A Beginning-Scientist-Communicator's Guide to Common Pitfalls and Landmines

11 Tips from Journalism for New Scientist Communicators

INTRODUCTION

Members of the public increasingly get science news and perspectives directly from the source: scientists and engineers. These scientists and engineers, who choose to serve as public sources of science news and perspectives, can better prepare to navigate the media/communication landscape by being aware of certain challenges that are regularly faced by journalists, but which could be unfamiliar or unexpected to scientists and engineers. This tip sheet has been created to help scientists and engineers at the beginning of their journey into science communication by illuminating certain tenets of journalism that are key to engaging with diverse audiences. Some of these common pitfalls relate to legal implications of communication, whereas others connect to ethical practices. This tip sheet is not intended to provide writing or broadcast training, but instead to provide a resource for broader communications issues.

This tip sheet was created as an outcome of a Kavli Foundation Symposium in May 2018, but it is intended to be a public document for anyone to use. It is a living document, and feedback is welcome.

GENERAL RESOURCES

"The Public Face of Science": http://www.amacad.org/publicfaceofscience/pfs.html
"Public confidence in science has remained stable for decades":
http://www.pewresearch.org/fact-tank/2017/04/06/public-confidence-in-scientists-has-remained-stable-for-decades/
"Science bloggers' self-perceived communication roles":
https://jcom.sissa.it/archive/14/04/JCOM_1404_2015_A02
"Science Communication in a Post-Truth Society"
https://www.pnas.org/content/116/16/7656

1 Go beyond the straight facts
Just informing people isn't necessarily persuasive

WHAT IT IS

The knowledge-deficit model is the concept that people simply don't know enough about a topic, and if you just give them the facts, their minds will be changed. Unfortunately, studies have shown that most often, this isn't the way that people operate. Simply slinging facts at them can make them double-down on their own positions, rather than accepting new ones, particularly if the topic has a lot of surrounding controversy.

TIPS/APPROACH

Storytelling can be your friend here. Find places where you can connect with the audience - where there are common goals. For instance, everyone can agree that they want to be healthy and they want their children to do well; these emotional touch points can be used to help present scientific information on topics including climate and medical advances. Empathize with the other position, put ideas in context, and connect with the audience through examples that have real-world implications. If you are trying to correct a false report, repeating it can paradoxically reinforce the false view in people's minds. George Lakoff advises instead using "truth sandwiches," where you say a truth, counter the lie, and end with another truth (see references below).

Scientists should also be careful about their own doubling-down on issues. Scientists are seen as having a lot of social power, so when they are critical, it can be perceived as "punching down." If a scientist feels that there are issues they need to stand up for on moral issues, make that clear and say why. And be open to discussion—welcoming questions can usually, counterintuitively, make an author seem more trustworthy and fair.

RESOURCES

https://www.ncbi.nlm.nih.gov/pubmed/27117768
https://blogs.plos.org/blog/2018/05/16/science-and-art-find-common-ground-the-importance-of-storytelling/
https://www.tandfonline.com/doi/abs/10.1080/17404622.2017.1400679?journalCode=rcmt20
https://blogs.scientificamerican.com/observations/the-future-of-science-storytelling/
https://www.americanscientist.org/blog/from-the-staff/8-myths-about-public-understanding-of-science
https://www.americanscientist.org/blog/macroscope/scientists-who-selfie-break-down-stereotypes
https://www.ted.com/talks/danielle_n_lee_how_hip_hop_helps_us_understand_science
Making science nicer, stupid | Emily Calandrelli: https://www.youtube.com/watch?v=V9haKpJakU4
Lakoff: https://twitter.com/georgelakoff/status/1008041254955839488
https://twitter.com/GeorgeLakoff/status/1068891959882846208

2 Avoid ad hominem attacks
Keep the focus off other people's personal traits

WHAT IT IS

An ad hominem attack is when writers or producers direct their narrative at a specific person in a way that makes the person the subject, rather than keeping the focus on the issue at hand. In general, it can be a method that an author uses to attack a person's character or motive instead of what that person is saying.

But it's important to be aware of nuances. For example, a story from a scientist about her own misgivings about science communication used another communicator's activities as an example. The author didn't intend the example to be an attack, but it came across that way to everyone else. New authors are often told to write about their own experiences, in their own voice, and that's likely what this author did. Understand there's a line here between writing with realism and shifting the focus onto someone else.

