Publication Practices & Responsible Authorship

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Two Steps Toward Establishing Priority of Discovery

- First, there is a transfer of knowledge from the researcher to the broader community, which we call disclosure.
- Second, the community responds to the disclosure by assessing whether it is correct and of sufficient interest to merit attention and further development, which we call validation.
Disclosure of New Information Requires Four Criteria

- Inclusion of all the data along with a written interpretation of the data
- A full description of the methodologies used, so that the work can be replicated and verified
- Inclusion of a time stamp to indicate when the work was disclosed
- Communication through a recognized, stable venue
Publication Practices

- Publication in a peer-reviewed journal is the most important way of disseminating a complete set of research results and getting credit for the work.
- First to publish a view or finding gets most of the credit for the discovery or idea.
- Digital technologies and the internet are creating new forms of publication and rapidly changing landscape.
The publication landscape is changing rapidly. What does it mean for researchers and how productivity is assessed by our peers?

How do we determine the appropriate outlet to publish our research in this changing landscape?

How do we compare journal quality and ease of publication in open-access journals versus more traditional outlets?
The Evolution of Publication

- Historically, numbers of papers and quality of journals have been the primary criteria for publication success.
- Recently, how one’s papers are cited have gained additional importance (e.g. H-index, i-10 index, etc.).
- Open access publishing is becoming more prevalent.
- Open access papers are immediately available online, with no restrictions on access or use, but authors have to pay a publication fee.
Assessment of Scholarly Productivity: A Changing Landscape

- Peer-Reviewed Publications
- Digital Objects (data, images, video, etc.)
- Digital Systems (web sites, databases, blogs)
- Services & Tools (software applications, analysis tools, data acquisition, visualization)
Faculty Concerns: Publication

- Speed and efficiency with the handling and review of manuscripts
- How quickly will a paper appear on-line and then in print?
- What is the reputation and quality of the journal?
- Do they have a prestigious editorial board?
- Are papers in the journal well cited?
Journal Impact Factors (+)

- Have been viewed as an objective criteria for journal quality by assessing how often papers published in the journal are cited by the research community.

- Such a metric can then be applied to (and by) authors and professional evaluators.

- A similar criteria can be applied to individual authors in that the collective impact of their work can be assessed (i.e. citation indexes).
There are organized efforts (e.g. scientific societies) to stop the use of journal impact factors in judging an individual researcher’s work.

Impact factors were never intended to be used to evaluate individual researchers, only journals.

Impact factors tend to bias certain disciplines over others, thus are not objective metrics.

Such metrics may also be a disincentive for conducting risky research – incremental research is cited more often than brand new areas of research.
Major Types of Journals

Traditional, subscription-based:
- Journals make their money through subscriptions to individuals and libraries (mainly the latter)
- Papers and data are behind a subscriber “paywall” for at least a few years due to copyright restrictions, available only to subscribers

Open Access:
- Paper and supporting data become immediately available to all upon publication
- No subscription fees, so authors have to pay a publication charge
The Cost of Publishing (average, per article)

- Subscription, print: $4,870
- Subscription, online only: $3,500
- Open Access, online: $2,280

Source: Nature 495:426-429
Predatory Open-Access Journals

- Have risen from 2,000 in 2010 to 8,000 in 2015
- About 420,000 articles in these journals in 2015
- Most in Engineering and Biomedicine
- Most common origins: India, North America, and Eastern Asia
- 27% of articles in journals where the origin is “impossible to determine”
Open Access “Watchdogs”

- Jeffrey Beall’s blog (Univ. of Colorado-Denver)
  - maintains a list of “potential or probably predatory scholarly open-access publishers” based on questionable marketing and peer-review practices

- Directory of Open Access Journals (DOAJ)
  - out of Copenhagen, lists open-access journals that have been reviewed for quality
Author Checklist to Identify Reputable Journals

 Does the publisher provide full, verifiable contact information, including address?
 Does the editorial board include recognized experts in your discipline?
 Are author fees clearly listed?
 Be wary of e-mail solicitations to publish there.
 Read several articles in the journal for quality.
Major Types of Journals

Pre-print Servers:

- Hold and distribute brand new science that has not yet been subject to peer review
- Major way to get important research out quickly

Who Is Doing It?

