

SPEAK FOR THE EARTH: THE VITAL ROLE OF COMMUNICATION IN FOSTERING GLOBAL SUSTAINABILITY

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Abstract: This paper argues that communication research and teaching can play a vital role in contributing to the ecological transformation toward sustainability. Communication scholars are well-positioned to explain how our understanding of the world, including ideas about ecological transformations, come into being and are both reproduced and challenged through communication. The ecological effects of mediated communications—and their potential to foster social change—should become a central dimension in our research and engagement with society.

Keywords: Ecological transformation, Communication research, Teaching, Sustainability, Environmental communication, Mediated communication, Social change.

Introduction

Confronted by increasingly severe and diverse ecological crises, researchers have called for a great transformation toward sustainability (German Advisory Council on Global Change [WBGU], 2011), of equal scale and scope to the neolithic and industrial revolutions and comprising all sectors of society. We, as researchers of communication and media, should consider how we can contribute to this ecological transformation founded on shared democratic values such as the principle of global and transgenerational social justice.

Communication research and teaching is well-positioned to contribute by enhancing society's communicative resources for a democratic transition toward sustainability—based on inclusive and open debates, rather than last-minute reactions to environmental disasters. Just as we expect medical scholars to explain how the human body and its diseases function, communication scholars should be expected to explain how our understanding of the world, including ideas about ecological transformations, come into being and are both reproduced and challenged through communication (Brevini, 2016; Carvalho, van Wessel, & Maesele, 2017). For this purpose, the growing interdisciplinary field of environmental communication (Akerlof, Timm, Rowan, Olds, & Hathaway, 2022) should be placed center stage in our scholarship, teaching, and academic practice. The ecological effects of mediated communications—and their potential to foster social change—should become a central dimension in our research and engagement with society, thus making communication research and teaching more ecologically transformative.

The unique vantage point of our interdisciplinary field could help society imagine and debate sustainable futures and to engage with those visions. We could do so by inducing *reflexivity* in public debates (e.g., enhancing ecological media literacy and exposing blind spots, propaganda, unequal chances for voicing one's ideas). In doing this, we could help reframe unproductive debates. Thus, we could help identify pathways for society that are just both for current and future generations.

To achieve this, public communication needs to be more inclusive than even the best existing democratic institutions. Existing democracies, to some extent, may represent the diverse interests and opinions of their respective electorates, yet sustainability as a principle calls for inclusion of those people who cannot vote in national elections because they do not hold recognized rights, as they live elsewhere or have not yet even been born. They can be included in the debate through speakers who act as advocates of those not salient in the public sphere.

Our field should realize this potential to contribute to the sustainable transformations of societies. In this article, we contribute by starting from the concept of (socioecologically) transformative science and then sketching out what transformative communication research, academic practice, and social engagement could mean. We focus specifically on how we as scholars can contribute to tackling the grand ecological challenges that humanity faces. Yes, we can and should engage in socioecological transformations—not only as citizens but also in our professional roles as scholars. This professional role provides us with privileges and expertise that we should make use of to help society find democratic and just ways to achieve ecologically sustainable ways of life.

Transformative Science and What It Could Mean for Our Discipline

Scientific practices that foster socioecological transformations have been termed “transformative science” (WBGU, 2011, p. 23). Transformative science (1) “takes real-world problems as the starting point of research” (Schneidewind, Singer-Brodowski, Augenstein, & Stelzer, 2016, p. 16); (2) induces reflexivity into the process of transformation; (3) engages with different social groups; (4) aims for societal impact in addition to the traditional criteria of scientific excellence; and (5) supplements rather than replaces conventional science (Schneidewind et al., 2016).

Transformative research implies that the researcher is not pretending to be a value-free, disinterested, and distant observer but an engaged citizen with values and purposes, such as preserving the ecosystems of the planet. As we have pointed out elsewhere when writing about “transformative journalism” (Brüggemann, Frech, & Schäfer, 2022), this should not be mistaken as partisanship. Staying within ecological boundaries is a common good and not a special interest. The principle of sustainability is a basic principle of justice and different from advocating certain policies over others.

