Overview

• Some results from a survey
• Some examples
• Distinction between science ethics and research ethics
• Various types of scientific misconduct
  – Plagiarism
  – Authorship
  – Salami publishing, imalas, ...
• The internal norms of science
• Conflict of interest
• Motives for scientific misconduct

Scientific dishonesty (definition)

• Scientific dishonesty frequently refers to actions or omissions in connection with research, which leads to false or distorted scientific results or gives misleading information about an individual contribution to research.

Implications

• It may directly or indirectly harm vulnerable research participants.
• It may undermine the general trust in science and scientists.
• It may cause harm if future research or therapy attempts to rely on fraudulent results.

Method

• A two-page questionnaire combining a survey developed at the
  – Department of Medical Ethics in Lund, Sweden with a
  – Survey developed by Kalichman (USA) was applied.
• The participants in the study were post-graduate students being enrolled in the PhD-program at all medical faculties in Norway, i.e., at the universities in
  • Oslo,
  • Bergen,
  • Trondheim, and
  • Tromsø.
Results

- 262 questionnaires were distributed, of which 189 were returned, giving an overall response rate of 72.1%.
- 59% of the respondents had attended lectures or courses in science ethics as part of their undergraduate studies while 31% had not.
- The pilot study was carried out in Oslo including 26 respondents with a response rate of 55.3%.

Main findings, events

- 65% of the respondents had not, during the last year, heard or read about researchers who committed scientific dishonesty.
- One respondent had experienced pressure to fabricate and to falsify data, and one had experienced pressure to plagiarize data.
- One respondent was uncertain whether he or she had plagiarized data and two were uncertain whether they had plagiarized publications.
- On average 60% of the respondents were uncertain whether their department had a written policy concerning scientific conduct.
- About 11% of the respondents had experienced unethical pressure concerning the order of authors during the last 12 months.

Main findings, attitudes

- 10% did not find it inappropriate to report experimental data without having conducted the experiment and
- 38% did not find it inappropriate to try a variety of different methods of analysis to find a statistically significant result.
- 13% agreed that it is acceptable to selectively omit contradictory results to expedite publication and
- 10% found it acceptable to falsify or fabricate data to expedite publication, if they were confident of their findings.
- 79% agreed that they would be willing to report misconduct to a responsible official.

### Table 3 How many PhD-students were uncertain about whether their department had written policies (in percent). Data from Sweden reproduced from Nilstun 2010.

<table>
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<th>Questions</th>
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*Data was returned blank and is not counted in the response rate as it does not contribute with information.*
Results on attitudes

- 29% agreed that it is more important that data reporting be completely truthful in a publication than in a grant application.
- 13% agreed that you have an ethical obligation to act if you witness someone committing research misconduct.
- 79% agreed that they would be willing to report that misconduct to a responsible official, if they had witnessed a co-worker or peer committing research misconduct, and
- 75% agreed that they would be willing to report misconduct to a responsible official if they had witnessed a supervisor or principal investigator committing research misconduct.
- 46% agreed that all co-authors must equally share in the blame if fabricated data are discovered in a published paper, and
- 29% agreed that all co-authors must receive the same punishment if fabricated data are discovered in a published paper.

Comparisons between groups

- More PhD-students with undergraduate studies outside Norway answered that they had been exposed to unethical pressure concerning results during the last 12 months than those who had studied in Norway (p=0.045, Fischer’s exact test), and that they were uncertain whether they had been exposed to unethical pressure concerning harassment (p=0.02, Fischer’s exact test).
- The PhD-students with undergraduate studies outside Norway differed also from those that had studied in Norway in that they found it more acceptable to selectively omit contradictory results to expedite publication if they were confident of their findings (p=0.008, Mann-Whitney).

Conclusion (on the survey)

- The survey shows that scientific dishonesty is not unknown to PhD students in Norway.
- Very few stated that they were exposed to pressure to fabricate, falsify, or plagiarise data.
- Pressure put upon post graduate students regarding the order of authors was more common.
- Some forms of scientific misconduct were considered to be acceptable by a significant minority e.g.,
  - almost two of five respondents found data fishing acceptable.
- There was little awareness of relevant policies for scientific conduct, but a high level of willingness to report misconduct.

