

The (new?) modus operandi  
of publishing science:  
current ethical demands for  
authors, reviewers and editors

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Chair, Committee on Publication Ethics

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## What's new about publication ethics?

### New(ish)

- Pressure to publish
- Copy & paste
- Photoshop
- Anti-plagiarism s/w

### Not new

- Academic rivalry
- Authorship issues
- Ambition
- Laziness
- Ignorance

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## Is misconduct increasing?

- We really don't know ....
- We may be getting smarter at detecting it
- But, there is still enough to worry about

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## Research fraud makes good headlines:

### (1) Hwang Woo-Suk

Hwang's human stem cells were all fakes (Nature)  
Seoul bans Hwang's stem cell research (Korea Times)  
Dr Hwang and the stem cell swindle (Independent)



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## (2) Jan Hendrik Schön



The dark secret of Hendrik Schön  
(Horizon)

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What should journal editors do  
about misconduct / fraud?

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## 'A few bad apples' or 'The tip of the iceberg'?



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## How common is misconduct?

- Systematic review (screened 3207 papers)
- Meta-analysis (18 studies)
  - surveys of fabrication or falsification
  - NOT plagiarism
- **2%** (95% CI 0.9-4.5) admitted misconduct themselves
- **14%** (9.9-19.7) aware of misconduct by others

Fanelli *PLoS One* 2009;4(5):e5738

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## How often is misconduct detected?

PubMed retractions	0.02%
US Office of Research Integrity (ORI)	0.01-0.001% (1 in 10,000 / 100,000 scientists)
Image manipulation in <i>J Cell Biology</i>	1% (8/800)
FDA audit – investigators guilty of serious sci misconduct	2%

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## Does peer review detect misconduct?

- Obviously not in all cases
- Prestigious journals are not immune (may actually be more vulnerable?)
- Reviewers sometimes spot:
  - plagiarism (especially of own work)
  - redundant publication (from checking refs)
  - multiple submission (from seeing same paper)
  - ?fabricated data ..... probably very rarely

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## Schön's retracted papers

- 8 in *Science* (published 2000-1)
- 6 in *Physics Review journals* (4 from 2001)
- 7 in *Nature* (published 1999-2001)

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## Can technology help?

- Probably
- But it costs time / money / people



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## Tools for detecting misconduct

- Anti-plagiarism software (eg CrossCheck, Turnitin, etBLAST)
- Screening images (PhotoShop)
- Data review (digit preference)
- Chemical structure checks
- Replication

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## eTBLAST

- Compares text similarity
- Checks accessible text (not most journals)
- Used to check Medline abstracts
- Used to create Déjà vu database
- <http://invention.swmed.edu/etblast/index.shtml>
- <http://spore.swmed.edu/dejavu/>

problem with false +ves / only open text

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## CrossCheck

- Based on iParadigms software
- Compares text against publishers' d-base
- D-base run by CrossRef (doi system)
- D-base currently contains 25mn papers
- Shows % concordance + source
- Can exclude "quotes" and references
- ?False positives / 'noise' level

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## Image screening

- Pioneered by *J Cell Biology*
- Used in some life sciences journals
- Important for research where the image = the findings
  - genetics / cell biology / radiography
- Manual check using PhotoShop
- Requires editor time / expertise

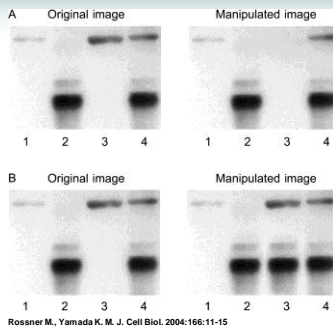
Found 1% unacceptable manipulation

Rossner & Yamada, *JCB* 2004;166:11-15

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JCB

Figure 1. Gross manipulation of blots

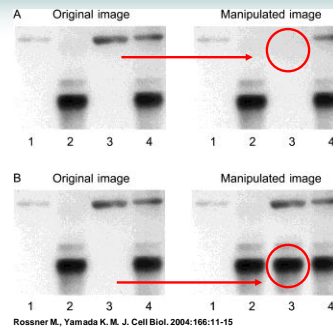


© 2004 Rossner et al.

