Cornell University

Comm 6660/STS 6661
Public Engagement in Science
Fall 2021

This syllabus (including any updates) appears on the Cornell Canvas site
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Instructor
Bruce Lewenstein
Professor of Science Communication
462 Mann Library
Cornell University
Ithaca, NY 14853 USA
Phone: +1-607-255-8310
E-mail: b.lewenstein@cornell.edu

Office hours
Wednesday, 1:00-3:00 pm
Mann Library 462
and happily by appointment at other times
https://blogs.cornell.edu/lewenstein/make-an-appointment/

Time and location
Monday and Wednesday, 9:35-11:05, 101 Kennedy Hall
To deal with the risks of in-person learning during the COVID-19 pandemic, everyone in the classroom must wear masks, and be following Cornell policy regarding vaccinations and testing.

Course description
For decades, discussion of "science literacy" was at the center of discussions about public communication of science and technology. But after the emergence of a "public engagement" model in the 2000s, the term "science literacy" fell out of (scholarly) favor, being seen as connected to a disparaged "deficit" approach.* Then a 2016 National Academies of Science, Engineering, and Medicine report renewed discussion about science literacy. At about the same time, the field of "science of science communication" consolidated.

Now the world has changed again, and we are worried about justice and equity, in a world filled with misinformation about science.

Our goal this semester is to make sense of current scholarly discussions – both to understand where we were at the end of the "before times" (pre-pandemic, pre-#MeToo, pre-Black Lives Matter), and see where we might go moving forward. This semester, we will begin with an overview of pre-2020 discussions about public communication of science and technology, including comments on public engagement, deficit, and other models, as well as the 2016 re-focus on science literacy and the 2016/2017 consolidation of "science of science communication." Then we'll look at the emerging literature on "inclusive science communication," finding ways to connect emerging questions to the enduring ones.

* Don't worry if you don't know what these models are – we'll discuss in class!

Everyone will be expected to do the reading and come to class prepared to explore the readings. To "explore the readings" means you've read the texts, you've thought about them, and you're ready to see where the arguments lead. It also means you've identified inconsistencies or problems with the logic and are ready to tear the texts apart. You will usually find material that is intellectually challenging: it may require multiple readings to make sense, or it may challenge beliefs you already have (even though you may not have known that you have them). You will be expected to justify your reactions with specific references to the texts or, when relevant, to other texts. In addition to our in-person class meetings, cyberspace discussions via Canvas will play a key role in the course.

Each student will be responsible for helping lead at least one of the in-class discussions. You will come to class with a specific set of questions raised by the texts. Those questions may emerge from the content of the reading, or they may question the logic or approach taken by the author(s). Discussion leaders should circulate the questions on the Canvas discussion module by 6:00 pm on Sunday, before class on Monday.

Learning objectives
After completing this course, students will be able to:

- Understand the consensus about public engagement in science though about 2017
- Understand key issues emerging in current scholarly debates about public engagement in science, especially around issues of equity and justice
- Identify holes in current scholarship on public engagement in science
- Plan, write, and present literature reviews on issues in public engagement in science

Texts
Most readings will be accessible online, either directly or through the Cornell Library. Some readings will be posted on Canvas.

Assignments
Reading response: Each week, you should submit a reading response of roughly 500 words. Responses should not be simple summaries of the readings, but *responses* – your statement of the key point of the reading and your sense of what works and what doesn't work in the author(s)'s argument. Provide detail. When there are multiple readings, you may either make an overall response or choose one or two articles to look at. You must post your response on the Canvas discussion module by Saturday, 6:00 pm, of each week – and you should plan on reading your colleagues' responses before class on Monday.[†]

Citation sleuthing: As we make sense of the literature, one tool is to follow citations. Beginning with one article, who did that article cite? Who has cited that article? What other articles or books have those authors (both of the original article, and of the ones you find by sleuthing) published? I will demonstrate this process in class. Then each of you will pick one of the readings we've used, and try it out yourself.

[†] We'll discuss this timing in class. I'm trying to strike a balance between encouraging you to take the weekends off – and recognizing the reality of student life and study cycles.

