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RE-EXAMINING SCIENCE COMMUNICATION:
MODELS, PERSPECTIVES, INSTITUTIONS

Rethinking science communication as the social conversation around science

Massimiano Bucchi and Brian Trench

Abstract

In this essay the authors reflect on some recent trends in science communication research, celebrating it as an inherently interdisciplinary endeavour. Some current tendencies in science communication are more limiting, however: they present theoretical and strategic prescriptions that do not adquately reflect the variety and cultural diversity of science communication internationally. Rethinking science communication in the context of such diverse practices and cultural reorientations, the authors revise some of their own views and revisit notions of communication as conversation to propose an inclusive definition of science communication as *the social conversation around science*.

Keywords

History of public communication of science; Science communication: theory and models

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Introduction: divergent tendencies[1]

Over the past two decades, as the infrastructure and culture of science communication have strengthened, tensions have also emerged that have the potential to be constructive or disruptive. The formats and actors of science communication are diversifying, in part at least as a consequence of media innovations. But the professionalisation of science communication through training and qualifications and its institutionalisation in research centres, higher education institutions and state agencies, together with increasing investments and public relations efforts, tend to support more or less standardised strategies. It is not clear whether such developments are pointing towards increasing public engagement and better quality of science communication or search for visibility and "marketing" of research and its key actors and institutions [Entradas et al., 2020]. The practices of volunteer science communicators — a very important part of the infrastructure — may not always sit comfortably with those of the newly emerging cadre of science communication professionals. How these tensions are negotiated

[1]This essay is adapted from part of the introduction to M. Bucchi and B. Trench (eds.): Routledge Handbook of Public Communication of Science and Technology (3rd edition, 2021). The authors acknowledge comments of two JCOM reviewers as contributions to this version.

in the coming years will have a critical influence on the development of the field of science communication.

Science communication studies include philosophically distinct tendencies to emphasise audience analysis through social research methods, or to emphasise understanding changing institutional contexts through sociological analysis, or to emphasise interpretation of media and other social representations of science through discourse analysis and other cultural studies approaches. We might hope to see divergent tendencies in science communication research as signs of maturation of our field, but much depends too on how these divergences are articulated. These circumstances relate to a discussion of a decade ago of science communication as a discipline. In a contribution to that discussion, we referred to science communication as "an emerging discipline" [Trench and Bucchi, 2010]. We now consider that this view of science communication as a discipline-in-the-making should give way to one of science communication as an inherently, even joyously, interdisciplinary field.

From the early 2010s, the case has been made, mainly in the U.S., that there is or can be a "science of science communication". This proposition, put forward by scholars in the field, has attracted others from neighbouring fields, notably political communication and social psychology, and gathered support from major funders. In considering the feasibility of a "science of science communication" we need to address the larger question, particularly pertinent in the English language, Is there a science of communication? In French and German, for example, this is hardly a question: *les sciences* and *die Wissenschaft* cover almost the full range of formal knowledge production. These designations of science include what is in English generally bracketed out as social sciences and humanities to distinguish them from *hard* sciences, namely the physical, material and life sciences.

Philosophically, that distinction resides in the separation of the subject-researcher from the object-nature; this does not apply in the study of society, language and culture, for example, in which the researcher is themselves thoroughly enmeshed. For there to be a communication science, this distinction needs at least to be acknowledged. But some enthusiasts for the science of science communication [e.g. Kahan, 2015] argue just to get on with the work, and not to dwell on the definitions. A more recent collected volume, published in a German series on communication science, refers to science of science communication and science communication research as interchangeable, drawing on decades-long disciplines in the humanities, notably linguistics [Leßmöllmann, Dascal and Gloning, 2020].

A longer-running, though related, argument has been collecting strength through the decade, that there is a harmful gap between research and practice that needs to be closed, principally by reorienting research. A commissioned report [National Academies of Sciences, Engineering and Medicine, 2017] set out an agenda for research in the field that could support more effective science communication practice. In this agenda, achieving effectiveness is strongly linked with applying notions of strategic communication to science communication, i.e. targeting closely defined publics with tailored messages. The science communication research underlying this approach — as reflected in the NASEM report's bibliography — presents the field as recently emerging and largely U.S.-based; the strategic pitch for political effectiveness reduces the history, geography and complexity of the field.

