Responsible Publication Practices

Ellen Fisher

Acknowledgments: Kathy Partin & Kate Browne

The Importance of Publishing

- Researchers have a responsibility to publish
- Scientific literature describes a publishable story, not all of one's research activities
- Publications are the coin of the realm
- Rules of authorship are not black and white
- PIs are responsible for
  - Determining when and what to publish
  - Setting specific authorship criteria
  - Training students and postdocs on publishing ethics

Scientists as writers

But in science, the credit goes to the man who convinces the world, not to the man to whom the idea first occurs.
-Sir Francis Darwin

- MiS – falsification, fabrication & plagiarism
- Metrics in scientific publishing
- Who is an author?
  - Order of authorship
  - Author responsibilities and risks
- Ownership and copyright issues
- Peer review

Publications stats

Table 3-14

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<th>Rank</th>
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Table 3-15

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Table 3-16

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Misconduct in Science - Pubs
- Misconduct defined as fabrication, falsification, or plagiarism
- Many allegations and findings of MiS found in the context of publications
- Manuscripts under greater scrutiny
- Plagiarism software (more later)
- Authorship: verification of contributions (more later)
- Other ethical issues also arise
  - Authorship disputes; reviewer bias, conflicts of interest
  - Duplicate publications, salami slicing, etc.

And one other issue...
- Training of students regarding publications
  - Students need to be informed about how the publishing process works
    - From the writing stage through peer review
    - “Rules” and responsibilities not always clear and could change with project, lab, etc.
  - How much do graduate students know?
  - Data from GRAD544, CHEM601, HES
  - Self reported information about prior knowledge

Ethical Issues in Publishing
- Distribution of ethical issues in American Physiological Society publications (1996 through March 2004)

Student Data – Self reported
“Which of the following topics have you discussed in a class, with peers, in a research group meeting or with your research advisor or other faculty member?” (Check all that apply)
- Methods for proper record keeping
- Principles for responsible use of animal subjects
- Principles for responsible use of human subjects
- Importance of honesty reporting what you find
- Criteria for authorship
- Risks of conflicts of interest
- The peer review process
- Responsibility and strategies for action after having witnessed research misconduct

GRAD544: Pubs Pre-test
- Which of the following do many journals consider to be a criterion for authoring journal articles?
  - Having a discussion with a colleague that leads her to test a new hypothesis
  - Drafting an article or revising it for critically important intellectual content
  - Providing materials or supplies for the experiments reported in a manuscript
  - Performing an experiment using specialized equipment
  - All of the above

- A = 6%
- B = 33%
- C = 0%
- D = 14%
- E = 47%
Authorship Criteria

- Nearly 20% of student authors have never had a conversation about authorship criteria.
- Less than 2/3 of student authors have discussed authorship criteria with a faculty member.

Publishing metrics...

Metric #1: Journal Impact Factor

- “A measure reflecting the average number of citations to articles published in science and social science journals” (Wikipedia)
- The number of articles published that year by the journal
- The number of times the articles were cited by other articles
- The ratio of the number of citations to the previous 2 years of the journal/the number of articles in those years
- CSU Libraries is the place to go to learn more
  - Web of Science
    - Journal Citation Reports
    - Cited Reference Search
  - Really varies dramatically by field!

What’s the JIF for Nature?

Impact Factor: Journals in Soil Science

Impact Factor: Journals in Biochemistry and Molecular Biology
Impact Factor is Not Everything

- There are many objections to the system
- High impact journals publish letters and opinions that are very controversial and thus get high citation rate
- Or “review” articles - very different than primary research articles
- Journals could tend to publish only in “hot new areas” instead of all disciplines if they are chasing impact factor
- 2-year vs. 5 year JIF – provides greater measure of “impact”

Other systems to rank journal impact
- PageRank (the algorithm Google uses to rank websites)
- Vignette #2: The Impact Factor

One (uncomfortable) bottom line...

No matter how you rank the journal, the ultimate decider for many career advancement steps will be
- the number of articles you publish,
- their quality (as measured by JIF?), and how they are cited.

Which brings us to Metric #2…

Metric #2: The Personal H-Index

A scholar with an index of \( h \) has published \( h \) papers each of which has been cited in other papers at least \( h \) times. The H-index reflects both the number of publications and the number of citations per publication. (Wikipedia)

How do you find someone’s H-index?

Cited Reference search (WoS) using “Fisher ER” as author

Searching with no other information but the author’s name can be difficult

Cited Reference Search: “Fisher, ER” and…

Adding known addresses to your search provides a more complete picture

Citation Report and “H-Index”

What more do you know about my science now that you didn’t know before?
What’s wrong with H-indices?

