Communicating climate change: from disaster to risk

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Abstract

Climate change is a risk and a transdisciplinary, pragmatic and constitutive communication phenomenon. From risk to crisis or emergency to disaster, this article offers a critical overview, given the explosion of this issue among and between communities of social scientists. Focused on the dilemmas in risk and environmental communication or disaster risk reduction, climate change communication is suggested as a point of confluence, a key to turning knowledge into action. Ideas communicated about climate change become the means of anticipating and expressing the future in our present.

Keywords
Communication, Risk, Environment, Climate Change, Disaster.

Resum

El canvi climàtic és un risc i un fenomen transdisciplinari de comunicació, pragmàtic i constitutiu. Des del risc fins a la crisi o des de l'emergència fins al desastre, es proposa un balanç crític davant l'explosió d'aquesta temàtica entre les comunitats de científics socials. A partir dels dilemes en la comunicació de risc, ambiental o la reducció del risc de desastre, s'aposta per la comunicació del canvi climàtic com a punt de confluència, clau per a la conversió del coneixement en acció. Les idees comunicades sobre el canvi climàtic esdevenen el mitjà d'anticipació i d'expressió del futur en el nostre present.

Paraules clau
Comunicació, risc, medi ambient, canvi climàtic, desastre.

The acceleration of the global risk society

One of sociology's main missions is to project a diagnosis of our time. The global climate risk is leading us to apocalyptic catastrophism (Beck, 2015: 79) in a high-speed society that is engendering different forms of alienation (Rosa, 2013). A climate crisis with anthropic causes yet uncertain consequences is situating us in a future-facing horizon, even as we—ironically—accumulate more technical and scientific knowledge in the present. Relating this social acceleration and climate emergency with mental suffering is pushing humanity to a dead-end (Petersen, 2021). We have to seek a kind of socially cathartic 'emancipatory catastrophe', as Beck (2016: 115-118) recently underscored, while Rosa proposes the concept of resonance in a relationship with the world in which the solution to the muteness of nature becomes central in what it can tell us (Rosa, 2019: 348-362). In our successful modernisation, the escalation of collateral effects is radically transforming us in light of the emerging ecological risks, shifting the social sciences and their conceptualisation (Beck & Rosa, 2022).

Likewise, Latour reflects on the disorientation of not knowing how to land or put our feet on the ground. Since the 2015 Paris Agreement on the climate, the instability of our situation on the planet is forcing us into a new understanding of the space where we are, accepting 'the New Climate Regime' where Earth becomes a new non-human actor with political entity, with the power to act and react against human action (Latour, 2019). This human occupation of Earth should make us wonder: How do we occupy a territory if this territory itself is actually occupying us? This space has become dynamic, agential and cyclical from the cellular to the cosmic level. The 'Earth' pole of attraction is defining a new geopolitical orientation in which the prefix 'geo-' becomes substantivised.

In this accelerated metamorphosis, the main communicative tasks underway are motivation and direction, consolidation and support, orientation and guidance, in a more dialogic, reciprocal way instead of being primarily educational and informative (Moser, 2019). The transition from risk to crisis is tipping us towards disaster and the certification of the climate emergency[1] (McHugh et al., 2021). These mutations reveal the collateral effects stemming from this wicked problem[2] which appears to be a tipping point.[3] Human life is already immersed in the new discursive and cultural spaces that have been created by the idea of climate change, expressed in language, symbolism, narratives and arguments (Hulme, 2017), with communication and risk in their most complete sense.

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The ground-breaking objectives of this cross-disciplinary conceptual revision are first to rethink the fragmentation and gaps among disciplines, and secondly to underscore the centrality of communication as a concept and communicating risk as a process. The purpose of this contrast is to learn how communication and risk have reflexively been incorporated into Communication of Climate Change (CCC) for inter-disciplines like Risk Communication (RC), Environmental Communication (EC) and Disaster Risk Communication (DRC). This conceptualisation examines risk and crisis, disaster and emergency, and then returns to the substantification of risk and communication in a privileged, innovative observation point for renewed knowledge of climate change.

(In) Disciplines and fields of (re) knowledge

In the past two decades plunged into the Anthropocene,[4] all the axes of social organisation have been shaken up in a transition from the risk society (Chernilo, 2021) to planetary emergency (Hackett, 2018), which is endangering sustainability and pushing us towards disaster. A reflective, critical and urgent response is needed. A communicative perspective needs to view communication as a science which requires the same levels of support and scientific attention to be done well as other disciplines receive (Lindenfeld et al., 2014: 125). Moser (2019) calls for a decalogue of these tasks as 'transformative communication' of climate change, while wondering what the unique contribution of a communication expert might be. Her proposal addresses communicators: find the curiosity to connect with people, feel responsible for forming part of an 'us' and strengthen dialogue by taking a committed stance.