Reflexivity means “that social practices are constantly examined and reformed in the light of incoming information about those very practices” (Giddens, 1990, p. 38). In an age of reflexive modernity, societies are constantly learning, and science may support this learning process (Schneidewind et al., 2016, p. 5). Which discipline could be better positioned to provide this reflexivity to public (mediated) debates about sustainable transformations? Providing reflexivity to debates seems like a very “academic” thing to do—but it is essential if you consider the importance of discourses for political

actions and consumption choices. It entails communicating beyond the confines of academic journals and university seminars.

Engagement with society is certainly *not* a new call, and such calls have been amplified recently (read, e.g., Brevini, 2016, asking for a type of environmental communication that delivers value to society, p. 685); Downey, 2017, discussing calls for public sociology; Murdock & Golding, 2005; Hoffmann, 2021, calling for “The Engaged Scholar”; Norgaard, 2018). Within our discipline, calls for public scholarship are less frequent (but see, e.g., the contributions in the recent volume edited by Powers and Russell [2020] or Waisbord’s [2020] *Communication Manifesto*).

Public scholarship entails communicating with different social groups and goes beyond being a selfdeclared “critical” researcher who preaches only to a small choir of like-minded academics (Haarstad et al., 2018). However, in reaching out beyond the choir, participation should not become an end in itself. Scientists should not become “uncritical co-producers” (Haarstad et al., 2018, p. 193) who effectively let others direct their research. On the contrary, science should bring its unique perspective into the debate. Social scientists may thus contribute to reframe unproductive debates—and communication scholarship is well-equipped to do this.

This means that our research and teaching aims for impact beyond our universities. Thus, we need to ask ourselves: How does our research help individuals, groups, and organizations respond effectively to climate change, for example? Does our research help to create awareness of ecological challenges and inspire debates about a democratic and just transformation toward sustainability?

Supplementing rather than replacing more conventional scientific practices and role conceptions, transformative research does not mean compromising on scientific methods or the production of excellent basic research published in academic journals. It is about extending our activities and purpose as researchers (Hoffman, 2021). It is about addressing matters of positionality explicitly and taking them seriously. “Neutrality” was never an option, and the current state of the planet makes any such intent much more problematic.

Transformative Research

The transformative parts of research happen, mostly, before and after the actual data gathering and processing. For communication research it means starting with addressing real-world problems related to the communicative dimension of socioecological transformations. To identify these problems, closer contact to different social actors involved in communicating ecological change is necessary, such as journalists, scientists, policy makers, and civil society groups. The purpose is observing and listening but *not* coproduction in the sense of letting others decide about the research questions. The strength of scientific authority rests on its independence, particularly relating to deciding what to research and how. This is the best way to explore blind spots that actors would be unable to perceive or prefer not to talk about. Therefore, while researchers are not neutral observers but people who do care, for example, about protecting the environment, they need to preserve their independence when engaging with society.

Not all research dealing with environmental problems is necessarily transformative (e.g., a content analysis of climate change debates on Twitter is not in itself transformative if there is no socially

relevant question driving it and no socially relevant conclusions are being drawn). To do this, underlying normative considerations should be made explicit as to why our analyses focused on certain phenomena. A key question would be: What kind of debates could actually help generate social change toward sustainability, and what kind of debates are deterring change? Carvalho, Russill, and Doyle (2021), for example, criticize the fact that discussions of climate policies are sometimes reduced to “carbon maths (more or less carbon dioxide–equivalent concentration in the atmosphere)” and neglect debating “the social distribution of risks/costs and benefits” of political actions (p. 3). In the area of climate change communication, a solid base of research has been established, but less so on other topics such as biodiversity or the study of debates around food production and consumption.

An emerging pillar of fostering green media literacy is to keep studying the materialities of mediated communication and their footprint, especially in light of our increased dependence on data-driven communication systems (Brevini, 2021). The production and consumption of public information and imagery depends on a dense array of communication infrastructures and machines, from underground cables and satellites to widescreen television sets, laptops and tablets, and smartphones (Brevini & Murdock, 2017; Kannengießer & McCurdy, 2021; Maxwell & Miller, 2012). Until recently, the fact that this infrastructure produces emissions, pollution, and waste attracted surprisingly little comment or analysis: “In communication and media scholarship, the overwhelming focus has been on texts, the industry that produces them, and the viewers that consume them; the materiality of devices and networks has been consistently overlooked” (Gillespie, Boczkowski, & Foot, 2014, p. 1).