Some of those active in this debate seek to ascribe to research a role in the service of practice or in the provision of evidence to guide practice, while others insist on the relative autonomy of research as a practice in itself. There are echoes here of a debate in communication studies over sixty years ago between "administrative" and "critical" research, the former dedicated to solving "real-world" problems, the latter more focused on generating new theories and concepts. In science communication, there is, at the very least, a widespread awareness of the pertinence of this relationship. However, some forms of the argument for closing the gap appear as a case for full instrumentalisation of research serving practice.

Much science communication research remains quite properly directed to working out conceptual relationships that may underpin approaches to policy and practice; the relationship may sometimes be remote. Understanding how science communication *really* works means bringing the tools *and theories* of social research in general to bear, and the resulting analyses may often not translate to practical recommendations. Leßmöllmann [2020, p. 679] observes that the perceived gap between research and practice in science communication is the

> same gap between science and its transfer to laypeople or practitioners that other fields grapple with … Not every practical problem is examinable with scientific methods, and not every scientific outcome from science of science communication research can be translated into practical advice.

More recently, advocacy has emerged for "evidence-based science communication", as a way of addressing the research-practice "double disconnect" [Jensen and Gerber, 2020]. This argument clearly has some relevance, since it would be unreasonable to practice science communication today as if the rich body of knowledge and results produced by research in this area did not exist. The implications of advocating "evidence-based science communication", however, seem stronger than this, verging on the prescriptive and raising the questions, Should all or could all science communication be evidence-based? And if so, on which evidence? The advocacy tends to be short on examples of the relevant evidence, and on proposals for building out the evidence base.

As with all rich research fields, science communication has produced different theorisations and different — sometimes even potentially contradictory — evidence. The stock of knowledge that most scholars would potentially recognise as common ground is expressed more in terms of concepts than specific results; also, it is constantly moving, expanding and revising itself. Should the latest evidence be the guiding light of science communication practice or should that rather be an awareness of the field as a whole, from its classic pioneering theorising to contemporary debates and doubts? Science communication involves many variables in terms of actors, contexts and aims that make it difficult for anyone, however knowledgeable, to anchor or even judge the process compared with available evidence. Also, evidence in our field, as in other fields, can be selectively invoked depending on the aims of actors or organisations. In the coronavirus pandemic we have seen "science", "evidence", and "data" promiscuously referenced in public discourse to support conflicting positions. Contests over evidence are perhaps even more likely to arise in claims about the effectiveness of given communication strategies than in interpretations of epidemiological data.

The evidence agenda belies the increasing variety and cultural diversity of science communication practices on a global scale; standard recipes or gold standards can hardly be universally agreed and applied. Much of the evidence produced in our field so far refers to Europe, North America and Oceania contexts of research and practice, but also with a significant and increasing representation of Latin America. Should such evidence guide science communication practice in Africa or Asia? Even within the geographical and cultural areas that have become the primary sources, we have witnessed substantial changes in the guiding political contexts of science communication. Think, for example, of the multiple shifts of European policy in this area during the last three decades from "raising public awareness" to "science and society" and "science in society", to "responsible research and innovation". Science communication practice has had to adapt to these shifts and science communication research has sometimes had to respond, including to reflect critically, to these shifts; more rarely it has contributed to shaping them. But some of the evidence produced within past policy frameworks has little but historical value today, as, for example, with the Public Understanding of Science movement of the mid-1980s. The same fate can perhaps be expected for some of the research produced within the contemporary policy frameworks.

The tendencies in science communication outlined above all have the effect of often limiting the scope of science communication research, training and advice to scientific institutions' and agencies' strategies. We believe science communication research and theories should contribute to a more informed, yet open, discussion of science in society at all levels and relating to all concerned actors. The coronavirus pandemic has highlighted, among other things, the fluidity and ubiquity of science communication across traditionally separated contexts like interactions between experts and policy makers, newsmaking and social media discussions. Addressing key concepts for the field like quality, trust, expertise, equity, engagement (and disengagement) we are addressing matters of concern to society, politics and research as a whole.

