

1 **[Final accepted manuscript]**

2

3 **Beyond false balance:**

4 **How interpretive journalism shapes media coverage of climate change**

5 Abstract:

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

17 Keywords:

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

19 1. Introduction

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

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

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

50 To assess how journalists report on climate change and how they deal with its denial, it is
51 first necessary to describe what we call the *climate change frame* or *IPCC view*, as well as the
52 *contrarian* voices in public debates. The climate change frame or consensus as presented in IPCC
53 reports and in scientific journals may be summarized in four statements (Brüggemann and Engesser,
54 2014; Shehata and Hopmann, 2012): (1) Global warming represents an extraordinary rise in average
55 global temperatures since the industrial revolution. (2) It is mainly caused by human-induced
56 emissions of CO₂ and other greenhouse gases. (3) It creates problems for both ecosystems and
57 humanity. (4) Emissions need to be reduced to avoid future damage. These statements allow us to
58 identify four types of contrarianism or challenges to the climate change frame; they focus on
59 doubting: the trend (climate change), the attribution (anthropogenic), the impact (risks, severe
60 problems), and the treatment (reducing emissions) (see Rahmstorf (2004) for the first three types of
61 contrarianism). This framework does not capture all variants of contrarian claims (Capstick and
62 Pidgeon, 2014); it focuses on the challenges that attack the core of the consensus among the world’s
63 leading climate scientists.

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

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

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

99 Explanations drawing on media logics – particularly the professional norms of journalism –
100 are strongly connected to the work of Boykoff and Boykoff (2004) who emphasize the professional
101 *norm of balance* as an important influencing factor: “[...] journalists present competing points of
102 views on a scientific question as though they had equal scientific weight, when actually they do not”
103 (127). The norm of balance is part of the broader concept of objectivity (Westerstahl, 1983), which
104 calls on journalists to provide a ‘neutral’ account by giving equal voice to both sides in a conflict
105 (Hopmann et al., 2012). Journalists follow this practice as it allows them to demonstrate their
106 professional objectivity and to fend off accusations of one-sided coverage (Gans, 1979; Tuchman,
107 1972). Balance also serves as a “surrogate for validity checks” (Dunwoody and Peters, 1992: 129) if
108 journalists lack the time or expertise to assess the validity of conflicting statements from different
109 sources. Earlier research on environmental and science journalists in the United States cited evidence

110 of their lack of knowledge about what climate experts consider to be basic common in climate
111 research (Wilson, 2000). The norm of balance is particularly powerful in cases of contested
112 knowledge claims and a lack of expertise among the journalists who cover the respective issue.
113 Finally, conflicts create news value and thus stories that grasp audience attention. The presence of
114 contrarians in media coverage may therefore be explained by either bias (ideological fit) as outlined
115 above or as part of journalistic norms (objectivity/balance) and routines (news values). Yet applying
116 the norm of balance amplifies the views of contrarians (which may attract audience attention) and
117 distorts coverage of the issue. By quoting contrarian voices out of context, journalists give them
118 legitimacy and ‘media standing’ that might also translate into political power (Gamson and Wolfsfeld,
119 1993).

120 Boykoff and Boykoff (2004) examined the coverage of climate change in US newspapers from
121 1988 to 2002, and found that half of the articles presented a balanced account of the issue; slightly
122 more than half of the television newscasts analyzed during that time did so (Boykoff, 2008). A
123 replication of the study found the share of balanced coverage reduced from more than a third of all
124 articles in 2003 to about three percent in 2006 in US newspapers (Boykoff, 2007). Thus, balanced
125 reporting may be retreating, but contrarians have not necessarily vanished from the media. Painter
126 and Gavin (2016) find that the British press quoted contrarians in every fifth article during the years
127 2007 to 2011. Schmid-Petri et al. (2015) find that almost a third of articles in the US press contain
128 contrarian voices. Have journalists therefore moved on to a one-sided promotion of denial of climate
129 change, which would be proof of ideological bias, rather than adhere to professional logics such as
130 the norm of balanced coverage?

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

143 Another trend in journalism should be considered for making sense of the finding that
144 balanced coverage may be gone, but not so, the quoting of contrarian voices. Studies find a trend
145 towards interpretive reporting among online science journalists (Fahy and Nisbet, 2011) and in
146 political journalism in different Western countries (Esser and Umbricht, 2014). Hiles and Hinnant
147 (2014) found a radically redefined understanding of objectivity among experienced climate
148 journalists that goes beyond ‘balanced coverage.’ They found that while these specialist journalists
149 still attempted to refrain from letting their biases influence their coverage, they followed “weight-of-
150 evidence reporting” (Dunwoody, 2005) in which stories reflect scientific consensus and are “written
151 with authority” (Hiles and Hinnant, 2014: 15), thereby distinguishing between views that represent
152 valid, peer-reviewed science and those that represent outliers with no backing from scientific
153 evidence or peers (Boykoff, 2011). Another qualitative interview study with science journalists in the
154 United States confirms this trend: journalists claim that they want to go “beyond balance” and even
155 ignore contrarian voices (Gibson et al., 2016).