Furthermore, communication research could cast a more critical look on greenwashing campaigns and highlight how the concept of sustainability is being captured and appropriated by economic and political actors to freeze the economic status quo and promote more consumption of pseudosustainable goods. There are good—although far from enough—examples of such research work, but most are published in journals outside the field of communication (Aronczyk & Espinoza, 2022; Fernández-Vázquez & Sancho-Rodríguez, 2020).

Yet, beyond these obvious but so far neglected objects of environmental communication research, practically all debates have ecological implications. This dimension tends to be overlooked, both by actors engaged in the debate and by scholars studying the debate. For example, studies of debates about new information intermediaries or election campaigns could and should inquire whether sustainability remains a blind spot or merely a buzz word.

Beyond describing and explaining the dynamics of public and mediated communication, we could point at neglected alternative perspectives that focus on the ecological dimension of their respective topics. Imagining sustainable futures has never been more urgent. Analyzing dominant symbolic systems and making their contribution to the environmental crisis evident should be paired with work aimed at foregrounding alternative frames, narratives, and visions of the future. Communication researchers do not necessarily have to invent alternative visions of desirable pathways toward ecological ways of life, but rather they may point at existing ideas that might have been neglected.

Communicating the Future by Lance Bennett (2021) provides an example of communication scholarship addressing the necessity of reframing debates about sustainability. Bennett argues that the

fragmentary discourses of a multitude of disconnected environmental advocacy organizations fail to develop a uniting frame or narrative and turn a blind eye to the deeper roots of ecological problems that are, in Bennett's view, situated in the capitalist system of growth and consumerism.

Thus, Bennett is providing an overarching conceptual scaffold for *intervening in the debate*. As such, an academic book is such an intervention, but its impact is limited as long as its message does not spread beyond the confines of academic discourses. Someone has to cross the line into *public* discourses. Why not us?

One example of how we can undertake this last step is a transnational network of universities that has been established to assemble research on the environmental impact of communication technologies to develop "green tech literacy" (Brevini, 2021, p. 108). The resulting body of literature explores the environmental costs of the production, supply, and consumption chain of communication technologies. Based on the findings collected in a database of research, programs of green tech literacy are launched for schools and citizens to enhance ecological awareness and enable change.

Green media literacy is something that would also be important for those journalists who do *not* regularly cover environmental or science beats. Here, past research has been transformative. An example of this is the learning process in journalism of letting go of the harmful practice of false balance. Journalists, routinely, try to give voice to "both sides" in a debate. This has contributed, historically, to undue salience to the denial of anthropogenic climate change. A study by Max and Jules Boykoff (2004) may be called transformative in drawing attention to this problem. The study even made it into Al Gore's film *An Inconvenient Truth* (Guggenheim, 2006) and its message slowly also trickled down into the consciousness of journalists who, at least in many leading news outlets, no longer provide a platform for false balance and the uncontextualized denial of climate change (Brüggemann & Engesser, 2017).

Situating findings so that they become actionable (Haarstad et al., 2018) is a task that calls for communication beyond the academic journal article. According to Max Boykoff (personal communication, May 22, 2023), no extraordinary outreach activity complemented his study. It rather touched a nerve and was amplified by the well-known climate journalist Andrew Revkin. This is only possible if, even within journal articles, some clues at what the data might mean for actual social problems is included so that they can be understood by interested audiences beyond academia. Possible practical takeaways of one's research could then be further elaborated on (e.g., in an opinion piece, an interview, or a blog post).

While it is part of a pluralistic society that different groups of actors will draw different conclusions from a given piece of research, researchers may themselves put their research in context and thereby reduce the risk of being (deliberately and strategically) misunderstood. This is one aspect of adding reflexivity to our research: to anticipate and intervene when research results are being taken out of context by political actors who might interpret the research in ways that can be at odds with the actual findings of the respective study.