Redefining the field: science communication in culture

Views of the role of research relate closely to different ways of thinking about and defining science communication. Many contemporary definitions focus on manifest or latent *purposes* of science communication practice, such as the transfer of information or provision of learning or even stronger political expectations — paternalistic in their mild form, disciplining or engineering the audience in their strong version. We recognise the recent advances in locating public communication of science as part of a continuous process, rather than as a terminal, residual stage of knowledge production. We believe no sharp distinction (even more so in the age of digital media and open science challenges) can be drawn between public and non-public communication of science communication of science, that is, communication within and between scientific communities. There is a rich variety and diversity of science communication, encompassing informal, pleasurable communication as well as that which is targeted and strategic.

A widening range of formats is being deployed in presenting science in public, and an increasing proportion of those formats draws on performance, musical and visual arts. Examples here could include science comedy, science theatre, songs in popular genres with scientific content, science cartoons and installation art engaging with scientific ideas. For some, this shift is expressed in the acronym,

STEAM, to replace the longer-established STEM: arts is inserted into the combination of science, technology, engineering and mathematics. At the same time and in a rather different spirit, a new model of science centre is being applied across the world based on 'colliding' science and art [Gorman, 2020]. The Science Gallery International network has grown out of the experience of a small centre established in Trinity College Dublin in 2008. As of 2020, there are sister galleries recently opened, or due to open soon, in Australia, Britain, India, Italy and United States. In these and other venues, art-science appears as a distinct model of science communication. This and other significant experiences suggest a broader, non-prescriptive rethinking of science communication, encompassing a variety of languages and formats that stimulate publics to think about, respond to and discuss science and its role in society. In this view, science communication is not about displaying stabilised knowledge (the Science Gallery does not have any permanent collection of objects to display, and explanation panels are minimal) but something that occurs in the encounter itself of different forms of expertise, communication, creation and visitors' engagement.

Such developments encourage the consideration of science communication in or as culture, requiring analysis with the tools and concepts of cultural studies. This theme has been taken up by Davies and Horst [2021], extending the work the same authors did in *Science Communication — culture, identity and citizenship* [Davies and Horst, 2016] and, with others, in an analysis of the same topics in a context of storytelling. In the last-named work, it is observed:

> Rather than public communication [of science] being about the transfer of certain facts — the nature of DNA, the scientific method, whether vaccines cause autism — it is instead about how particular societies or groups explain the world. Understanding science communication as meaning-making therefore draws our attention to its functions at the level of shared identities and imaginations, alongside its undoubted role in disseminating particular scientific notions [Davies, Halpern et al., 2019, p. 3].

Over twenty years ago Jean-Marc Lévy-Leblond proposed that science communication was about the *mise-en-culture* of science [Lévy-Leblond, 1996]. He deliberately suggested a connection with the putting-on-stage (*mise-en-scène*) of a piece of theatre but he may also have been hinting at the application in science of *mise-en-culture*, which refers to the cultivation of organisms *in-vitro*. There is no corresponding phrase in English for the theatrical version, hence the use of *mise-en-scène* in English too, and we have that notion in mind when we consider how ideas and images from science infuse into and percolate through general culture. Writing on science in popular culture Bucchi and Lorenzet [2008, p. 140] described the interchanges of "ideas circulating in the public arena and in the specialist discourse" as "cross-talk"; this was proposed as "a different understanding of science communication" — different from the dominant model of information transfer. In the same collection of essays, Trench [2008, p. 131] named as conversation the 'base communication model' underlying the science communication model of participation, situated in a triad with deficit and dialogue models. In a further contribution to that collection Bauer [2008, p. 23] outlined a possible "paradigm change for science communication" proposing that "cultivating public conversations that are highly scientifically literate, but also sceptical of the hyperbolic claims of professional knowledge marketers" could be a

mark of "universally desirable" science and technology in society. Bauer later [2009, p. 235] referred to the challenge of mapping "the societal conversation of science" as equivalent to showing "the presence of science in public conversations". Later, picking up the threads of this discussion, we suggested that the object of science communication research might be expressed as "how society talks about science" [Bucchi and Trench, 2014, p. 10] and Trench [2018] spoke of science communication as "society telling stories about science … [including] everyday stories about science on radio programmes, in social networks, in artists' studios, in cafés and bars". Add to that the novels, pop and rock songs, theatre and comedy performances that give presence to science in public and popular culture and in the everyday, and we come to a definition: *science communication is the social conversation around science*.

