

Science—and Its Communication— Transcending Boundaries: Some Highlights of the 2019 AAAS Annual Meeting

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The 2019 annual meeting of the American Association for the Advancement of Science (AAAS), held February 14–17 in Washington, DC, bore the title “Science Transcending Boundaries.” Thus, at this wide-ranging scientific meeting, some sessions on communicating science addressed the spanning of boundaries, including those between sectors, media, genders, or publication models. The following summaries focus on some sessions that science editors and those in related fields may find of particular interest.

Communicating Science Seminar

By Christina B Summers

A daylong seminar on communicating science preceded the formal opening of the 2019 AAAS annual meeting. The following are some highlights. The seminar also included a session titled “Strategies for Sustaining Public Engagement in a Research Career,” a networking fair, and a variety of additional breakout sessions.

“Connecting Science and Policy: Opportunities for Dialogue with Policymakers”

In this session, three speakers presented their experience in and advice for communicating science to policymakers.

Elizabeth Suhay, of the American University School of Public Affairs, pointed out that evidence isn’t the only thing that influences policy. Understanding more about

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Figure 1. Photo credit: Chantal Cough-Schulze.

other factors and about how the government works more generally can aid in planning an effective communication approach. One way to connect with policymakers, she said, is to take advantage of whatever connections—geographic, organizational, personal, topical—might already exist. For example, approaching a legislator as a constituent might be a way to use a common geography to begin the conversation. For more, Suhay recommended a website she created based on her research, <https://www.american.edu/spa/scicomm/>.

Sarah Brady, of the California Council on Science and Technology (CCST), shared the work of her organization, which provides reports and expert briefings to members of the California legislature and their staff. She said it is important to know whether one is providing scientific advice or advocating for a specific position or vote. CCST’s nonprofit status means that it must engage only in the former, but that means its information tends to be trusted, she said. “Our independence, our non-partisanship is our bread and butter,” Brady added. She also said people shouldn’t be discouraged if granted a meeting only with a staff member, as that person is in a position to take the results of the meeting to the legislator.

Jesús Alvelo-Maurosa, a 2017–2018 AAAS Science and Technology Policy Fellow in the National Science Foundation



Figure 2. Speakers in the “Policymakers and Communicating Science” session. Photo credit: Jessica Scarfuto.

Directorate of Engineering, Division of Engineering and Educational Centers, suggested avoiding two big mistakes people make when communicating science to policymakers. First, he said, don’t see the interaction with an elected official as a transaction. Instead, consider it a dialogue. Second, continue the conversation past the one meeting or phone call. The key is to “keep building that relationship,” he said.

Breakout Session: “Simplified Doesn’t Have to Mean ‘Dumbed-Down’”

Miriam Krause, Director of Education and Outreach at the multi-institutional Center for Sustainable Nanotechnology, led an interactive session in which participants critiqued examples of science communication, some done well—others not so. The popular news articles that communicated science well generally had a few things in common. First, they made the research relatable, often through analogies. Second, they were accurate, yet interesting and appropriate to the audience. Third, in many cases, they made good use of visuals. Finally, the best articles had characters—though not necessarily human ones—and drama.

Krause said that every time someone communicates science to the general public, there is a risk-benefit calculation to be considered. After all, there is always a chance that the information will be misused or presented in such a way as to undermine credibility of the individual scientists, their institutions, and even science as a whole. Therefore, scientists and science communicators must always weigh whether it is better to get the word out, even if a few people misunderstand, or better not to share the information at all.

If one does decide to move forward, Krause suggested a few ways the basic structure of a scientific paper should be flipped in order to communicate the information to non-specialists. For example, the “hook,” or the most interesting (to a lay audience) part of the paper, might be buried in the discussion section, and so a popular news article would move that information to the first sentence. It is also important to know what can be left out: For example, a scientific paper needs a detailed methods section so another scientist can replicate the research. However, a news article about the research doesn’t require that level of detail, if it includes any information about the methods at all.