#overlyhnstmthds

- “asked a labmate to explain which statistical test i should choose. he said “the one that gives you the most stars” ”
- “I said I chose the 36hr timepoint based on the literature, but I actually chose it b/c I overslept the 24hr timepoint”
- “if you editors really expect me to read 150+ papers just to write 1 review paper, you guys are dumber than I thought…”
- “told my PI I cant cite some papers b/c we cant access the journals so I cant read them. he said to “cite them anyway””
- “I ran my experiment on Saturday so I chose arbitrary timepoints so I could get drunk, sleep in, and watch football”
- “my PI didn’t let me submit a paper i’ve been working on for 18 months b/c it contradicts one of his papers from his phd”
#overlyhnstmthds

- “‘Sample was incubated overnight’ is another way of saying ‘sample was incubated until I felt like getting out of bed’”
- “My PI rejected a paper out of spite because the PI that submitted the paper ‘scooped’ him last year”
- “My PI made me cite other PIs that agreed to cite him in return, even if their citations are irrelevant to the paper”
- “I say my data is ‘statistically significant’ but I don’t really know how it’s calculated or what I mean when I say it”
- “The most dishonest thing that I tell people is that my ‘results are easily reproducible’”
- “The words ‘exactly’ and ‘precisely’ are two words that are always written in my protocols, but rarely enforced”

Science ethics versus Research ethics

- Research ethics:
  - Ethics for research on human beings (and animals)
  - External norms
- Science ethics:
  - Internal norms in science
  - Researchers’ professional codes of ethics

Types of misconduct

- undeclared conflicts of interest, corruption
- wrong analysis
- withholding method details
- fabrication
- biased or post-hoc revision of study design
- ignoring previous work of others
- suppressing own data, dropping data points
- undeserved authorship
- wrong observation
- overlooking others’ use of flawed data
- suppressing fraud allegation
- plagiarism
- falsification
- inadequate record keeping
- unfair review, wrong testimony

Plagiarism is serious

- “Theft” (from Latin plagium/plagiarius, kidnapping)
- “Counterfeiting”
- Breaches with basic norms in science ethics

See separate ppt

PLAGIARY
Plagiary

- Plagiary as an academic and ethical term
- Plagiary as a legal term
- Cheating as a legal term

Plagiary as defined in:
http://en.wikipedia.org/wiki/Plagiarism

- "the practice of claiming, or implying, original authorship, or incorporating material from someone else’s writing, in whole or in part, into one’s own, without adequate acknowledgment.
- Within academia, plagiarism is seen as academic dishonesty and is a serious subject to academic censure.
- Plagiarism may occur unintentionally as when an author fails to include quotations or give the appropriate citation.”

ABSTRACT. The science/non-science distinction has become increasingly blurred. This paper investigates whether recent cases of fraud in science can shed light on the distinction. First, it investigates whether there is an absolute distinction between science and non-science with respect to fraud, and in particular with regards to manipulation and fabrication of data. Finding that it is very hard to make such a distinction leads to the second step: scrutinizing whether there is a normative distinction between science and non-science. This is done by investigating one of the recent internationally famous frauds in science, the Sudde case. This case demonstrates that moral norms are not only needed to regulate science because of its special characteristics, such as its potential for harm, but also because of its potential for harm. However, the Sudde case demonstrates that moral norms are not only needed to regulate science because of its special characteristics, such as its potential for harm, but also because of its special characteristics. Hence, moral norms are crucial in differentiating science from non-science. This does not mean that ethics can save the life of science, but only that it can play a significant role in its resuscitation.

Moral norms are crucial in differentiating science from non-science. However, this does not mean that ethics can save the life of science, but only that it can play a significant role in its resuscitation.

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Moral norms are important in differentiating science from non-science. This does not, however, mean that ethics can save the life of science. Nevertheless, it can play a significant role in its resuscitation.
• Moral norms are important in differentiating science from non-science. This does not, however, mean that ethics can save the life of science. Nevertheless, it can play a significant role in its resuscitation.

• Science can be differentiated from non-science by its moral norms. This means that ethics can play an important role in reviving science, if it may not be that ethics can save the life of science.

• Science can be discriminated from other social activities by its set of moral norms. This means that ethics is important for demarcating science.
Referencing

- "The primary purpose of Institutional Review Boards (IRBs) is "to protect the rights and welfare of human research subjects recruited to participate in research activities conducted under the auspices of the institution with which [they are] affiliated" (OHRP, 1993)."
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Authorship

“An “author” is generally considered to be someone who has made substantive intellectual contributions to a published study, and biomedical authorship continues to have important academic, social, and financial implications.” (ICMJE)

What is the function of authorship?

Allocation of credit for the academic work described in the paper / book
  - No “free rides”
  - No unjustifiable exclusions
Allocation of responsibility for the academic work
  - There is no such thing as a free lunch!

But note that the function of authorship is influenced by culture, including the culture of each specific academic field

Authorship ICMJE rules

Authorship credit should be based on
1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;
2) drafting the article or revising it critically for important intellectual content; and
3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3.

