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Traditional and Shifting Roles of Science Journalists and Environmental Reporters Covering Climate Change

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Summary

Climate journalism is a moving target. Driven by its changing technological and economic contexts, challenged by the complex subject matter of climate change, and immersed in a polarized and politicized debate, climate journalism has shifted and diversified in recent decades. These transformations hint at the emergence of a more interpretive, sometimes advocacy-oriented journalism that explores new roles beyond that of the detached conduit of elite voices. At the same time, different patterns of doing climate journalism have evolved, because climate journalists are not a homogeneous group. Among the diversity of journalists covering the issue, a small group of expert science and environmental reporters stand out as opinion leaders and sources for other journalists covering climate change only occasionally. The former group's expertise and specialization allow them to develop a more investigative and critical attitude toward both the deniers of anthropogenic climate change and toward climate science.

Keywords

science communication, journalism, science journalists, climate change, environmental journalism, journalistic roles, advocacy, interpretive journalism, climate reporting

Climate change as a long-term process cannot be experienced by human beings and needs to be reconstructed through processes of sense making. Journalism has been identified as the "primary sense-making practice of

modernity" (Hartley, 1996, p. 32), and while it has long lost its status as exclusive gatekeeper, it still directs attention toward the topics and problems that matter for many people. Journalists, therefore, do contribute substantially to defining climate change as a social problem. They do so as reporters linking current events, such as reports from the Intergovernmental Panel on Climate Change (IPCC), the annual United Nation's conventions, or extreme weather events, to the more abstract phenomenon of climate change. They do so by deciding whom to quote as legitimate voices on climate change, and they do so by commenting on the causes of the problems and the adequacy of responses to climate change. This is why the practices of climate journalism are a relevant topic for research. It also means paying attention to climate journalists, defined as the actors who produce climate-related content in journalistic media outlets.

This article will map what we know about how journalists deal with the challenges posed by climate change and how the roles of science journalists and environmental reporters have changed over time. While there is no comprehensive, comparative long-term study that could clearly map the evolution of climate journalism in different countries and media types over the last decades, the findings of existing studies add up to the conclusion that there has been, indeed, a change in the role of climate journalists since the early 2000s , both with regard to role perceptions, as articulated in interviews and surveys, and with regard to actual "role performance" (Mellado, 2014) in professional practices. At the same time, there is not just one kind of climate journalism, but an increasing variety of climate journalisms driven by the expanding digital media universe.

To examine the changing roles of climate journalism it is first important to understand why climate change is a challenge for journalism, then to distinguish the two types of climate journalists (prolific and occasional), and finally to identify four shifts in climate journalism:

1. From sporadic to routine coverage of climate change.

2. From ignorance about the scientific consensus to an interpretive community around the basic assumption of anthropogenic climate change as a serious problem.
3. From (falsely) balanced reporting that neutrally juxtaposed deniers and warners about climate change to authoritative reporting that contextualized different voices.
4. From the dominance of newspaper beat reporters to diversified, networked journalism.

Climate Change as a Challenge for Journalism

Communicating climate change is a formidable challenge for journalists, because it conflicts with established media logics, i.e., the patterns that structure the way the media reconstruct an issue in their coverage (Altheide, 2004; Berglez, 2011). The geographical and time scales of the phenomenon cut across the categories of journalistic coverage in several ways (Carvalho, 2010). First, the time frame of climate change is decades and centuries, while journalism reconstructs the world as a set of short-term events in line with the production rhythm of the respective media type. Second, the geographical categories of journalism (local, national, and international) are neatly separated, while the causes and effects of climate change transcend borders and are local and global at the same time. National borders are an important category for journalistic coverage, yet they are completely irrelevant for climate change impacts. Third, climate change touches upon different dimensions and resists fitting neatly into a particular journalistic beat: it not only is an environmental or science story, but also raises policy questions and challenges the economic order as well as health and ways of life, thereby challenging our culture (Hulme, 2009). Finally, journalism is focused on providing objective facts about issues and thus is not well prepared to deal with the uncertainties inherent in, for example, climate models and the attribution of specific extreme weather events to climate change.