Conversation and conversations

Two related usages of *conversation* are in play here: a mode of interactive communication that is set in contrast with dissemination or other hierarchical modes, and a concept that embraces all that is being said on a certain matter in society. Our inclusive definition of science communication not only validates activities such as science cafés and science comedy that are oriented to pleasure, but also recognises as part of the wider practice of science communication the 'spontaneous' use in popular culture of images and ideas from and related to science. Hozier, an Irish singer-songwriter with an international audience, picked up from a TED Talk by astrophysicist Katie Mack the notion that the expansion of the universe could be reversed. He named Mack in a line in his song, No Plan: "As Mack said, there will be darkness again". This naming found its way into the Wikipedia entry for Mack,[2] the pair met in 2019 after one of his concerts and tweeted excitedly about the encounter, and so the conversation has continued on Twitter and by other means, continually amplifying Mack's thesis. In her book, *The end of everything (astrophysically speaking)* [2020], she returned the compliment to Hozier, by quoting him. Thus, we find science communication as conversation where there are no science communicators, self-designated or not.

Conversation also emphasises long-term continuity in science communication: *conversazione* (in the Italian form) was a widely used designation in the 19th century for public displays, demonstrations and explanations of current science mounted by scientific societies for the enlightenment and entertainment of their expanding publics. Further back in history, Robert Hooke's *Micrographia* [1665], a book of sixty illustrations mostly drawn from observations at the microscope, was originally designed to *include in the conversation* King Charles II, who was expected to pay a visit to the Royal Society; his Majesty could obviously not be asked to sit together with the fellows and look into the microscope [Nicolson, 1956].

A different kind of conversation over time can be seen in the trajectory of pictures of the dodo bird painted by the 17th-century Flemish painters Roelant and Jan Savery about the time when the last living exemplar was seen in Mauritius. Two centuries later, mathematician and writer Charles Dodgson (pseudonym, Lewis Carroll) introduced the bird as a character in *Alice's adventures in Wonderland* [1865]. He was likely inspired by a Savery image of a dodo that he had seen in Oxford in guiding his illustrator, John Tenniel. In the same period naturalist Richard Owen

[2] https://en.wikipedia.org/wiki/Katie_Mack_(astrophysicist).

[1866] was figuring out how to reconstruct fossil remains of a dodo sent to him at the British Museum and used Roelant Savery's paintings as a source. Three years later, Owen acknowledged he had been misled by such paintings to represent the dodo as 'squat and overly obese' [Hume, Cheke and McOran-Campbell, 2009, p. 45; see also Parish, 2013; Hume, Martill and Dewdney, 2004], but by then the image of the clumsy and funny dodo had stuck. We see here an interesting conversation loop from images in art influencing science and literature and settling in popular culture [Bucchi and Canadelli, 2015].

A characteristic of conversation articulated in communication studies and philosophy is that it is unpredictable and open-ended; we are also adopting deliberately this characteristic. Franco-Moroccan philosopher Ali Benmakhlouf [2016] stresses this, drawing insights from *Alice's adventures in Wonderland*, which features many false starts and misunderstandings in conversations. Ideas, information or images from and about science can spread widely, as one conversation opens another: in the process, the ideas, information and ideas inevitably acquire new meanings. This process does not always or only depart from and return to science, its actors and its institutions; it swirls in society somewhat independently, and with interruptions, and that is what we intend to capture with the preposition, *around*, in our definition of science communication as the social conversation around science.

For key thinkers on the public like Dewey and Habermas, talk and conversation were basic ingredients of civil, democratic and public life. Dewey [1927] declared the decline of conversation '*the* problem of the public'. Communications theorist James Carey advocated strongly from the 1970s for conversation as fundamental to democracy and for journalism as facilitating that conversation. By the 1990s communications scholar Michael Schudson was writing of the 'obsession' with, and 'romance' of, conversation, drawing attention to differences between rules-bound problem-solving conversation, which can be difficult and even boring, and sociable conversation that is "an end-in-itself, an aesthetic pleasure" [1997, p. 300]. In turn, Finnish scholar Risto Kunelius [2001, p. 45] questioned Schudson's hard distinctions:

> If we deem only certain kinds of conversations democratically virtuous, we run the risk of uprooting democratic interaction from its cultural settings, and glorifying something that is at the same time in great danger of becoming irrelevant and hollow … the "public pleasure" of the participants is an important (preliminary) piece of evidence against the categorical idea of the uncomfortable and dangerous nature of public conversations.