When a large, multi-center group has conducted the work, the group should identify the individuals who accept direct responsibility for the manuscript. These individuals should fully meet the criteria for authorship defined above and editors will ask these individuals to complete journal-specific author and conflict of interest disclosure forms.

Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.

All persons designated as authors should qualify for authorship, and all those who qualify should be listed.

Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.

Typical authorship misconduct

- Exclusion from authorship
- Gift authorship
- Ghost authorship
- Authorship achieved by coercion
- Unsolicited authorship
- Refusal to accept responsibility as an author when other misconduct is detected
Co-authorship: some challenges

- (Mis)use:
  - Make collaboration visible
    - Supervisor, PI, head of institute
    - Collaborative groups
  - Authorship merits (funding)
  - Persons who have not participated in drafting the manuscript are co-authors

Core Questions Co-authorship

- Author?
- Contributor?
- Signing?


Other forms of misconduct

- Duplicate publication and other forms of redundant publication
- “Salami” and “imalas” publication
- Misconduct in reviewing
- Fabrication of data
- Manipulation of data
- Plagiarism of ideas and publications

Salami-publishing

- Slicing the research sausage into thin slices
- Dividing the data set into smaller parts published separately
- Problem: double count (eg. Metaanalyses)

imalas-publishing

- In imalas-publishing one puts the sausage together over a period of time.
- First one publishes the results for the first (20) patients, two years later the same patients plus (20) new patients, and so on.
- Problem: double count.

RANKING OF SERIOUSNESS
Conflict of interest

The BMJ’s definition

“A competing interest exists when professional judgment concerning a primary interest (such as the validity of research or the choice of an external supplier) may be influenced by a secondary interest (such as financial gain).

We believe that the best decisions are made when knowledge of any competing interests is shared among all parties to a decision. We are not aiming to eradicate competing interests -- they are almost inevitable.

We used to ask about any competing interests, but we have decided to restrict our request to financial interests for the time being. This is largely a tactical move. We hope that it will increase the number of disclosures of competing interests.

EXTENSION

How often do scientists (and doctoral students) cheat?

Rank according to seriousness

undeclared conflicts of interest, corruption
wrong analysis
witholding method details
double and sliced publications
fabrication
biased or post-hoc revision of study design
ignoring previous work of others
illegal human experiments
suppressing own data, dropping data points
undeserved authorship
espionage, giving away secrets
misuse of public funds
bullying, nepotism
wrong observation
overlookig others’ use of flawed data
suppressing fraud allegation
no informed consent
plagiarism
falseification
inadequate record keeping
unfair review, wrong testimony

Data collected by the individual scientist, abuse or misuses:

Massaging – (...) extensive transformations or other maneuvers to make inconclusive data appear ... conclusive)
Extrapolating – (...) predicting future trends based on unsupported assumptions ...
Smoothing – (...) discarding data points too far removed from expected ... values)
Slanting – (...) selecting certain trends in the data, ... discarding others which do not fit ...
Fudging – (creating data points to augment incomplete data sets ...
Manufacturing – (creating entire data sets de novo, ...)

From: Sindermann C. J. "Winning the games scientists play" (Plenum Press, NY, 1982)

Revised Nylenna-Simonsen-Chalmers Diagram (Lancet 2006;367:1882)

Error

Misconduct

Fraud

1. wrong observation
2. wrong analysis
3. inadequate record keeping
4. witholding method details
5. double and sliced publications
6. biased or post-hoc revision of study design
7. ignoring previous work of others
8. suppressing own data, dropping data points
9. undeclared conflicts of interest, corruption
10. undeserved authorship
11. unfair review, wrong testimony
12. espionage, giving away secrets
13. misuse of public funds
14. bullying, nepotism
15. overlookig others’ use of flawed data
16. suppressing fraud allegation
17. no informed consent
18. plagiarism
19. fabrication
20. inadequate record keeping
21. - illegal human experiments

average

high

low overall impact

EXTENSION

How often do scientists (and doctoral students) cheat?
How common is misconduct?

“A pooled weighted average of 1.97% (N = 7, 95% CI: 0.86–4.45) of scientists admitted to have fabricated, falsified or modified data or results at least once—a serious form of misconduct by any standard—and up to 33.7% admitted other questionable research practices. In surveys asking about the behaviour of colleagues, admission rates were 14.12% (N = 12, 95% CI: 9.19–19.72) for falsification, and up to 72% for other questionable research practices.”


“Why scientific misconduct?”

DRIVERS - MOTIVATION

Table 2. Summary statistics of self-reported reasons and attitudes towards self-reported reasons of scientific students.

Table 3. Answers to the questions about scientific dishonesty and other unethical behavior in connection with research integrity. Tot/Col/Percentage.

Table 4. Adverse effects of scientific misconduct and other unethical behavior in connection with research integrity. Tot/Col/Percentage.