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JCB

Figure 1. Gross manipulation of blots



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## Chemical structure checks

- Examined structure-factor files
- Identified >70 bogus organic structures
- Authors had taken a genuine structure and switched metals (eg Fe / Cu) or chemical groups (CH<sub>2</sub> / NH / OH)
- Editors note: "it is a concern and a disappointment that these [chemically implausible or impossible structures] passed into the literature"
- >70 articles retracted

Acta Crystallographica 2010;E66:e1-2

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## Are editors alert to misconduct?

- Survey of science editors (n=231)
- Asked about 16 ethical issues including:
  - falsified or fabricated data, plagiarism, redundant publication, unethical research design or conduct, image manipulation
  - authorship problems, reviewer misconduct, undisclosed commercial interests

Wager et al. J Med Ethics 2009;35:348-53

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For each issue, at their journals, editors asked about:

Score	0	→	3
<b>Severity</b>	not a problem		a very serious problem
<b>Frequency</b>	never		very often (>once/month)
<b>Confidence</b>	not at all confident		highly confident

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Average ratings (0-3)

	Severity	Frequency
Redundant pub	1.09	1.39
Plagiarism	0.86	0.96
Duplicate sub	0.79	1.01
Author Col	0.73	0.90
Reviewer Col	0.69	0.94
Fals/fabr data	0.56	0.58
Image manip.	0.30	0.80

0 = not a problem

0 = never  
1 = < 1/yr

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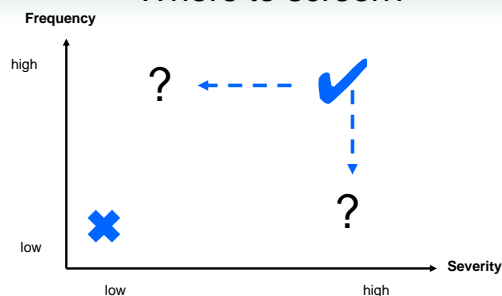
## Our conclusions

- *'Most editors of science journals seem not very concerned about publication ethics and believe that misconduct occurs only rarely in their journals'*

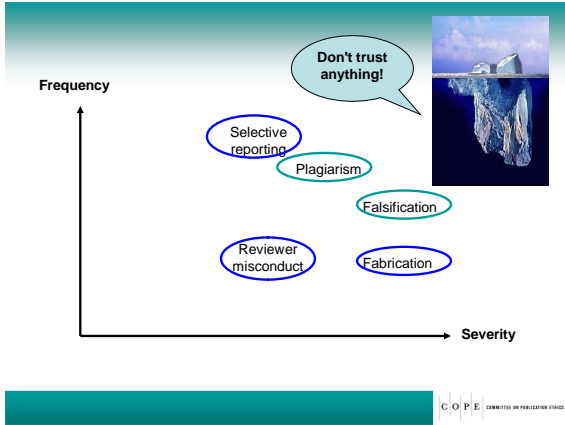
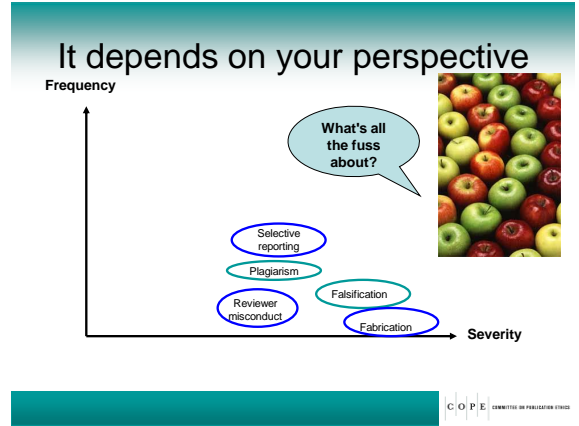
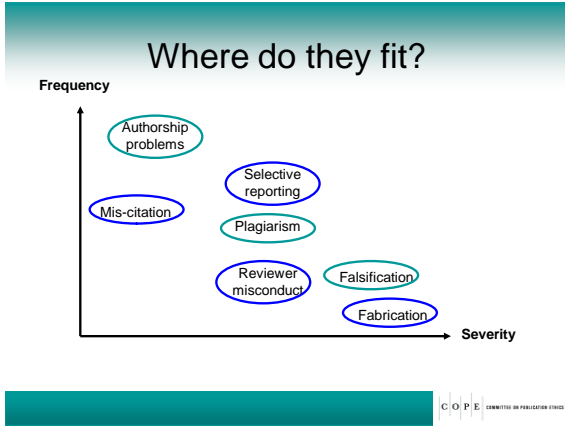
Wager et al. J Med Ethics 2009;35:348-53