The advent of climate change on the public agenda has grown exponentially, carrying with it concepts and disciplines. If we view risk as a means of governing the future, with crisis, disaster and emergency as the urgent threats today, CCC requires that a transversal response be prioritised. Its weaknesses have to be turned into strengths in order to overcome the geographic biases, theoretical restrictions and methodological limitations (Agin & Karlsson, 2021). Framing analysis has been the approach used the most in CCC (Schäfer & O'Neill, 2017); this variation in the conceptual frameworks contributes to civic, scientific and political awareness capable of transforming the future in the present. It has also been the most common methodological choice in RC (Nisbet, 2015) and EC (Nisbet et al., 2015). The media clearly have enormous power to connect with people, introduce terms into the agenda, name them and frame them (Kunelius & Roosvall, 2021: 10).

Climate change has precipitated the process of communicating it, both quantitatively and qualitative: its purpose, scope or extent, in debates on the subjects of study and disciplines, in the forms of knowledge and challenges. The leap has been taken from mitigation to adaptation, from scientific consensus to the co-production of meanings, from empathetic messages to harsher ones, from strategic communication to civic engagement and social movements. The goal has been to find integrative answers beyond media coverage or the language used (Nerlich et al., 2010). After all, the forms of recounting and explaining climate change are not enough; we have to shift into action (De Meyer et al., 2021) to the extent of considering unifying a strategic narrative to achieve it (Bushell et al., 2017) or incorporating others ones, such as those of health or climate services, to promote more meaningful, close-up knowledge among audiences (Farré et al., 2019). This is just like in the model of public engagement thanks to the interactive potentialities of the media (Rajanen, 2021) or the attempts to integrate EC (Lindenfeld et al., 2012) and RC into the science of sustainability, where perceptions, uncertainty and communication shape our relations with the environment (Smithberger, 2021).

Risk and Environmental Communication: from risk to crisis

In 1970s, the subfield of RC was viewed as a part of risk analysis. Conflicts on nuclear energy and chemical risks gave way to an entire body of literature to bring expert knowledge to lay audiences, which for some time was geared at correcting the public's erroneous and irrational perceptions. However, the evolution of RC turned it into a much more participative quest focused on the social dimensions of the conflicts and political processes of risk. To confirm this transformation, we can cite the example of the transition from its early formulation focused on practically improving the effectiveness of risk communication (NRC, 1989) to the formulation highlighting informed decisions in a democratic society as the keys to understanding risk (NRC, 1996). When the risk becomes systemic, a sociocultural construct, the importance of engaging communities via governance, dialogue and deliberation becomes a priority (Renn et al., 2011; Pidgeon, 2021).

The genealogy of the concept of risk can be traced back to the proposal of a premodern cultural history of risk (Mairal, 2020), in which we were pressed to imagine the future. In this conceptual journey, risk appears as the offspring of the globalisation processes that grapple with the challenge of dominating distant territories on the other side of the immense blank spaces of deserts and oceans. Now this empty space to be domesticated is *Earth* itself. Mairal shows how the way of explaining risk was associated with the press and journalistic style in the sixteenth to seventeenth centuries, and that it appeared as a narrative resource long before it became the result of the law on probabilities (2020: 240-241). Even though it is not a new challenge for risk studies, it is expressed in and by communication (Zinn & Müller, 2022: 10; Horlick-Jones & Farré, 2010). We researchers should ask what we can offer that is differentially different (Berger, 2010).

The communicative shift in RC is illustrated in the metamodel

of communities and mediations of Gonzalo and Farré (2011: 125-133), where *risk communication communities* take part in the production, circulation and reception of risk, attributing it meaning distinctively. In the transition from the media to mediatisation, the multiple mediations to which institutions, experts, the media themselves and audiences are subjected are expressed in the meanings of the environment. Media and journalistic research have to deal with this complexity from discursive, interdisciplinary, internationalisation and practical challenges (Olausson & Berglez, 2014). In precarious times, the absence of the environment and sustainability as priority issues in communicative research in the era of mediatisation has become unsustainable (Christensen & Nilsson, 2018; Kannengießer et al., 2021). EC is defined as the study and practice of pragmatic, constitutive means of expression that define and confront our ecological relations with the world. Pragmatic communication means instrumental communication; it is used to do something such as educate, alert or persuade. The goal is to convince the audience and influence their behaviour, attitudes or practices. Likewise, constitutive communication is defined in an active sense, playing a dynamic role in what we believe or whom we trust and what matters to us (Pezzullo, 2017). RC and EC dovetail in incorporating climate change as a core issue in their research agendas, as shown in the two reference journals *Risk Analysis* and *Enviromental Communication*.