There may well be useful analogies to be drawn here with conversations on and around science, and the common tendency to prioritise those virtuous ones that (aim to) provide learning over those pleasurable ones that (merely) entertain. Also relevant to science communication, with its frequently asymmetrical relations, is the observation of U.S. communications scholar John Durham Peters that "conversation is no more free of history, power, and control than any other form of communication" [2000]. In other words, conversation can be manipulated and is not *necessarily* open and equitable. Many attributes can be a handicap to participation, including gender, educational level, ethnicity and language. It takes conscious action to address these imbalances and exclusions.

Many meanings of conversation can be accommodated in this discussion, from the structured engagement across society, the sponsored consultation to spontaneous, even unruly, café chat. And there are more pertinent usages too: the notion of a national conversation as often deployed with a desire to shift public opinion in a certain direction; the Internet-mediated flow of information between experts and publics as expressed in the online initiative, The Conversation.

The conversation we speak of is both singular — *the* social conversation — and plural — the dispersed conversations of communities and colleagues, including the behind-the-scenes conversations of scientists that come increasingly into public view through social networks. Scientists' cafeteria and corridor conversations resonate with public chat and feed into expert presentations for lay audiences, touching both ends of a spectrum that we represent graphically as various kinds of conversation that bear on science in society in diverse ways (Figure 1). This representation has its origins in a table used to illustrate an analysis of science communication models [Trench, 2008]. We consider frameworks for the conversation and models of communication to be near-equivalent: they refer to the assumptions underlying a chosen communicative action. But what appeared in the earlier version as a fairly fixed triad of deficit, dialogue and participation is intended here to be seen as dynamic: the two-headed arrow points to orientations that are, for example, more or less closed, more or less open. Similarly, purposive and non-purposive should not be seen as a binary on-or-off but rather a greater or lesser emphasis on stated or unstated purposes of a communication. The figure is proposed as an aid to setting up, joining, or making sense of, conversations around science. The spectrum illustrated in this way may be compressed or extended, like an accordion, in any period or over time. New formats of science communication, notably art-science projects, may well facilitate conversations around science of kinds not yet envisaged. The range of modes is continually growing, but not just in the direction of more participation, or co-creation, as a 'progressivist' point of view might suggest. In the Covid-19 crisis, science was often invoked and scientific legitimacy was claimed by policy-makers, to support measures that sought the population's compliance and thus limited social conversation.