Policymakers and Communicating Science: Opportunities and Best Practices

By Jessica Scarfuto

When communicating science with policymakers, scientists should think like politicians in order to get evidence-based policy on the books. That was the main advice at the session “Policymakers and Communicating Science: Opportunities and Best Practices.”

Elizabeth Suhay, of American University, Washington, DC, began the session with six recommended practices for communicating science with policymakers. The recommendations stemmed from a comprehensive research project by Suhay and three collaborators. “Scientists are excellent researchers but dive into the communication process without doing comparable research,” Suhay said. To help navigate the political world and help promote evidence-based policy, Suhay gave the following recommendations:

1. Know more than just the name and job responsibilities of your contact. Research your target audience beforehand, including his or her knowledge level of your subject, political party, and district or demographic represented.
2. Make sure your goals are very clear, but also consider the goals of the policymaker. As you craft your communication strategy, keep in mind that policymakers ultimately want to serve their constituents.
3. Be ethical, clear, relevant, and credible. Give the policymaker a complete picture of the research, not just your opinion. This will build trust and help the policymaker make the right choice for his or her constituents.
4. Be social. The world of politics is all about relationships and reputations, and it tends to be more social than most scientists’ workplaces.
5. Embrace political diversity, and recognize that many factors in addition to scientific conclusions shape policy outcomes.

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6. Learn about the policy-making process, particularly the lifecycle of legislation that you want to affect.

Karen Akerlof, visiting scholar at AAAS and affiliate faculty at George Mason University, built on Suhay's talk by discussing the communication problem from the policymaker's perspective. "Congress actually does use science all the time," she said, but it is typically in support of positions decided on while running for election. She pointed out that voters "might not be as willing to go for somebody who says 'well, I'll make a decision when I get to Congress.'" Understanding the barriers to communicating science, she stated, might help address the breakdown in understanding that both parties experience. Akerlof said that appreciating the complexity of science, learning about the intricacies of Congress, and understanding the role of bias among both scientists and politicians might lead to a more understanding and productive relationship.

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To close the session, Chris Tyler, of University College London, spoke on how evidence is used in the UK Parliament. After a brief overview of the UK Parliament for Americans, he discussed how issues of timing and scientific complexity relate to British politics much as they do to American politics. His conclusion: Both politicians and scientists need to be better at setting aside their differences and working together: "There needs to be a much greater effort to co-design research programs with policymakers."

YouTube: Friend or Foe in Communication about Science and Health

By Courtney Adams

At this session, the speakers discussed YouTube's role in science communication. They described how the Google-owned video sharing platform can be used not only to expand science literacy but also to spread false information.

YouTube has more than 1.5 billion monthly users, which is almost one-third of all internet users, said speaker Shiyu Yang of the University of Wisconsin-Madison. Thus, science communicators have a "very great potential of using YouTube to reach a wide extensive audience," she said.

Yang provided several tips for using YouTube as a science communication tool:

- Produce relatively short videos to receive more views.

- Create short and informative video titles to attract viewers.
- Ensure that the video is viewable from a mobile phone, not just a computer or tablet screen.
- Use newsletters and emails to encourage your existing community to subscribe to your videos.

Although the ability to reach many people can be a positive for the science community, the other two speakers discussed the potential harm of YouTube as a propagator of false information.

"YouTube is a medium, not a source," said Asheley Landrum, of Texas Tech University. She stated, "YouTube allows for us to find information that we can arm ourselves with." However, she noted that anybody can post on YouTube if they follow the site's guidelines, which do not include ensuring that the content of the video is accurate. Landrum discussed the role of YouTube in the spread of the flat-earth conspiracy. Her research team asked 30 flat-earthers about the origin of their beliefs, and 29 said they decided the earth was flat after watching YouTube videos about the matter. In a larger-scale study, involving 402 YouTube users, the team found that people with lower science literacy were more vulnerable to being swayed by a conspiracy video.