156 Yet, whether these approaches are put into practice has not been comprehensively
157 investigated with regards to different media types in different cultural contexts. Most studies focus
158 on the US and British contexts or on the coverage of upmarket newspapers (Schäfer and Schlichting,
159 2014). Grundmann and Scott (2014) also include France and Germany from 2000 to 2010 and a great
160 number of newspapers using corpus linguistic methods. Their study shows that, overall, contrarians
161 are much less prominent in media discourses than speakers who support the climate change
162 consensus. They also show that countries consistently diverge on the salience of contrarians, with a
163 much stronger entrenchment of contrarian voices in the United States. This is in line with findings
164 from Painter and Ashe (2012), who also included quality papers from Brazil, China, France, and India
165 in their analysis. They compared the coverage in 2007 and 2009/2010 during the UN Climate summit
166 in Copenhagen and, at the same time, ‘Climategate’ (the pseudo scandal constructed around
167 personal e-mails between climate researchers that were published by contrarian bloggers in order to
168 discredit climate research, Holliman (2011)). Overall, these findings show that there is no linear
169 decline in contrarianism in the news, but rather that specific events (or staged pseudo events like
170 Climategate) provide ‘media opportunity structures’ (Adam et al., 2003) for contrarians to become
171 salient voices in media coverage. This explains why Shehata and Hopmann (2012), who focused on
172 media coverage between 1997 and 2007, did *not* find contrarians in the news. They studied UN
173 climate conferences, where contrarians have not managed to play a significant political role. This was
174 radically different in the context of the Climategate campaign: the content analysis of Painter and
175 Ashe (2012) found that contrarian views occurred in every third article in the United States, followed
176 by the United Kingdom, while contrarians played only a negligible role in all other countries.

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

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

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

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

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

208 This leads us to posit three *research questions*:

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

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

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

214 3. Methods

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

221 3.1 Case selection and sampling

222 Due to the global scope of climate change and our interest in transnational patterns of climate
223 coverage, we included journalists and their news stories from Germany, India, Switzerland, the
224 United Kingdom, and the United States in our study. All five countries have high amounts of CO₂
225 emissions (either total or per capita), and are thus likely to feature vivid debates on climate change.
226 Climate change reporting in the industrialized countries features varying degrees of contrarianism: it
227 is relatively high in the United States, medium in the United Kingdom, and low in Germany,
228 Switzerland, and India (Grundmann and Scott, 2014; Painter and Ashe, 2012). India is included as an
229 exemplary emerging economy that debates climate change not in terms of contrarians vs. climate
230 science but as a conflict between traditional CO₂ emitters and the emerging economies (Billett, 2010;
231 Painter, 2011). We selected leading news outlets from different sectors of the media landscape in
232 each country: two upmarket newspapers (preferably one right leaning and one left leaning), one
233 mass-market or mid-market newspaper, one regional newspaper from a complementary
234 metropolitan area, and one major online news outlet (Online Appendix Table A1 further explains the
235 case selection). Our selection of news outlets was inspired by previous studies (Boykoff et al., 2016;
236 Schmidt et al., 2013). Both print and online editions were included.

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

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

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

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

268 The extended sample of the content analysis (N = 936) covered the years 2011 and 2012,
269 which represents a period of modest and routine coverage of climate change. This time frame
270 featured two UN climate summits, COP (Conference of the Parties of the UN Framework Convention
271 on Climate Change) 17 and COP 18, two special IPCC reports, a couple of extreme weather events,
272 such as a hot summer in the United States in 2011 and a hot spring in Europe in 2011, as well as
273 hurricanes Irene and Katia. While the COPs received a substantial amount of coverage in our sample
274 (18%), the special IPCC reports were largely ignored (1%), and weather events comprised 6% of the
275 coverage. Among the most important news pegs were the publication of scientific studies (32%) and
276 the actions of domestic governments (16%).

277 **3.2 Measures and coding**

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

- 281 1. Global warming: The average global temperature has been rising for about 150 years.
- 282 2. Anthropogenity: Global warming has been largely caused by humans through CO₂
283 emissions and other greenhouse gases.
- 284 3. Risks: The impact of global warming will most likely create major problems for our global
285 ecosystem.

286 4. Emission reduction: Humankind must strongly reduce CO₂ emissions in order to limit
287 future global warming.

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

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

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

308 4. Findings

309 4.1 Challenges to the anthropogenic climate change frame

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

319 [Insert Figure 1 here].

320 4.2 Contextualization of contrarians

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

327 [Insert Figure 2 and 3 here].

328 The negative evaluation of contrarians co-occurs with quoting them: Three-fourths of the
329 articles that contained a negative evaluation of contrarians also quoted them (see Figure 4). Yet
330 almost three-fourths of the very few articles (N = 11) that positively depicted the contrarians did not
331 include a quotation. This means that journalists do not necessarily quote contrarians to legitimize
332 them or provide them with a public platform; they often do so to debunk contrarians. This strategy
333 may be called *dismissive quotation*. Journalists who support the contrarians tend to refrain from
334 quoting them. We suggest to label this practice *protective omission*. To provide an illustrative
335 example of a dismissive quotation, we might cite a *Guardian Blog* post (from May 2, 2012) that
336 provides a direct quote from a contrarian after explaining that 600 MPs had voted for a climate-
337 related bill, against three opponents: “Conservative MP Peter Lilley, one of the lonely trio who voted
338 against the climate change act, told the audience: ‘I am the token denialist, a suitable case for
339 treatment for deviating from the Stalinist line.’” Further down, the article explains: “The sceptics are
340 a fringe within a fringe. Another sceptic, Stuart Wheeler, stood up to say there had been no warming
341 for 15 years (yawn) and that the costs of climate action were too high and then walked out,
342 uninterested in further debate.”¹

343 [Insert Figure 4 here].