Finally, the art of synthesis is underdeveloped in our field. This means not only counting what has been studied but clearly pointing out what we know and what it means; for a best practice see, for example, the article "Understanding (and Reducing) Inaction on Climate Change" by Hornsey and Fielding

(2020) or a recent review showing that reducing psychological distance might actually not be the most important or effective way for climate communication—contrary to what many guidelines say (van Valkengoed, Steg, & Perlaviciute, 2023). The Oxford-based organization Climate Outreach routinely provides evidence-driven advice on how to communicate, for example, scientific uncertainties around climate change (Corner, Lewandowsky, Phillips, & Roberts, 2015). Synthesizing complex research results into a limited set of findings is a valuable art that should not be left to journalists or civil society groups alone but also involve researchers who understand the field and its theories and methods.

Transformative Teaching and Academic Practices

If we are serious about environmental communication science having transformative potential, one important audience that we have is our students. Seminars on environmental communication that also include practitioners as partners or interact with local actors could become part of the curriculum. We can influence whether our department offers an elective in environmental communication or whether such topics make it to the core curriculum.

So far, such topics are rarely found in either electives or the core curriculum (Karmasin & Voci, 2021). Why? We think the answer lies in the still marginal position of environmental communication in the field. Faculty tend to teach their research specialisms if possible. While there may be many advocates for the curriculum to consider political communication, journalism, or social media, there are relatively few advocates for the inclusion of the environment. This tends to be reinforced when new hires are made as faculty tend to lobby for and appreciate the work of colleagues in their respective subfields. The answer to this is simply to hire more faculty who have a research specialization in environmental communication. This would encourage more early career researchers to pursue doctorates in the subfield, and this will eventually filter through to curriculum change and impact on students.

Ideally, electives and core teaching on environmental communication should enable transformative research and academic practices. It should empower students to assume agency in the process of transformation. It should explicitly discuss normative questions and focus on involving students in creative solutions to problems related to media, communication, and the environment.

One of the exemplars of such an approach was the late William Gamson, who established the Media Research and Action Project. It describes itself as a faculty-student-community collaboration with a variety of activist groups (Ryan & Gamson, 2009) tackling negative representations in mass media and promoting mobilization and positive representations, with the ultimate aim of bringing about social change. The key here is that the methods adopted seek not only to understand the world but to bring about change through intervention in a manner similar to participatory action research methods (Martens, Venegas, & Tapuy, 2020).

There is research on how best to teach ecological crises and the need for transformation that emphasizes the importance of challenging the status quo, engaging with social experimentation, and reflecting on how best to bring about change (Leichenko, Gram-Hanssen, & O'Brien, 2022). This teaching, of course, can have specific communicative foci.

After our students, the next most likely place to look to have a transformative impact is our institutions. Deeply mundane and unfashionable as it is, we can influence the value of cycle to work schemes, the

use of renewable energy on campus, and so on and so forth. No doubt your institution has a promotions committee, a teaching committee . . . Does it have an environment committee? Possibly, but probably not yet, most likely because environmental issues touch on the work of all areas of activity, from the provision of food in the student canteens to the insulation of accommodations, and are dealt with separately and in a very fragmented way. It is time to join them up and add in environmental communication for staff and students for good measure.

There are a number of ways in which communication scholars can engage in their universities. For instance, we can strongly advocate for our institutions to declare robust and concrete climate or sustainability commitments and demand immediate divestment from fossil fuels. Despite a global trend among educational institutions toward divestment (Global Fossil Fuel Divestment Commitments Database, 2022), universities in Australia and the United States, according to media reports, have worrisome conflicts of interest between these same universities and the fossil fuels industry (Analysis and Policy Observatory, 2018). The quest for more transparency, as well as exposing greenwashing even within our own institution, is a challenge for communication and therefore falls within our disciplinary mandate.

