Good scientific practice

A very short guide on being a good scientist

A very biased selection by J. K. Thalmann,

available at: https://homepage.uni-graz.at/de/julia.thalmann/

adopted from a very good overview by Manfred Schüssler

(formerly Max Planck Institute of Solar Physics, Justus-von-Liebig Weg 5, Göttingen)

available at: https://www.mps.mpg.de/phd/good-scientific-practice-2013.pdf

Outline

Definitions
Motivation

Reasons for misconduct
Forms of misconduct

Avoiding misconduct
Reacting on misconduct

Appendix:
Rules of the Uni Graz
Contact

Research ethics

… What is it?

Research ethics (good scientific practice) covers different topics:

– Care

The way in which scientific analysis is carried out (→ responsibility).

– Recognition

The awarding of science achievements (→ credit, citation, co-authorship).

– Trust

Mutual respect between scientists (and/or their work).
Awareness of the expectations of the general public towards (people working in) science.

– Misconduct

The (un)known violation of scientific and ethical "standards".

Research ethics

… Are we speaking of the same thing?

Scientists generally agree on the basic standards, but may disagree on, e.g.,

– What counts as breaking a rule

Does not reporting failed experiments count as cheating?

– The facts of a case

Has the researcher really used information from reviewing a paper/proposal for his/her own paper/proposal?

Was the researcher really unbiased when reviewing a proposal? Isn't a conscious bias something good too?

Research ethics

… Are we speaking of the same thing?

In order to judge we need:

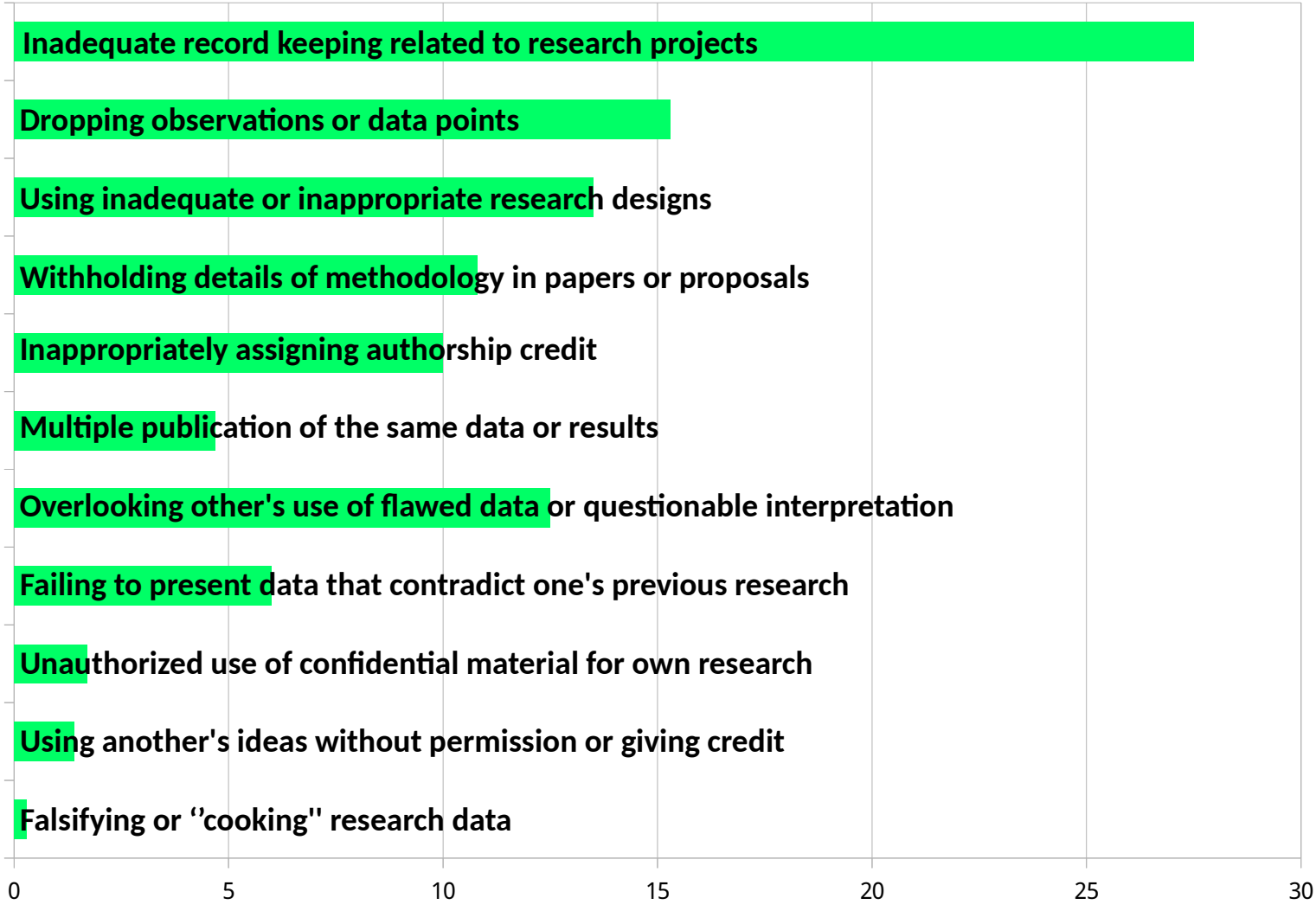
– Rules … about providing material upon which publications are based

