Academic Integrity

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Outline

- Ethics in science: an overview

- Guidelines that can help me make an ethical decision

- How to avoid problems

- Dealing with specific ethical issues

Why are ethics important in science?

Why are ethics important in science?

Science and scholarly communication: based on trust

- Building on (and depending on) the knowledge/information provided by others in order to move the frontier further

- Integrity in science – vital for its quality

- Consequences of unethical behavior in science:
  - For author
  - For university/institution
  - For colleagues and other scientists
  - For credibility of science (public, funding)

Academic Integrity

On Being a Scientist

Can you think of some behaviors/practices which are considered unethical in science?

Ethics in science: unethical behavior

Breaches of academic/scientific/research integrity, scientific/research misconduct:

- Falsification
- Fabrication
- Plagiarism

Questionable/detrimental research practices: violating other standards (e.g., conclusions without data, misleading/wrong statistics, misinterpretation, publishing issues)

More: Purdue, National Center for Biotechnology Information, Questionable research practices in ecology and evolution

Ethics in science

Ongoing discussion on many other issues

...the "borders" and possibility of charges are likely to develop through time

- Scientific dilemmas, responsibility of a researcher, misuse of scientific information, reproducibility
- Pseudoscience, junk science
- Evaluation of research: validity of metrics, funding (2017+)
- Publishing industry: publishers and subscription policies (open access, open science), paper mills, predatory, hijacked or other controversial journals
- Peer review: open/blind, fake, conflict of interest (reviewer, author)
- Use of AI in research, writing
- Collaboration: authorship, workplace relations (e.g., misusing seniority, favoritism)

Ethics in science: guidelines

Academic and research integrity concepts

[The European Code of Conduct for Research Integrity](): principles

- **Reliability** in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources
- **Honesty** in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way
- **Respect** for colleagues, research participants, society, ecosystems, cultural heritage and the environment
- **Accountability** for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts

More: [STEMskiller – Academic ethics and integrity: concepts and definitions](),
       [Dilemma Game]() (cards, app) – dilemmas in context, specific examples; [Integrity Games]()

Ethics: universities and other institutions

Universities and faculties

- CTU: [Code of Ethics](#) (2014), [Czech version](#) (2022)
- UCT: [Code of Ethics an Ethics Committee](#)
- CU: [Code of Ethics](#)

> …internships, exchanges and collaborations – what is the "norm" there?
>
> e.g., [University of Southampton](#)

Other institutions

- CAS: [Code of Ethics for Researchers of the Czech Academy of Science](#)
- GAČR: Code of Conduct ([reviewers](#), [investigators](#), [tender documents](#))
- European Commision: [Ethics](#)

Ethics: publishing, journals

Journals: Instructions for authors/reviewers (sometimes hard to find)

- [Journal of Hydrology](), [Springer Journals]()

Examples of guidelines and policies (publishers):

- Elsevier: [Policies and Ethics for Authors](), [Publishing Ethics]()
- Springer: [Publishing Ethics for Journals](), [Editorial Policies]()
- Wiley: [Guidelines - Publishing Ethics]()

Avoiding problems

Designing research

- Why: reasons for the research (benefits vs. possible misuse)

- What and how: possible ethical issues in planned research (e.g., environment protection, working with personal data/human participants/cells)

- Solid [research design](#) and [data management](#) plan ([Horizon Europe](#)): to avoid mistakes, archive information, enable data validation and replicability of results

- When **preparing a grant application** ethical issues should be thought through

European Commission: Funding & tender opportunities: [How to complete your ethics self-assessment](#) (Horizon Europe, Digital Europe and European Defence Fund)

Throughout the research process

- Research and scientific method: being systematic and creative, involving scepticism a critical appraisal, double-checking, **avoiding bias** (e.g., cognitive, socio-cultural, expectations, [algorithmic](#))

- **Collaboration with colleagues**: respect, safety, communication, and delegation of roles

- Proper recording, analyzing, and storing of data: aiming for replicability of research methods

Reporting research: writing and publishing

- Try to be accurate, clear, and transparent

- Responsible reporting ([data protection](), [research involving humans or animals]())

- Working carefully with references, avoid plagiarism

- Choice of journal (predatory journals)

- Read and follow the **journal guidelines** (requirements e.g., format, referencing, [preprint]() policy, data management, conflict of interest)

- Avoid [duplicate]()/concurrent submission and publication, copyright infringement ([www.howcanishareit.com]())

Specific issues

Falsification and fabrication

"**Falsification** is manipulating research materials, equipment or processes or changing, omitting or suppressing data or results without justification."

"**Fabrication** is making up results and recording them as if they were real."

Definition taken from: ALEEA – All European Academies. *The European code of conduct for research integrity*: *Revised Edition* [online]. 2017-03-24 [cit. 2017-12-01], p. 8. Available at: https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

Video: Data Fabrication and Falsification

How to avoid

- Be meticulous when working with data, do not tamper with results

- Keep the (raw) data, have a documented research plan

- Double-check your work (by yourself and your colleagues): on discovering mistakes

Falsification and fabrication

- **Image manipulation**
  - Inappropriate enhancement of the image: e.g., removing/moving/adding/obscuring specific features, duplication, rotation, plagiarism
  - Small adjustments might be acceptable (but always check the journal policies)
  - ORI: Tips for Presenting Scientific Images with Integrity, examining images techniques: Forensic Droplets, Guidelines for Best Practices in Image Processing
- **The** Misleading graph

Cases

- The Rector Who Never Was
- Potential fabrication in Alzheimer research (with a meta-ethical twist)

Plagiarism

"**Plagiarism** is using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs."