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Two Types of Climate Journalists

The most important finding for understanding climate journalism derives from the cross-border, multidimensional nature of climate change. This feature turns all kinds of journalists into "occasional climate journalists" (Brüggemann & Engesser, 2014): Local reporters, national editorial writers, foreign correspondents, and economic reporters may all touch upon climate change in some of their articles. A study of climate journalism in five countries (Brüggemann & Engesser, 2014) showed that a large group of journalists who write very few articles about climate change can be contrasted with another very small group of "prolific climate writers." The latter type of journalist produced dozens of climate change related articles per year, and while they constituted only a fourth of the population of journalists writing about climate change in the news outlets under analysis, they produced two thirds of the climate coverage. The prolific writers mostly worked on the science and environment beat and stood out with regard to their expertise and their role conceptions. The small group of prolific climate journalists are likely to function as opinion leaders and agenda setters within the community of climate journalists due to two dynamics inherent in journalism. First, journalists are very in-group-oriented professionals (Reinemann, 2004), as indicated by Gans (1979). Second, science journalists, not unlike other journalists, frequently practice "food-chain journalism," which means copying each other's story lines (Wilson, 2000, p. 4). Both processes, however, need further empirical scrutiny with regard to climate journalism.

Drawing the distinction between occasional and prolific climate writers is essential when researching their shifting role perceptions and performances. The occasional climate journalist is very unlikely to differ from the average journalist in demographics or role perceptions. Thus, studies with a relatively broad sampling strategy, trying to cover all environmental or science journalists in a given country, found no differences between the profile of journalists

represented in general surveys of journalists and environmental reporters, for example, in the United States (Sachsman, Simon, & Myer Valenti, 2010). Another study in the United States found that the "environmental" journalists under analysis spent more than half of their time on work not related to the environment beat (Detjen et al., 2000). This explains why the presumed environment-beat journalists are not so different from the statistically average journalists portrayed in broader surveys of journalists, such as the world of journalism surveys directed by Hanitzsch (Hanitzsch et al., 2011) or the collection of national reports from different countries assembled in Weaver and Willnat (2012). These surveys, while portraying the diversity and complexity of journalistic role conceptions around the world, also showed a certain global convergence around the Western self-image of the journalist as a detached observer who monitors government, thus performing both a conduit's and a watchdog's role. A broad sample of environmental reporters in the United States reflected this role conception, with every second reporter saying that environmental journalists should be objective and should never advocate environmental protection (advocacy) or help communities find solutions to environmental problems (civic/public journalism) (Sachsman & Myer Valenti, 2015). This shows, again, how the average environmental journalist is not much different from the average journalist.

This is in line with the observation that the environment beat that thrived in the late 1980s had already been dissolving in the 1990s, and was particularly altered after 9/11 refocused media attention to foreign affairs (Friedman, 2015). Mixed with attempts by some news outlets to shift priorities away from environmental coverage and with the motivation to cut costs was a trend toward "mainstreaming" environmental coverage by dissolving the beat and relocating its staff onto different desks, thus reflecting the multidimensional nature of environmental problems like climate change (Friedman, 2015). It remains to be seen whether this strategy does indeed lead to more, rather than less, coverage of an issue like climate change.

Climate change is a professional beat for only a very small fraction of science and environmental writers who can really focus on the topic. This core of specialized writers are likely to differ from average journalists, as has been shown by studies that were based on a smaller subset of journalists. Dunwoody (1980, p. 14) argued that in science journalism,