– Conventions … on authorship (e.g., sequence)

– Knowledge … on the practices of a field (cf. conventions above)

Why do we need this lecture?

… Some statistics



Percentage of scientists who say that they engaged in the behavior listed within the previous three years (n=3247). The early- and mid-career scientists, are based in the United States and funded by the National Institutes of Health (NIH), and were asked to report their own behaviors. (From Martinson, Anderson & de Vries, “Scientists behaving badly”, 2005, Nature 435, 737).

Why do we need this lecture?

… It's your duty! *)

§ 1. Gute wissenschaftliche Praxis und wissenschaftliches Fehlverhalten

§ 1. Good scientific practice and scientific misconduct

Wissenschafterinnen und Wissenschafter, die an der Karl-Franzens-Universität Graz tätig sind, sind verpflichtet, …

Scientists, employed at the University of Graz are obliged to …

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html, **for a detailed listing/translation see p. 24ff in this presentation**

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Possible reasons for misconduct

… Why does it happen?

Reasons (environments) for (performing) misconduct:

– Dependencies

Peer review system (→ supervisors, superiors, referees, committees, etc.)

– Reputation

Statistical assessment (→ publications, grant proposals, committee memberships, etc.)

– Importance

Need for further funding (visibility).

Forms of scientific misconduct

… Falsification & Fabrication*)

– Undisclosed **selective reporting and rejection** of unwanted results

Addition of false or misleading statements (falsification).

– **Manipulation** of a study, representation or illustration

Creation of a data set for an experiment that was never actually conducted (fabrication).

– **Falsification of research accomplishments**

Publishing the same results in multiple papers (→ self plagiarism!).
False statements concerning the status of publication (→ submitted vs. accepted vs. in press).

*) Modified from the Office for Research, University of Miami (http://uresearch.miami.edu/

Forms of scientific misconduct

… Plagiarism*)

– **Stealing** and passing off (the ideas or words of another) as one's own

– **Presenting** ideas or products from an existing source as new and original

Includes self-plagiarism → Conference proceedings!

– **Committing** literary theft

Giving incorrect information about the source of a quotation.
Changing words but copying the sentence structure of a source without giving credit.
Copying from sources so that it makes up the majority of your work (even if you give credit!)

*) From www.plagiarism.org

Forms of scientific misconduct

… Another interesting case *)

Retraction Watch

Tracking retractions

Should this engineering paper have been retracted?

with 26 comments

The journal *Safety Science* has retracted a 2013 paper by a group of engineers from Brazil who had published the article previously, albeit in a much abbreviated form, a year earlier.

What makes this case more than a straightforward matter of duplication/self-plagiarism is that the authors greatly expanded upon the earlier article. The initial paper also appeared in a conference proceedings — the 18th World Congress on Ergonomics – Designing a Sustainable Future — priority that, at least in the minds of some, doesn't really constitute a true publication.

Here's what the retraction notice has to say about the matter:

> This article has been retracted at the request of the Editor-in-Chief.
>
> A shorter version of this paper (about 50% different, it had 5106 words, while this paper has 10,788 words plus 5 original Figures) was submitted to a conference, whose proceedings were published as a special issue of the WORK journal [Work 41 (2012) 3069–3076. http://dx.doi.org/10.3233/WOR-2012-0565-3069]. When submitting the paper to the conference, authors did not noticed that copyright had been automatically granted to this journal. Thus, they did not know the short paper will be published when they submitted an extended version to Safety Science. The third author of the Safety Science paper (Dr. Éder Henriqson) was not co-author of the conference paper, and not aware of its publication in WORK.

*) From https://retractionwatch.com/2013/12/27/should-this-engineering-paper-have-been-retracted/

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Avoiding misconduct

… What can we do?

Careful conducting and reporting research

– Base research on a **proper hypothesis**

Minimize unconscious bias.

– **Proper documentation** of data and methods

Reproducibility.