After our students and home institutions, the next most likely group of people that we can have an impact on is our learned societies. These societies, after all, claim to exist for us and should be responsive to our views. At worst, these societies can be very sophisticated travel agencies-cum-conference machines, with thousands of people flying millions of air miles to present their work in bite-sized portions in far-flung destinations. At best, our learned societies can provide intellectual impetus for the field. Every decision to fly somewhere needs to be thought through. Many in-person meetings can be replaced by online conferences that may be more equitable and less of an environmental burden. Given that every action whether online or offline will have an environmental cost at some point, it is about making sure that the benefit of the action outweighs the costs.

Transformative Engagement With Society

The distinctive contribution that communication scholarship can make is not merely in understanding the communication and information environment that shapes public opinion, beliefs, and actions but in inspiring debates about how to transform societies toward more sustainable ways of living. As communication scholars engaged in global networks capable of impacting public debates on the climate emergency, we have a clear responsibility to aim at a trajectory of pragmatic sociology of critique (Boltanski, 2011): to constantly check the ways in which critique is “mobilized” by ordinary people rather than “theorized” by scholars and experts.

A crucial form of social impact would be to collaborate with social groups and communities who are marginalized or ignored in environmental debates and policies, who are often the ones that bear most costs of degradation (Pezzullo, 2009). By promoting their communicative capacities and sense of political agency, we could aid the democratization of dealing with environmental problems. By publicly exposing their exclusion by media or decision makers, we could indirectly contribute to inclusion, pluralism, and justice. By working with them to develop strategies for intervention in public debates, we can directly contribute to tackling socioecological problems.

Communication scholars could support relevant social groups and institutions in improving their communication practices. For example, the Intergovernmental Panel on Climate Change has started to integrate communication research in their reports and wider forms of communication (Corner, Shaw, & Clarke, 2018) and has acknowledged the importance of communication scholarship (Krug, 2022). But not everyone has the resources to translate or invite the translation of academic research into actionable knowledge. Therefore, our connections to environmental NGOs, citizen groups, social movements, and others should be expanded; for an example of this connection, see Tarin, Upton, Swords, and Yang (2017).

Devising ways of living more sustainably with our environments involves rethinking the ways in which communities govern common goods such as natural spaces. Within the prevailing liberal democratic framework, environmental governance tends to be shaped by expert judgement. In “stakeholder” consultations, problems and goals are predefined and the scope for citizen discussion and influence is quite limited; hence, communication is structurally distorted. Communication researchers could experiment with ways to change this.

In 2017, researchers at the University of Aarhus, in Denmark, launched a project that turned out to be transformative. They started off with a concrete real-world issue, namely the return of wolves to Denmark’s territory and social conflicts over how to “manage” them. The Wolf Dialogue Project took a “critical-utopian dialogue approach,” with the design based on the Critical-Utopian Action Research methodology (Hansen, Dethlefsen, Fox, & Jeppesen, 2022). In collaboration with a local village council, they invited residents to attend an information meeting and, from then on, a series of workshops that spanned over two years. The process was initiated independently from any authorities and, from the outset, it was made clear to participants that the agenda was open and the terms of the debate were not constrained. Having agreed to follow Habermasian ethics for the dialogue, based on the principles of respect for all participants (no interruptions, no personal attacks, short comments), citizens were free to discuss whatever they wanted related to the presence of wolves in the area. The team of researchers endeavored to build trust, both among citizens and toward themselves, from the very outset. They did so by means of allowing enough time for extensive contact and by creating informal interaction opportunities. Meetings came to be felt as a “safe space” for all participants to voice their views. Drawing inspiration in the Future Creation Workshops developed by Norbert R. Müllert and Robert Jungk (1987), the first workshop aimed at allowing citizens to think about alternative futures. They started by expressing their critique and concerns about the present situation, and imagined ideal scenarios. In thinking about implementation, they then formulated some questions that researchers and experts were invited to answer. In later stages, participants presented their vision to the public and wrote a report that was presented to political authorities at the national level. The process was aimed at facilitating the participants empowerment. Gradually, they became more motivated to take responsibility and strived to extend the project.

The Wolf Dialogue Project garnered significant media attention and political recognition, with the Danish government implementing some recommendations and institutionalizing dialogue meetings with local communities. The project was originally supported by a grant from Aarhus University, and

several academic articles accounting for the process and its outcomes have been published (e.g., Hansen et al., 2022). The whole process illustrates how the relation between environmental communication and governance can be reimagined.