TIPS/APPROACH

If you are writing about a topic, consider if you'd feel comfortable if someone else put you in that example role.
If you do feel that a person is a legitimate example, ensure that you are focusing on the person's activities that are relevant to that example.

RESOURCES

Problem article:
https://www.sciencemag.org/careers/2018/03/why-i-dont-use-instagram-science-outreach
Response:
http://science.sciencemag.org/content/360/6385/162.2.full and http://science.sciencemag.org/content/360/6385/163.1
General thoughts on approaches:
https://www.americanscientist.org/article/reasonable-versus-unreasonable-doubt
https://www.publish.csiro.au/PC/PC17022
Ad hominem attacks differ from libel and slander. Those are defined here:
https://www.nolo.com/legal-encyclopedia/libel-vs-slander-different-types-defamation.html

3 Understand abuse of expertise
Don't overextend results outside your field, and check scholarship outside your field

WHAT IT IS

Scientists and engineers writing for the public may wish to give their audience a sense of broader context. Readers or viewers may not inherently understand the line between the areas where a scientist/engineer may be speaking from knowledge, and where he/she is extrapolating, however.

Example: A microbiologist who has made discoveries about microbial societies proposes that those results will apply to human society, without examining scholarship in human social sciences.

Example: A scientist discusses the ills of trolls misappropriating research results for their own purposes, without looking at research in communication to see what has already been studied.

TIPS/APPROACH

It's always a good idea to review your own writing or proposals with a critical eye. Are all your conclusions supported? Have you done a search for any relevant discussions or papers that might bolster your position? If you are going to extend your ideas beyond your own expertise, do some additional background reading in the field you are extending into. There may be a lot of scholarship in that field of which you are not aware or familiar, and ignoring that work could undermine the points you are trying to make.

RESOURCES

http://williambadke.com/BadkeExpertiseAuthority.pdf
https://www.scientificamerican.com/article/you-don-t-know-as-much-as-you-think-false-expertise/
https://www.psychologytoday.com/us/blog/everybody-is-stupid-except-you/201008/the-expertise-bias

4   Define your role for your audience
Are you acting as an expert or an outside reporter?

WHAT IT IS

When scientists/engineers take up communication, they may want to write about their own work, or they may wish to report on the work of others, or even switch between the two. It's important for the audience to know the role you are taking as an author: Are you acting as an expert in your own field, or are you acting in the role of a reporter about another field, where you are gathering different viewpoints?

TIPS/APPROACH

Be clear about the perspective, or point of view, you are taking in your work. Especially if you switch between a topic where you have personal expertise, to discussing a topic where you are relying on other sources, ensure that the audience know that you have switched, and what your sources are.

RESOURCES

https://www.americanpressinstitute.org/journalism-essentials/bias-objectivity/lost-meaning-objectivity/
Ed Yong discusses personal bias:

https://www.theatlantic.com/science/archive/2018/02/i-spent-two-years-trying-to-fix-the-gender-imbalance-in-my-stories/552404/

5   Be prepared for potential social-media blow up
Defenses without feeding trolls...

WHAT IT IS

It's great when something you've written or produced gets a lot of positive attention and sharing, but widespread posts can also attract detractors. Social-media reactions to blogs, videos, or social posts can be swift, intense, and highly personal, particularly around issues that have become politically or emotionally charged for various groups. Using hashtags can bring greater attention to your posts, but it can also attract social-media uses that have a personal agenda on all posts on a topic. Most of the time, such comments will be the only result of such interactions, although they can still be upsetting. But in rare cases, the result of a viral flare-up can include doxxing (posting a person's private information, such as an address, with the purpose of harassing that individual); misunderstanding and misinterpretation by members of the public; as well as political or employment fallout.

TIPS/APPROACH

Before posting to social media, try to think of all the ways that detractors could undermine the post, and try to preemptively address those issues. Consider any phrasing that could be misconstrued. But if you are attacked, consider the person who is doing the attacking. If that person has a legitimate point of view and a concrete question, it's possible that in certain situations, responding in a respectful, constructive way can often defuse a charged situation and slow a viral onslaught. You might, for instance, offer to help or to take the conversation offline where an exchange of ideas isn't limited by word counts; social exchanges

rapidly cross a point of diminishing returns, however. However, if the comment seems to be made purely as part of a more general disinformation agenda, and resorts to rudeness and bullying, it's often better to swiftly block and mute, and not respond at all.

Become familiar with doxxing practices and protections.

