

# Publicity or perish: finding the balance in science communication

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Much of natural science research involves detecting a signal or relationship in noisy data. The evidence that the climate is warming is ‘unequivocal’, according to the Intergovernmental Panel on Climate Change (IPCC), because analysis of historical datasets shows a warming signal clearly emerging from the noise of natural year-to-year variability. Every year is not necessarily warmer than the last, but the trend is upwards over time.

The emergence of a signal amid noise also describes the process by which knowledge is accumulated by the scientific community at large. A consensus understanding emerges in the scientific community over time from the noise of different scientists’ individual research findings or publications. Unlike pure mathematics, there are not unbreakable proofs in science. Instead, thanks to individual scientists challenging each other’s work and retesting hypotheses with different data, methods and assumptions, we advance a consensus on the workings of the natural world.

The public and policymakers are, however, often exposed more to the noise—like a specific new finding—than the signal—the existing consensus on

the subject. The popular science news, in fields like health and global change, can read like a back-and-forth tennis match. One week, blueberries are good for you, and the land carbon sink is increasing. The next day, blueberries cause cancer, and the land carbon sink is saturated.

The back-and-forth dynamic emerges from the commercial nature of the news media. Every news story needs a hook to attract readers or viewers. “New study agrees exactly with all previous studies” is not a click-worthy headline. “New study challenges all previous studies” is. Outside groups take advantage of this dynamic to push their agenda. The bipolar nature of science reporting has helped anti-regulation and anti-science lobby groups advance the notion that the science is “not settled” on questions from the human role in climate change to the safety of vaccines to smoking and cancer.

We scientists and our institutions are not innocent bystanders. The increasing pressure to seek public attention for our work can lead us and our institutions to a focus on the new individual finding rather than the core knowledge. Add this to the nature of the media and the actions of lobby groups, and the result is a positive feedback effect that often exaggerates the level of disagreement and uncertainty within the scientific community.

The desire for public attention is laudable. It is borne in part out of a recognition of our responsibility and accountability to public, the ultimate funders or

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most scientific research. Yet there is also an undeniable transactional aspect to public and media attention. It can help institutions with fundraising and student recruitment, plus it can directly and indirectly (via impact on scholarly citations and invitations) help individuals with job searches and academic promotions.

The clearest example of ‘publicity or perish’ is the culture of media releases. University public affairs offices, which have a mandate to promote the institution, have effectively internalized the filtering work once done by a shrunken traditional media. Media releases that are constructed and titled so as to promote a particular new study, rather than the findings of the scientific community at large, are posted verbatim by news aggregation sites and liberally clipped by the media. If reading the health and science section of an old daily newspaper was like watching a tennis match, reading *Science Daily*, which reprints media releases from scientific institutions, is like hunkering down for a five-set thriller at the U.S. Open.

In light of the election of Donald Trump, there are many calls for scientists to speak out. Before doing so, we need to each carefully interrogate our own motives. Is our desire to speak out about the public? Or about us? Are we speaking to advance science literacy and to contribute to science-based policy-making in our area of expertise? Or we seeking attention for our own work, and the endorphin rush from the retweets?

The late Stephen Schneider, a prominent climate scientist, famously argued that scientists engaging with the public and policymakers faced a “double ethical bind” between being effective as a communicator and being honest about the limits and complexity of scientific knowledge. Today, with so many open avenues for public communication, and with increasing pressure to promote our own work, scientists face an additional ethical bind between talking about the noise, the hard-earned findings from our own research, and the signal, the consensus of the scientific community on the subject. We need to communicate our own work in order to get attention, but we may do so at the risk of minimizing the findings of our field at large.

If the goal is to advance public science literacy and public support for science, we need to always place our findings in context and be cautious of the promotional aspect of the media release culture. This means policing our institutions. It also need means policing ourselves: individual scientists with blogs or

a social media presence—including myself—sometimes fall into the trap of communicating their own work at the expense of advancing public understanding of the subject.

This thoughtful approach to public engagement is especially critical at time when powerful actors, inside and outside of government, actively seek to dismiss scientific knowledge or the role of science in policy-making. The people fighting against science consistently repeat the same core message. Scientists can learn a lesson about message discipline from Republican political consultant Frank Luntz, best known for a 2003 memo advising Republican candidates to intentionally stress uncertainties in climate science in order to combat efforts to address climate change:

There’s a simple rule: You say it again, and then again and again and again and again, and about the time that you’re absolutely sick of saying it is about the time that your target audience has heard it for the first time. And it is so hard, but you’ve just got to keep repeating, because we hear so many different things – the noises from outside, the sounds, all the things that are coming into our head, the 200 cable channels and the satellite versus cable, and what we hear from our friends<sup>1</sup>

There is certainly value in publicizing new and contradictory findings. As a community, we must be honest about the noise in our data and understanding. We also need to recognize the greater social dynamics at play and consistently repeat the consensus understanding of the subject. On this, we can follow the science: research actually shows that emphasizing scientific consensus is effective at increasing public understanding of various scientific subjects, including the safety of vaccines (van der Linden et al. 2015) and the human role in climate change (Cook 2016).

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