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Commentary

Science Communication at a Time of Crisis: Emergency, Democracy, and Persuasion

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Abstract: This commentary essay reflects on the role of science communication in contemporary democratic societies, with a particular focus on how it should be imagined and practiced in times of crisis and emergency such as the COVID-19 pandemic or climate change. I distinguish between science communication that is oriented to strategic and democratic goals, and argue for the continued importance of science communication in nurturing democracy even at times of crisis. I close by suggesting principles that might guide such communication, and by relating these arguments to an understanding of science communication as 'the social conversation around science'.

It is no longer controversial to suggest that we live in a time of crisis, one that is being made manifest along multiple fronts. "Our beautiful planet is sore", wrote Maria Puig della Bellacasa in 2011 [1], "and bearable living conditions continue to be inaccessible to many" (p. 85). How much more true this reads ten years later, at a moment of global pandemic, in which the 'slow disaster' [2] of climate change is speeding up to produce extreme weather and unliveable conditions. The world is on fire, and the disasters that the last years have brought, from COVID to wildfires and flooding and environmental degradation, are indicative of our times not just in their urgency but in that they are technoscientific: understood through, managed by, and sometimes directly caused by scientific expertise and technological development [3]. Science, and therefore science communication, are central to them.

It is this sense of crisis or emergency that I take as my starting point for this short commentary. In it I build on research carried out before the pandemic that explored the role of science communication in society, and that argued that how we think about the purpose of public communication of science is intimately entangled with our shared ideals about the nature and correct functioning of the societies we live in [4]. Science communication matters, I suggested, because it contributes to democracy, and because many of us wish to live in democratic societies. Here I write in dialogue with this earlier work, seeking to extend and critically reflect on it and to explore how to think it in the context of (climate and other) crises that many in science communication are committed to ameliorating—as far as that is, at this stage, possible. Such discussion inevitably touches on questions whose full answers are far outside the scope of this text. How should democracy be imagined and articulated at times of emergency? How can one maintain openness to diverse positions whilst remaining deeply committed to one's own? What is the role of the communicator: to persuade, enable, empower, or recruit? I do not, of course, answer these questions; rather, in exploring how to think about science communication in times of emergency I begin to unpack how we can consider our own positionality, our ethics, as scholars and practitioners of science communication, and thus to contribute to discussions of what such communication can and should be.

1. Strategic and Democratic Science Communication

What is science communication for? This question was one starting point for the earlier work I have mentioned, an interview study with science communication scholars and teachers across Europe that explored their views about the role and nature of European science communication [4,5]. In drawing out themes from their answers and combining these with arguments from science communication literature, I suggested that we can categorise the purposes of science communication along (at least) six lines: it ensures the accountability and legitimacy of publicly funded science; has practical value (such as enabling laypeople and policy makers to make good choices in today's technologically oriented societies); enhances democracy by empowering citizens; allows access to the beauty of science as an aspect of culture; serves promotional purposes (for instance in the form of 'university PR'); and plays an economic role in recruiting people into scientific careers or preparing a market base for technological innovations. In a further stage of analysis, I argued that, taken together, these rationales can be further deconstructed to identify assumptions that underpin them and that point to shared understandings of how we (should) live together as societies. Specifically, we can view notions of *democracy* (the possibility for active participation of all citizens in scientific governance and decision making) and *equity* (the just sharing of public goods) as being central to arguments about the importance of science communication.

How comprehensive this categorisation is remains, to me, an open question: I am particularly curious how these arguments might differ if similar research was carried out in different parts of the world (as I discuss at the end of the essay, not all contemporary societies are democracies, after all), or with the citizens who consume science communication. Whilst keeping in mind their provisional nature, in the context of this commentary I think it is useful to combine these categories with Susanna Priest's [6] distinction between strategic and democratic communication. In an insightful chapter on the ethics of communication Priest argues that science communication may be *strategic*—oriented to bringing about specific goals that serve the interests of the communicator—or *democratic*: "serving the interests of democracy and its citizens by enabling informed decisions about science-related interests" (p.57). While these categories overlap, and distinguishing between them in particular instances of public communication may not be straightforward, Priest suggests that caution is required in carrying out strategic science communication. As she writes, "[s]trategic science communication goals are not always unethical, but they are always worth scrutinizing" (ibid)—particularly because they may clash with democratic aims. Strategic communication is ultimately instrumental, and its ends are defined by communicators or those who commission them. Of the rationales outlined above, promotional and economic goals are clearly strategic: their ends are not open, but defined by communicators, and science communication is designed so as to best reach those ends. Accountability and enhancing democracy (and to some extent allowing access to science as an aspect of culture), on the other hand, can be seen as democratic within Priest's schema. They "put the power to make decisions in the hands of the message recipient" (p.59).