RESOURCES
"How to protect yourself from doxxing":
http://www.niemanlab.org/2015/07/how-to-protect-yourself-from-doxxing-and-what-to-do-if-it-happens-anyway/
"How to deter doxxing":
https://niemanreports.org/articles/how-to-deter-doxxing/
https://blogs.scientificamerican.com/observations/earth-day-and-the-hockey-stick-a-singular-message/
An article about the need for campaigns to counter disinformation: h
ttp://www.pnas.org/content/early/2018/11/21/1805868115.short
https://undark.org/article/dilemma-climate-scientist-advocate/
https://issues.org/journalism-under-attack/
https://issues.org/the-science-police/
https://www.forbes.com/sites/dangingiss/2018/09/24/how-to-handle-trolls-in-social-media/#5dde37781767
http://sciencecommunicationmedia.com/constructively-dealing-with-trolls-in-science-communication/
https://www.hindawi.com/post/im-scientist-and-i-want-use-social-media-now-what/
https://www.vox.com/culture/2020/1/20/20808875/gamergate-lessons-cultural-impact-changes-harassment-laws

These are some specific initiatives that are working to help with online harassment:
http://www.womensmediacenter.com/speech-project
https://www.osce.org/representative-on-freedom-of-media/safety-female-journalists-online
https://blocktogether.org/
https://iheartmob.org/

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6 | Fact-checking
Always go back to primary sources

WHAT IT IS
It's easy to get all sorts of information from Internet sources, and harder to instantly determine what is true or not true. Authors who engage in public outreach should never trust/share without verification.

TIPS/APPROACH
Question everything. Even if a page or article is well researched, verify claims against original sources: research papers or other literature, experts, witnesses, etc. Such checks are particularly necessary for verifying names, dates, and statistics. Never retweet or share without double-checking the assertion, especially when the topic is politically fraught (and thus possibly more subject to hyperbole or other flaws). Be aware of your own cognitive biases.

RESOURCES
"Fact checking: How to think like a journalist":
https://www.sciencenewsforstudents.org/blog/outside-comment/fact-checking-how-think-journalist

7 Facts and opinions
State not just the fact, but how you know it to be true

WHAT IT IS

Opinion is a protected form of speech in the United States. The difference between fact and opinion comes up frequently when scientists communicate directly or indirectly with the general public. Courts consider whether a reasonable reader or listener could understand the statement as asserting a verifiable fact, as well as the context of the statement. (A verifiable fact is one that can be proven true or false.)

TIPS/APPROACH

Authors should not just state what they understand to be true, but explain why they do, including links to evidence. Saying "I believe," or "I think," or "In my view," isn't sufficient to guarantee a judgment of opinion in legal cases. Second, labeling a statement as opinion, such as in a letter to the editor or in the comments of a blog, doesn't make it so.

RESOURCES

"Libel concerns are a reality for scientists who speak out in public":
https://www.the-scientist.com/profession/libel-concerns-are-a-reality-for-scientists-who-speak-out-in-public-58098

8 Self-plagiarism
A rule of thumb is no more than 6 words

WHAT IT IS

As with research paper publishing, it's important in popular writing not to pass off work as original if you have recycled it from other documents you have already written. Indeed, such self-plagiarism is some-times called "recycling fraud." The general rule of thumb is that a phrase of not more than six words can be carried over from another source that you have authored. There is some debate in the academic world about whether or not it's ok (or indeed in some cases desirable) to use the same wording in certain cir-cumstances, such as standardized protocols across research papers, but in journalistic pieces, original phrasing is always expected.

TIPS/APPROACH

If you want to include information about a topic that you have covered elsewhere, consider the phrasing, and find some alternatives. That rephrasing will likely work out better anyway, because if you're covering some of the same material, it's probably for a different audience where a different phrasing would be more appropriate anyway. If for some reason you cannot rephrase, cite your other work with the section.

RESOURCES

https://ori.hhs.gov/plagiarism-13
https://www.the-scientist.com/the-nutshell/when-is-self-plagiarism-ok-43088
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4201805/
https://www.aaas.org/news/fresh-look-self-plagiarism
https://academic.oup.com/bioscience/article/66/1/5/2463944
https://textrecycling.org/

9   Conflicts of interest
When in doubt, mention any potential conflicts

WHAT IT IS

Although U.S. courts in general are reluctant to settle matters of scientific inquiry, in recent years, several high-profile court cases have illustrated the risks associated with failing to disclose conflicts of interest to the public. For scientists who consult with companies, the line between what constitutes "commercial speech" and what is opinion is blurry.