In *Risk Analysis*, which was launched in 1980, one can trace the transformation of the concept of risk through the revision of RC according to messengers, attributes of the message and audiences (Balog-Way et al., 2020) until identifying its current state: new themes yet with continuity; polyhedral approach without dominant formulas; intense, complex debate on concepts like trust, transparency and uncertainty;[5] and finally 'perseverance' (Kasperson, 2014) as a basic processual value that cannot be considered shut. In *Environmental Communication*, which was created in 2007, the field is institutionalised (Akerlof et al., 2022) with the seminal article by Cox (2007), which defines EC as a discipline in crisis with a non-negotiable ethical burden,[6] completing the leap from an embryonic common future (Brundland, 1987) to this inescapable journey that we have to take to reach sustainability (NRC, 1999). In both RC and EC, the formula chosen to classify the communication research dovetails in segmenting the process classically into senders, messages and receivers (Rickard, 2019) or into production, content and social implications (Hansen, 2011). Similarly, Moser (2010) chooses these essential segments in the communication process applied to CCC. The coincidence in dissatisfaction with the partial results underscores the need to connect it to the entire communication process.

EC, which was defined by Cox as a discipline in crisis, will have a hard time breaking away from the pragmatic dogmas geared at instrumental communication aimed implicitly at 'resolving the crisis'. A pragmatic perspective fails when considering the forms whereby communicating risks transforms the social meanings, relations and power dynamics related to the environment. As

Rickard (2019: 3) reports, Pezzullo and Cox (2016) subsume CR as a field of research within EC. This synthesis between risk and crisis converges in the definition of the pragmatic and constitutive functions of communication, which should coexist convergently in light of climate change,[7] with new ambitions for communication research.[8]

Disaster Risk Communication

Natural disasters have ceased being so by either anthropic action or omission. The higher frequency of disasters and the need to lower their risk converge in the Sendai Framework (2015), the most elaborate formulation for responding on multiple scales. This interdisciplinary proposal promotes the community engagement, and institutions have to work in an integrated fashion (Donovan et al., 2019). It views disaster as a severe disruption in the functioning of a community which surpasses its ability to respond to it with its own resources, where linear transmission is insufficient and lacks the capacity to capture singularities. Calls for convergence are repeated in the underpinnings of this field (Peek et al., 2020), and the conceptualisation of communication is once again the object of bias and simplification. However, a holistic understanding of the problem pushes for the engagement of the affected communities from the very start of the process. 'Emergency' marks the turn towards impactful, urgent phenomena, where unpredictability becomes defining in the reduction of disasters but is understood in a more integral fashion from 'prospective risk management' in order to avoid and prevent them (Esquivel, 2021).

RC is crucial in lowering the risk of disaster (Volenzo et al. 2019) in that it implies anticipation and response to potential threats. In order for this process to be effective, institutional trust and community and media engagement are needed, in addition to integrated communication in the messages, which should be appropriate in time and form in both transmission and reception (Fakhruddin, 2020). This focus on building integrative models capable of encompassing the diversity of communicative intervention actions in situations of risk, crisis and emergency are a paradigmatic example of the instrumental vision in the form of alerts and messages of protection and evacuations or recommendations. Reynolds and Seeger (2005) discern between risk and crisis communication according to the goals, scope and forms of intervention, but they suggest a connected, interdependent working communication model (Crisis and Emergency Risk Communication, CERC). Pragmatic communicative immersion necessitates reviving a constitutive vision in which the RC process participates more democratically in the co-production of knowledge, which is essential for DRC (Donovan et al., 2019).

DRC has historically been dominated by the transfer of information in a single direction, from the authorities to the public, more than an interactive flow of information (Bradley et al., 2014). The difficulties of the evaluation, design and

effectiveness of these interventions are quite high because of the specificities of the disasters, the confusion of the responses or the complexity of the recovery actions. The communicative relationship established with communities is key in breaking with misunderstandings of the measures agreed upon. Despite the organisational efforts to include situated knowledge in the reconstruction phase, those in charge tend to choose technical solutions, even if the local communities co-produce decisions, inscribing them in the communicative processes (Opdyke et al., 2016).

This shift leads concepts to emerge like disaster communities (Matthews & Thorsen, 2020), meaning subjects, *disaster communication communities*. The local media and local journalism take on a prominent role when adaptively intervening in the communicative dynamics and social interconnections that emerge from the dangers, vulnerabilities and inequalities that are driving the disaster. As an on-the-ground field, DRC has reinforced the importance of action in light of extreme weather phenomena. In this scenario, communities play a transformative role, turning the disasters into opportunities by lowering their risk. Good communication saves lives through communities with greater resilience; however, the conversion towards action does not respond to simple recipes in which communication is merely a toolkit. Lavell notes that lowering risk is one thing, and avoiding it is another (Esquivel, 2021: 254). Corrective, reactive or compensatory management are insufficient if we consider risk as central and therefore how to avoid its construction in the future. This requires prospective management geared at impeding or preventing it more than at lowering the existing risk.

The process of merging communication and risk with the climate crisis and emergency is coupled with the conceptual transformation of disaster risk management, which works towards preventive, anticipatory actions focused less on disasters. In this mutation, CCC faces the transdisciplinary and conceptual challenge of reversing the direction by making risk prevail over disaster while strengthening resilience, equity and community integration actions.