a small "inner club" of writers who knew each other and cooperated over a long period had a strong influence on U.S.-American readers. It is open to further scrutiny whether, in the current diverse online environment, such an inner club with members who personally know each other still exists, but the data of Brüggemann and Engesser (2014) showed that a group of prolific writers still exists and that it comprises only a few people. Furthermore, journalists with a high degree of specialization may enjoy greater freedom in choosing topics and angles for their reporting than other journalists. Personal preferences, role conceptions, and interpretations might thus exert a stronger influence on their reporting (Detjen et al., 2000, p. 4). This might also lead to "beat parochialism" (Sigal, 1973, p. 47). As just one example of this phenomenon, McCluskey (2008) showed that environmental reporters provided more positive coverage of environmental NGOs than their colleagues from other beats. Yet, there is diversity within the group of environmental journalists: while some follow the role model of the detached observer, there are also environmental crusaders on the other end of the spectrum (Giannoulis, Botetzagias, & Skanavis, 2010). Detjen (2002; Detjen, Fico, Li, & Kim, 2000) took up an idea from a book by Carl Frankel and called for combining fair, objective, and politically engaged journalism in "sustainable journalism" that reports fairly but also strives to educate people about how to live a more environmentally sustainable life. He mentioned climate change as an important topic for this kind of journalism.

Accordingly, climate change cannot be considered an independent beat due to the large number of occasional climate journalists from diverse backgrounds. Yet a core of journalists have specialized in climate issues and have particular importance as opinion leaders for more sporadic climate journalists. Both groups together shape climate journalism, which is also affected by general developments in media change and the economic crisis that most heavily hit daily newspapers, the traditional home of science and environmental reporters.

Four Shifts in Climate Journalism

Four changes have been observed in climate journalism since climate journalism emerged as a distinct pattern of professional practice.

From Sporadic to Routine Coverage

While the science and the environment beats emerged in the 1970s and 1980s in the context of the establishment of the environmental movement (Dunwoody, 2014), climate reporting intensified in the late 1980s when the issue spilled over from science onto the political arena (for the case of Germany, see Weingart, Engels, & Pansegrau, 2000). Key events were the founding of the IPCC (Intergovernmental Panel on Climate Change), Margaret Thatcher's acknowledgment of the risks posed by climate change, and James Hansen's testimony before the U.S. Congress (Carvalho & Burgess, 2005; Hulme, 2013, pp. 1–11; Ungar, 2014). Since then, there has been an increase in climate coverage worldwide (Holt & Barkemeyer, 2012; Schäfer, 2015; Schmidt, Ivanova, & Schäfer, 2013). Peaks in journalistic coverage were triggered less by extreme weather events or vulnerability to climate change than by political events like the UNFCCC (United Nations Framework Convention on Climate Change) annual conferences (Schäfer, Ivanova, & Schmidt, 2014; Schmidt et al., 2013). The summit in Copenhagen in 2009 constituted an all-time high of climate coverage. The summit's failure was followed by "climate fatigue" (Kerr, 2009, p. 927) and limited climate coverage. A more recent increase in coverage occurred around the 2015 summit in Paris (Boykoff et al., 2016). While there has been no linear rise in climate coverage and no continuous intensive coverage, professional routines have evolved around media events like the COPs (Conferences of the Parties), the reports of the IPCC, and, to a lesser degree, scientific studies being published in top academic journals like *Nature* and *Science* (or the press releases issued about them). In particular, climate summits are regularly attended by a crowd of (for some

summits) almost 1,000 journalists, a small core of whom have become recurring attendants at all recent climate summits (Lück, Wozniak, & Wessler, 2016). The Paris conference accommodated 3,000 of the 6,000 journalists who asked for accreditation (Howard, 2015). While climate change is not a proper beat, climate journalism has nevertheless managed to develop routines that deal with the events related to climate change and global climate science and policymaking.

From Ignorance to Interpretive Community

Wilson (2000) surveyed environmental journalists and tested their knowledge about the scientific debate on climate change. The study, although it contacted exclusively journalists who are members of the Society of Environmental Journalists and thus specialize in this area, still found substantial deficits in the journalists' knowledge about what was consensus and what was debated among climate researchers. Basic concepts like the greenhouse effect were not well understood. Levels of climate knowledge varied depending on whether the journalist was a full-time environmental reporter and on his or her use of scientists as sources of information. Again, the study hinted at differences between experienced climate reporters and occasional climate writers. Today, there are indications that a learning process has occurred that also affects the less specialized journalists. A more recent study on climate journalists in Sweden drew a more positive picture (Sundblad, Biel, & Garling, 2009). It found that journalists' knowledge of climate change ranked second behind that of experts but ahead of that of policymakers and laypersons. A recent cross-national survey of climate journalists (both occasional and prolific writers) found that almost all of them were well aware of the scientific consensus about basic concepts of anthropogenic global warming. The study concluded that journalists from the leading print and online outlets in the countries under analysis formed an "interpretive community" with