Outside of legal conflicts of interest, there are also ethical considerations. If you have a personal stake in something you are writing about (say you are writing about autism and your brother is autistic, or you are writing about health regiments and you own a gym), a lack of disclosure may reduce your credibility with your audience. On the flip side, if you disclose these matters yourself, you may boost your audience's connection to your topic and their feeling that you have relevant background.

Example: Kevin Folta, an American plant scientist and advocate for genetically modified organisms, hosted a podcast aimed at "sorting through the shills and charlatans to distill the scientific truth." On his show, Folta adopted an alter ego who interviewed guests. In one episode, he interviewed himself as Kevin Folta and discussed the science of GMOs and the false perception of ties between agricultural scientists and industry. He never disclosed his financial and intellectual ties to Monsanto; however, those conflicts of interest were eventually revealed.

Example: STAT News, a publication that covers health, pharmaceutical, and biotech news, came under fire for publishing opinion pieces written by physicians with undisclosed industry ties, including one article penned by a public relations firm instead of by the physician who was listed as the author. The physician in question had received more than $300,000 from the drug industry over a four-year period and yet failed to disclose these financial ties. STAT retracted the article.

TIPS/APPROACH

Failure to disclose conflicts can have serious consequences, including costly and time-consuming litigation. Embrace transparency in your writing, mentioning any possible conflicts, or even possible appearances of conflict. Libel laws differ among countries and scientist/engineer authors also should familiarize themselves with the broad differences.

RESOURCES

"Take science off the stand": https://www.nature.com/articles/nm.4303
https://www.buzzfeed.com/brookeborel/when-scientists-email-monsanto?utm_term=.ldKPDXz8q#.tb5RnMg25
https://www.statnews.com/2017/09/13/op-ed-guidelines-updated/
https://www.cjr.org/special_report/nda-agreement.php

10 Copyright/Permissions
Trace sources back to the actual owner

WHAT IT IS
Images and other material that is readily downloadable from the internet may seem like fair game, but just because you can save it does not mean you can use it without asking. Unfortunately there are many cases where an image is posted over and over again without proper links to its owner or originator.

TIPS/APPROACH
If you cannot find the primary source for artwork, it's better to find a different option. Sites such as Getty Images allow for free usage with appropriate citation. There are also large online sites of work that is out of copyright; search for public domain images. If you do find a source, ask for permission; just posting with a citation of the source without asking may not be enough.

RESOURCES
https://www.forbes.com/sites/emmawoollacott/2014/03/06/getty-gives-bloggers-free-access-to-35-million-images
https://publicdomainreview.org/collections

11 Fair use
When it is (and isn't) ok to use without asking

WHAT IT IS
When is it permissible to link to information, quote from articles and blogs, or use someone else's images or other creative works? On the one hand, copyright is designed to protect the creator by controlling the right to copy and distribute their content; on the other hand, fair use is designed to balance the rights of others by ensuring copyright doesn't stifle creativity and innovation. The Copyright Act says Fair Use is "…for purposes such as criticism, comment, news reporting, teaching, scholarship, or research, is not an infringement of copyright." Examples of fair use include publishing a clip from a film or an excerpt from a book for the purposes of review or criticism, making multiple copies of an article for classroom use, and parody.

TIPS/APPROACH
A person cannot argue fair use simply because the content is publicly available on the Internet, because they are using the content for non-commercial or educational purposes, or because they provided credit. Like the courts, you should consider four factors, none of which is determinitive:

- What is the purpose and nature of the use? Transformative uses are favored over copying in judgments of what constitutes "fair use"; non-commercial uses are also favored.
- What is the nature of the copyrighted work? Factual or fictional? Published or unpublished? Creative works receive more copyright protection; factual material is more often fair use.

- What amount of the work is being used? Are you only using the part that you need in order to make your point?
- Does the use affect the market value of the original?

RESOURCES

http://cmsimpact.org/code/code-best-practices-fair-use-scholarly-research-communication/
https://www.copyright.gov/fair-use/fair-index.html
https://www.smith.edu/edtech/who-we-are/center-for-media-production/copyrightformediaproducers/fairuse/
https://www.lib.umn.edu/copyright/fairthoughts
https://www.poynter.org/news/these-tools-will-help-you-find-right-images-your-stories

https://blogs.scientificamerican.com/compound-eye/infringement-or-fair-use-have-a-look/