- Physics: arXiv
- Biology: bioRxiv and PeerJ
What does it mean to be an author on a scientific publication?

http://images.inmagine.com/400nwm/iris/ikonimages-004/ptg01570387.jpg
What is an “Author”?

- An individual who receives a byline on a published paper

- There are different authorship standards depending on publication and discipline

- Authorship is one of the most common disputes in conducting research
Why is authorship important?

- In scholarly communication, order of authorship indicates amount of involvement, responsibility, and credit for research.
- It counts for students & postdocs trying to get positions and for faculty promotion & tenure decisions.
- It indicates individuals who can be contacted for further information and clarification.
Why Do We Need to “Define” Authorship?

• Assigning credit for work done on the research and preparation of the paper

• Assigning responsibility for the contents of the publication

• Many top journals now require that the contributions of each listed author be provided for publication
Historical Trends in Authorship

The average number of authors:

slightly over 1.0 in 1925
2.8 in 1980
over five in 2010
Historical Trends in Authorship

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- slightly over 1.0 in 1925
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- over five in 2010

several recent papers: over 1,000!
Trends in Authorship

Disciplines with the most and fewest single-authored papers

Most: Social Sciences
     Economics & Business

Fewest: Molecular Biol. & Biochemistry
       Microbiology
Ethics and Authorship

Gift Authors – listed out of a sense of obligation (mentors, etc.); generally did not contribute directly to the research or writing

Honorary Authors – gratuitous authorship to those who have not met authorship criteria (typically prestigious colleagues)

Coercion Authors – pressured authorship, which comes from the inappropriate author and not the research team

Each of these erode confidence in research
Ethics and Authorship (cont’d)

- **Ghost Author** — contributed significantly to the work but was **not** listed as an author
- Example: students not given credit
- Example: professional writers
- It is misconduct if the ghost author is from a financial interest that has a clear COI
- A 2009 article in *Science News* estimated that ca. 10% of biomedical publications have ghost authors, often related to clinical drug trials
Who is entitled to be an author?

ICMJE (Int. Committee of Medical Journal Editors):

"Authorship credit should be based only on substantial contributions to
(1) conception and design or analysis and interpretation of the data;
(2) writing the article or revising it critically for important intellectual content;
(3) final approval of the version to be published.

Conditions 1, 2 and 3 must be all met"
ICMJE Guidelines

- Appear to address most concerns in principle about authorship issues
- However, they are viewed by many as being overly restrictive
- They don’t prevent the inappropriate authorship they were designed to deter
- As a result, some journals require all authors to list their specific contributions to the paper
Council of Science Editors

Requires 2-3 of the following:

- CONCEPT: the idea for the research; framing the hypotheses
- DESIGN: planning the methods to generate results
- SUPERVISION: oversight and responsibility for the organization and course of the project and the manuscript
- RESOURCES: funding, equipment, space, personnel vital to the project
- MATERIAL: biological materials, reagents, referred patients
- DATA COLLECTION &/or PROCESSING: responsibility for doing experiments; organizing and reporting data
- ANALYSIS &/or INTERPRETATION: statistical analysis; modeling
- LITERATURE SEARCH: responsibility for this necessary function
- WRITING: responsibility for creating all or a substantive part of the manuscript
- CRITICAL REVIEW: reworking the manuscript for intellectual content before submission, not just spelling and grammar checking
- OTHER: for novel contributions
Could digital badges clear up author contributions?

- This idea has been in development since before 2014.
- Authors’ badges would integrate with ORCID to identify authors’ roles on their various publications.
Authorship Issues with Large, Interdisciplinary Research Teams

- Authorship disputes occur more frequently
- Lack of clear assignment of responsibility among all the potential authors is the usual cause of such disputes
- Who answers questions about the paper that may arise after publication?
Allocation of credit in the author list

**THE AUTHOR LIST:** Giving credit where credit is due

- **The first author**
  Senior grad student on the project. Made the figures.