climate scientists along the basic lines of the IPCC reports (Brüggemann & Engesser, 2014). Outright denial of climate change, the huge anthropogenic component, the link to CO^2 emissions, and the problematic and risky nature of the process, is not part of the interpretive community. A follow-up study also analyzed the content produced by the same journalists and found that their coverage clearly reflects their basic understanding of climate change. Perceptions (about climate change) and performance (journalistic coverage) are in line: Leading news outlets (comprising daily newspapers and their online editions, including conservative and liberal, regional and popular papers from five countries) only rarely doubted that climate change exists, is anthropogenic, produces severe risks, and calls for a reduction CO^2 emissions (Brüggemann & Engesser, 2017).

From Balanced to Authoritative Reporting

The conflicting messages emanating from climate scientists and from the industry-sponsored "denial machine" of conservative think tanks, AstroTurf groups, and conservative bloggers (Dunlap & MacCright, 2010) had led many journalists, at least in the U.S. press around the turn of the century, to produce falsely "balanced" coverage by providing equal space to "both" sides of the debate while effectively misrepresenting climate science (Boykoff & Boykoff, 2004). This journalistic practice unwillingly promoted an "uncertainty" frame (Antilla, 2005) that played in the hands of the actors who lobby to stop climate legislation. The practice of "balanced" climate reporting has been explained by a journalistic role performance as neutral observers who provide objective reporting through practicing balance (Boykoff & Boykoff, 2004). As mentioned, before the turn of the century, some journalists might have been doubtful or confused about the actual state of research (Wilson, 2000), but today this is indeed not the reason why contrarians make news. Yet, a change in journalistic role conceptions has been detected in qualitative interview studies that focus on the core of

prolific climate writers. Shipley Hiles and Hinnant (2014) found a "radically redefined" understanding of objectivity: while journalists still proclaimed to refrain from letting their biases influence coverage, they followed the model of "weight-of-evidence reporting" (Dunwoody, 2005). Stories are supposed to reflect the scientific state of the art and are "written with authority" (Shipley Hiles & Hinnant, 2014, p. 15). Thus, journalists intend to provide something that was lacking from "balanced" coverage of climate change (Boykoff, 2011): the contextualization of certain views as representing valid, peer-reviewed science and others as representing outliers with no backing through scientific evidence and peers. 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 toward ignoring contrarian voices (Gibson, Craig, Harper, & Alpert, 2016).

More recent replications of the original study by the Boykoffs have found only a tiny share of articles (3% and 5%) with balanced coverage for 2006 and 2012 (Boykoff, 2007; Boykoff & Boykoff, 2007; Schmid-Petri, Adam, Schmucki, & Häussler, 2015). Also, contrarians are still relatively prominent in British and U.S. media coverage (Painter & Ashe, 2012; Schmid-Petri et al., 2015). What is new is that journalists clearly put contrarian voices into context, such as by pointing to their lack of scientific credentials (Brüggemann & Engesser, 2017). Thus, both journalistic role conceptions and role performance have evolved from an objective to a more interpretive form of journalism, a trend that has been observed for political journalism (Esser & Umbricht, 2014) as well as for science journalism online (Fahy & Nisbet, 2011).