Dan Romer, of the University of Pennsylvania, discussed the viral spread of pro-tobacco-related content on YouTube. E-cigarette use in young people has increased dramatically over the last 7 years, Romer said. Romer and his colleagues had 1000 random people aged 18–24 watch either a video-montage of people using tobacco or a video unrelated to tobacco use. They found that members of the former group tended to believe that more people regularly use tobacco. Romer said that when people watch individuals like them engage in certain activities, they are more likely to consider these activities normal and safe. Romer called for increasing corrective content on YouTube in order to fight misinformation.

In response to a question from the audience, all three speakers agreed that it is important to continue using YouTube to inform people about science, so this medium is not flooded with only false information.

A Feminist Agenda for Science Communication: Necessary and Timely

By Corley-Ann Parker

Speakers at this session addressed the lack of feminist agendas in science and science communication. The main question the panelists addressed was, "If the field of science communication is increasingly female-dominant, why are women in science and science communication still so marginalized?"

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Tania Perez-Bustos, of Universidad Nacional de Colombia, Medellin, Colombia, said a feminist agenda in science communication means more representation of feminine values present in science. “The fact that there are more women in science communication implies that science communication carries certain feminine values—values that are culturally defined,” she said, calling for more coverage of accomplishments by women and minorities in the sciences that display these values.

Stephanie Steinhardt, of Michigan State University, also emphasized expanding representation but mentioned that diversity goes beyond the obvious differences in race and gender, saying that “no matter how empathetic you are, you are still blind to those unlike you.” Steinhardt suggested a feminist agenda that openly celebrates these differences, and she said that science journalists should include more stories that highlight diversity and “embrace the singularity.”

Megan Halpern, of Michigan State University, discussed perceptions of women in the sciences and associated communications, and said that despite efforts in the media, women are still marginalized. “We have really beautiful visions for what science and technology can do, but women and minorities often find themselves where they can’t use them,” she said. Halpern said that creating a solid feminist agenda for science communication means actively offering stories, coverage, and other opportunities to more women and minorities.

Overall, the panelists emphasized that science communicators must challenge current perceptions of science-related fields and increase visibility of women involved in these fields.

Open Access Publishing: Considerations and Opportunities for Researchers

By Barbara Gastel

Recent initiatives to mandate publication in open access journals or otherwise increase availability of scientific literature have important implications for researchers, publishers, and others. At this session, speakers and

audience members discussed such initiatives from a variety of perspectives.

Moderator Jeremy Berg, editor-in-chief of *Science* and its family of journals, stated that there are many ways to make research widely available while attending to quality. He then recounted some history. Among items mentioned were the launching in 1991 of the preprint server now called arXiv, the advent of open access journals in the 1990s, the emergence in 2008 of the public access policy of the National Institutes of Health for papers reporting research it funded, and the development of additional preprint servers in the last several years.

David Sweeney, of United Kingdom Research and Innovation, spoke in his capacity as co-chair of the implementation task force for Plan S. This plan, from Science Europe, will require researchers funded by participating institutions to publish in fully open access journals or to use compliant repositories. “Why have we failed to deliver?” Sweeney asked, calling for complete access to all research upon publication. He advocated the ideal of achieving this goal while also sustaining the current publication system.

Rajini Rao, of the Johns Hopkins School of Medicine, spoke as a practicing scientist. She noted a trend toward open access in recent years, and she endorsed posting preprints. She expressed concern, however, about possible unintended consequences of changes in publishing. For example, she noted that decreases in professional societies’ income from their journals can reduce funding available for the societies’ other activities. She emphasized that during the time of transition to new publishing norms, care should be taken to avoid letting trainees’ career advancement suffer because of shifting expectations.

During the discussion period, voices from various stakeholders—including commercial journal publishing, open access journal publishing, and the library community—joined those of the speakers. Rao said she liked having peer reviewers confer among themselves to provide a cohesive set of recommendations. An audience member noted that authors whose research is not well funded can have difficulty paying publication charges. In a closing interchange, participants indicated that journals should be transparent about uses of funds received.

The 2020 AAAS annual meeting, themed “Envisioning Tomorrow’s Earth,” will be held February 13–16, 2020, in Seattle, WA. For more information, please see <https://www.aaas.org/>.