatment of contrarians: "Contrarians should…			
…*not* be given much of chance to make their points"	Quotation of contrarians	.14	.280
	Evaluation of contrarians	-.27	.039
…be given the chance… *as extensively as others*"	Quotation of contrarians	-.19	.149
	Evaluation of contrarians	.29	.039

N = 62 journalists (correlated with the aggregated averages of the content patterns in their 747 articles related to climate change)

Online Appendix (Brüggemann, M. / Engesser, S.: Beyond False Balance: How Interpretive Journalism Shapes Media Coverage of Climate Change)

Table A1*: Sampling by Countries and News Outlets*

Market segment	Country				
	CH	DE	IN	UK	US
Upmarket newspaper	*NZZ* (right leaning) *Tages-Anzeiger* (left leaning)	*FAZ* (right leaning) SZ (left leaning)	*Hindustan Times* (centrist) *Indian Express* (centrist)	*Daily Telegraph* (right leaning) *Guardian* (left leaning)	*WSJ* (right leaning) *NYT* (left leaning)
Mass-/midmarket newspaper	*Blick* (centrist)	*BILD* (right leaning)	*MidDay* (left leaning)	*The Sun* (right leaning)	*USA Today* (centrist)
Regional newspaper	*Berner Zeitung* (centrist)	*Berliner Zeitung* (left leaning)	*Hindu* (left leaning)	*Manchester Evening News* (left leaning)	*LA Times* (left leaning)
Major online news outlets	News.ch	*Spiegel* Online (left leaning)	*Times of India* (centrist)	BBC News	Huffington Post (left leaning)
N = 936	169	201	134	201	231

Note: With this case selection, we aimed to represent each country's journalistic print and online media landscape and to compare functionally equivalent news outlets (Wirth, Kolb 2004) across countries. We selected outlets that can be considered leaders in terms of prestige and audience reach in each market segment. The regional newspapers selected are based in another metropolitan area than the upmarket papers selected. While they have a clear regional base, they are not necessarily limited in geographic scope to this area. In the case of India, we were restricted to English-language news outlets. Outlets like the *Guardian* and the *New York Times* may also be regarded as global players, yet they are also influenced by the journalism culture of their country and reflect the specifics of the national debate about climate change. The *Times of India* is an upmarket newspaper but is also widely regarded as the country's leading online news outlet. For audience reach, see Olmstead et al. (2011) and WAN (2010).

We included one right-leaning and one left-leaning upmarket newspaper in every country. In India, only the *Hindustan Times* could be clearly classified as left leaning. We sampled the paper as regional because it comes from Southern Chennai. For the comparative analysis of right- and left-leaning outlets, we used the upmarket newspapers in each country. For India we included the *Hindu* and the *Hindustan Times*. For the BBC and News.ch we did not assign political leanings in the table above as the BBC is legally bound to be impartial and balanced, and News.ch heavily relies on relatively impartial news agency material. For the political leanings of the other outlets, see Gentzkow and Shapiro (2010), Painter (2013), and Schmidt and Schäfer (2015). Political leanings were furthermore assigned after consultation with country experts for the respective countries.

Table A2: *Reliability Test Results*

Category	Item	S-Lotus (adjusted by chance)	Pearson's *r*
IPCC view	Warming	0.89	
	Anthropogenity	0.75	
	Risks	0.75	
	Emission reduction	0.80	
	IPCC view index[a]		0.86
Actor mentioning[b]	IPCC	0.98	
	Contrarians	0.89	
Actor evaluation[c]	IPCC	0.97	
	Contrarians	0.90	

Note: [a]Average index of the four respective IPCC view items; [b]Scale: 0 = "not mentioned," 1 = "mentioned," 2 = "quoted/several mentions," 3 = "quoted at length"; [c]Scale: -1 = "negative," 0 = "not mentioned"/"balanced," to 1 = "positive"

References

Gentzkow, M. & Shapiro, J. M. (2010). What drives media slant? *Econometrica*, 78(1), 35–71

Olmstead, K., Mitchell, A., & Rosenstiel, T. (2011). *Navigating news online: Where people go, how they get there and what lures them away*. Pew Research Center, http://www.journalism.org/files/legacy/NIELSEN%20STUDY%20-%20Copy.pdf

Painter, J. (2013). *Climate Change in the Media: Reporting Risk and Uncertainty*. London: Tauris.

Schmidt, A., & Schäfer, M. S. (2015). Constructions of climate justice in German, Indian and US media. *Climatic Change*, 133(3), 535–549

Wirth, W., & Kolb, S. (2004). Designs and Methods of Comparative Political Communication Research. In F. Esser & B. Pfetsch (Eds.), *Comparing Political Communication. Theories, Cases, and Challenges* (pp. 87–115). Cambridge: Cambridge University Press.

World Association of Newspapers (Ed.). (2010). *World Press Trends*. Paris.