From Newspaper Beat Reporting to Diversified, Networked Journalism

A number of external pressures shape science communication and also climate journalism: the emergence of digital networks has enabled climate scientists, but also lobbyists for the denial of climate change, to reach audiences directly (without journalistic intermediaries) through blogs, Twitter, and other networks. The (climate) journalist no longer serves as gatekeeper. The new journalistic role has misleadingly been labeled

"gatewatcher" (Bruns, 2008, p. 783), but could better be described with terms like *pathfinder* or *scout* in the jungle of information. Media change has also contributed to an already ongoing decline of audiences and advertising revenues for printed daily newspapers, leading to cuts in the traditional job market of science journalists, thus turning science journalism into an "imperiled occupation" (Dunwoody, 2014, p. 27). This development is (only) partly offset by new jobs for climate journalists offered by specialized online outlets like, in the United States, the subscription-based expert news service "Climate wire," the hybrid journalistic-scientific enterprise "Climate Central," or "Inside Climate news," which even won a Pulitzer Prize in 2013 (Brüggemann, 2014; Nisbet & Fahy, 2015). A new "science media ecosystem" (Fahy & Nisbet, 2011, p. 783) has evolved that is very different from the science pages of the newspapers that used to be the prime forum of climate coverage. Professional climate reporters also play different roles in this new ecosystem. Fahy and Nisbet (2011), identified a whole list of new journalistic roles beyond that of the traditional reporter and conduit, who basically forwards the elite's debates in a "neutral" and "balanced" way. Fahy and Nisbet found, for example, the curator, who finds and restructures relevant information found on the Internet, the convener of debate, the public intellectual, who provides ideas and opinions, and the civic educator or the political advocate. In addition to generally finding a more interpretative role for journalists, they also described a more collaborative relationship with both audiences and sources.

Evidence for the emergence of all of these new roles and trends can be found in climate journalism. While journalists traditionally ignored their audiences (Gans, 1979) and even in the digital age neither read nor respond to user comments (Usher, 2014), there was a different attitude among journalists covering the climate summit in Copenhagen for the *Guardian*: users provided constructive criticism, hints about additional sources, and story ideas. Their comments were read by journalists and were taken into consideration in subsequent reporting (Graham & Wright, 2015). The close and constructive alignment with certain sources has also been observed for climate conferences, where different

networks of journalists and environmental NGO representatives are entangled in close interactions, thus effectively "co-producing" media coverage of climate summits (Lück et al., 2016; Russell, 2013). The boundaries between environmental journalism and advocacy are also blurring as some NGOs provide not only self-promotion but also more breadth and depth of climate reporting from climate conferences than some legacy media outlets (Russell, 2013). Thus, climate journalism is produced by other kinds of actors and in other institutional settings that are based less on the ideal of the detached observer than on the advocate and mobilizer of public participation. At the same time, some science journalists also develop a more critical watchdog attitude, not only toward climate change deniers but also toward climate scientists and other sources. Science is no longer being viewed as producing truth, but as a process of truth seeking that can also be criticized by journalists (Fahy & Nisbet, 2011, p. 785, drawing on, e.g., Trench, 2007, and Hansen, 2009). Thereby, science and environmental journalists rediscover one of the more traditional role perceptions, the role of the journalistic watchdog. This development relates primarily to the small group of prolific climate writers, however, as the survey of Brüggemann and Engesser (2014) revealed, where the cluster of prolific writers showed not only a clear rejection of climate change denial but also (small) signs of critical distance from the IPCC positions and an explicit dedication to critical and investigative reporting. Prolific writers also emphasized the importance of reporting the uncertainty in the findings of climate sciences. The occasional writers, on the contrary, displayed undivided full support for the IPCC view on climate change and did not find that the issue of uncertainty deserved particular discussion. Leaving aside caveats and uncertainty is a feature of the traditional journalistic depiction of science (Nelkin, 1987; Stocking, 1999) that is still strong today. Yet, the avant-garde of expert climate journalists may be developing a new kind of watchdog climate journalism. This should not be confused with the uncertainty spreading that occurred around the fundamentals of climate change that was induced by the practice of false balance in media coverage in some British and U.S. media outlets: rather, it actively contextualizes and identifies uncertainties related to, for example, certain aspects of climate models.

These new roles provide a stronger position for the climate journalist as an individual, unique voice, rather than a faceless reporter. An additional consideration is economic necessity: science and environmental journalists are no longer employees of daily newspapers, but freelancers, who may work for daily newspapers, foundations, NGOs, or universities. Thus, a journalist needs to establish a personal brand through blogging, Tweeting, and writing traditional media articles with the aim of gaining "visibility, credibility and a book contract" (Dunwoody, 2014, p. 36).