Final paper: You will write a 10-20 page final paper exploring the scholarly literature around one aspect (of your choice) of public engagement with science.

Grades
Grades will be based on class participation (50%, including written comments on readings, the sleuthing assignment, and contributions to class discussions both physically and virtually) and on the final paper (50%).

Note: The next few sections of this syllabus look like boilerplate. But they're not. Reading and understanding them is critical to success in this course and in your overall education. Please let me know if you have any questions.

Academic integrity
Academic integrity is crucial to your personal scholarly identity. Your rights and responsibilities in this area are outlined in the Cornell University Code of Academic Integrity: https://theuniversityfaculty.cornell.edu/dean/academic-integrity/code-of-academic-integrity/.

Violations of the code of conduct include but are not limited to:

- Submitting work in this class that has also been submitted for a grade in another course without prior permission of both instructors.
- Using, obtaining, or providing unauthorized assistance on examinations, papers, or any other academic work.
- Misrepresenting another person's work as your own. You are responsible for obeying the Code of Academic Integrity. Ignorance of the code is not an excuse.

The most common problem for many students is plagiarism, which will not be tolerated and will be sanctioned by failure of the course. Students from cultures outside the United States should be especially aware that American standards of acknowledgement and use of material prepared by others (especially one's professors) can be much different than those in other cultures. More information about plagiarism is available at http://plagiarism.arts.cornell.edu/tutorial/index.cfm.

By taking this course, you acknowledge that all required reading responses, papers, and other course work may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted material will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

If you have any questions about how to interpret the Code in the context of assignments or activities in this class (especially any that involve collaboration with your colleagues), please feel free to contact the instructor or the University Ombudsman.

Students with special circumstances

Cornell University (as an institution) and I (as a human being and instructor of this course) are committed to full inclusion in education for all persons. Services and reasonable accommodations are available to students with temporary and permanent disabilities, to students with DACA or undocumented status, to students facing mental health issues, to students with other personal situations (such as family emergencies or religious observances), and to students with other kinds of learning needs. Please feel free to let me know if there are circumstances affecting your ability to participate in class. Some resources that might be of use include:

- Office of Student Disability Services, https://sds.cornell.edu/
- Cornell Mental Health site – student section, https://mentalhealth.cornell.edu/get-support/support-students (you can explore other parts of the site, as well)
- Undocumented/DACA Student Support, https://scl.cornell.edu/identity-resources/undocumented-daca-support
- Learning Strategies Center, http://lsc.cornell.edu/
- Office of Spirituality and Meaning Making/Cornell United Religious Work, https://scl.cornell.edu/identity-resources/office-spirituality-and-meaning-making

I would be glad to help you identify other resources if needed.

Credits

I have developed this syllabus over many years, and in the past haven't kept track of specific credits. This year, as I built the sections on equity and justice, I am grateful for comments and suggestions from Emily Dawson (University College London), Marina Joubert (Stellenbosch University), Sunshine Menezes (University of Rhode Island), and Mark Sarvary (Cornell).

Tentative course schedule

Week 0, No class

Classes this semester begin on Thursday, 26 August – but this is a Mon/Weds class. So, no class meetings. BUT: Please take the time to read in advance: http://informalscience.org/news-views/public-engagement. Shouldn't take you more than 15-20 minutes, if that!

Week 1, 30 Aug and 1 Sept: Introduction

Brossard, Dominique, & Lewenstein, Bruce V. (2010). A Critical Appraisal of Models of Public Understanding of Science: Using Practice to Inform Theory. In LeeAnn Kahlor & Patricia Stout (Eds.), *Communicating Science: New Agendas in Communication* (pp. 11-39). New York: Routledge. [on Canvas]

National Academies of Science, Engineering, and Medicine. (2017). Public Engagement. In *Human Genome Editing: Science, Ethics, and Governance* (pp. 125-137). Washington, DC: National Academies Press. [link, free download]

Storksdieck, Martin, Stylinski, Cathlyn, & Bailey, Deborah. (2016). *Typology for Public Engagement with Science: A Conceptual Framework.* Washington, DC: AAAS Office of Public Engagement. [link]

Supplementary reading

Bauer, Martin W., (ed.). (2014). Public Engagement [special issue]. *Public Understanding of Science*, 23(1), 3-76. https://doi.org/10.1177/0963662513518149.