- **The second-to-last author**
  Ambitious assistant professor or post-doc who instigated the paper.

- **The second author**
  Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

- **The middle authors**
  Author names nobody really reads. Reserved for undergrads and technical staff.

- **The last author**
  The head honcho. Hasn’t even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

Most Common Authorship Structure in Large Lab Groups

- **Primary Author**: graduate student or post-doc that takes the lead on the experiments and writes the primary draft of the paper

- **Senior Author**: faculty advisor (mentor) or lab lead P.I. who coordinated the experiments and worked closely with the primary author on manuscript preparation
The **primary author** (student, post-doc) is listed as the first author, followed by other lab members or faculty from the student’s supervisory committee that made significant contributions, by order of contribution, and the **senior author** (usually the PI) is then listed last.
First (Primary) Author

- Author that composes/writes the first draft of the manuscript
- Generally performs more of the experiments than any other authors
- Shares responsibility for the entire paper and study with the Last (Senior) Author
Middle Authors

- Contributed significantly to the study
- Rank in authorship corresponds to the extent to which they contributed to the study (usually decided by Senior Author)
- Take specific responsibility for their contribution and general responsibility for the paper
Last (Senior) Author

- Shares responsibility for the entire study, including the written manuscript, with the First Author.
- Generally is head of the research group conducting the study.
- Often conceived the study, obtained funding, and should have contributed to most aspects.
Allocation of credit in the author list

THE AUTHOR LIST: GIVING CREDIT WHERE CREDIT IS DUE

The first author
Senior grad student on the project. Made the figures.

The second-to-last author
Ambitious assistant professor or post-doc who instigated the paper.

The third author
First year student who actually did the experiments, performed the analysis and wrote the whole paper. Thinks being third author is “fair”.

The second author
Grad student in the lab that has nothing to do with this project, but was included because he/she hung around the group meetings (usually for the food).

The middle authors
Author names nobody really reads. Reserved for undergrads and technical staff.

The last author
The head honcho. Hasn’t even read the paper but, hey, he got the funding, and his famous name will get the paper accepted.

A Critically Important Practice: Assigning Authorship

- The selection of authors (and author order) for a paper should be jointly agreed upon by all the collaborators on a project as soon as the group has decided on the assignment of responsibilities and workload for the project.

- Failure to achieve such consensus at the outset can cause conflict later if authors are deleted or inserted.
Authorship responsibilities

- Good writing
- Accuracy
- Context and Citations
- Publishing negative results
- Disclosing conflicts of interest
- Acknowledging sponsorship
- Ensuring IP rights are respected
Authorship “Mistakes”

References Cited:
- Paraphrasing from a source without proper attribution – this is plagiarism
- Secondary citations without obtaining the original document you are citing
- Using outdated references for innovative methodology (might not be innovative now)
- Inaccurate citations – using reference software can ensure accuracy, should check links for URLs frequently
Authorship “Mistakes” (cont’d)

- Excluding problematic data or results and not detailing why that information was excluded

- Publishing substantially the same results in more than one journal – called “republishing”

- Fragmentary publication (LPU’s) – can lead to potentially inconsistent messages from research groups to the research community (are also shown to not be cited as well)
Authorship “Mistakes” (cont’d)

Digital images are data – in fact, arrays of numerical data.

Over-manipulation (i.e. photo-shopping) of images without a clear description of changes made to the image can be a form of misconduct.
Paper Retractions: Issues

- A retraction is needed when a mistake or misconduct makes the paper’s conclusions fundamentally flawed (vs. a corrigendum)

- Retractions from honest mistakes need to be agreed upon by all authors

- Retraction due to misconduct can be complicated as university-based investigations are not open and findings can be contested
Authorship: Summary

- Need to define what an “author” is so that all authors meet the definition and know in advance.
- Order is important – primary and senior authors, plus supporting authors.
- Authors have clear responsibilities and in the event of mistakes, they need to be objectively handled and communicated.
- Should publish all results, both (+) and (−).