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

349 **4.3 National bias**

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

362 [Insert Figure 5 and 6 here].

363 Of the countries studied, the British and US media most heavily quote contrarian voices (in
364 25% of the British and 17% of the US articles), and these are clearly negatively evaluated. The
365 standard deviation of the IPCC index values is considerably higher for the data from Britain than for
366 the other countries, which indicates a polarized debate with different kinds of coverage by different
367 news outlets and journalists.

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

368

4.4 Organizational bias

369 These findings about country differences need to be refined by looking at the level of media outlets
370 and even individual journalists: a single columnist for the *Daily Telegraph* (Christopher Booker) wrote
371 48% of the 77 UK articles that challenged the basic assumptions of anthropogenic climate change.
372 Other individuals in our sample consistently doubt aspects of the climate change consensus, such as
373 the Danish economist Bjørn Lomborg and the former German politician Fritz Vahrenholt. They were
374 allowed to raise their doubts in guest contributions to the *Wall Street Journal* and the German
375 tabloid *BILD Zeitung*, respectively. Yet, in contrast to Booker, they are not regular columnists of these
376 outlets. Apart from the *Daily Telegraph*, the *Wall Street Journal*, and the *BILD Zeitung*, only the *SUN*
377 and the *Berner Zeitung* feature more than 10% of climate-related articles that challenge the climate
378 change consensus. It should also be mentioned that almost all of the popular and regional
379 newspapers have only very scarce coverage of climate change: a total of about a dozen articles
380 published over the course of roughly 18 months. Organizational factors thus not only impact bias but,
381 perhaps most importantly, the degree of attention that is paid to climate change.

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

388 [Insert Figure 7 and 8 here].

389

4.5 Individual bias

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

405 [Insert Table 1 here].

406 It is interesting to note that statements about whether contrarians should be excluded or
407 have equal voice do *not* translate into more or less quoting of contrarians. Journalists who agree with
408 the statement that contrarians should *not* be given the chance to voice their opinions seem even
409 more inclined to quote them, while journalists who demand equal voice for contrarians do *not* quote
410 them more often. While neither correlation is statistically significant, they are still highly plausible in
411 light of the journalistic practices identified above: journalists with a negative attitude towards

412 climate contrarians quote them in their articles, but only in order to dismiss them (dismissive
413 quotation), while journalists who think favorably of climate contrarians support their arguments but
414 avoid quoting them (protective omission).

415 5. Discussion

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

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

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

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

456 The negative contextualization of contrarians, particularly in outlets like the *Huffington Post*
457 and the *Guardian*, takes the form of a news narrative about climate change deniers who are part of a
458 professionally organized lobbying effort ('denial machine' (Dunlap and MacCright, 2010)) that is
459 ultimately directed against any restrictive regulations or laws to fight climate change. This narrative
460 can be seen as a product of interpretive journalism, but it can also be explained by news value
461 theory: the story provides conflict and negativity, and thereby attracts attention. Media logics such
462 as the rise of interpretive journalism and the continuing adherence to news values thus converge to
463 explain the enduring salience of contrarians in coverage by journalists who are fully aware of the
464 basic scientific agreement concerning anthropogenic climate change.

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

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

490 6. Conclusion

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

500 The implications of the resulting patterns of media coverage with regards to contributing to a
501 democratic public sphere – and thus a constructive debate on climate change – are unclear.
502 Democratic theory calls for a journalistic watchdog, and complex issues like climate change call for
503 more contextualization than is provided in the traditional model of objective, balanced journalism.
504 Interpretive journalism may thus be welcomed from this normative perspective, because it provides
505 a better base for creating public understanding of complex issues like climate change and climate
506 politics. It can be viewed as part of the professional duty of journalists to provide “weight-of-
507 evidence reporting” (Dunwoody, 2005) and therefore contextualize contrarian voices. The good news
508 arising from this study is that *contextualized reporting* is moving closer to what is widely understood
509 as a consensus around the basics of climate change: journalism can be blamed less for confusing the
510 public.

511 Yet, the fixation on the clash between contrarians and climate science may crowd out more
512 relevant debates related to climate change policy-making and climate science. This narrative may
513 entertain partisan audiences on both sides of the political spectrum, but it also polarizes the debate.
514 A more constructive turn would be to ignore the contrarians and look for new narratives: for
515 example, journalists could hold politicians accountable to their public pledges given at the recent
516 climate summit (COP-21) in Paris by investigating the national implementation of promises to reduce
517 CO₂ emissions. It is a challenge for journalists to search for new ways to frame climate change, and a
518 challenge for researchers to detect these new emerging narratives in order to provide a more
519 nuanced analysis of climate debates. Both journalists and media scholars need to look for new
520 dimensions in the debate. One step in this direction is the framework offered by Corry and
521 Jørgensen, who map the climate policy debate by taking into account the perception of the climate
522 problem as more or less “wicked” and the preferred solutions that can rely on a more individualist or
523 holistic framework (Corry and Jørgensen, 2015).