Academic input to journalists and media organizations on trends and problems with the coverage of environmental issues could lead to better journalism. Such input can take many forms, and there are good examples already, such as the Decálogo sobre el Cambio Climático developed by the Fundación Ecología y Desarrollo (ECODES) and the Complutense University of Madrid (ECODES, 2019). This is a set of recommendations (based on research findings) for journalists working on climate change. News media organizations were invited to commit to the guidelines, and many of them have done so (ECODES, 2019). Such approaches could be emulated in other countries or at the European level.

For the engaged academic embracing transformative practice in times of crisis, the motivation is clearly intrinsic and not the result of external incentives. Yet, the structures in many university systems function as a disincentive to engage.

There are still those colleagues who claim that social and environmental engagement makes us less of a scientist. Others claim that engagement may lead to a loss of trust in science, a claim that is so far only based on limited empirical evidence. Yet, the fundamental problem seems to be working time dedicated to engagement rather than maximizing the number and impact factor of publications. This hurts those researchers who are not yet tenured, if their engagement is not recognized by the academic system.

In some university systems, this problem is already recognized. For example, in the United Kingdom, social impact including policy and community engagement has become part of the academic research assessment exercise (Downey, 2017). Also, there are universities in Portugal where annual reports for individual assessment can be adjusted by academics in view of a predominantly teaching-, research-, management-, or public engagement/outreach-oriented profile, and activities in the latter domain can weigh up to 30% in one's performance.

Engaging with society offers the prospect of bringing about significant change well beyond the academy. It is undoubtedly true that academics undertaking such work need to accommodate themselves to the existing rules of the game, at least to a certain extent, to gain influence. Yet, the key issue is whether academics active in politics also seek to change the rules of the game, bringing about more progressive change than existing political logics allow for. It is about bringing more fundamentally critical moments into the policy arena, to persuade policy makers of the need for new rules rather than engaging in a servile science-policy relationship. This could be thought of as a dialectic where academics should attempt to exercise their own agency in a critical rather than subservient manner.

Conclusion

The increasingly obvious and severe character of climate change, not to mention other socioecological crises, demand that we as a field reconsider the marginal role that environmental communication still plays in our research, our broader academic practices, and what we hope to achieve socially through our work. It is time to move environmental communication and the environmental dimension of our respective research topics to center stage and to take up the challenge of making communication a transformative science. This means changes in our research priorities, teaching, engagement with our

universities, learned societies, and societies, whether one sees oneself primarily as an environmental communication scholar or not.

There are many different ways in which we can make our work more transformative. As Waisbord (2020) puts it in his more general appeal to engage more, “Decide the public scholar you want to be” (pp. 97–98). No one is expected to do or can do everything, everywhere, all at once. One person may engage on Twitter, while another may be great at asking the most urgent research questions with real-world relevance, while someone else might enjoy experimenting with teaching or interacting with journalists. And many scholars have already taken steps to move from being bystanders of ecological disaster toward being participants in the project of bringing about just socioecological transformations. We invite all of our colleagues to join in.

References

- Akerlof, K. L., Timm, K. M. F., Rowan, K. E., Olds, J. L., & Hathaway, J. (2022). The growth and disciplinary convergence of environmental communication: A bibliometric analysis of the field (1970–2019). *Frontiers in Environmental Science*, 9, 814599. doi:10.3389/fenvs.2021.814599
- Analysis and Policy Observatory. (2018). *Exposing the ties between Australian universities and the fossil fuel industry*. Melbourne, Australia: Swinburne University of Technology. Retrieved from <https://apo.org.au/node/233981>
- Aronczyk, M., & Espinoza, M., I. (2022). *A strategic nature: Public relations and the politics of American environmentalism*. Oxford, UK: Oxford University Press. doi:10.1093/oso/9780190055349.001.0001
- Bennett, L. W. (2021). *Communicating the future: Solutions for environment, economy and democracy*. Cambridge, UK: Polity.
- Boykoff, M. T., & Boykoff, J. M. (2004). Balance as bias: Global warming and the U.S. prestige press. *Global Environmental Change*, 14(2), 125–136. doi:10.1016/j.gloenvcha.2003.10.001
- Boltanski, L. (2011). *On critique: A sociology of emancipation*. Cambridge, UK: Polity.
- Brevini, B. (2016). The value of environmental communication research. *International Communication Gazette*, 78(7), 684–687. doi:10.1177/1748048516655728
- Brevini, B. (2021). *Is AI good for the planet?* Cambridge, UK: Polity.
- Brevini, B., & Murdock, G. (Eds.). (2017). *Carbon capitalism and communication: Confronting climate crisis*. London, UK: Palgrave Macmillan.