Rowe, Gene, & Frewer, Lynne J. (2005). A typology of public engagement mechanisms. *Science, Technology & Human Values*, 30(2), 251-290. http://doi.org/10.1177/0162243904271724.

House of Commons Science & Technology Committee. (2017). *Science communication and engagement*. [link]

Salmon, Rhian A., Priestley, Rebecca K., & Goven, Joanna. (2017). The reflexive scientist: an approach to transforming public engagement. *Journal of Environmental Studies and Sciences,* 7(1), 53-68. https://doi.org/10.1007/s13412-015-0274-4.

Week 2, 6 & 8 Sept: Science of Science Communication

[Note: Monday, 6 September: NO CLASS, LABOR DAY]

Kahan, Dan, Scheufele, Dietram A., & Jamieson, Kathleen Hall. (2017). Introduction: Why Science Communication? In Kathleen Hall Jamieson, Dan Kahan, & Dietram A. Scheufele (Eds.), *Handbook of Science of Science Communication* (pp. 1-11). New York: Oxford. [Cornell Library link]

Akin, Heather. (2017). Overview of the Science of Science Communication. In Kathleen Hall Jamieson, Dan Kahan, & Dietram A. Scheufele (Eds.), *Handbook of Science of Science Communication* (pp. 25-33). New York: Oxford. [Cornell Library link]

National Academies of Science. (2016). *Communicating Science Effectively: A Research Agenda.* Washington, DC: The National Academies Press., chapters 3-5 [link, free download]

Week 3, 13 & 15 Sept: Science literacy

Snow, Catherine E., Dibner, Kenne A., & Committee on Science Literacy and Public Perception of Science (Eds.). (2016). *Science Literacy: Concepts, Contexts, and Consequences*. Washington, DC: National Academies Press. [link, free download]

Besley John, C., & Hill, Derek. (2020). Science and Technology: Public Attitudes, Knowledge, and Interest. In National Science Board (Ed.), *Science and Engineering Indicators 2020* (NSB-2020-7). Alexandria, VA: NSF National Center for Science & Engineering Statistics. [link]

Supplementary reading

Miller, Jon D. (1983). Scientific Literacy: A Conceptual and Empirical Review. *Daedalus, 112*(2), 29-48. [link]

Week 4, 20 & 22 Sept: Citizen science and community science

[NOTE: Class on Wednesday, 22 September, will be held via Zoom on Canvas]

Pandya, Rajul, & Dibner, Kenne Ann (Eds.). (2018). Mapping the Landscape. In *Learning through Citizen Science: Enhancing Opportunities by Design* (pp. 27-51). Washington, DC: National Academies Press. [link, free download]

Ottinger, Gwen. (2017). Crowdsourcing Undone Science. *Engaging Science, Technology, & Society, 3*, 560-574. https://doi.org/10.17351/ests2017.124.

Kinchy, Abby. (2017). Citizen Science and Democracy: Participatory Water Monitoring in the Marcellus Shale Fracking Boom. *Science as Culture, 26*(1), 88-110. http://doi.org/10.1080/09505431.2016.1223113.

Blacker, Sarah, Kimura, Aya H., & Kinchy, Abby. (2021). When citizen science is public relations. *Social Studies of Science*, http://doi.org/10.1177/03063127211027662.

Cooper, Caren B., et al. (2021). Inclusion in citizen science: The conundrum of rebranding. *Science, 372*(6549), 1386. http://doi.org/10.1126/science.abi6487.

Week 5, 27 & 29 Sept: Science communication around the world

Gascoigne, Toss, Schiele, Bernard Schiele, Leach, Joan, Riedlinger, Michelle, Lewenstein, Bruce V., Massarani, Luisa, & Broks, Peter (Eds.). (2020). *Communicating Science: A Global Perspective*. Canberra: ANU Press. [link, free download] Selected chapters.