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

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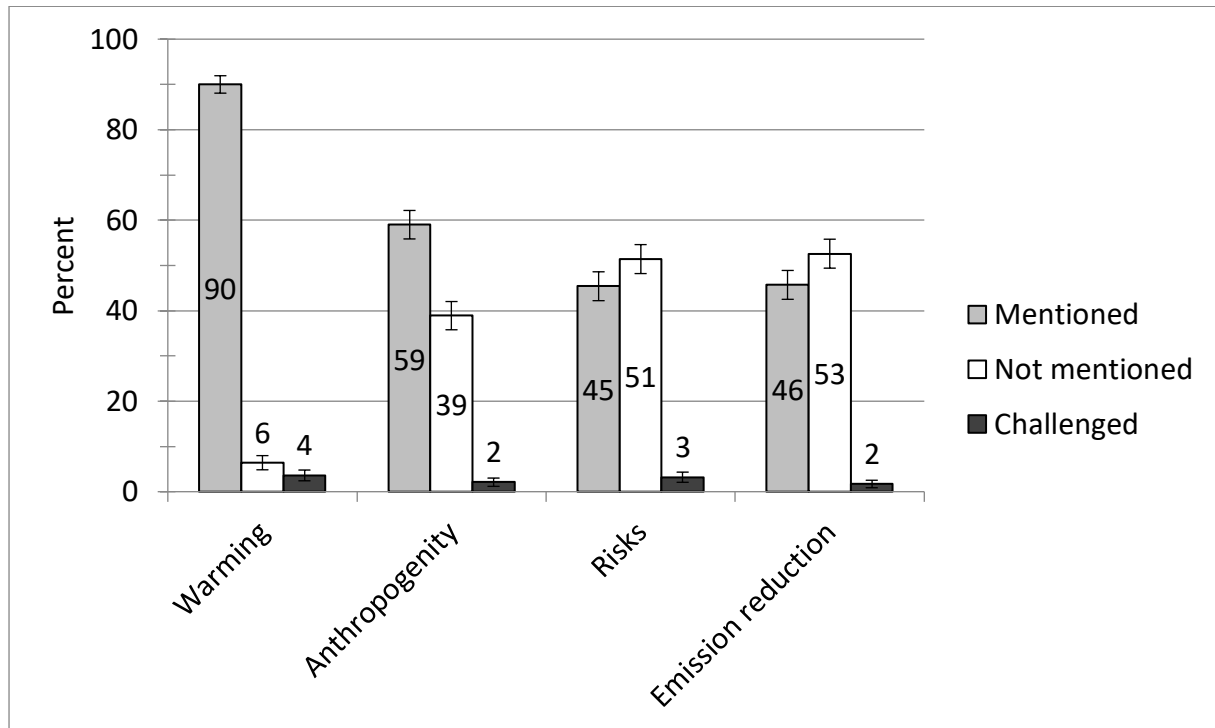
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687 Figure 1: Agreement with the IPCC View across Countries and News Outlets



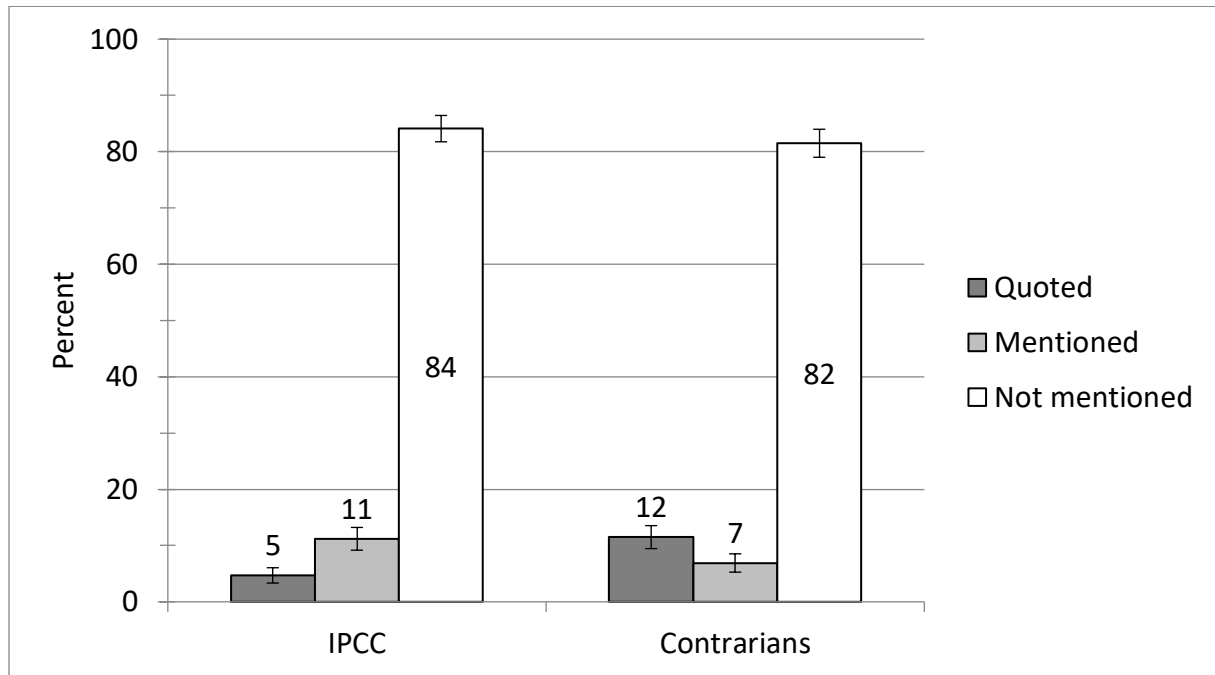
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689 Note: N = 936 articles (CH, D, UK, US, IN; 1 January 2011 – 31 December 2012)

