

Professional Ethics & Research Misconduct

What does “professional ethics” in science/research mean?

Clear citations – giving appropriate credit, attributing work to the correct person

Giving credit to junior folks

Not falsifying data, accurately presenting your results

Appropriate behavior – with facilities and with colleagues

Don't abuse your position as an expert (media, public facing).

Harassment, abuse, discrimination

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APS task force on ethics

(Kate Kirby & Frances A. Houle, 2004):

- Truthful, careful handling and reporting of data
- Responsible, respectful interactions with colleagues and subordinates
- Adherence to publication guidelines, including proper recognition of research contributions










Research misconduct is defined under *federal policy* as **fabrication**, **falsification** or **plagiarism** in proposing, performing or reviewing research, or in reporting research results.

Research misconduct does not include honest errors or differences of opinion.

Research Misconduct

- **Fabrication**: making up data or results and recording or reporting them
- **Falsification**: manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research control
- **Plagiarism**: the appropriation of another person's ideas, processes, results or words without giving appropriate credit
- Missing: Responsible, respectful interactions with colleagues and subordinates

Research Misconduct

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-  Data falsification
 -  Not including appropriate authors
 -  Plagiarism
 -  Less than truthful reports
 -  Not citing prior work
 -  Delaying referee reports
 -  Including inappropriate authors
 -  Other

Distribution of ethics violations categories of which junior members of the APS reported having personal knowledge. Of the junior members responding to the APS ethics survey 39% cited one or more of these transgressions

Fabrication of Data

(Ethics in Engineering Practice and Research by Caroline Whitbeck)

- 1998: Victor Ninov claimed the discovery of two new elements (“super-heavy” element called 118 and decay product 116)
- Ninov’s colleagues and coauthors left it to him alone to deal with the raw data – only he knew how to run the computer programs that analyzed the data
- Other investigators were not able to replicate the experimental results
- Officials at Lawrence Berkeley National Lab investigated in 2002
- Computer log file found with evidence that data had been cut and pasted and numeric values were changed
- Ninov was fired, **coauthors reprimanded** and news release made to withdraw the discovery

Example

A CAREER IN THE BALANCE

Francine was just months away from finishing her Ph.D. dissertation when she realized that something was seriously amiss with the work of a fellow graduate student, Sylvia. Francine was convinced that Sylvia was not actually making the measurements she claimed to be making. They shared the same lab, but Sylvia rarely seemed to be there. Sometimes Francine saw research materials thrown away unopened. The results Sylvia was turning in to their common thesis advisor seemed too clean to be real.

Francine knew that she would soon need to ask her thesis advisor for a letter of recommendation for faculty and postdoc positions. If she raised the issue with her advisor now, she was sure that it would affect the letter of recommendation. Sylvia was a favorite of her advisor, who had often helped Sylvia before when her project ran into problems. Yet Francine also knew that if she waited to raise the issue the question would inevitably arise as to when she first suspected problems.

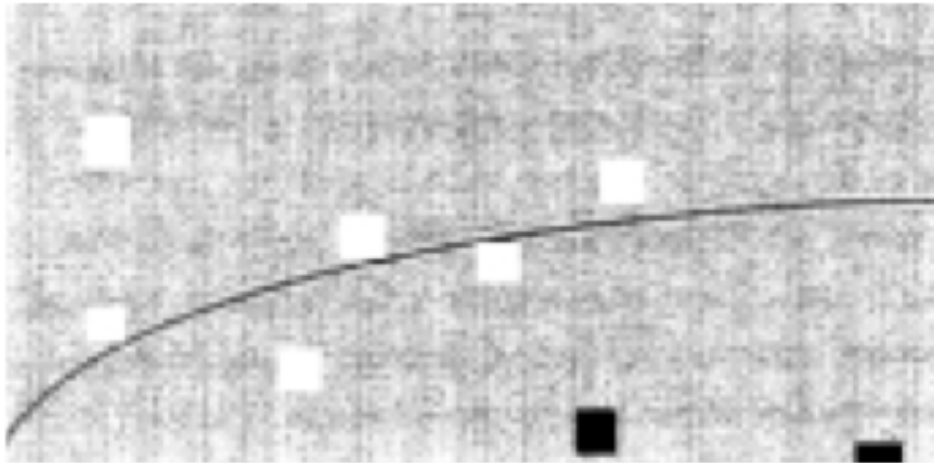
Both Francine and her thesis advisor were using Sylvia's results in their own research. If Sylvia's results were inaccurate, they both needed to know as soon as possible.

1. Should Francine first try to talk with Sylvia, with her thesis advisor, or with someone else entirely?
2. Does she know enough to be able to raise concerns?
3. Where else can Francine go for information that could help her decide what to do?

Falsification of Data: Expected Results

THE SELECTION OF DATA

Deborah, a third-year graduate student, and Kathleen, a post-doc, have made a series of measurements on a new experimental semiconductor material using an expensive neutron source at a national laboratory. When they get back to their own laboratory and examine the data, they get the following data points. A newly proposed theory predicts results indicated by the curve.



During the measurements at the national laboratory, Deborah and Kathleen observed that there were power fluctuations they could not control or predict. Furthermore, they discussed their work with another group doing similar experiments, and they knew that the other group had gotten results confirming the theoretical prediction and was writing a manuscript describing their results.

In writing up their own results for publication, Kathleen suggests dropping the two anomalous data points near the abscissa (the solid squares) from the published graph and from a statistical analysis. She proposes that the existence of the data points be mentioned in the paper as possibly due to power fluctuations and being outside the expected standard deviation calculated from the remaining data points. "These two runs," she argues to Deborah, "were obviously wrong".

Confirmation Bias

- **Confirmation bias** is the tendency to search for, interpret, favor, and recall information in a way that confirms one's preexisting beliefs or hypotheses - Wikipedia
- Proposals set us up for this.