

Peer Review

Marek J. Druzdzel

with minor additions from Peter Brusilovsky

University of Pittsburgh

School of Information Sciences
and Intelligent Systems Program

marek@sis.pitt.edu
<http://www.pitt.edu/~druzdzel>

Peer Review

Overview

- Peer review
- How to do it well?
- Concluding remarks



Peer Review

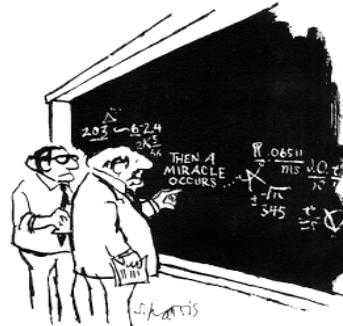
Peer review

The basic mechanism of advancement in science

Peer review is used in:

1. Publishing research results
2. Awarding of funding for research
3. Patents
4. Standards

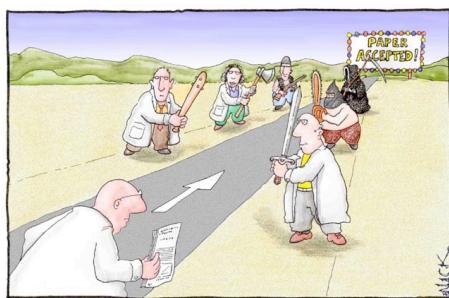
Each of these involve slightly different practices, but ultimately colleagues ("peers") are evaluating each other.



"I think you should be more explicit here in step two."

Peer Review

The process of peer review



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

The review can be internal (done by editorial staff) or external. Most typically, once a paper has been submitted for consideration of publication, the editor will select a small number (typically not more than three) scholars in the same field to evaluate the paper.

It can also be open or blind (anonymous). Nowadays, it is almost always anonymous review, i.e., the author does not know the identity of the reviewer. Sometimes, the reviewer does not know the identity of the author (double-blinding).

Peer Review

Process of peer review

- The reviewers respond with their comments (within a reasonable period of time, between a month and several months), which are then forwarded to the author for response to or compliance with reviewer's suggestions. This typically adds weeks or even months to the process.
- Today, moving text back and forth electronically has dramatically accelerated the process, although the bottleneck is still the demand of time that the process imposes on (volunteer) reviewers.



Dr. Prebish didn't always fit in with the other scientists.

Peer Review

Why do peer review?

- Filtering out papers that are not ready for publication
 - More papers submitted than could be printed
 - Eliminate bad science, pseudo-science, harmful science, ...
- Collegial stamp of approval
- Aura of "quality" (only the best gets in)
- Peer review relies on honest and unbiased judgment by informed individuals
- The two main criteria in judging somebody's work are: (1) importance, and (2) quality.



Peer Review

Peer review: Flaws



Peer review does not do well at:

- detecting innovative research
- filtering out fraudulent, plagiarized, redundant publications

Reviewers may:

- be biased in favor of well-known researchers
- be biased in favor of researchers at prestigious institutions
- review work of competitors unfairly
- be unqualified to provide authoritative review
- take advantage of ideas in unpublished manuscripts and grant proposals that they review

Peer Review

Peer review: Flaws

- Famous papers that were published and did NOT get peer reviewed:
 - Watson & Crick's 1951 paper on the structure of DNA in Nature
 - Abdus Salam's paper "Weak and electromagnetic interactions" (1968). Led to Nobel Prize
 - Alan Sokal's "Transgressing the Boundaries..." in 1996 turned out to be a hoax. Now known as the Sokal Affair.
- Famous papers that were published and passed peer review that later proved to be fraudulent:
 - Jan Hendrik Schon (Bell Labs) submitted and passed peer review 15 papers published in Science and Nature (1998-2001) found to be fraudulent.
 - Igor and Grichka Bogdanov 1999 & 2002 published papers in theoretical physics believed by many to be jargon-rich nonsense.
- Famous papers that got rejected that later turned out to be seminal works:
 - Krebs & Johnson's 1937 paper on the role of citric acid on metabolism was rejected by Nature as being of "insufficient importance", was eventually published in the Dutch journal Enzymologia. This discovery, now known as the Krebs Cycle, was recognized with a Nobel prize in 1953.
 - Black & Scholes 1973 paper on "the pricing of options and corporate liabilities", rejected many times, was eventually published at the intercession of Merton Miller to get it accepted by the Journal of Political Economy. This work led to the Nobel Prize.

The process is imperfect, but still good things will eventually get out to the world.

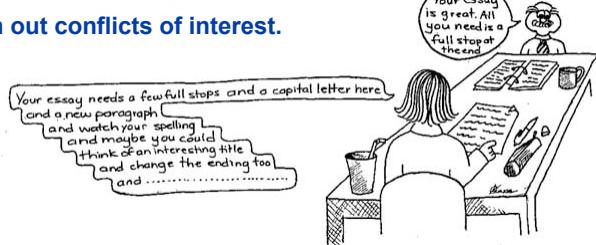
Credit: P. Dominy, J. Bhatt

Peer Review

How to review well?



- Do it well - it is your moral responsibility.
- Treat others the way you would like to be treated.
- If you criticize somebody's work, you should be able to show a superior approach.
- When reviewing papers (but also when listening to oral presentations), don't automatically suspect that not understanding something is your fault. Ask questions, do not be afraid to look silly. (Remember "The king is naked?" fable?)
- Watch out conflicts of interest.



Peer Review

How to receive reviews well?

- When you are sure that your work is of good quality, do not get discouraged by bad reviews. Believe in yourself! Correct the obvious mistakes, improve the paper, work on its readability, and send it out again!
- Treat the reviews seriously! Even if the reviewers are wrong, it is possibly your fault that you did not communicate your ideas clearly. Work on the presentation in this case.
- Never just submit your paper to another venue without addressing the reviewers' criticism.

Peer Review

Concluding remarks

- Sometimes, in case your work is repeatedly rejected, it may be a good idea to go for a journal rather than conference publication: You can argue with reviewers there.
- Aim always high!
- Do not submit too much “noise” and “junk” papers – do take care of your reputation.
- Peer review of research proposals is different when it is conducted by a panel.
- Suggest your advisor that you can help with reviewing and do it well.
- Be very careful about conflicts of interest and of ethics of reviewing.

Peer Review

Training on Peer Reviews

- Peer reviewing can be improved by training
 - Research found that trained reviewers perform better, but not remarkably better
 - Short training provide only a small quality increase
 - Even with trained reviewers the quality of outcome is not guaranteed
 - You should practice and improve over your research life
 - Best approach – see all reviews after the paper is processed
- We will practice Peer Reviewing in an important case: your prelim exam
 - Review past prelim papers using form-based approach
 - Compare your reviews, discuss results

Peer Review