Ten Simple Rules for Scientific Fraud & Misconduct

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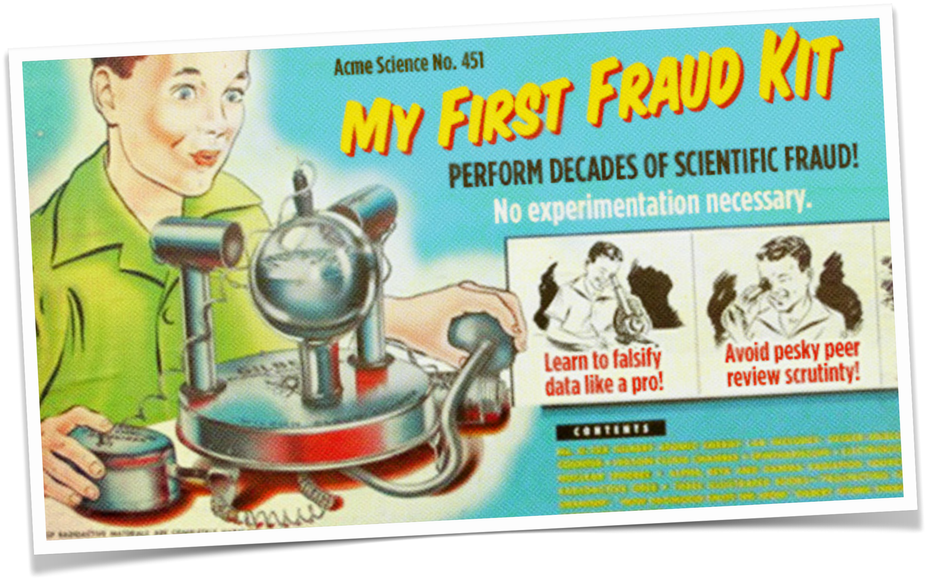
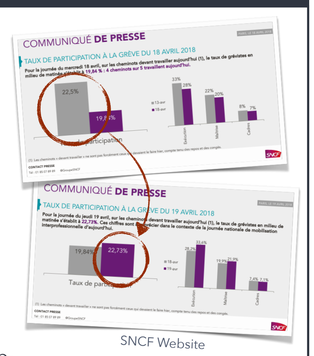


Disclaimer. We obviously do not encourage scientific fraud nor misconduct. The goal of this poster is to alert the reader to problems that have arisen in part due to the Publish or Perish imperative, which has driven a number of researchers to cross the Rubicon without the full appreciation of the consequences. Choosing fraud will **hurt science**, end careers, and could have impacts on life outside of the lab. If you're tempted (even slightly) to beautify your results, keep in mind that the benefits are probably not worth the risks.

Preprint available at `https://peerj.com/preprints/27395/`

Rule 1: Falsify & misrepresent

In order to start your life as a scientific fraudster, the first thing you need to do is learn how to convincingly **misrepresent, falsify, or fabricate data**. If you're still hesitant about embracing the dark side of science, you can start with a slight misrepresentation to support your hypothesis – a hypothesis you're sure is right anyway.



SNCF Website

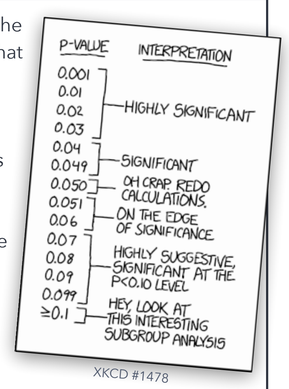
However, it might be good to consider other options as well. Starting with real data, you only need to change a few points in order to take a non-significant result and turn it into something with an astoundingly highly significance.Just see what's possible using the p-hacker application. The advantage of tweaking real data is that the results look both good and not very suspicious.

Whatever option you choose, make sure to have a backup story in case people start asking about the details of the experiments. A number of misconduct cases have been detected with just a few questions.

Rule 2: Hack your results

If you are reluctant to manipulate your data, you still have the option of searching through your results to find anything that reaches significance (a.k.a. p-hacking). This can provide an appealing alternative to scientific misconduct.