(→ Allow others to spot fabrication or falsification; Data repository at IGAM → Roland.)

– **Critical consideration** (interpretation) of results

Avoid wishful thinking.

– **Appropriate treatment of published mistakes**

Erratum.

– **Respec**t of intellectual property

Give credit.

Avoiding misconduct

… What can we do?

Follow conventions when submitting papers to journals

– **Honor scientific contributions** by all authors

No contributors are to be left out.
Work must be original with the authors.

Retraction Watch

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Avoiding misconduct

… What can we do?

Follow conventions when submitting papers to journals

– **Get consent** of all co-authors

Separately, for each submitted version
(→ intellectual property).

– **Obtain permissio**n to use copyrighted material

Also for your own publications!

– **No parallel submission**

Submitted work must be new
(conference proceedings vs. refereed journals).

– **Report** previous submissions

Declare reason for eventual retraction/rejection
(upon request, provide editorial correspondence, including referee report(s)).

Avoiding misconduct

… What can we do?

Follow conventions when submitting papers to journals

– No “guest” or “honorary” authorship

All co-authors should have contributed an essential part
(scientific ideas, data analysis, methods, interpretation, writing, funding, …).

''Authors are individuals identified by the research group to have made substantial contributions to the reported work and agree to be accountable for these contributions. In addition to being accountable for the parts of the work … , an author should be able to identify which of their co-authors are responsible for specific other parts of the work. In addition, an author should have confidence in the integrity of the contributions of their co-authors. All authors should review and approve the final manuscript.''[*)]

[*)] From Council of Science Editors (http://www.councilscienceeditors.org/):

Avoiding misconduct

… What can we do?

Follow conventions when submitting papers to journals

– Declare responsibility

For the complete content of the paper!

"Authors are individuals identified by the research group to have made substantial contributions to the reported work and agree to be accountable for these contributions. In addition to being accountable for the parts of the work … , an author should be able to identify which of their co-authors are responsible for specific other parts of the work. In addition, an author should have confidence in the integrity of the contributions of their co-authors. All authors should review and approve the final manuscript."[*)]

[*)] From Council of Science Editors (http://www.councilscienceeditors.org/):

Avoiding misconduct

… What can we do?

Submitting papers to journals

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WIKIPEDIA
The Free Encyclopedia

Main page

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Schön scandal

From Wikipedia, the free encyclopedia

The **Schön scandal** concerns German physicist **Jan Hendrik Schön** (born August 1970 in Verden an der Aller, Lower Saxony, Germany) who briefly rose to prominence after a series of apparent breakthroughs with semiconductors that were later discovered to be fraudulent.[1] Before he was exposed, Schön had received the Otto-Klung-Weberbank Prize for Physics and the Braunschweig Prize in 2001 as well as the Outstanding Young Investigator Award of the Materials Research Society in 2002, which was later rescinded.

On September 25, 2002, the committee publicly released its report.[5] The report contained details of 24 allegations of misconduct. They found evidence of Schön's scientific misconduct in at least 16 of them. They found that whole data sets had been reused in a number of different experiments. They also found that some of his graphs, which purportedly had been plotted from experimental data, had instead been produced using mathematical functions.[5]

The report found that all of the misdeeds had been performed by Schön alone. All of the coauthors (including Bertram Batlogg who was the head of the team) were exonerated of scientific misconduct. This sparked widespread debate[7] in the scientific community on how the blame for misconduct should be shared among co-authors, particularly when they share significant part of the credit.[5]

Avoiding misconduct

… What can we do?

Trust

– Between mentors and mentees:

Trust of supervisor into the student's proper work habits.

Trust of the student in the supervisor for proper guidance.
Trust of the student in the supervisors choice of topic (solvable, state-of-the-art, unique).
Trust of the student in the supervisors advice of scientific handling.

– Between colleagues:

Discussed ideas and studies shall not be taken over.
No contributions are to be dropped "on the way".

Avoiding misconduct

… What can we do?

Respect

Respectful behaviour

- Professional and respectful conduct of all attendees is expected.
- Bullying, harassment, intimidation, and discrimination of any kind will not be tolerated.

Be aware that the respect/trust in your science work is tightly linked to that of you as a person (e.g., handle "Social events" with care).

From: https://egu2020.eu/about_and_support/egu_general_assembly_rules_of_conduct.html

Reacting on misconduct

… What can we do?

– Ethical **obligation**

To act in cases of suspected misconduct.
Note that not reporting of misconduct is so too!

– Seek **advice**

From trusted fellow researchers, senior scientists, supervisor, group/department head, ombudsperson, etc.
Note that only dialog with ombudsperson is confidential[*)].