Communication of Climate Change: from disaster to risk

The effectiveness of measures to get citizens engaged and the way to inform them in a plain, meaningful way based on expertise in decision-making has been a priority. However, since the second decade of this century, this vision focused on mitigation, education or persuasion has shifted towards an approach that is much more focused on getting the public engaged and adapting to the impacts. Moser (2016) optimistically reinterprets the advances in CCC which have successfully coped with many of the shortcomings through greater professionalisation and sophistication, thus reformulating her pessimistic diagnosis in Moser (2010). Regardless, the science of climate communication is dealing

with the processual nature of communicative practice, changes in technologies (Pearce et al., 2019; León et al., 2021) and the lack of societal engagement, while activating communication in all phases of the process so that the two processes can cease being a disconnected problem (Moser & Pike, 2015). A single formula that is effective for all audiences does not exist, and segmenting them when guiding or instructing them is not sufficient. The debate has to be revitalised based on difference to maintain public engagement with truly living science, not controlled by the agents who are part of the problem. Carvalho et al. (2021) reflect critically on this while highlighting the processes of constructing meaning, sociocultural contexts, relational dynamics and issues associated with power.[9]

Craig's (1999) metamodel is applied to CCC in an inspiring way by Ballantyne (2016), who states that communication has been inadequately theorised in climate research (Kumpu, 2022). As an ontological entity beyond epistemological and methodological discussions, communication enriches and actively intervenes in the partial debates that have prevailed in the social research on climate change.[10] The constitutive shift considers other ways much more closely aligned with its complexity, yet also with communication as a concept and process. Smith and Lindenfeld (2014) suggest the cross-disciplinary integration of media studies to contribute to resolving the dilemmas of EC and CCC. Researchers have to not only get involved in the media contents and effects but also promote social learning that can drive the transition to sustainability. They have to set out to generate solutions by taking part in cross-disciplinary teams to participate in deciding what information is communicated, why and with what impact. This added value positions them in a broader working context where scientists, journalists and public decision-makers act as true interlocutors to reorient the questions about the media and what ends they are pursuing.

From disaster to risk, CCC is geared at the praxis of everything that matters to people. The upcoming transformation depends on what the community of communication experts can do in the midst of an unavoidable crossroads: strengthening the constitutive ambition of their conceptual approach, and the cross-disciplinary integration and ethical responsibility of their proposals, in convergence with EC's call:

> *Scholars, teachers and professionals have the duty to educate, question, critically evaluate, or otherwise speak in appropriate forums when social/symbolic representations of 'environment', knowledge claims or other communication practices are constrained or suborned for harmful or unsustainable policies towards human communities and the natural world. Relatedly, we have a responsibility through our work to identify and recommend practices that fulfil the first normative tenet: to enhance the ability of society to respond appropriately to environmental signals relevant to the well-being of both human civilization and natural biological systems.*

(Cox 2007:16, cited in Pezzullo 2017)

Communication research has a great deal to contribute

to this ongoing conversation. Even though it cannot do it alone, it has to be steadfast in what it can offer, while also showing curiosity towards what other fields can contribute. It is a complex problem that has to be tackled in a network with multiple connections, in which people's participation and ideas outside academia, poised to interact, are prioritised (Sprain et al. 2010). When environment and climate change cease being issues of experts and come to affect all political and everyday spheres, communication practices have to be shielded in their primacy both in the mediated circulation of narratives and in the production of solution-oriented social knowledge. Communication research with its modalities of access and influence over the public is shifting towards a dialogic positioning with other academic disciplines and society. In the conversion of knowledge into action, as the science of sustainability is necessitating, the ideas communicated about climate change become of a means of expression of the future in our present.

Notes

1. 'Climate emergency' is an expression that was first promoted in *The Guardian* in 2019 in the guise of recommendations to help journalists to be scientifically accurate and to better communicate complex, urgent environmental topics to readers. Since then, it has become a symbol of the impetus for mobilisation. Acknowledged as the word of the year by the Oxford Dictionary in 2019, it has been included in many political declarations. With the hopes of relaunching climate action for global governance, it has been interpreted in many different ways according to perceptions, interests and values. Hulme (2019) questions its effects: there is no going back now, and its grassroots effectiveness may strip it of meaning while challenging attention to the SDGs, which are now the heart of climate emergency policies.

2. A 'wicked problem' is a complex, intractable natural phenomenon without an obvious solution characterised by a large dose of uncertainty, controversy and scepticism, and with limited citizen engagement.

3. 'Tipping point' is a widely used metaphor to drastically alert the public about the irreversibility or danger of climate change while highlighting the impossibility of going back. Despite this, its overuse means that it has been used quite differently by scientists and journalists depending on their communicative purposes: as a specific alert, a theoretical concept, a dramatic resource or a generic cry for radical social change (van der Hel et al. 2018).