What is the p value of your NHST? If it's close to your field's standard, can't you use expression such as *nearly acceptable level of significance* (p=0.06) or *very closely brushed the limit of statistical significance* (p=0.051)? While these statements don't make much sense, they might be sufficient to convince a naive reviewer or reader.



XKCD #1478

The Grad Student Who Never Said "No" (2016)
When she arrived, I gave her a data set of a self-funded, failed study which had null results (it was a one month study in an all-you-can-eat Italian restaurant buffet where we had charged some people 1/2 as much as others). I said, "This cost us a lot of time and our own money to collect. ***There's got to be something here we can salvage*** *because it's a cool (rich & unique) data set... – Brian Wansink*

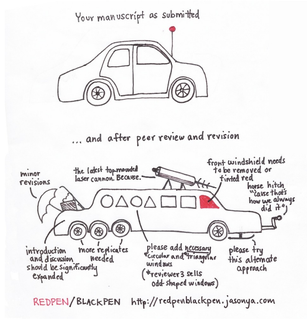
Rule 3: Copy from others

Writing is a tedious task and can be a fair amount of work. Summarizing the state of the art in your field will force you to actually read about what your colleagues have been doing over the past few years. It is a very time consuming task.

But in doing that reading, you may find that one of these colleagues wrote a nice introduction to the field or a wonderful summary of its current state. If so, why bother writing a new one? It's much simpler to copy/paste what he/she has written. Plagiarism is the nuts and bolts of scientific misconduct, be it literal copying, substantial copying or paraphrasing (see definitions from the committee on publication ethics (COPE) procedure for handle plagiarism in a submitted or published article).

Rule 4: Review yourself

It is surprisingly easy to do. As you submit, you will often be asked to give name of possible reviewers. Just provide phony names, along with email addresses that will be redirected to your mailbox and you can write your own review (but be careful to write a convincing one)



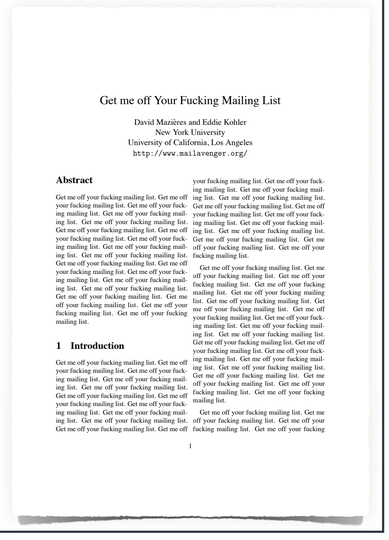
Can you spot the fake review?

- Sorry for our long silence, due to some perplexity on our side at reading your manuscript
- The paper is presented as a rather undigestible and tortuous collection of disparate results
- In order to be able to publish this manuscript it needs to be rewritten in the form of a scientific article
- The biggest problem with this manuscript, which has nearly sucked the will to live out of me, is the terrible writing style.
- Nice paper. Definitely.

Rule 5: Publish with predators

If you're worried that peer review will reveal your misconduct, you still have opportunities for publishing your results. There are many predatory publishers on the internet. These predators will publish just anything (see article on right that has been published) and you have a 100% chance of publication with a lighting fast review - less than 24h for some journals.

To find a predatory published, you can take advantage of the Think/Check/Submit website, which provides a easy-to-use checklist that researchers can refer to when they are investigating whether a journal is trustworthy. You'll obviously just want to take the opposite of their recommendations.



Rule 6: Don't share data

You definitely cannot give others access to your raw data, especially if it doesn't exist! Fortunately, researchers have been avoiding sharing their data for decades with all kind of silly reasons:

- My data are not anonymized
- Data are available on my webpage (maybe)
- You can contact me to (try to) get my data
- I cannot give it for free

Editorial of the New England Journal of Medicine (2016):
A second concern held by some is that a new class of research person will emerge – people who had nothing to do with the design and execution of the study but use another group's data for their own ends, possibly stealing from the research productivity planned by the data gatherers, or even use the data to try to disprove what the original investigators had posited. There is concern among some front- line researchers that the system will be taken over by what some researchers have characterized as ***research parasites****.*

–D.L. Longo and J.M. Drazen, Data sharing

Rule 7: No replication

It may surprise you, but some researchers may want to **check** and/or **replicate your results** using the methods explained in your article.