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## Where to screen?



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*"It is a vice to trust all, and equally a vice to trust none"*

Seneca 4 BC – 65 AD

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- ### My personal view
- Deliberate fraud (eg data fabrication) is probably rare but does occur in all areas
  - Questionable practices (eg massaging data, inappropriate analyses, image manipulation) is more common
  - Some misconduct is due to ignorance
  - Institutions should educate all researchers about good practice and give clear guidance and leadership on research integrity
  - Editors need to avoid complacency and being over-zealous (and making unreasonable demands on authors)
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- ### Frank Wells
- *'Human nature is flawed, and the temptation to cheat, fabricate, falsify, or plagiarize, coupled with degrees of arrogance and greed, will indeed always remain with us. That temptation will, from time to time, fail to be resisted'.*
  - The research community needs *'mechanisms that will minimize the occurrence of research misconduct'* and also mechanisms to *'deal with it responsibly and expeditiously'* when it occurs.
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## What is COPE?

- The Committee On Publication Ethics
- Founded 1997
- Forum for editors to discuss cases
- Provides guidance for editors and publishers on all aspects of publication ethics and misconduct
- <http://publicationethics.org>

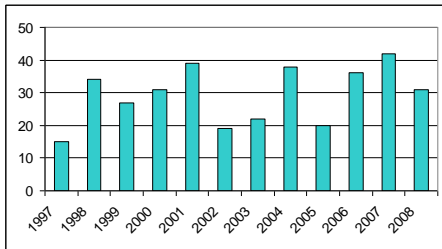
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## What are COPE cases?

- Members bring anonymised cases to quarterly Forum meetings
- All cases are entered into a database
- Cases are available at: [www.publicationethics.org](http://www.publicationethics.org)
- Cases are searchable by keyword
- Keywords were rationalized in 2008

author mistakes authorship changes in authorship consent for data fabrication/ falsification data ownership dis authorship editorial decisions editorial misconduct gift authorship lack of ethical review/approval multiple submit overlapping publications participant confidentiality participant plagiarism protection of subjects (human) quality research redundant publication reviewer misconduct sponsor sanctions for misconduct authors reporting undeclared Col (an undeclared Col (reviewer) unethical research unethical treatment whistleblower

## Number of cases by year



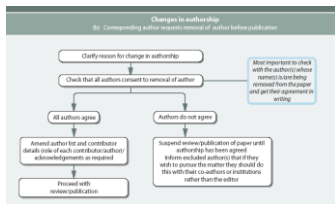
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## COPE case topics over time

	97-99	00-02	03-05	06-08
<b>Total</b>	<b>76</b>	<b>80</b>	<b>80</b>	<b>109</b>
Unethical editorial decisions	3	3	10	11
Plagiarism	4	6	11	13
Authorship	17	23	9	18
Fabrication / falsification	9	4	3	7
Unethical research	32	40	41	38

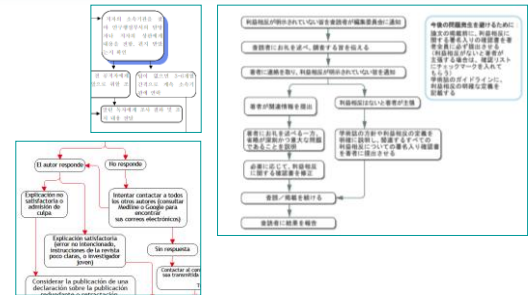
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## COPE provides guidance to editors (eg flowcharts)