- Ignores lots of things, including…
  - Self citations
  - Variations in citation practices between fields
  - Duration of career
- And what about MPU’s
  - The smallest amount of data that would allow a paper to be published
  - Some very high impact journals have very low MPU requirements (e.g. Nature)
- Useful to have spectrum of journals (and MPUs)
  - A few high impact
  - A few low impact (why is this important?)
  - Vast majority should be peer-reviewed (journals/conference proceedings)

Challenges with publishing in “Peer Reviewed” journals

- Bias (discipline, training, gender)
- Virtually impossible to reproduce data
- Dogma (new conclusions are risky)
- COI (financial and profession)
- Lack of expertise/wrong expertise
- Mistakes can still happen
- Authors can always find another journal

Peer Review: Conceptually Speaking

- Peers with similar expertise can often be the best judges of the quality of work
- Peers can assess originality, methodology and context
- Peers can spot inconsistencies and often improve data presentation and interpretation
- Peers are the most likely to plagiarize.

Who gets to be an Author?

- When do we decide?
  - And why?
- How do we decide?
  - Who has the final say?
- What does it take to be an author?
  - In your field?
  - In your lab?
  - In the journal you want to publish in?
- Are there “rules” published somewhere?

Authorship Rules: Science

**Submission Requirements and Conditions of Acceptance**

Authors of all authors must agree to the final manuscript, its content, and its submission to Science. Science will send an email to all authors to confirm receipt of each paper. Submission of a paper that has not been approved by all authors may result in an immediate rejection without appeal. Any changes in authorship must be approved in writing by all the original authors. All authors of accepted manuscripts are required to **disclose any commercial or financial conflicts** of interest that the author may have in relation to this publication. This includes any conflicts of interest that arise from the author’s relationship with the journal they are publishing in.

Promoting Scientific Standards

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_In science, it is crucial to maintain a high standard of scientific ethics. Good science requires integrity, honesty, and transparency. The editors and referees play a crucial role in maintaining these standards. To ensure the integrity of the scientific process, all authors are encouraged to adhere to the highest ethical standards._

“Rules” on Authorship

- What are the criteria for authorship?
  - Varies (widely) from field to field
  - Social sciences vs. physical sciences (Subfields also differ)
- General guidelines
  - A significant intellectual contribution to the research AND
  - An ability to describe and defend the content of the paper at some reasonable level
- Excludes
  - Honorary authorship
  - Authorship by someone who simply provides a chemical or runs an assay
- Acknowledgments vs. authorship
Things to Consider

- Researchers at different stages of their careers
- Differences in roles and status compound the difficulties
- Range of practices acceptable
- Authorship
  - Depends on work (field)
  - Traditions within the field
  - Arrangements within the team
  - Also establishes accountability as well as credit
  - Footnotes may explicitly assign responsibility for different parts of the paper

Are there uniform standards for authorship in the publishing world?

ICMJE Guidelines*: Authorship credit should be based on:
1) substantial contributions to the 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.

**Vignette #4: To author or not**

*International Committee of Medical Journal Editors

Issues with ICMJE Standards

- Many scientists do not know about these standards, although >500 medical journals subscribe to them.
- Some scientists do not agree with the standards.
- For trainees, these standards are a good starting place for authorship discussions with their mentors.
- The advisor (faculty member) makes the final determination.

Best Practice

- Develop general authorship guidelines for your research group, team, projects
- Example & Handout:

  In general, authorship on papers will be given to group members who contribute substantially to data collection and analysis, interpretation of the results, and writing of the manuscript. If a group member is listed as an author on a manuscript, they will have some responsibility for writing/editing. Senior group members who are substantially responsible for getting a junior group member trained and started in the group will have their name on the junior member’s first paper and/or the paper wherein the first data taken are published. Also, if there are multiple student coauthors on a given manuscript (the project “belongs” to the person who is first author on the manuscript and hence that person will include the manuscript as part of their thesis/dissertation. Portions of manuscripts may be split between dissertations, depending on the nature of the project. Final decisions on authorship lies with Ellen.

Contributions of authors...

**Vignette #3: Paula and her students**

Authorship Practices: Order of Authorship

- Average number of authors
  - New England Journal of Medicine
    - 1925: slightly higher than 1
    - 1995: >6
  - Highly dependent on area of research
    - High energy physics and genome sequencing
    - If authors can rise into the hundreds
  - Increase in collaboration/# of authors
  - Can lead to differences on authorship

**Vignette #3: Paula and her students**

Who Gets to be First and Why?