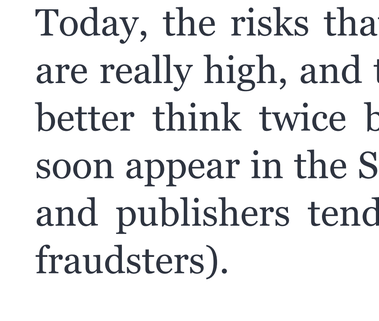
If people try to replicate your work and do not get the same results, you have a problem. They may insist on seeing your actual data and, if you refuse, you might be suspected of fraud or misconduct.

Thus, you can try to attach a "Do not replicate order" alongside your article or to question those who want to check your science.

"I have heard from graduate students opting out of academia, assistant professors afraid to come up for tenure, mid-career people wondering how to protect their labs, and senior faculty retiring early, all because of ***methodological terrorism****."*

– Susan Finske, APS former president, 2016

Rule 8: Never ever retract



If you've made a genuine (and big) mistake in your work, there is no problem in asking for the retraction of your paper.

However, if you've been engaged in fraud, having your paper retracted is like an admission of guilt. It's something to be avoided.

It is thus critical to act quickly and to defuse the crisis with a simple corrigendum admitting a bad - but not fatal - error during preparation of the publication.

Don't hesitate to publish as many corrigendum as necessary to make critics happy. You can drag this out for several years, which is hopefully enough time for people to forget about the issues.

Rule 9: Deny if caught

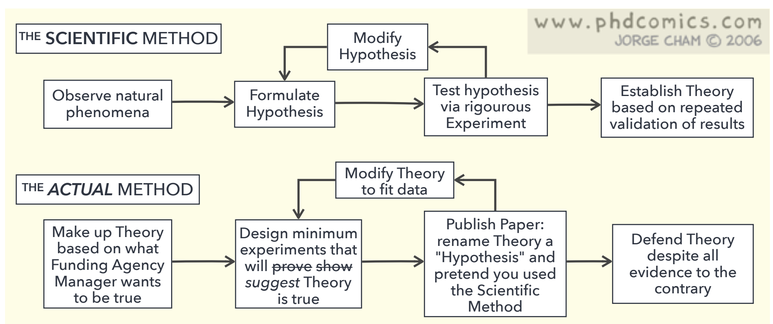
If you intend to persist in a rogue scientific career, you have to be aware that you're likely to get caught sooner or later. There is a set of simple rules to follow if you need to deny scientific misconduct.

Ian Intern[1], John Bigname[2], John Dunno[1,2], Matt Supervisor[1,*]

- If you're first author, explain you were supervised by the last author and had no choice.
- If you're last author, explain you were not aware of the misconduct of the first author.
- If your name is not first nor last, claim that you didn't even know your name appeared in the publication.
- Send threatening letters to those who have spotted your misconduct
- Follow through on those threats and sue'em all

Rule 10: Be creative (for once)

All the tactics mentioned above are already quite well known by the research community and some people are really good at spotting fake science (e.g. Dorothy Bishop, Elisabeth Bik, Nick Brown, Smut Clyde, Leonid Schneider, Guillaume Cabanac, etc.). If you want to stay off the radar while committing fraud and misconduct, you'll want to be creative and invent your own rules



But the game is probably not worth the risks (or is it ?).

By following the simple rules above, you should get scientific glory if only temporarily. The downside is that it could be followed by jail time. A former researcher has been sentenced to 57 months jail and to pay-back 7.2 millions dollars. Science has been and is still poisoned by fraud and misconduct, but it is now fighting back with increasingly high-tech tools.

Today, the risks that come when you engage in fraud and misconduct are really high, and the chances of being caught have gone up. So you'd better think twice before committing misconduct, or your name will soon appear in the Science Hall of Shame (even tough some institutions and publishers tend to evade responsibility and by doing so, protect fraudsters).

(Don't try at all actually)