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## they have been translated into several languages



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## Involved in developing guidelines for authors

- 2<sup>nd</sup> World Conference on Research Integrity
- Singapore, July 2010
- Universal standards (across all disciplines)

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## Responsible research publication: international standards for authors

- 1 The research being reported should have been conducted in an ethical and responsible manner and comply with all relevant legislation
- 2 Researchers should present their results clearly, honestly, and without fabrication, falsification or inappropriate data manipulation
- 3 Researchers should strive to describe their methods clearly and unambiguously so that their findings can be confirmed by others

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## Responsible research publication

- 4 Researchers should adhere to publication requirements that submitted work is original, is not plagiarised, and has not been published elsewhere. Work should not be submitted to more than one publication at a time.
- 5 The authorship of research publications should accurately reflect individuals' contributions to the work and its reporting.

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## COPE retraction guidelines

- Wager, Barbour, Yentis & Kleinert
- Published Sept 2009
- Available at: [www.publicationethics.org](http://www.publicationethics.org)
- Co-published in several journals

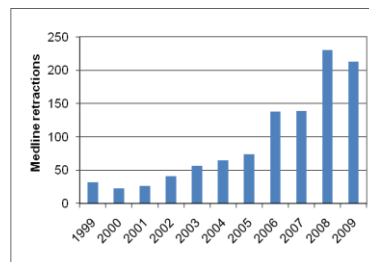
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## Why did we need guidelines on retraction?

- Some editors seem reluctant to retract
- Some retraction statements are unclear (?misconduct / honest error)
- Some retracted articles are not properly labelled
- Some editors retract inappropriately (eg for authorship disputes)

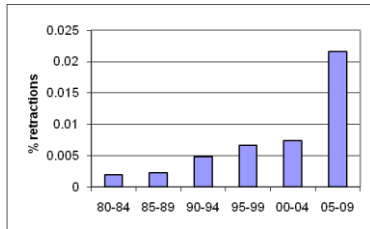
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## Medline retractions 99-09



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## Retractions as % of total no of publications in Medline



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## What do the guidelines say?

- The main purpose of retractions is to correct the literature and ensure its integrity rather than to punish authors who misbehave

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## Editors should consider a Retraction:

- If they have clear evidence that findings are unreliable due to misconduct or honest error
- In cases of:
  - plagiarism
  - redundant publication
  - unethical research

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## Use an Expression of Concern

In cases of:

- inconclusive evidence of misconduct
- institution will not investigate
- investigation is not fair, impartial or conclusive
- on-going investigation

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## Use a Correction if:

- a small portion of an otherwise reliable publication is misleading
- the author / contributor list is incorrect

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## What do authors need to know about retractions?

- Your work may be retracted if it is seriously flawed / misleading
- You should alert the editor ASAP if you discover problems with published work
- Editors can retract articles even without the authors' permission

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## Can authors dissociate themselves from retracted work?

- If retraction is due to the actions of only some authors, the notice should mention this
- BUT most editors consider authorship entails some degree of joint responsibility for the integrity of the reported research so it is NOT appropriate for authors to dissociate themselves from a retracted article even if they were not directly culpable of any misconduct

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## Misconduct is a continuum – what is plagiarism?

- Retype whole published article by other authors and resubmit it under your name
- Copy 3 paragraphs of text from another author's work setting out a novel argument and use it in your own without accreditation
- Copy a few sentences describing a well-known method
- Use an accepted phrase

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## What is reviewer misconduct?

- Take an idea from a paper you are reviewing and try to delay its publication while you publish your own paper
- Take an idea from a grant proposal, suggest the proposal is rejected, but submit your own proposal with this idea
- Take an idea from a grant proposal but approach it in a different manner
- Take an idea from a submitted paper and use it to guide your own research
- Contact the author of a submitted paper and ask if you can collaborate

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## What is editorial misconduct?