- Many fields
  - Earlier a name appears, greater implied contribution
- Conventions differ greatly among disciplines and groups
  - Greatest name recognition listed first
    - Traditionally seen in some areas (old school synthetic organic chemistry)
    - Research leader’s name is always last
    - Physical chemistry
  - Supervisor’s names rarely appear on papers
    - Some medical/biochemical research,
    - Some social sciences (anthropology)
  - Professor’s name always appears on papers coming out of the lab
    - Most chemistry research, often in experimental (cognitive) psychology
  - Authors listed alphabetically
    - High energy physics/genomics
    - Cantor’s dilemma (Carl Djerassi)

Other Authorship Responsibilities

- Writing with clear, concise language
- Using only accurate methods and results
- Placing work in context & accurate citations
- Publishing negative results
- Managing COI (financial & professional)
- Acknowledging sponsorship
- Preventing duplicative publication (self-plagiarism)
- Preventing fragmentary publication
- Protecting intellectual property rights

Vignette #7: Duplication of Data

Authorship Disputes

- Authorship order
- Missing authors
- Extra authors
- Authorship disputes are not “research misconduct” under most federal policies.
  - Or university policies
  - Could be considered “questionable research practices”
- Allegations of plagiarism or misappropriation of data/information are “research misconduct”

Solutions to authorship disputes

- Upfront discussions about expectations
- Authorship contracts or agreements (prenups)
- Changes in authorship during publication process = red flag
- Mediation or negotiation:
  - Within the research group
  - External to the group - especially student advisory committees!
  - Department heads/college deans may ultimately become involved
- The discussion should focus on credit & responsibility:
  - Who can defend the data if there are allegations of misconduct?
  - “Contributions Section”
  - Nature strongly encourages this (only ~1/3 do)

Other Authorship Issues

- Honest Errors
  - Unintentional, minor errors are sent in to the journal as “Erratum” by the corresponding author
  - If the errors compromise part of the conclusions, the authors should issue a “Correction”
- Inadvertent errors that invalidate the study should be sent in as a “retraction”
- Typically, all authors must agree to these actions
- Intentional falsification, fabrication or plagiarism should be investigated as research misconduct

Self-plagiarism

- “Self-plagiarism” is a practice of re-publishing content in different venues
- Not so B&W; many of us give talks on the “same” content; many of our “Materials and Methods” are almost verbatim in different articles.
- When data are presented at meetings or in press, there is an expectation of novelty.
- Future search committees may do an analysis of listed publications looking for self-plagiarism.
- Publication of the identical words in more than one venue can lead to allegations of copyright infringement.
Help with plagiarism issues

- iThenticate software
- CSU owns a license – free to use
- Access through the library’s website
  - http://libguides.colostate.edu/content.php?pid=413097
  - https://app.ithenticate.com/en_us/login

Software being used by
- NSF
- Journal publishers
- Revised manuscripts

Copyright and Ownership Issues

(used with permission from Linda Schutjer, Office of General Counsel, CSU)

- Copyright is a form of protection provided by the laws of U.S. to authors of original works of authorship
- Protections are assigned the moment work is fixed in tangible medium, without notice
- Copyright term is “Life of author + 70 years”
- Rights include: to reproduce, distribute, or display the work
- “Work for Hire” has slightly different rules (this would apply to students who get paid by CSU)
- Activity in the Library and the classroom may have slightly different rules

Copyright and Data Ownership

Summary

- A student’s academic class work belongs to the student
- If a student creates work as an employee of CSU as, for example, a teaching assistant, they are a MEMBER for Section J but still own their copyrighted works, although CSU has some rights to use them.
- Copyrighted works that support a patent (lab notebooks) are retained by CSU but the student can make copies.
- Ownership can be varied by contract including sponsored arrangements. So, if you work on a grant to create a deliverable, your copyright interests may be assigned to or shared with the funding entity.
- If you work together with others, you may end up being joint authors if that was the intent from the beginning. In that case you each share the whole work.
- If you create something with substantial use of University resources – such as a film project or something – the University may end up being the owner.

Resources at CSU

- Writing@CSU – writing consultants from English Dept.
  - http://writing.colostate.edu/wcenter/
  - Questions about getting started
  - Review of a draft
- College Liaison and Subject Librarians
- Research Assistance
- Citation Assistance
- Preliminary Thesis/Dissertation Checks
  - Graduate School
  - grad_thesis_checks@colostate.edu
- Graybill Statistics Consulting
  - Data analysis of your own data
  - Help with stats software
  - http://www.stat.colostate.edu/consulting/stat_lab.html

Summary

- You need to publish
  - Wisely and in good journals
  - To build a strong CV, with history of productivity
- If you like to write, there are many possibilities
- If you are going to publish with others,
  - Get details straight upfront & be ready to modify
- Understand the rules of the game
  - What’s SOP in your field
- Get help sooner versus later
- Learn “how” to be a good reviewer

Questions & Case Studies