Week 6, 4 & 6 Oct: Inclusive science communication

Canfield, Katherine, Menezes, Sunshine, & Liu, Christine. (2020). *The state of inclusive science communication: A landscape study*. Kingston, RI: Metcalf Institute, University of Rhode Island. [link]

Canfield, Katherine N., Menezes, Sunshine, Matsuda, Shayle B., Moore, Amelia, Mosley Austin, Alycia N., Dewsbury, Bryan M., . . . Taylor, Cynthia. (2020). Science Communication Demands a Critical Approach That Centers Inclusion, Equity, and Intersectionality. *Frontiers in Communication, 5*(2). http://doi.org/10.3389/fcomm.2020.00002.

Bevan, Bronwyn, Calabrese Barton, Angela, & Garibay, Cecilia. (2020). Broadening Perspectives on Broadening Participation: Professional Learning Tools for More Expansive and Equitable Science Communication. *Frontiers in Communication, 5*(52). http://doi.org/10.3389/fcomm.2020.00052.

Polk, Emily, & Diver, Sibyl. (2020). Situating the Scientist: Creating Inclusive Science Communication Through Equity Framing and Environmental Justice. *Frontiers in Communication, 5*(6). http://doi.org/10.3389/fcomm.2020.00006.

Week 7, 11 & 13 Oct: Different abilities

[Note: Monday, 11 October, NO CLASS: INDIGENOUS PEOPLES' DAY]

[Note: The virtual Symposium on Inclusive Science Communication will be held 14-16 October. See the website for registration details.]

DUE: Friday, 15 October: Citation sleuthing

Pérez-Montero, Enrique. (2019). Towards a more inclusive outreach. *Nature Astronomy,* 3(2), 114-115. https://doi.org/10.1038/s41550-019-0693-3

Reich, Christine, Price, Jeremy, Rubin, Ellen, & Steiner, Mary Ann. (2010). *Inclusion, Disabilities, and Informal Science Learning*, online at https://www.informalscience.org/inclusion-disabilities-and-informal-science-learning.

Reich, Christine. (2012, 30 November). Changing practices: Inclusion of people with disabilities in science museums. *ASTC-Dimensions*, online at http://www.astc.org/astc-dimensions/changing-practices-inclusion-of-people-with-disabilities-in-science-museums/

Week 8, 18 & 20 Oct: Language

Márquez, Melissa C., & Porras, Ana Maria. (2020). Science Communication in Multiple Languages Is Critical to Its Effectiveness [Opinion]. *Frontiers in Communication*, *5*(31). https://doi.org/10.3389/fcomm.2020.00031

Ro, Christine. (2020, 16 Janaury). What happens if you have no word for 'dinosaur'. *BBC Future,* online only, at https://www.bbc.com/future/article/20200116-what-happens-when-you-have-no-word-for-dinosaur.

Zoubi, Kawther, Sharon, Aviv J., Nitzany, Eyal, & Baram-Tsabari, Ayelet. (2021). Science, Maddá, and 'Ilm: The language divide in scientific information available to Internet users. *Public Understanding of Science*, https://doi.org/10.1177/09636625211022975 [see also related video at https://www.youtube.com/watch?v=ZYTlIdUWxss]

Fish, Derek, Allie, Saalih, Pelaez, Nancy, & Anderson, Trevor. (2016). A cross-cultural comparison of high school students' responses to a science centre show on the physics of sound in South Africa. *Public Understanding of Science*, *26*(7), 806-814. https://doi.org/10.1177/0963662516642725

Landis, Ben Young, Bajak, Aleszu, de la Hoz, Jenny F., González, José G., Gose, Robin, Tibbs, Claudia Pineda, & Oskin, Becky. (2020). CómoSciWri: Resources to Help Science Writers Engage Bicultural and Bilingual Audiences in the United States [Opinion]. *Frontiers in Communication*, *5*(10). https://doi.org/10.3389/fcomm.2020.00010

Week 9, 25 & 27 Oct: Race, Socio-Economic Status, and Decolonization

[Note: I'm troubled by this grouping of topics. We should discuss in class.]