In Priest's text, but also more widely in science communication literature, it is clear that science communication for democratic goals is viewed as best practice [5]. Indeed—and notwithstanding the very real diversity of the 'ecosystem' of science communication [7]—the interest in dialogue and public engagement that has defined the field over the last two decades [8–10] can be understood as exactly seeking to shift the emphasis within public communication away from the persuasive goals of scientists and communicators and towards the interests, knowledges, and concerns of lay audiences. Public engagement is about 'opening up' science to public goals and values [11] and giving a voice, and agency, to lay actors [9]. Similarly, even when not engaged in dialogic communication many science communicators and journalists view their work as supportive of democracy and as empowering and enabling lay citizens [5,12]. Strategic science communication—that designed to serve the interests and agendas of communicators or their funders—is thus often viewed with suspicion. It is telling, for instance, that in the research described

above [4] interviewees not only cited dialogue as best practice in science communication, but frequently complained about science communication that took the form of 'marketing', 'PR', or 'advertisement', suggesting that this should not receive public funding. "Quite a lot of science communication in the media often acts as a kind of podium for researchers", one informant noted, "so the critical voices are often absent". The gold standard of science communication is thus construed as a space of *critical* engagement with science—one that nurtures democracy through enabling interrogation of the power, priorities, and values of publicly funded research.

Science communication should therefore be viewed as a vital part of the public sphere, with its purpose being not only to entertain or enchant, but also to equip and empower citizens. Technoscientific knowledge, institutions, and experts play hugely important and powerful roles in contemporary societies: such power demands public scrutiny, input, and shaping. The experiences of the last years have, however, complicated even further the already complex terrain of public engagement and deliberation [13]. What does science communication for democracy mean in an age of emergencies such as the COVID pandemic or extreme weather, where scientific knowledge and advice is central, contested, and urgent? How can we nurture democratic engagement with science in contexts where 'science-related populism' [14] is on the rise, where views of science are entangled with other identities and experiences [15], and where misinformation is rife [16]? What does it mean to be deeply committed to a particular position—for instance, the overall safety of vaccines, or the urgency of mitigating climate change—whilst also wishing for spaces where a multitude of positions and voices can be heard?

One response to these questions is to move into a mode of strategic communication. In a crisis there is often a sense that deliberative or participatory democracy is a luxury that elites cannot afford [17], and that communication must be clear, persuasive, and effective (in the sense of resulting in the outcomes defined as desirable by governments or experts). Indeed, much science communication is in practice already strategic in the sense that many communicators have clear goals that involve changing the views and behaviours of their audiences. Much research and practice in environmental communication explicitly considers how best to persuade individuals or groups to believe certain truths (such as the reality of climate change) or behave in certain ways (such as reducing flying): see, for instance, the discussion in Whitmarsh et al. [18]. Similarly, there is a tradition of research in science communication that unproblematically searches for and tests strategies of persuasion [6,19]. Priest exactly relates these methods to situations that are urgent, as defined by current scientific knowledge:

> Perhaps we should distinguish between an issue like climate change, which may constitute a science communication emergency because our window of opportunity for turning things around appears (based on the 'best available' scientific evidence) to be closing, and other areas where science education can more safely wait for more extended discussion. This sense of immediacy also colors our moral judgements. Climate change is thus more like vaccination and less like evolution; immediate and partially irreversible harm is taking place [6] (p. 64).

Perhaps. I find, however, that I am not ready to entirely abandon ideals of science communication for democracy in contexts of crisis just yet, at least as one part of the 'ecosystem' of communication [7]. To quote the title of a recent book chapter reflecting on democracy in the pandemic: "Some Things Are So Urgent That We Can't Afford to Do Them Quickly" [17]. Or, from the same volume: "in the face of an emergency, centralising attitudes and policy that overly concentrate power are misguided. Participation and deliberation are not just possible. They are valuable, perhaps even indispensable" [17] (p. 1). In the rest of this commentary, I therefore experiment with some ways of holding together what can seem like conflicting goals—nurturing democracy and acting for public safety—by briefly outlining some initial principles in response to the question: what could science communication look like in times of (slow) disaster and emergency?

2. Grasping the Landscape

Almost 20 years ago Sheila Jasanoff [20] argued for 'technologies of humility' within the management of science in society—methods of participation that acknowledge "the limits of prediction and control" within scientific governance (p. 227). The need for humility has not become less urgent at a time when science at all stages from early findings to final consensus is present in public. To engage in science communication is thus to proceed with humility, tentatively exploring the landscape into which we speak. If we wish to serve democracy by equipping and empowering citizens, we might start—I would suggest—by examining the dynamics of knowledge and contestation in a particular area.