Both the new economic conditions of journalism and the new possibilities for digital networks foster the performance of professional roles that have always coexisted with the disseminators' role, but are gaining more traction now, such as providing more interpretation, advocacy, and encouraging audience participation, while also providing traditional reporting (for an overview of basic typologies, see Donsbach, 2008, or Hanitzsch, 2011).

Outlook: Visions for Future Roles in Climate Journalism

Climate journalism, particularly in the online environment, is a moving target. Some roles may become particularly relevant for climate journalism, but are—so far—topics of academic discussion rather than powerful trends in practice. These roles touch upon different dimensions of the challenge that climate change poses to journalism and all of them demand further development of established professional norms of journalism, such as negativism (exposing what is going wrong in society), focusing on facts and short-term events, and reporting rather than providing context and analysis.

Another challenge is the transnational character of climate change, which partly leads to global journalism (Berglez, 2008) or global media (Olausson, 2013). These concepts are not synonymous with foreign reporting; instead, they identify the global in local affairs and vice versa. Empirically, Kunelius and Eide (2012), looking at reporting about the climate summit in Copenhagen in 2009, found instances of both cosmopolitan journalism, which they also associated

with advocacy for a global climate agreement, and traditional "detached and partly nationally grounded discourse of power realism" (p. 266).

Sustainable journalism is a somewhat related perspective: it shifts the focus to the blind spots of environmental journalism, such as consumer culture—blind spots likely born out of journalism's dependence on commercial advertising that is arguably decreasing in the new media economy. Detjen (2002) argued that environmental journalists were good as watchdogs when looking at particular incidents of environmental crimes, but they neglected the more systematic threats to the environment that are woven into the fabric of the capitalist system. To deal with the long-term process of climate change, Gess (2012) introduced the term *slow journalism*, which parallels the concept of slow food, with its appreciation for high quality instead of fast and cheap production. Slow journalism, like sustainable journalism, would produce "a media that builds community sustainability, resilience and adaptability in the face of the challenges of a time of global climate change" (p. 59). Part of sustainable journalism also would be to show how to live a sustainable life. This kind of journalism, focused on solutions rather than problems, is called "constructive" or "solutions journalism". While the former term was used in an article by Chalmers (1959) to apply to the muckrakers whose critical and investigative reporting served a progressive purpose, Dyer's (2015) idea of solutions journalism, while sounding very similar, suggested focusing on "on what's going right in the world rather than what's going wrong"—which is not exactly the idea behind the investigative, critical reporting of the muckrakers. With regard to the severe risks associated with climate change, this approach could inspire new narratives beyond "climate catastrophe" vs. its absence and, instead, focus on what we can do and what is already being done about climate change.

Nisbet and Fahy (2015), in an article about the climate debate in the United States, further elaborated the concept of "knowledge-based journalism" advanced by Patterson (2013) and Donsbach (2014). The basic idea is that journalists are supposed to acquire expertise on environmental and science topics, such as climate change, so that they can serve as "knowledge brokers," "dialogue brokers," and "policy brokers" who could provide context to, and widen the perspective on, polarized and ideologically entrenched debates about climate change. While Nisbet and Fahy (2015)

repeatedly mentioned Andrew Revkin, climate and science blogger hosted by the *New York Times,* as an example of a "knowledge journalist," as well as some other authors and projects from the U.S. context, it remains to be seen whether knowledge-based journalism will evolve into a broader trend in journalism.

Climate change is a politicized science topic that has created a special situation for climate scientists that has been coined "post-normal" by Functovicz and Ravetz, emphasizing the implications of science that, due to complexity and the need for risk assessment, has to deal with high uncertainties but also touches values questions and the need for urgent political decision making. It remains to be seen whether climate change also leads to "post-normal journalism" (as elaborated in Brüggemann, 2017), which might entail some of the phenomena mentioned here. So far, these new journalistic practices are emerging at the fringes of climate journalism, rather than constituting trends that are already transforming mainstream coverage of climate change.

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