DUE: Wednesday, 27 Oct: Final paper memo

Biyela, Sibusiso. (2019, 12 February). Decolonizing science writing in Africa. The Open Notebook. Retrieved 13 July 2020 from https://www.theopennotebook.com/2019/02/12/decolonizing-science-writing-in-south-africa/

- See also: Kwon, D. 2019. Decolonizing science through sci comm. Symmetry (December 2019). Available at: https://www.symmetrymagazine.org/article/decolonizing-science-through-sci-comm

Dawson, Emily, & Wang, Sophia. (2020). *Equity, Exclusion, and Everyday Science Learning: The Zine Edition*. London. [link]

- Drawn from: Dawson, Emily. (2019). *Equity, Exclusion, and Everyday Science Learning: The Experiences of Minoritised Groups*. Routledge.

Orthia, Lindy. (2020). Strategies for including communication of non-western and indigenous knowledges in science communication histories. *JCOM: Journal of Science Communication*, *19*(2), A02, online only, http://doi.org/10.22323/2.19020202.

Lorenz, Lissette. (2020). Addressing diversity in science communication through citizen social science. *JCOM: Journal of Science Communication*, *19*(4), A04, online only, http://doi.org/10.22323/2.19040204.

Week 10, 1 & 3 Nov: Gender

Lewenstein, Bruce V. (2019). Editorial introduction: The need for feminist approaches to science communication. *JCOM: Journal of Science Communication*, *18*(4), C1801, online only, http://doi.org/10.22323/2.18040301.

Halpern, Megan. (2019). Feminist Standpoint Theory and Science Communication. *JCOM: Journal of Science Communication*, *19*(4), C02, online only, http://doi.org/10.22323/2.18040302.

Pérez-Bustos, Tania. (2014). Of Caring Practices in the Public Communication of Science: Seeing through Trans Women Scientists' Experiences. *Signs: Journal of Women in Culture and Society*, *39*(4), 857-866, https://doi.org/10.1086/675540.

Orthia, Lindy A., & Morgain, Rachel. (2016). The Gendered Culture of Scientific Competence: A Study of Scientist Characters in Doctor Who 1963–2013. *Sex Roles*, *75*(3), 79-94. https://doi.org/10.1007/s11199-016-0597-y.

Steinke, Jocelyn. (2005). Cultural Representations of Gender and Science: Portrayals of Female Scientists and Engineers in Popular Films. *Science Communication*, 27(1), 27-63. http://doi.org/10.1177/1075547005278610.

Davidson, Natalie R., & Greene, Casey S. (2021). Analysis of scientific journalism in *Nature* reveals gender and regional disparities in coverage. *bioRxiv*, 2021.2006.2021.449261. http://doi.org/10.1101/2021.06.21.449261.

- See also: https://physicstoday.scitation.org/do/10.1063/PT.6.2.20210806a/full/, which includes commentary on Davidson et al.
- See also Yong, Ed. (2018). I Spent Two Years Trying to Fix the Gender Imbalance in My Stories. Here's what I've learned, and why I did it. *The Atlantic: Science*, *2018* (6 February). https://www.theatlantic.com/science/archive/2018/02/i-spent-two-years-trying-to-fix-the-gender-imbalance-in-my-stories/552404/.

Week 11, 8 & 10 Nov: Neglected spaces

Wilkinson, Clare. (2021). Neglected spaces in science communication. *JCOM: Journal of Science Communication, 20*(1), C01, online only. http://doi.org/10.22323/2.20010301.

Wilkinson's piece is the introduction to a special issue – follow it by reading the other articles available at the same link.

Week 12, 15 & 17 Nov: Topics you've identified

Readings to come

Week 13, 22 & 24 Nov: Presentations, 1

Class presentations of final paper topics

[Note: No class on Wednesday, 24 November – Thanksgiving]

Week 14, 29 Nov & 1 Dec: Presentations, 2

Class presentations of final paper topics

Week 15, 6 Dec: Conclusion

What did we learn this semester?

Finals week, 11-18 Dec

Final papers due, date to be determined