[*)] **For respective contact at the University of Graz see page 33 of this presentation.**

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University rules of good scientific practice*)

Wissenschaftliche Integrität und gute wissenschaftliche Praxis sind unverzichtbare Prämissen wissenschaftlicher Arbeit und Zusammenarbeit. Sie sind Voraussetzungen für die Reputation von Forscherinnen, Forschern und Forschungseinrichtungen, vor allem aber für das Vertrauen, das diesen von Seiten der Gesellschaft entgegen gebracht wird. Die Durchführung wissenschaftlicher Arbeiten unterliegt daher in allen Disziplinen zum Teil allgemeingültigen und zum Teil fachspezifischen rechtlichen Regelungen und/oder ethischen Normen.

Scientific integrity and good scientific practice are essential premisses of scientific work and collaboration. They are requirements for the reputation of scientists and scientific institutions, but especially for the trust from the public. The conduct of scientific work thus is subject to universal and/or subject-specific legal regulations and/or ethical norms.

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 1. Gute wissenschaftliche Praxis und wissenschaftliches Fehlverhalten

§ 1. Good scientific practice and scientific misconduct

*Wissenschafterinnen und Wissenschafter, die an der Karl-Franzens-Universität Graz tätig sind, sind **verpflichtet**, ...*

Scientists, employed at the University of Graz are **obliged to** ...

- **perform** their scientific work following the legal regulations and ethical norms
- **document** results **and question** results critically
- **be explicit** on the contribution from partners/competitors/precursors
- **avoid** scientific misconduct in their own research (as far as possible) and prevent it in their scientific environment
- **follow** the specific university's regulations

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

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University rules of good scientific practice*)

Scientists, employed at the University of Graz are **obliged to prohibit…**

1) Misrepresentation

Making up, falsify data, untrue information in applications or proposals

2) Violation of intellectual property

Plagiarism, exploitation of scientific ideas (especially as a referee), unjustified claim or acceptance of co-authorship

3) Falsely claiming (partial) authorship without permission

4) Sabotage of research work

Damage, destroy, or manipulate experimental set-ups, devices, documentation, hardware, software, …

5) Removal of primary data

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 2. Vermittlung und Verantwortung in Leitungsfunktionen und in der Lehre

§ 2. Mediation and responsibility in leading and teaching positions

- Leaders of organizational (sub-)units are responsible for a proper organization and to ensure that the tasks of **guidance**, **control**, **conflict management** and are assigned and recognized.

- Supervisors of young scientists (especially master and PhD students) are responsible for an appropriate supervision and **creating awareness** of a good scientific practice

- Teaching scientists should **discuss** the principles and problematic of scientific misconduct in their lectures in a appropriate fashion.

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 3. Sicherung auf Aufbewahrung von Daten

§ 3. Backup and storage of data

Data that are the basis of one (or more) scientific publication(s) are to be kept on a **persisting and secured storage device in the institution** in which they were produced, for **7 years**, if possible and reasonable.

Whenever possible, any documents essential for a specific research (protocols, software, etc.) should be kept in the institution for the same time span too.

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 4. Wissenschaftliche Veröffentlichungen

§ 4. Scientific publications

(Co-)authors of a scientific publications **share the responsibility** on the content.

(Co-)authors of scientific publications are asked to **discuss** the order of co-authorship before publishing.

So-called ``honorary'' authorships are forbidden, i.e., **only substantial** contribution to the presented research qualifies for co-authorship.

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 5. Veröffentlichungen im Internet und Verwendung von Internet-Quellen

§ 5. On-line publications and usage of on-line sources

Are subject to the same regulations as other publications and sources.

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice*)

§ 6. Beschwerdekommission für Fälle vermuteten wissenschaftlichen Fehlverhaltens

§ 6. Committee for suspected scientific misconduct

Is obliged to accept and investigate reported suspect of scientific misconduct and to decide on its handling.

Investigates, as confident as possible, the accusation regarding plausibility, concreteness, possible motives as well as all possible ways to clear the accusation and hears all involved parties

If the accusation proofs justified, or the suspicion was not resolved sufficiently, the committee suggests according legal …

*) From http://www.uni-graz.at/zvwww/gesetze/satzung-ug02-04.html

University rules of good scientific practice

Committee for suspected scientific misconduct

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Neuigkeiten

Alle Neuigkeiten

Lehrpreis 2014/15

Fokus: kooperative Lern- und Arbeitsformen

Kein Zahlschein mehr

Änderung bei der Fortsetzung des Studiums im Wintersemester

Studieren

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Fr 09:00-15:00 Uhr

Gesonderte Öffnungszeiten in den Ferien.