- [Several types](#) of plagiarism

- **Anti-plagiarism (text duplication) software:** it is easily found out (universities check their theses, journals – articles); e.g., [Turnitin](#), [Odevzdej.cz](#), [iThenticate](#)

- Both **ethical** and **legal issue** (intellectual dishonesty, copyright violation)

Plagiarism

- **Unintentional plagiariasm** (a.k.a. [cryptomnesia](#)) – still plagiarism, punishment might be less severe but your reputation is damaged nonetheless. **How to avoid**:
    - Be meticulous when writing and working with citations ([more](#))
    - Before submitting text, run it through text duplication/anti-plagiarism software
    - Try not to rush things at the last minute

- **Self-plagiarism** – presenting your previously published findings as original ([the case of Zygmunt Bauman](#)). **How to avoid**:
    - Cite yourself! (but don't overdo it)

Authorship

"Authorship should be limited to those who have made a significant contribution to the concept, design, execution or interpretation of the research study. All those who have made significant contributions should be offered the opportunity to be listed as authors. Other individuals who have contributed to the study should be acknowledged, but not identified as authors."

- Ghost/gift authorship is considered an ethical issue as well

- Publishers: **author contribution statement** (CRediT Contributor Roles Taxonomy)

- How to handle authorship disputes: a guide for new researchers (COPE)

- Acknowledgement section (minor contributions)

- Different fields, different customs: sequence of authors (significance, alphabetical, last author)

Predatory journals

- Beware of the spam emails (e.g., speedy publication offers): there are also predatory conferences and predatory publishers of books

- Characteristics of predatory journals (not always right)

- Check Beall's list (archive, 2016)

- Check "White lists": [WoS](WoS), Scopus, Directory of Open Access Journals (DOAJ), including (temporarily) excluded journals: [WoS](WoS), Scopus

- Check with your supervisor/librarian/colleague

- Tools and tips: https://thinkchecksubmit.org/, 8 Ways to Identify…

- Predatory journals: no definition, no defense

Articles: rejection and retraction

- Rejecting papers before publication (review, anti-plagiarism software)

- **Retraction** of already published papers
  - Reasons: both misconduct and honest mistakes
  - Different journals might use different ways to mark retracted articles, (not) provide reasons
  - COPE: [Retraction guidelines for scholarly publishing](#)

Retraction studies

An in-depth analysis of papers retracted in the Web of Science *Proceedings of the 19th International Conference on Science and Technology Indicators* (pp. 337-344)

Thed van Leeuwen, Marc Luwel (2014)

Web of Science (?-2014) - 2479 retracted articles
22.1% Fraud
21.2% Errors
12.4% Fraud by 1 author
11.5% Duplicated / concurrent publishing
8.0% Plagiarizing
6.2% No motivation given
5.3% No approval by competent authority for experiments
4.4% Classification errors in journal or WoS
4.4% Independent review
2.7% Incomplete consultation between authors/ listed an author without consent
1.8% Errors by editiors

Misconduct accounts for the majority of retracted scientific publication

Ferric C. Fang, R. Grant Steen, Arturo Casadevall (2012)

PubMed - 2047 retracted articles, English only
43.4% Fraud, suspected fraud
21.3% Error
14.2% Duplicate publication
9.8% Plagiarism

Retractions: the good, the bad, and the ugly

What do you think:

Why does scientific misconduct occur?

Sources: stay updated

- [Retraction Watch](): [database]()

- [Committee on Publication Ethics]() (COPE): [Flowcharts]()

- [The Office of Research Integrity]()

- [PubPeer](): post-publication peer-review forum

- Wikipedia: [List of scientific misconduct incidents]()

- Věda a výzkum: [Akademická Integrita]()

Learning outcomes

- Ethics are a part of the scientific endeavour

- The most common breaches of academic integrity are fabrication, falsification, and plagiarism

- There might not be a straightforward solution for every situation; norms and requirements differ in time and space – stay updated

- Be aware of your institutional and journal/grant requirements

- To avoid problems:
  - Be meticulous when working with data and resources
  - Aim for replicability of research (dealing with data, reporting research)
  - Stick to the scientific method
  - Respect your colleagues, society, and the environment

Get Assistance

Schedule a [consultation](#):

- Please don't be shy; [our team](#) includes doctoral candidates who know the issues you face
- We also provide consultations about creating a comprehensive search strategy and organizing yourself as you begin a specific writing project

Useful links:

- [STEMskiller](#): skills set map for early career researchers
- [ENAI & FAIT](#): [support and consultation](#) in suspected academic misconduct
- [ČAD](#): The Czech Association of Doctoral Researchers

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Thank you

Questions?