I do not want to over-intellectualise such exploration. While I have in mind methods such as controversy mapping (which can be adapted to be rather informal and ad hoc [21,22]), in essence I think this is about an attitude to the practice of public communication, one that starts with the situation at hand rather than our own priorities and definitions of what is important. Such enquiry will involve asking questions such as: where is power being articulated, and in what ways? Whose voices are not being heard? Where is there inequity? Where are there pathologies or gaps in public discourse, and how might science communication speak into these? In this respect there are clear parallels both with arguments for deliberative democracy as being spread throughout societies rather than concentrated in specific events or processes [23], and with recent work in science communication that has emphasised that much of it is currently designed for and consumed by an extremely narrow segment of possible audiences [24]. As many have argued in the context of the COVID pandemic, crises exacerbate inequality and injustice [17,25]. If science communication is to support democracy, then, one starting point is to seek to understand where such injustice (epistemic or otherwise [26]) is being perpetuated, and to use this understanding to develop science communication that amplifies unheard voices, gives access to science to marginalised groups, or brings together different communities in new partnerships.

3. Grasping the Issues

A related principle extends such analysis into an understanding of what is at stake for different publics and stakeholders. What are the concerns that lie behind and animate particular views about or responses to technoscientific issues, and how can these be articulated, discussed, and—perhaps—responded to? This means, I think, taking both critical and enthusiastic responses to science seriously, viewing them as indications of particular forms of sense-making and ways of life rather than (static) positions in and of themselves [27,28]. Public concerns or hesitations are thus not obstacles to be overcome through persuasive techniques, but symptomatic of divergences in values or of wider democratic malaise. If we understand the issues that lie behind them, we might be able to speak to the causes rather than to surface-level effects.

Two examples may be helpful here. The first is the work of Candis Callison [29] in exploring engagement with climate change within different US communities, from Inuit leaders to science journalists and evangelical Christians. All of those that Callison worked with were convinced of the reality of climate change, but they made sense of it in very different ways, using what Callison calls their own 'vernaculars' to set scientific knowledge into localised "belief systems and ethical imperatives" (p.24). Climate change was less meaningful in and of itself, more a topic that became urgent because of wider commitments: to traditional lands, to economic growth, to a creator. Callison's work therefore emphasises that technoscientific issues are always embedded in and experienced through specific forms of sense-making, concerns, and values, and that they only become meaningful in the context of these. A more applied example is the engagement between New Zealand's government and social care sector and its street gangs in the context of COVID vaccination drives, in which cabinet ministers and gang leaders met to 'hash out a strategy' around vaccination [30]. The approach was, as ministers admitted, bold: they were engaging with communities that were frequently marginalised and sensationalised. However, by working

with community leaders, it became possible to understand positions towards vaccination (and ultimately to encourage its uptake). In such ways might science communication practice identify and understand the issues and concerns that lie behind positions such as climate scepticism or vaccine hesitancy, and seek to be relevant to those issues.

4. Enabling Others

So far the principles I have suggested have been rather analytic in nature: understanding the landscape of public debate (and its deficiencies) and the issues that are at stake for publics, and then seeking to develop science communication that speaks to or magnifies (marginalised) public meanings. Democratic debate may also, however, involve activism by civil society groups or actors. While the extent to which science communicators should or could understand themselves as activists or advocates is contested [31,32], science communication's democratic function might also be fulfilled through equipping, enabling, or supporting the activism of others. There are now many groups and organisations that advocate for climate action (for instance): how might science communication play a role in supporting these?

This point relates to my first, in that understanding the landscape of a particular issue may well result in identifying pathologies or lacunae within public debate on it [7,23]. Where is there a need for information, particular forms of communication, or engagement or deliberation? Which groups are under-resourced in comparison to others? By asking such questions science communicators might see their work as a kind of strategic resource, one that could be used to help repair democratic deficiencies but also to support advocacy with which they would personally align themselves. Their stance would not be to seek to persuade citizens themselves, but to contribute resources that might be used by others. This approach therefore requires both understanding activist activities as important forms of science communication in and of themselves [33], and valuing them as one aspect of democratic public sphere debate [34]. Through acknowledging the value and importance of science-related activism, science communication might fulfil its goal of supporting and empowering citizens without itself engaging in strategic communication, in the sense of seeking to directly persuade or to advocate for particular positions.