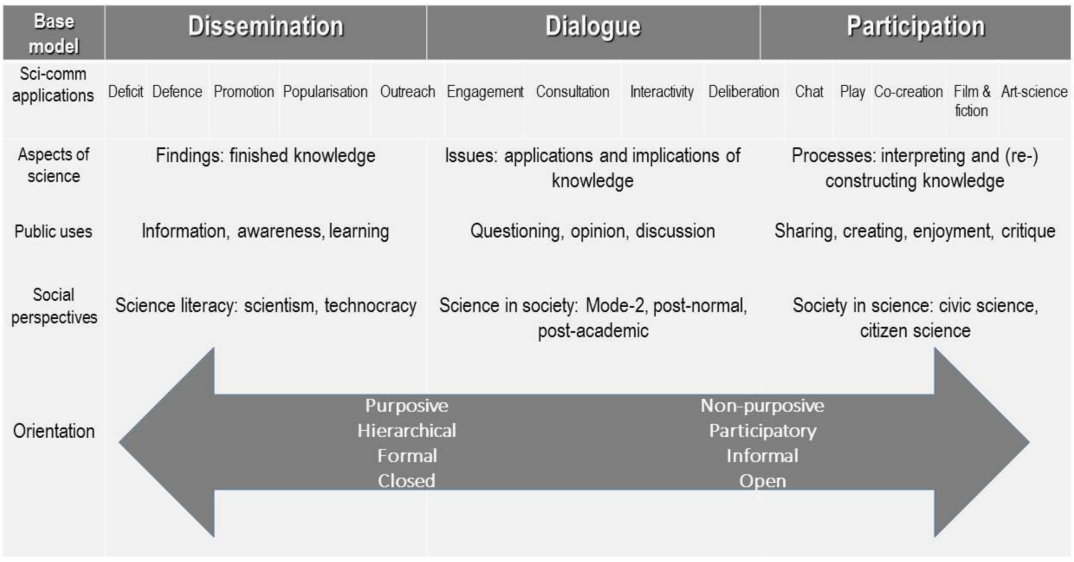

Figure 1. Framework of the social conversation around science.

Conclusion

The perspective on science communication as social conversation/s that we outline here has implications for science communication research, both applied and fundamental, raising the priority given to questions of ethics, equity, inclusion, quality and history. It suggests that evaluation of science communication practice might be done in terms of how, and how much, a given practice or set of practices stimulate wider conversation. It also points to a wider context for analysis and reflection on science communication's social role and responsibility, putting long-standing issues of impact and effectiveness of science communication into a new context. It fosters reflection on the underlying values and purposes of science communication and on the largely tacit political and economic connotations of keywords like "responsible innovation" or of fashionable formats for presenting science to young audiences, as well as on their long-term consequences for the public perception and social role of science.

A narrow definition of science communication has often carried with it a narrow definition of quality as impact or effectiveness, raising and reflecting expectations of quick fixes and solutions. Viewing science communication as social conversation expands and deepens also the quality challenge, increasing the range of relevant points of views and stakeholders: the quality of a conversation can never be judged just by one of the parties to that conversation.

References

Bauer, M. W. (2008). 'Paradigm change for science communication: commercial science needs a critical public'. In: Communicating science in social contexts. New models, new practices. Ed. by D. Cheng, M. Claessens, T. Gascoigne, J. Metcalfe, B. Schiele and S. Shi. Dordrecht, Netherlands: Springer, pp. 7–25. https://doi.org/10.1007/978-1-4020-8598-7_1.

— (2009). 'The evolution of public understanding of science — discourse and comparative evidence'. *Science, Technology and Society* 14 (2), pp. 221–240. https://doi.org/10.1177/097172180901400202.

Benmakhlouf, A. (2016). La conversation comme manière de vivre. Paris, France: Albin Michel.

Bucchi, M. and Canadelli, E. (2015). Nature immaginate. Immagini che hanno cambiato il nostro modo di vedere la natura. Sansepolcro, Italy: Aboca Edizioni.

Bucchi, M. and Lorenzet, A. (2008). 'Before and after science: science and technology in pop music, 1970–1990'. In: Communicating science in social contexts. New models, new practices. Ed. by D. Cheng, M. Claessens, T. Gascoigne, J. Metcalfe, B. Schiele and S. Shi. Dordrecht, Netherlands: Springer, pp. 139–150. https://doi.org/10.1007/978-1-4020-8598-7_8.

Bucchi, M. and Trench, B. (2014). 'Science communication research: themes and challenges'. In: Routledge Handbook of public communication of science and technology. Ed. by M. Bucchi and B. Trench. 2nd ed. London, U.K. and New York, U.S.A.: Routledge, pp. 1–14. https://doi.org/10.4324/9780203483794.

Carroll, L. (1865). Alice's adventures in Wonderland. London, U.K.: Macmillan.

Davies, S. R., Halpern, M., Horst, M., Kirby, D. A. and Lewenstein, B. (2019). 'Science stories as culture: experience, identity, narrative and emotion in public communication of science'. *JCOM* 18 (05), A01. https://doi.org/10.22323/2.18050201.

Davies, S. R. and Horst, M. (2016). Science communication: culture, identity and citizenship. London, New York and Shanghai: Palgrave Macmillan. https://doi.org/10.1057/978-1-137-50366-4.