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



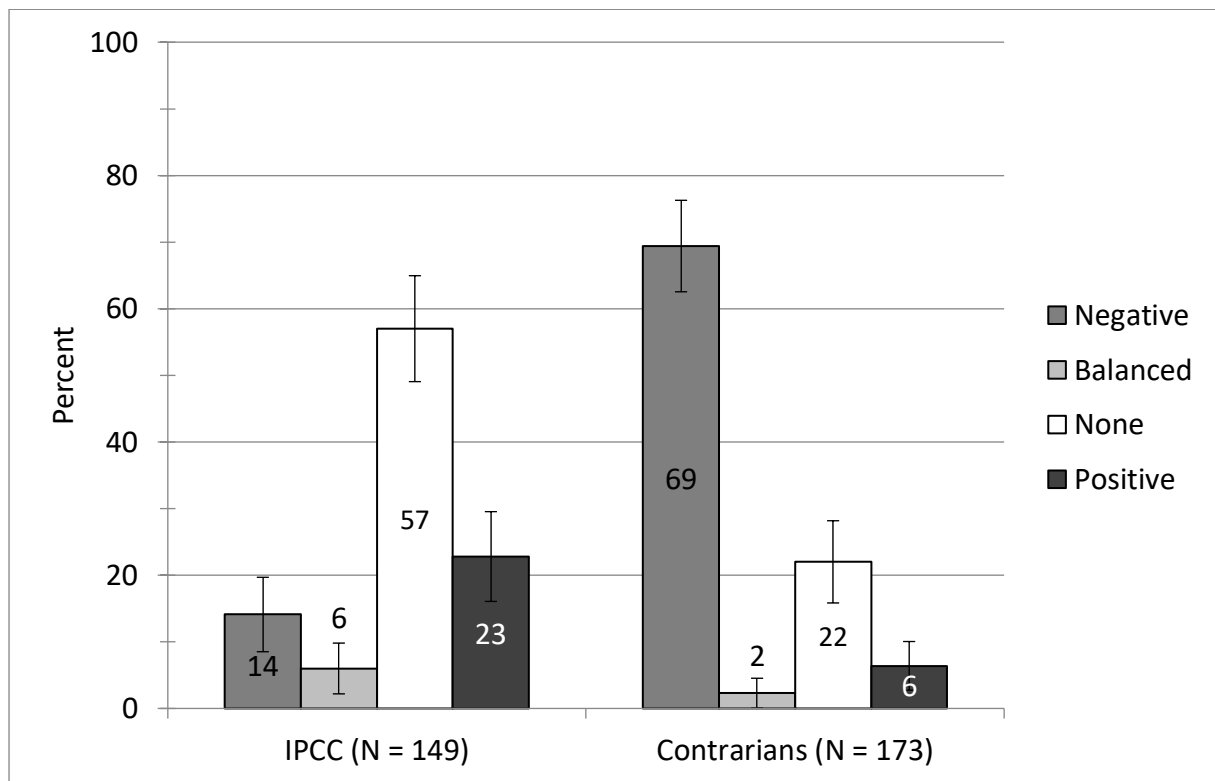
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694 *Note: N = 936 articles (CH, D, UK, US, IN; 1 January 2011 – 31 December 2012)*

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



698

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

700

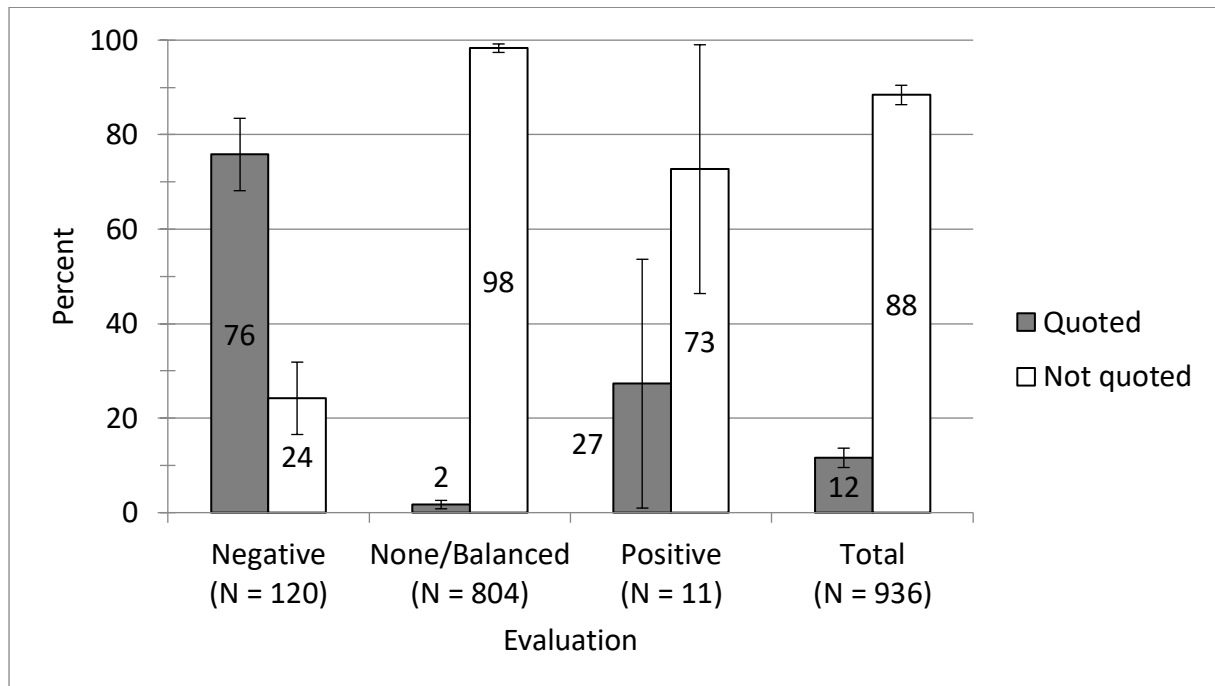
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705 Figure 4: Quotation and Evaluation of Contrarians in Media Coverage