- Allowing editorial board to publish any paper in the journal bypassing peer review
- Looking favourably on a close colleague's work and not having a system in place to ensure editors with a CoI are not involved in decision making
- Appointing an active editorial board who do high quality work and encouraging them to submit it to the journal
- Using contacts to commission commentaries and encouraging colleagues to submit good work to your journal

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## Grey areas

- What is publication? (preprint servers, abstracts, conference proceedings, webcasts from conferences)
- Authorship – conventions vary between disciplines – often not codified
- Dividing work to ensure one message per article / relevant for journal readership / to fit journal word limits vs 'salami science'

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## What should journals & institutions do?

- Educate
- Raise awareness
- Have clear policies
- ?screen
- ?discipline



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## What keeps editors awake at night?

- Duplicate submissions
- Redundant publications
- Undeclared conflicts of interest
- Authorship problems
- Selective publication
- Plagiarism, fabrication, falsification



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## Keeping editors happy

- Never submit to >1 journal at the same time
- Be transparent about linked papers – supply copies when submitting
- Submit protocol for review
- Publish all findings (not just +ve)
- Follow authorship guidelines (no guests or ghosts)
- Transparency



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## Conclusions

- We don't know how common misconduct is
- Some forms of misconduct are easier to commit but also easier to detect than before
- Serious misconduct can damage the evidence base / waste resources / pose dangers
- Journals and institutions need to be alert but not paranoid
- Authors and reviewers should understand and follow the guidelines and conventions

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*"Search for the truth is the noblest occupation of man; its publication is a duty"*

**Madame de Stael (1766-1817)**



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## Recent COPE case

- Institution asks journal to retract article (because of misconduct)
- Author disagrees (says it was honest error and proposes a correction)
- Should the editor:
  - Retract the article
  - Issue an Expression of Concern
  - Publish a Correction?

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## COPE case

- Editor finds serious plagiarism in an article published 'online ahead of print'
- Article is removed from journal website and does not appear in the print journal / databases
- Was this the correct course of action?
- If not, why not?

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## Case study

- You are co-author on a paper describing a complex study involving many investigators across many sites in several countries
- After publication, a reader alerts the Editor that a short paragraph in the Introduction has been plagiarized from one of the referenced papers (there is no problem with the data)
- What should you (a co-author) do?
- What should the Editor do?

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## Case study

- You are doing research using a new piece of equipment
- After 6 months of hard work you get exciting results
- You write up your findings and get a conditional acceptance from a top journal with favourable reviewer comments
- Just before you submit your revised paper, your boss tells you he has been having problems with the equipment and thinks it may be giving inaccurate readings
- What should you do?

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## Case study

- A colleague tells you about findings relevant to your own research
- She read these in a manuscript she was reviewing for a journal
- She does not know who the authors are or whether the paper will be accepted
- Is it OK to do some experiments based on these findings?

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## Case study

- You submit a manuscript on car pollution showing it is more common / harmful than previously thought
- The journal sends it to 2 reviewers, one is quite positive, the other is negative but makes very vague criticisms and personal attacks
- The journal rejects your paper
- You think you know who the critical review is and, if it is the person you suspect, you know they do a lot of research funded by a car manufacturer
- What should you do?

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## Case study

- Your lab has been working on an informal collaboration with a lab in another country
- You share some preliminary data and give some technical support
- The head of the other lab goes ahead, without consulting you, and publishes the findings (including some of your data) with no acknowledgement of your lab's involvement
- What can you do?

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## Case study

- A young postdoc presents a new theory and some preliminary data at a conference
- A senior researcher expresses interest and says he's been working on the area for some time and the new idea may be helpful
- A few months later the senior researcher publishes a paper giving a detailed mathematical proof of the theory without acknowledgement of any other workers
- Is this acceptable?

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## Case study

- You are one of many authors of a report of a collaborative project involving labs in many different countries
- You are not involved in drafting the paper but are given a chance to comment on a draft and approve the final version
- The sections you are responsible for seem fine
- After publication somebody informs the journal that a large part of the Discussion section is a direct translation from a Russian paper which is not cited and accuses the group of plagiarism
- The Editor suggests the paper should be retracted