Davies, S. R. and Horst, M. (2021). 'Science communication as culture: a framework for analysis'. In: Routledge Handbook of public communication of science and technology. Ed. by M. Bucchi and B. Trench. 3rd ed. London, U.K. and New York, U.S.A.: Routledge.
Dewey, J. (1927). The public and its problems. New York, NY, U.S.A.: Henry Holt and Company.
Entradas, M., Bauer, M. W., O'Muircheartaigh, C., Marcinkowski, F., Okamura, A., Pellegrini, G., Besley, J., Massarani, L., Russo, P., Dudo, A., Saracino, B., Silva, C., Kano, K., Amorim, L., Bucchi, M., Suerdem, A., Oyama, T. and Li, Y.-Y. (2020). 'Public communication by research institutes compared across countries and sciences: building capacity for engagement or competing for visibility?' *PLoS ONE* 15 (7), e0235191. https://doi.org/10.1371/journal.pone.0235191.
Gorman, M. J. (2020). Idea colliders: the future of science museums. Cambridge, MA, U.S.A.: MIT Press.
Hooke, R. (1665). Micrographia. London, U.K.: Royal Society.
Hume, J. P., Cheke, A. S. and McOran-Campbell, A. (2009). 'How Owen 'stole' the Dodo: academic rivalry and disputed rights to a newly-discovered subfossil deposit in nineteenth century Mauritius'. *Historical Biology* 21 (1–2), pp. 33–49. https://doi.org/10.1080/08912960903101868.
Hume, J. P., Martill, D. M. and Dewdney, C. (2004). 'Palaeobiology: Dutch diaries and the demise of the dodo'. *Nature* 429 (6992), p. 621. https://doi.org/10.1038/nature02688.
Jensen, E. A. and Gerber, A. (2020). 'Evidence-based science communication'. *Frontiers in Communication* 4, 78. https://doi.org/10.3389/fcomm.2019.00078.
Kahan, D. M. (2015). 'What is the "science of science communication"?' *JCOM* 14 (03), Y04. https://doi.org/10.22323/2.14030404.
Kunelius, R. (2001). 'Conversation: a metaphor and a method for better journalism?' *Journalism Studies* 2 (1), pp. 31–54. https://doi.org/10.1080/14616700117091.
Leßmöllmann, A. (2020). 'Current trends and future visions of (research on) science communication'. In: Science communication. Ed. by A. Leßmöllmann, M. Dascal and T. Gloning. Berlin, Germany and Boston, MA, U.S.A.: De Gruyter Mouton, pp. 657–688. https://doi.org/10.1515/9783110255522-031.
Leßmöllmann, A., Dascal, M. and Gloning, T., eds. (2020). Science communication. Berlin, Germany and Boston, MA, U.S.A.: De Gruyter Mouton.
Lévy-Leblond, J.-M. (1996). La pierre de touche. La science à l'épreuve… Paris, France: Gallimard.
Mack, K. (2020). The end of everything (astrophysically speaking). London, U.K.: Allen Lane.
National Academies of Sciences, Engineering and Medicine (2017). *Communicating science effectively: a research agenda*. URL: https://www.nap.edu/read/23674/chapter/1.
Nicolson, M. H. (1956). Science and imagination. Ithaca, NY, U.S.A.: Great Seal Books.
Owen, R. (1866). Memoir on the Dodo. London, U.K.: Taylor and Francis.
Parish, J. C. (2013). The dodo and the solitaire: a natural history. Bloomington, IN, U.S.A.: Indiana University Press.
Peters, J. D. (2000). Speaking into the air: a history of the idea of communication. Chicago, IL, U.S.A.: University of Chicago Press.
Schudson, M. (1997). 'Why conversation is not the soul of democracy'. *Critical Studies in Mass Communication* 14 (4), pp. 297–309. https://doi.org/10.1080/15295039709367020.

Trench, B. (2008). 'Towards an analytical framework of science communication models'. In: Communicating science in social contexts. New models, new practices. Ed. by D. Cheng, M. Claessens, T. Gascoigne, J. Metcalfe, B. Schiele and S. Shi. Dordrecht, Netherlands: Springer, pp. 119–135. https://doi.org/10.1007/978-1-4020-8598-7_7.

— (2018). *Opening address to PCST Conference, Dunedin, New Zealand, 3–6 April*. URL: https://pcst.co/news/article/49.

Trench, B. and Bucchi, M. (2010). 'Science communication, an emerging discipline'. *JCOM* 09 (03), C03. https://doi.org/10.22323/2.09030303.

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