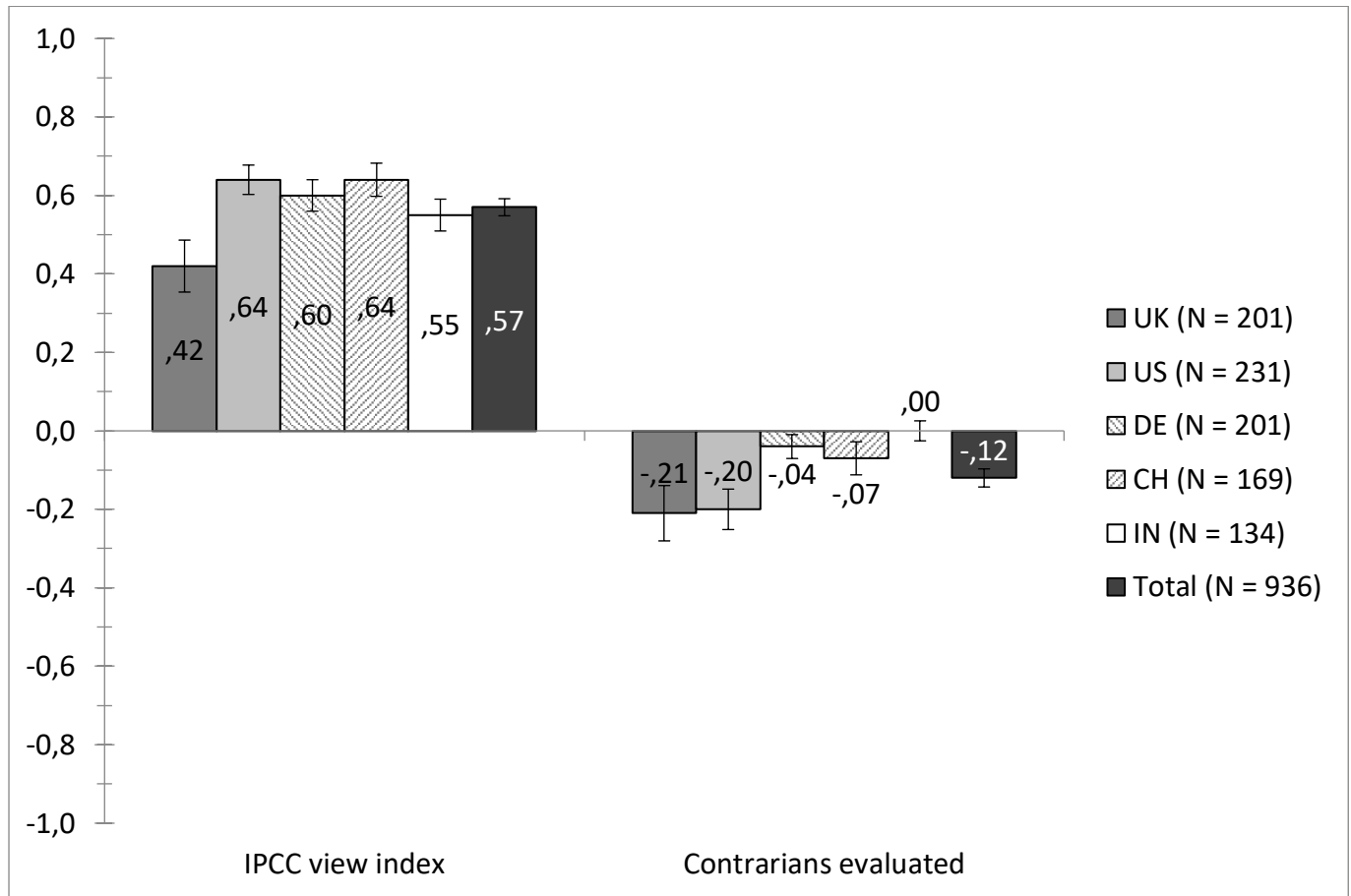


706

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

709

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



711

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