Table 5. Adverse effects of scientific misconduct and other unethical behavior in connection with research integrity. Tot/Col/Percentage.
The perpetrator’s own explanation

John Darsee:

'This was an extremely difficult period for me. I had too much to do, too little time to do it in, and was greatly fatigued mentally and almost childlike emotionally. I had not taken a vacation, sick day, or even a day off from work for six years. I had put myself on a track that I hoped would allow me to have a wonderful academic job and I knew I had to work very hard for it.'

(Quoted in JAMA, 8 April 1983, p. 1806)

Why do researchers cheat?

Because some people are cheaters – also among researchers. (Erik Tunstad, Jules Hvordan forskere svindler - og hvorfor det ikke er sa farlig, 2011).

Why commit misconduct?

In a letter to Judge William Sessions, Ill, U. S. District Court for the District of Vermont, Eric T. Posner said he had convinced himself that it was acceptable to falsify data for the following reasons:

'First, I believed that because the research questions I had framed were legitimate and worthy of study, it was okay to misrepresent “minor” pieces of data to increase the odds that the grant would be awarded to UVM and the work I proposed could be done.'

'Second, the structure at UVM created pressures which I should have, but was not able to stand up to. Being an academic in a medical school setting, I saw my job and my laboratory as expendable if I were not able to produce. Many aspects of my laboratory, including salaries of the technicians and lab workers, depended on my ability to obtain grants for the university. I convinced myself that the responsibility I felt for these individuals, the stress associated with that responsibility, and my passion and personal ambition justified “cutting corners.”

'Third, I cannot deny that I was also motivated by my own desire to advance as a respected scientist because I wanted to be recognized as an important contributor in a field I was committed to.' (Office of Research Integrity 2006, p. 5)

*UVM is the abbreviation for the University of Vermont at Burlington.

Why do researchers cheat?

• Because their research seems justified
• Significant expectations and pressure
• Career and advancement
  (Office of Research Integrity 2006, p. 5)
• Simple (to copy, plagiarize)
• Used to cheating earlier (in their training and education)

Why do researchers cheat?

• «The research system of today emphasizes competition and prestige more than integrity. This imbalance promotes scientific fraud.»
  Dag Rune Olsen, Morgenbladet 2.6.2006

What is good science?

NORMS OF SCIENCE
Integrity and knowledge

“Integrity without knowledge is weak and useless, and knowledge without integrity is dangerous and dreadful.”

Samuel Johnson.

How to be a good researcher?

1. Tell the truth about your research
2. Openly report your methods and results
3. Openly disclose any commercial interests and other ties
4. Consciously examine and present the basic assumptions underlying your studies
5. Do not steal research results from others (e.g. from younger colleagues)
6. Conduct your research in an orderly manner (e.g. by maintaining documentation and retaining data)
7. Do not conduct your research in a way that could harm other people (e.g. subjects)
8. Be fair in your assessment of other people’s research

Scientific norms (K.E. Tranøy, 1988)

Internal norms (science ethics)
- Epistemic
  - Truth, testability, coherence, consistency, simplicity
- Social
  - Openness, honesty, collaboration

Linkage norms
- Usefulness, relevance, usability

External norms
- Research ethics

The norms constitute the profession

1. Competence
2. Disinterestedness
   - Welfare goal
3. Internal disciplining
   - Professional codes
   - Internal norms
4. Professional autonomy

Robert Merton, “The normative structure of science”, 1942

The CUDOS norms
- Communism of knowledge (knowledge is common property)
- Universalism (the validity of a scientific claim does not depend on the personal or the social attributes of its proponents)
- Disinterestedness (the motives of the scientist are irrelevant)
- Organized Scepticism

- Granskingsutvalget for redelighet i forskning har laget et skjema for innmelding av saker.
- Granskingsutvalget kun går inn i mulige alvorlige saker. Andre saker skal behandles lokalt.
Ten principles for good health research

1. The principle of human dignity
2. The principle of autonomy
3. The Soundness principle
4. The Risk-benefit principle
5. The principle of freedom of research
6. The professionality principle
7. The commonality principle
8. The confidentiality principle
9. The principle of openness and transparency
10. The principle of advance assessment

Source: NOU 2005 "God forskning – bedre helse"

Good science

- Good science is published science?
  - Problem: Retraction
  - Problem: Referee system
- Can you have good science when breaching with science's internal norms (e.g. CUDOS)?

Research Ethics Committees

- The National Committee for Medical and Health Research Ethics (NEM)
- The National Committee for Research Ethics in Science and Technology (NENT)
- The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH)
- The National Committee for Research Ethics on Human Remains
- http://www.etikkom.no/en/In-English/

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