4. This era was defined by the Nobel prize-winner in Chemistry, Crutzen (2002:23). For a media and communicative approach to the Anthropocene in a radicalised environment of mediatisation in the construction of both sense and meaning, see Bergillos (2020; 2021). For a more historical and philosophical vision of the effects in the social sciences, see Charbonnier (2017).

5. Another transversal concept to be considered in intrinsic interconnection with communication is public engagement and all its derivations and degrees of application. In fact, this has become a priority topic of research in recent years. Wibeck (2014) offers a systematic review of the scholarly literature on communication and public engagement geared at environmental education. From a more political standpoint, see Carvalho et al. (2017). The conceptual discussion of civic engagement as an ultimate goal and priority challenge once again clashes with the pragmatic or constitutive approach, where instead of being mere receivers of messages, citizens should actively integrate in learning, consensus, action and the generation of knowledge (Brulle 2010; Pearce et al 2015).

6. The ethical responsibilities of EC researchers with regard to ecological degradation make them a group committed to grapple with the greatest challenge of our time (Joosse et al 2020).

7. 'To deal with these challenges at society level, which often entail addressing environmental risks and for human health, the science of sustainability has emerged in the past two decades as a research process geared at solutions in which multiple stakeholders, from experts in thematic areas to members of the lay public, create knowledge designed to inform and support action, as well as to maintain socioecological health' (Rickard 2019: 9).

8. 'Research adopting a ritual view of communication tends to be less interested in questions of influence, asking more specific questions about the pervasive and ubiquitous role media play in the ways society's institutions function, as well as in the way people structure and give meaning to their everyday lives' (Deuze 2021: 9).

9. 'Rather than an individual process, engagement with climate change is viewed as tied to social and material interactions, whereby meanings are shaped and challenged collectively. In addition, rather than positioning people as consumers (of products and ideas) and spectators (of politics), we are interested in anti-essentialist understandings of their agency as citizens in civic places. We posit that people's understandings of climate change, as well as of their positionality and potential agency in relation to climate change, are *constituted* in their communication. Likewise, civic action is largely *performed* through communication practices' (Carvalho et al. 2021:2).

10. Carvalho et al. (2021) claim that much of the research on climate change in the social sciences has been surprisingly a-social, focusing on individually themes rather than on the social level. This makes the link between research in CCC and action geared at civic participation more necessary than ever.

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References

Agin, S., & Karlsson, M. (2021). Mapping the Field of Climate Change Communication 1993–2018: Geographically Biased, Theoretically Narrow, and Methodologically Limited. *Environmental Communication*, 1-16. https://doi.org/10.1080/17524032.2021.1902363

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. https://doi.org/10.3389/fenvs.2021.814599

Balog-Way, D., McComas, K., & Besley, J. (2020). The Evolving Field of Risk Communication. *Risk Analysis*, *40*(S1), 2240-2262. https://doi.org/10.1111/risa.13615

Ballantyne, A. G. (2016). Climate change communication: what can we learn from communication theory? *WIREs Climate Change*, *7*(3), 329-344. https://doi.org/10.1002/wcc.392

Beck, U. (2015). Emancipatory catastrophism: What does it mean to climate change and risk society? *Current Sociology*, *63*(1), 75-88. https://doi.org/10.1177/0011392114559951

Beck, U. (2016). *The Metamorphosis of the World*. Polity.

Beck, U., & Rosa, H. (2022) Escalating side effects. The transformation of modern society through processes of cosmopolitanization, acceleration and increasing global risks. In: B. Bornemann, H. Knappe & P. Nanz. (Eds.). *The Routledge Handbook of Democracy and Sustainability* (p. 153-162). (1st edition). https://doi.org/10.4324/9780429024085

Berger, C. R. (2010). Making a Differential Difference. *Communication Monographs*, *77*(4), 444-451. https://doi.org/10.1080/03637751.2010.523601

Bergillos, I. (2020). Media life in the Anthropocene. *Journal of Environmental Media*, *1*(1), 27-31. https://doi.org/10.1386/jem_00004_1

Bergillos, I. (2021). Approaches to the Anthropocene from Communication and Media Studies. *Social Sciences*, *10*(10), 365. https://doi.org/10.3390/socsci10100365

Bradley, D. T., McFarland, M., & Clarke, M. (2014). The Effectiveness of Disaster Risk Communication: A Systematic Review of Intervention Studies. *PLoS Currents*. https://doi.org/10.1371/currents.dis.349062e0db1048bb9fc3a3fa67d8a4f8

Brulle, R. J. (2010). From Environmental Campaigns to Advancing the Public Dialog: Environmental Communication for Civic Engagement. *Environmental Communication*, *4*(1), 82-98. https://doi.org/10.1080/17524030903522397

Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission on Environment and Development*. Geneva, UN-Documents A/42/427. https://bit.ly/3g00WoP

Bushell, S., Buisson, G. S., Workman, M., & Colley, T. (2017). Strategic narratives in climate change: Towards a unifying narrative to address the action gap on climate change. *Energy Research & Social Science*, *28*, 39-49. https://doi.org/10.1016/j.erss.2017.04.001