715

716

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

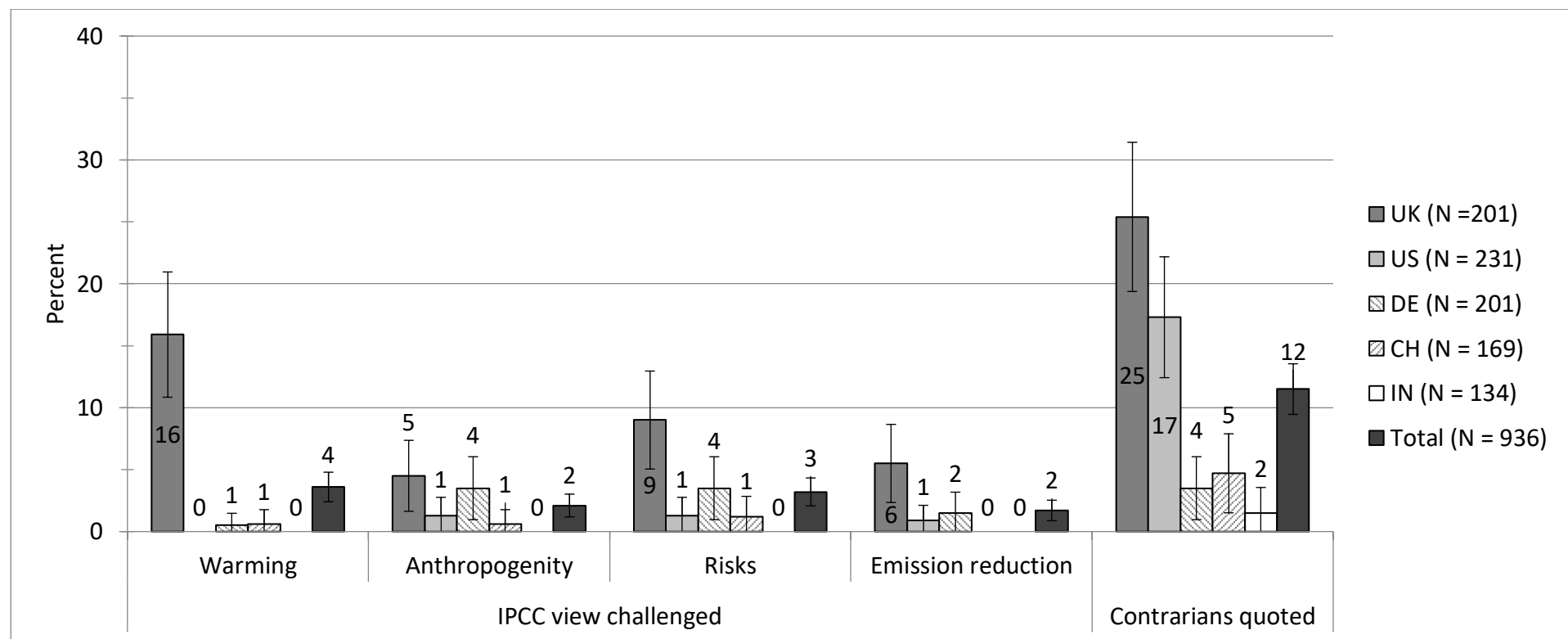
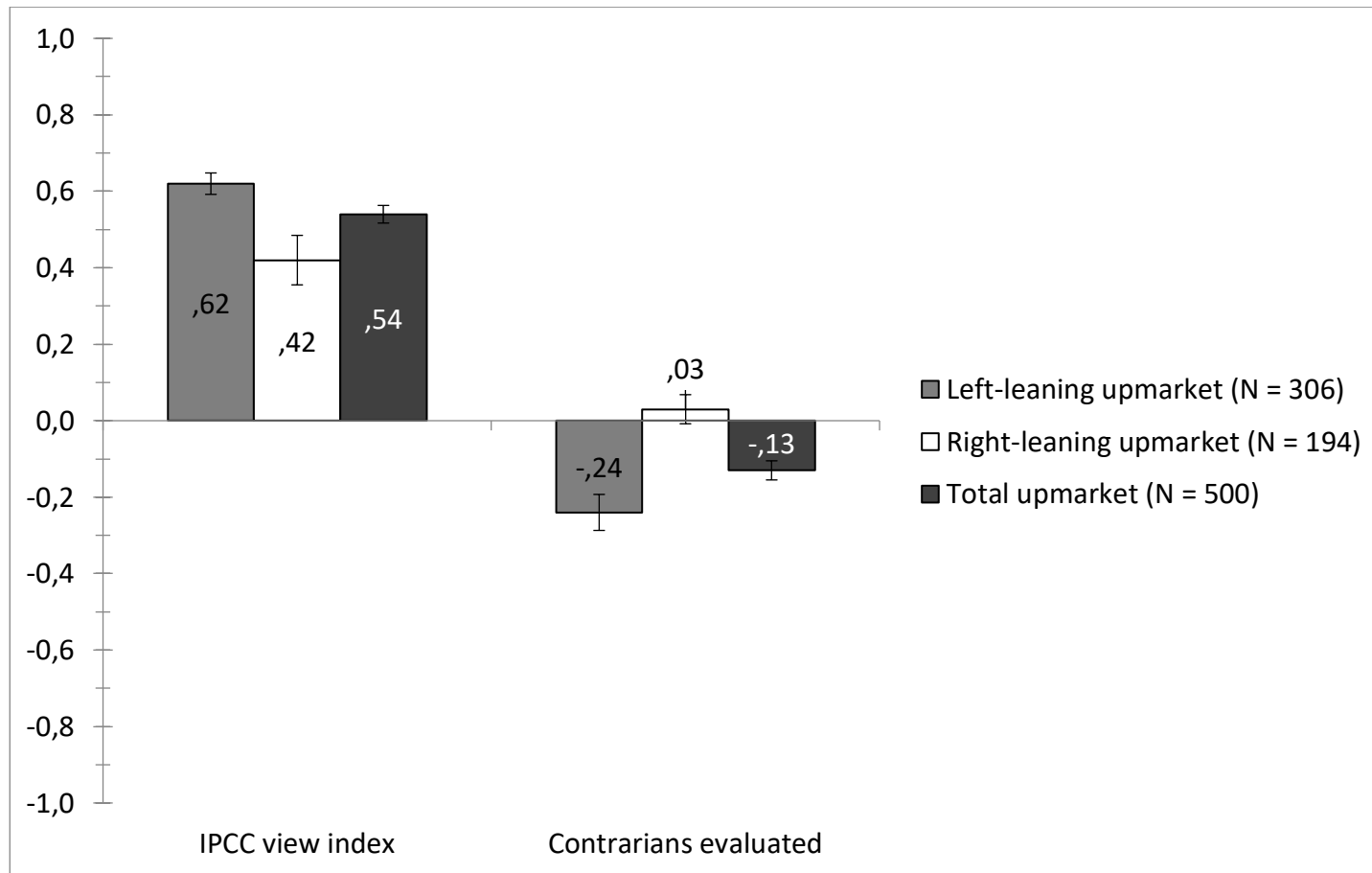
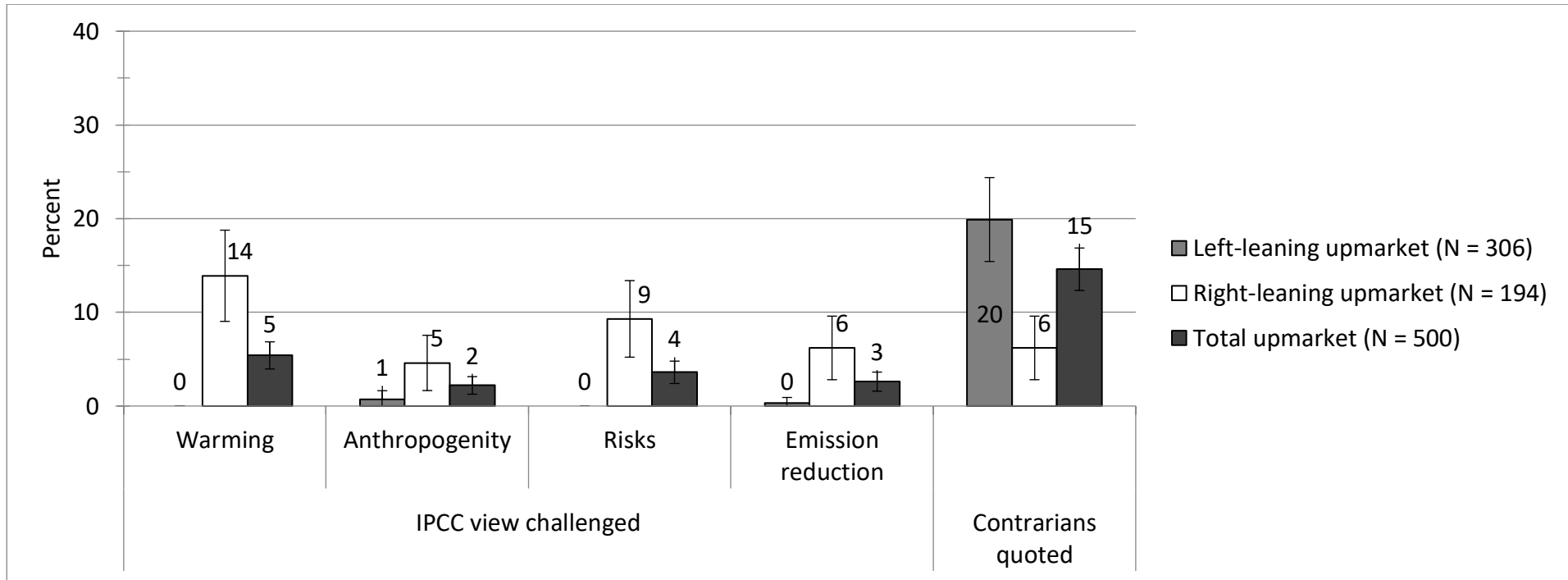