5. Being Authentic

Thus far I have suggested some approaches through which science communication might contribute to democratic engagement with science, even in contexts of crisis or emergency where we ourselves, as communicators or scholars, may be committed to particular positions. My final principle moves away from the practices of enabling, analysing, or supporting that I have thus far primarily described, towards situations that are more aligned with strategic communication. How can science communication and communicators acknowledge their (scientifically grounded) positions, perhaps even advocate or advise for them, whilst maintaining an interest in other views and in democratic debate generally?

I think it is possible to hold together a concern for supporting democratic processes with oneself taking a position within such processes. It is challenging, perhaps, because it requires advocating for the practice of multi-vocal engagement and debate as much as for one's own particular views, but—given the now long history of science communication's commitment to public participation and deliberation [9]—this is something that many in science communication should not be unfamiliar with. Such advocacy must, however, be honest. As many others have noted, public engagement is frequently practiced as persuasion, and publicity or marketing branded as education [10,35]. If science communication (and science) is to maintain any credibility, it seems vital to acknowledge the stances that we take, the commitments that we adhere to, and the reasoning through which we have arrived at these. We cannot pretend to be neutral in situations where we are not. Along with theorists of deliberative democracy [36], however, I believe that it remains possible to engage in good faith engagement and discussion even where there is difference. Such honesty and authenticity are, of course, strategies for communication in and of themselves;

beyond such instrumentalism, though, they seem essential to a stance where we seek to nurture democracy by taking the various interlocutors of science communication seriously, as citizens, however strange or unfamiliar their positions may be.

6. Conclusions

I am aware that much of this text remains at a rather abstract level, dealing with ideas and ideals rather than concrete cases. To some extent this is inevitable: within it, I have tried to start to think about the meaning of science communication in the light of many communicators' commitments to its role in democractic societies, alongside the concerns (of myself and many others) about the crises we find ourselves in. If the world is on fire, how should we—scholars and practitioners of science communication—respond? The answers I have tentatively posed maintain the value of a continuing commitment to (deliberative) democratic engagement as one aspect of the landscape of science communication, and suggest (again, very tentatively) some strategies for realising this. Emergency situations should not, I believe, result in a wholesale switch to strategic communication that seeks to persuade and convince citizens of the views of ourselves, of scientists, or of governments. Indeed, it is likely that such an approach is counter-productive: as Smith et al. write, "Hearing the voices of those who are rarely listened to can radically change accepted opinions about what needs to be done. Diversity results in better decision-making" [17] (p. 4).

To reflect on these issues brings us back to the question of what science communication is, and what it is for. In emphasising the functions of public communication and engagement with science for democracy I have framed it not so much as a process where information is transferred or negotiated, but as a means through which societies can nurture shared sense-making about the issues that face them. It is, as Bucchi and Trench have recently argued, "the social conversation around science" and is therefore "unpredictable and open-ended" [37] (pp. 6–7). In times of crisis this unpredictability and openness may appear a liability—but we might also see such emergencies as spaces of possibility, where new practices and habits can be inculcated. With this final idea I will close by quoting Dawson and Streicher [25], whose call for equity and social justice in science communication in the light of the pandemic is closely related to imaginations of science communication as playing an essential role in democratic societies:

We conclude that now, more than ever, we must redefine the science engagement sector with social justice, equity and inclusion at its foundations . . . Socially just practice cannot be framed as peripheral to our work, now, more than ever, it is an absolute necessity [25].

7. Afterword

I wrote much of this commentary at the tail end of 2021, returning to it in March 2022. The events of the intervening months—and in particular the invasion of Ukraine by Russia—have only added to the crises that many science communicators are seeking to respond to. They also bring to the surface a vital issue that I largely ignored in my discussion. To talk of science communication as playing a role in democratic societies is to assume that we do, indeed, live in places where some version of democracy is accepted as a shared ideal. Recent months have acted as a stark reminder that this is not the case: the right to self-governance is eroded or non-existent in many countries, whether that is occupied Ukraine or non-democracies such as China, Cuba, North Korea, or Yemen [38,39].

For at least some people, science is intrinsically tied to democracy. Merton's early sociology of science—written during the rise of other authoritarian regimes in the 1930s and 1940s—argues that there is a fundamental conflict between "the totalitarian state and the scientist" [40] (p. 258). To examine the role of science communication in times of democratic crisis therefore calls us to interrogate even further the societal values that we (as individuals, groups, and communities) wish to promote, and the degree to which it is possible for us to do so. What is our science communication for? What role is it able to play in the wider contexts in which we work? The realities of those contexts will be more or less challenging, and our actions more or less constrained. To think of science communication

as a practice that can nurture democracy therefore demands not only that we reflect on our own activities, but stand in solidarity with, and support for, those in our global community of science communication scholars and practitioners who may wish to promote democracy (in the context of science and beyond), but cannot.

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