Carvalho, A., van Wessel, M., & Maeseele, P. (2016). Communication Practices and Political Engagement with Climate Change: A Research Agenda. *Environmental Communication*, *11*(1), 122-135. https://doi.org/10.1080/17524032.2016.1241815

Carvalho, A., Russill, C., & Doyle, J. (2021). Editorial: Critical Approaches to Climate Change and Civic Action. *Frontiers in Communication*, *6*. https://doi.org/10.3389/fcomm.2021.711897

Charbonnier, P. (2017). A Genealogy of the Anthropocene: The End of Risk and Limits. *Annales. Histoire, Sciences Sociales*, *72*(2), 199-224. https://doi.org/10.1017/ahsse.2019.10

Chernilo, D. (2021). One globalisation or many? Risk society in the age of the Anthropocene. *Journal of Sociology*, *57*(1), 12-26. https://doi.org/10.1177/1440783321997563

Christensen, M., & Nilsson, A. E. (2018). Media, Communication, and the Environment in Precarious Times. *Journal of Communication*, *68*(2), 267-277. https://doi.org/10.1093/joc/jqy004

Cox, R. (2007). Nature's "Crisis Disciplines": Does Environmental Communication Have an Ethical Duty? *Environmental Communication*, *1*(1), 5-20. https://doi.org/10.1080/17524030701333948

Craig, R. T. (1999). Communication theory as a field. *Communication Theory*, *9*(2), 119–161. https://doi.org/10.1111/j.1468-2885.1999.tb00355.x

Crutzen, P. (2002). Geology of Mankind. *Nature*, *415*(23). https://doi.org/10.1038/415023a

De Meyer, K., Coren, E., McCaffrey, M., & Slean, C. (2020). Transforming the stories we tell about climate change: from 'issue' to 'action'. *Environmental Research Letters*, *16*(1), 015002. https://doi.org/10.1088/1748-9326/abcd5a

Deuze, M. (2021). On the 'grand narrative' of media and mass communication theory and research: a review. *El profesional de la información*, *30*(1), e300105. https://doi.org/10.3145/epi.2021.ene.05

Donovan, A., Borie, M., & Blackburn, S. (2019). Changing the Paradigm for Risk Communication: Integrating Sciences to Understand Cultures. A *Global Assessment Report on Disaster Risk Reduction*, (GAR 2019) United Nations Office for Disaster Risk Reduction (UNDRR).

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Esquivel, C. (2021). Una mirada desde la gestión del riesgo de desastres, el cambio climático y los efectos por la COVID-19: entrevista a Allan Lavell. *Estudios de la Gestión: revista internacional de administración*, 10, 253-260. https://bit.ly/3CTKqji

Fakhruddin, B., Clark, H., Robinson, L., & Hieber-Girardet, L. (2020). Should I stay or should I go now? Why risk communication is the critical component in disaster risk reduction. *Progress in Disaster Science*, 8, 100139. https://doi.org/10.1016/j.pdisas.2020.100139

Farré, J.; Prades, J., & Gonzalo, J. L. (2019). Las narrativas del cambio climático. In: J. Espluga (Coord.) *El cambio climático y sus metáforas. Como dar sentido a las narrativas mediáticas sobre un riesgo difuso y global* (p.33-58). Icaria.

Gonzalo, J. L., & Farré, J. (2011). *Teoría de la comunicación de riesgo*. UOC.

Hackett, R. (2018). Planetary Emergency and Sustainable Democracy: What Can Media and Communication Scholars Do? *The Political Economy of Communication, 6*(1), 989-106. https://bit.ly/3EDbdSf

Hansen, A. (2011). Communication, media and environment: Towards reconnecting research on the production, content and social implications of environmental communication. *International Communication Gazette*, *73*(1-2), 7-25. https://doi.org/10.1177/1748048510386739

Horlick-Jones, T., & Farré, J. (2010). On the communicative constitution of risk objects in mediated times. *Catalan Journal of Communication & Cultural Studies*, *2*(2), 131-143. https://doi.org/10.1386/cjcs.2.2.131_2

Hulme, M. (2017). Climate Change, Concept of. *International Encyclopedia of Geography: People, the Earth, Environment and Technology*, 1-6. https://doi.org/10.1002/9781118786352.wbieg0343

Hulme, M. (2019). Climate Emergency Politics Is Dangerous. *Issues in Science and Technology, 36*(1), 23-25. https://doi.org/10.17863/CAM.46233

Joosse, S., Powell, S., Bergeå, H., Böhm, S., Calderón, C., Caselunghe, E., Fischer, A., Grubbström, A., Hallgren, L., Holmgren, S., Löf, A., Nordström Källström, H., Raitio, K., Senecah, S., Söderlund Kanarp, C., von Essen, E., Westberg, L., & Westin, M. (2020). Critical, Engaged and Change-oriented Scholarship in Environmental Communication. Six Methodological Dilemmas to Think With. *Environmental Communication*, *14*(6), 758-771. https://doi.org/10.1080/17524032.2020.1725588