Figure 7: IPCC view and Evaluation of Contrarians by Political Slant of Upmarket Newspapers



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 <i>r</i>	<i>p</i>
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..."			
... <i>not</i> be given much of chance to make their points"	Quotation of contrarians	.14	.280
	Evaluation of contrarians	-.27	.039
...be given the chance... <i>as extensively as others</i> "	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	<i>NZZ</i> (right leaning)	<i>FAZ</i> (right leaning)	<i>Hindustan Times</i> (centrist)	<i>Daily Telegraph</i> (right leaning)	<i>WSJ</i> (right leaning)
	<i>Tages-Anzeiger</i> (left leaning)	<i>SZ</i> (left leaning)	<i>Indian Express</i> (centrist)	<i>Guardian</i> (left leaning)	<i>NYT</i> (left leaning)
Mass-/midmarket newspaper	<i>Blick</i> (centrist)	<i>BILD</i> (right leaning)	<i>MidDay</i> (left leaning)	<i>The Sun</i> (right leaning)	<i>USA Today</i> (centrist)
Regional newspaper	<i>Berner Zeitung</i> (centrist)	<i>Berliner Zeitung</i> (left leaning)	<i>Hindu</i> (left leaning)	<i>Manchester Evening News</i> (left leaning)	<i>LA Times</i> (left leaning)
Major online news outlets	News.ch	<i>Spiegel Online</i> (left leaning)	<i>Times of India</i> (centrist)	BBC News	Huffington Post (left leaning)
<i>N</i> = 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 <i>r</i>
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: ^aAverage index of the four respective IPCC view items; ^bScale: 0 = "not mentioned," 1 = "mentioned," 2 = "quoted/several mentions," 3 = "quoted at length"; ^cScale: -1 = "negative," 0 = "not mentioned"/"balanced," to 1 = "positive"

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