- Brüggemann, M., & Engesser, S. (2017). Beyond false balance: How interpretive journalism shapes media coverage of climate change. *Global Environmental Change*, 42, 58–67. doi:10.1016/j.gloenvcha.2016.11.004
- Brüggemann, M., Frech, J., & Schäfer, T. (2022). Transformative journalisms: How the ecological crisis is transforming journalism. In A. Hansen (Ed.), *The Routledge handbook of environment and communication* (2nd ed., pp. 221–236). New York, NY: Routledge. Retrieved from <https://osf.io/mqv5w/>
- Carvalho, A., Russill, C., & Doyle, J. (2021). Critical approaches to climate change and civic action. *Frontiers in Communication*, 6, 711897. doi:10.3389/fcomm.2021.711897
- Carvalho, A., van Wessel, M., & Maesele, P. (2017). Communication practices and political engagement with climate change: A research agenda. *Environmental Communication*, 11(1), 122–135. doi:10.1080/17524032.2016.1241815
- Corner, A., Lewandowsky, S., Phillips, M., & Roberts, O. (2015). *The uncertainty handbook: A practical guide for climate change communicators*. Bristol, UK: University of Bristol.
- Corner, A., Shaw, C., & Clarke, J. (2018). *Principles for effective communication and public engagement on climate change: A handbook for IPCC authors*. Oxford, UK: Climate Outreach.
- Downey, J. (2017). For public communication: Promises and perils of public engagement. *Javnost—The Public*, 24(2), 173–185. doi:10.1080/13183222.2017.1288779
- Fernández-Vázquez, J. S., & Sancho-Rodríguez, Á. (2020). Critical discourse analysis of climate change in IBEX 35 companies. *Technological Forecasting and Social Change*, 157, 120063. doi:10.1016/j.techfore.2020.120063
- Fundación Ecología y Desarrollo. (2019). *Decálogo de recomendaciones para informar sobre el cambio climático: Invitación a cumplir con los compromisos sobre cómo comunicar el cambio climático* [Decalogue of recommendations for reporting on climate change: Invitation to comply with the commitments on how to communicate climate change]. Zaragoza, Spain: Author. Retrieved from <https://ecodes.org/hacemos/cambio-climatico/movilizacion/los-medios-de-comunicacion-y-cambio-climatico/decalogo-de-recomendaciones-para-informar-sobre-el-cambio-climatico>
- German Advisory Council on Global Change. (2011). *World in transition: A social contract for sustainability*. Berlin, Germany: Author. Retrieved from

<https://www.wbgu.de/en/publications/publication/world-in-transition-a-social-contract-for-sustainability>

Giddens, A. (1990). *The consequences of modernity*. Stanford, CA: Stanford University Press.

Gillespie, T., Boczkowski, P. J., & Foot, K. A. (Eds.). (2014). *Media technologies: Essays on communication, materiality, and society*. Cambridge, MA: MIT Press.

Global Fossil Fuel Divestment Commitments Database. (2022). Divestment Database. Retrieved on July 19, 2022, from <https://divestmentdatabase.org/>

Guggenheim, D. (Director). (2006). *An inconvenient truth* [Motion picture]. Los Angeles, CA: Paramount.