Kannengießer, S., & McCurdy, P. (2020). Mediatization and the Absence of the Environment. *Communication Theory*, *31*(4), 911-931. https://doi.org/10.1093/ct/qtaa009

Kasperson, R. (2014). Four questions for risk communication. *Journal of Risk Research*, *17*(10), 1233-1239. https://doi.org/10.1080/13669877.2014.900207

Kumpu, V. (2022). What is Public Engagement and How Does it Help to Address Climate Change? A Review of Climate Communication Research. *Environmental Communication*, *16*(3), 304-316. https://doi.org/10.1080/17524032.2022.2055601

Kumpu, V. (2022). What is Public Engagement and How Does it Help to Address Climate Change? A Review of Climate Communication Research. *Environmental Communication*, *16*(3), 304-316. https://doi.org/10.1080/17524032.2022.2055601

Kunelius, R., & Roosvall, A. (2021). Media and the Climate Crisis. *Nordic Journal of Media Studies*, *3*(1), 1-19. https://doi.org/10.2478/njms-2021-0001

Latour, B., & Cuartas, P. (2019). *Dónde aterrizar*. Taurus.

León, B., Bourk, M., Finkler, W., Boykoff, M., & Davis, L. S. (2021). Strategies for climate change communication through social media: Objectives, approach, and interaction. *Media International Australia*, 1329878X2110380. https://doi.org/10.1177/1329878x211038004

Lindenfeld, L. A., Hall, D. M., McGreavy, B., Silka, L., & Hart, D. (2012). Creating a Place for Environmental Communication Research in Sustainability Science. *Environmental Communication*, *6*(1), 23-43. https://doi.org/10.1080/17524032.2011.640702

Lindenfeld, L., Smith, H. M., Norton, T., & Grecu, N. C. (2014). Risk communication and sustainability science: lessons from the field. *Sustainability Science*, *9*(2), 119-127. https://doi.org/10.1007/s11625-013-0230-8

Mairal, G. (2020). *A Pre-Modern Cultural History of Risk: Imagining the Future*. Routledge.

Matthews, J., & Thorsen, E. Introduction: Media, Journalism and Disaster Communities. In: J. Matthews & E. Thorsen. (Eds.). *Media, Journalism and Disaster Communities* (p.1-16), Palgrave Macmillan.

McHugh, L. H., Lemos, M. C., & Morrison, T. H. (2021). Risk? Crisis? Emergency? Implications of the new climate emergency framing for governance and policy. *WIREs Climate Change*, *12*(6). https://doi.org/10.1002/wcc.736

Moser, S. C. (2009). Communicating climate change: history, challenges, process and future directions. *WIREs Climate Change*, *1*(1), 31-53. https://doi.org/10.1002/wcc.11

Moser, S. C. (2016). Reflections on climate change communication research and practice in the second decade of the 21st century: what more is there to say? *WIREs Climate Change*, *7*(3), 345-369. https://doi.org/10.1002/wcc.403

Moser, S. C. (2019). Not for the faint of heart: Tasks of climate change communication in the context of societal transformation. In: G. Feola, H. Geoghegan, & A. Arnall. (Eds.), *Climate and culture. Multidisciplinary Perspectives on a Warming world*. (p. 141-167). Cambridge University Press.

Moser, S. C., & Pike, C. (2015). Community engagement on adaptation: Meeting a growing capacity need. *Urban Climate*, *14*, 111-115. https://doi.org/10.1016/j.uclim.2015.06.006

National Research Council. (1989). *Improving Risk Communication*. The National Academies Press. https://doi.org/10.17226/1189.

National Research Council. (1996). *Understanding Risk: Informing Decisions in a Democratic Society*. The National Academies Press. https://doi.org/10.17226/5138.

National Research Council. (1999). *Our Common Journey: A Transition toward Sustainability*. The National Academies Press. https://doi.org/10.17226/9690

Nerlich, B., Koteyko, N., & Brown, B. (2009). Theory and language of climate change communication. *WIREs Climate Change*, *1*(1), 97-110. https://doi.org/10.1002/wcc.2

Nisbet, M. (2015). Framing, the media, and risk communication in policy debates. In: A. H. Cho, T. Reimer, & K. McComas. *The SAGE handbook of Risk Communication* (p. 216-227). SAGE Publications, Inc.

