# Discussing scientific ethics: what would you do?

**Seth Stein**, **Jeffrey McDonnell** and **M Meghan Miller** want us to talk more about scientific ethics in the real world – and have some suggestions about how to do it.

The American Geophysical Union (AGU) and other scientific societies have recently been promoting scientific ethics policies, often in the face of media – and social media – headlines about unethical behaviour. In discussing these as AGU section officers, we recognized that in our research, educational and community roles, ethical issues are often grey areas. What to do is not always obvious and a good case can often be made for different options.

We suggest that discussing scientific ethics by generalizing past dilemmas can be an effective way to engage students, postdocs and early-career faculty. The US National Academies book *On Being a Scientist* does this with complex examples. Here we present simpler issues based on personal experiences that might stimulate discussion and debate among the younger and increasingly diverse rising generation of scientists.

**"What to do is not always obvious; a case can be made for different options"**

Some key ethical issues centre on attributing credit, publications and collaboration. In each of the following cases, what would you do?

- You have identified an interesting phenomenon in publically available data, and developed a good explanation. Before you write it up for publication, you receive someone else's paper to review. The paper notes the same phenomenon, but offers an explanation that is clearly wrong. Pointing out the error will almost certainly lead the other authors to your answer.
- You are finishing a paper just in time to meet a journal's special issue deadline. A coauthor suggests doing further analysis that is a direct extension of what you've done. To your surprise, the additional analysis gives a different result. You're pretty sure there's a problem with the new analysis, but can't figure out what's wrong.
- You are presenting a poster at a meeting showing your data and possible explanations, all of which you know are inadequate. Someone looking at the poster offers a simple and much better explanation.
- You are a student discussing with your advisor where to submit a paper. You are tempted by a prestigious open-access journal. Your advisor is amenable, but explains that paying the fees would spend the funds that would let you attend an upcoming conference.
- A journal has rejected several papers you submitted. They then ask you to review a paper for them.

## Relationships

Other dilemmas focus on professional – and not so professional – relationships in science.

- You are a faculty member chatting with a graduate student, who complains that he gave a paper draft to his advisor several months ago and has yet to get comments back. The topic is far from your expertise, and the advisor is a friend. You would like to help the student but don't want to cause them difficulties.
- You are a faculty member who encouraged a younger colleague to apply for a position in your department. To your surprise, their thesis advisor wrote a negative recommendation letter, which takes your friend's application out of consideration. You want to tell your friend about their advisor's letter.
- You are a faculty member to whom a younger friend, a postdoc at another university, turns for advice after an unpleasant experience. Your friend describes driving in a remote area on the way to a field trip, and being repeatedly groped by their passenger, a senior government scientist. The two were alone in the car, so there are no witnesses.
- You are a teaching assistant or faculty member who has identified students cheating in class. Under university rules, all you can do is report them to the Dean's office, who rarely impose penalties even in such blatant cases.

## Ideal vs practical solutions

Discussing such questions leads rapidly to considering the benefits and costs of different approaches to the issue at hand, for the individuals and institutions. This in turn leads to the challenge of how to choose between approaches, given that ideal and practical approaches often differ. In many cases, how different approaches would actually work is unclear. Action in some of the examples given would depend on an institution's policy and culture.

Ultimately, there may be more than one constructive approach, balancing costs and benefits to individuals and institutions. Reflection and common sense can provide useful guidance. One criterion is to ask: "How would I feel if 'this' was on the front page of my local newspaper or going viral on social media?"

We encourage scientists and scientific societies to discuss the spectrum of ethical challenges with their mentees – through special conference panels and sessions, in departmental seminars and around the coffee table. There is much to be learned through personal examples and honest reflection on choices made and what one might have done differently in hindsight. Discussing scientific ethics in the real world may help engage our community in raising awareness and devising proactive solutions to common dilemmas. ●

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