Haarstad, H., Sareen, S., Wanvik, T. I., Grandin, J., Kjærås, K., Oseland, S. E., . . . Wathne, M. (2018). Transformative social science? Modes of engagement in climate and energy solutions. *Energy Research & Social Science*, 42, 193–197. doi:10.1016/j.erss.2018.03.021

Hansen, H. P., Dethlefsen, C. S., Fox, G. F., & Jeppesen, A. S. (2022). Mediating human–wolves conflicts through dialogue, joint fact-finding and empowerment. *Frontiers in Environmental Science*, 10, 826351. doi:10.3389/fenvs.2022.826351

Hoffman, A. J. (2021). *The engaged scholar: Expanding the impact of academic research in today's world*. Stanford, CA: Stanford University Press. doi:10.1515/9781503629257

Hornsey, M. J., & Fielding, K. S. (2020). Understanding (and reducing) inaction on climate change. *Social Issues and Policy Review*, 14(1), 3–35. doi:10.1111/sipr.12058

Kannengießer, S., & McCurdy, P. (2021). Mediatization and the absence of the environment. *Communication Theory*, 31(4), 911–931. doi:10.1093/ct/qtaa009

Karmasin, M., & Voci, D. (2021). The role of sustainability in media and communication studies' curricula throughout Europe. *International Journal of Sustainability in Higher Education*, 22(8), 42–68. doi:10.1108/IJSHE-10-2020-0380

Krug, T. (2022). Concluding commentary to the special issue: “Climate Change Communication and the IPCC.” *Climatic Change*, 171(3–4), 23. doi:10.1007/s10584-021-03255-1

- Leichenko, R., Gram-Hanssen, I., & O'Brien, K. (2022). Teaching the “how” of transformation. *Sustainability Science*, 17(2), 573–584. doi:10.1007/s11625-021-00964-5
- Martens, C., Venegas, C., & Tapuy, E. F. S. S. (Eds.). (2020). *Digital activism, community media, and sustainable communication in Latin America*. Basel, Switzerland: Springer International. doi:10.1007/978-3-030-45394-7
- Maxwell, R., & Miller, T. (2012). *Greening the media*. Oxford, UK: Oxford University Press.
- Müllert, N., & Jungk, R. (1987). *Future workshops: How to create desirable futures*. London, UK: Institute for Social Inventions.
- Murdock, G., & Golding, P. (2005). Culture, communications and political economy. In J. Curran & M. Gurevitch (Eds.), *Mass media and society* (4th ed., pp. 60–83). London, UK: Hodder Arnold.
- Norgaard, K. M. (2018). The sociological imagination in a time of climate change. *Global and Planetary Change*, 163, 171–176. doi:10.1016/j.gloplacha.2017.09.018
- Pezzullo, P. C. (2009). *Toxic tourism: Rhetorics of pollution, travel, and environmental justice*. Tuscaloosa: University of Alabama Press.
- Powers, M., & Russell, A. (Eds.). (2020). *Rethinking media research for changing societies*. Cambridge, UK: Cambridge University Press. doi:10.1017/9781108886260
- Ryan, C., & Gamson, W. A. (2009). Are frames enough? In J. Goodwin & J. M. Jasper (Eds.), *The social movements reader: Cases and concepts* (2nd ed., pp. 167–174). Malden, MA: Wiley-Blackwell.
- Schneidewind, U., Singer-Brodowski, M., Augenstein, K., & Stelzer, F. (2016). *Pledge for a transformative science: A conceptual framework* (Wuppertal Papers No. 191). Wuppertal, Germany: Wuppertal Institute for Climate, Environment and Energy.
- Tarin, C. A., Upton, S. D., Sowards, S. K., & Yang, K. C. C. (2017). Cultivating pride: Environmental engagement and capacity building in the UTEP–Rare partnership. In T. Milstein, M. Pileggi, & E. L. Morgan (Eds.), *Environmental communication pedagogy and practice* (1st ed., pp. 195–206). Abingdon, UK: Routledge. doi:10.4324/9781315562148-19
- van Valkengoed, A. M., Steg, L., & Perlaviciute, G. (2023). The psychological distance of climate change is overestimated. *One Earth*, 6(4), 362–391. doi:10.1016/j.oneear.2023.03.006

Waisbord, S. (2020). *The communication manifesto*. Cambridge, UK: Polity.