Nisbet, M., & Newman, T. (2015). Framing, the media, and environmental communication. In: A. Hansen & R. Cox. (Eds.). *The Routledge handbook of environment and communication* (p. 325-383). Routledge

Olausson, U., & Berglez, P. (2014). Media and Climate Change: Four Long-standing Research Challenges Revisited. *Environmental Communication*, *8*(2), 249-265. https://doi.org/10.1080/17524032.2014.906483

Pdyke, A., Javernick-Will, A., Koschmann, M., & Moench, H. (2016). A Constitutive Communication Lens of Stakeholder Participation in Post-Disaster Construction. *Engineering Project Organization Conference. Best Paper Award.* https://bit.ly/3RWBFsX

Pearce, W., Brown, B., Nerlich, B., & Koteyko, N. (2015). Communicating climate change: conduits, content, and consensus. *WIREs Climate Change*, *6*(6), 613-626. https://doi.org/10.1002/wcc.366

Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2018). The social media life of climate change: Platforms, publics, and future imaginaries. *WIREs Climate Change*, *10*(2). https://doi.org/10.1002/wcc.569

Peek, L., Tobin, J., Adams, R. M., Wu, H., & Mathews, M. C. (2020). A Framework for Convergence Research in the Hazards and Disaster Field: The Natural Hazards Engineering Research Infrastructure CONVERGE Facility. *Frontiers in Built Environment*, *6*. https://doi.org/10.3389/fbuil.2020.00110

Petersen, A. (2021). Social Acceleration and the Climate Crisis: On the Production of Mental Distress and the Stimulation of the Resourceful Feeling of Anger. *Pléyade (Santiago)*, *27*, 82-105. https://doi.org/10.4067/s0719-36962021000100082

Pezzullo, P. C., & Cox, R. (2016). *Environmental Communication and the Public Sphere* (4th ed.). Sage Publications, Inc.

Pezzullo, P. C. (2017). Environment. In: D. Cloud (Ed.). *Oxford Research Encyclopedia of Communication and Critical Studies*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190228613.013.575

Pidgeon, N. (2020). Engaging publics about environmental and technology risks: frames, values and deliberation. *Journal of Risk Research*, *24*(1), 28-46. https://doi.org/10.1080/13669877.2020.1749118

Rajanen, D. (2021) Interactive and participatory media for public engagement with climate change: A systematic literature review and an integrative model. *INTERACT*, 5. University of Oulu. https://bit.ly/3VhEdot

Renn, O., Klinke, A., & van Asselt, M. (2011). Coping with Complexity, Uncertainty and Ambiguity in Risk Governance: A Synthesis. *AMBIO*, *40*(2), 231-246. https://doi.org/10.1007/s13280-010-0134-0

Reynolds, B., & W. Seeger, M. (2005). Crisis and Emergency Risk Communication as an Integrative Model. *Journal of Health Communication*, *10*(1), 43-55. https://doi.org/10.1080/10810730590904571

Rickard, L. N. (2019). Pragmatic and (or) Constitutive? On the Foundations of Contemporary Risk Communication Research. *Risk Analysis*, *41*(3), 466-479. https://doi.org/10.1111/risa.13415

Rosa, H. (2013). *Social Acceleration: A New Theory of Modernity*. Columbia University Press.

Rosa, H. (2019). *Resonancia: Una sociologia de la relación con el mundo*. Katz.

Schäfer, M., & O'Neill, S. (2017). Frame Analysis in Climate Change Communication. In: *Oxford Research Encyclopedia of Climate Science*. Oxford University Press.

Smith, H. M., & Lindenfeld, L. (2014). Integrating Media Studies of Climate Change into Transdisciplinary Research: Which Direction Should We Be Heading? *Environmental Communication*, *8*(2), 179-196. https://doi.org/10.1080/17524032.2014.906479

Smithberger, L. K. (2021). *The Communicative Constitution of Environment: Land, Weather, Climate*. [PhD Thesis]. USF Tampa Graduate Theses and Dissertations, University of South Florida. https://bit.ly/3EzZl39

Sprain, L., Endres, D., & Rai Petersen, T. (2010). Research as a Transdisciplinary Networked Process: A Metaphor for Difference-Making Research. *Communication Monographs*, *77*(4), 441-444. https://doi.org/10.1080/03637751.2010.523600

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Quaderns del CAC 48, vol. XXV - October 2022

United Nations (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*. United Nations. https://bit.ly/2ICrj1S

van der Hel, S., Hellsten, I., & Steen, G. (2018). Tipping Points and Climate Change: Metaphor Between Science and the Media. *Environmental Communication*, *12*(5), 605-620. https://doi.org/10.1080/17524032.2017.1410198

Volenzo, T. E., & Odiyo, J. O. (2019). Linking risk communication and sustainable climate change action: A conceptual framework. *Jàmbá Journal of Disaster Risk Studies*, *11*(1). https://doi.org/10.4102/jamba.v11i1.703

Wibeck, V. (2013). Enhancing learning, communication and public engagement about climate change – some lessons from recent literature. *Environmental Education Research*, *20*(3), 387-411. https://doi.org/10.1080/13504622.2013.812720

Zinn, J. O., & Müller, M. (2021). Understanding discourse and language of risk. *Journal of Risk Research*, *25*(3), 271-284. https://doi.org/10.1080/13669877.2021.2020883

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