



Writing in the Sciences

Module 6.1: Plagiarism



Example

- Michelle Obama 2008: **"You work hard for what you want in life; that your word is your bond and you do what you say you're going to do; that you treat people with dignity and respect..."**
- Melania Trump 2016: "From a young age, my parents impressed on me the values that **you work hard for what you want in life; that your word is your bond and you do what you say** and keep your promise; that **you treat people with respect.**"
- Michelle Obama 2008: **"We want our children — and all children in this nation — to know that the only limit to the height of your achievements is the reach of your dreams and your willingness to work for them."**
- Melania Trump 2016: **"We want our children in this nation to know that the only limit to your achievements is the strength of your dreams and your willingness to work for them."**



Plagiarism of others' work

- Passing off other people's writing (or tables and figures) as your own.
 - Includes:
 - cutting and pasting sentences or even phrases from another source
 - slightly rewriting or re-arranging others' words
 - "borrowing" material from sites like Wikipedia



Example

- **Original Version (Wikipedia):** Ernest Miller Hemingway (July 21, 1899– July 2, 1961) was an American author and journalist. His economical and understated style had a strong influence on 20th-century fiction, while his life of adventure and his public image influenced later generations. (Source: Wikipedia)
- **Plagiarized Version:** Ernest Hemingway's thrifty and understated style strongly influenced 20th-century fiction. His audacious lifestyle and public image also influenced later generations.

When writing about others' ideas/work:

- You must understand the material well enough to put it in your own words!
- Work from memory
- Draw your own conclusions
- Do not mimic the original author's sentence structure or just re-arrange the original author's words.

Plagiarism example

Original passage (Klibanski et al. 1995):

"One possibility is that the dose of estrogen effective in treating postmenopausal women is inadequate in a younger population. Second, whether continued improvement in bone mass can be seen in patients treated for a duration of time longer than the current study is unknown. A third possibility is that patients were not compliant with hormone therapy....A fourth and likely explanation is that estrogen therapy alone cannot correct the multiple factors contributing to bone loss in women with anorexia nervosa. In addition to profound estrogen deficiency, nutritional and other hormonal variables have been implicated in the pathogenesis of bone loss. These factors, including IGF-1 deficiency cortisol excess and decreased androgen production are unaffected by estrogen administration and may have a continuing deleterious effect on bone mass."

Plagiarism example

Plagiarized passage (Munoz et al. 2002):

"One possibility is that the ~~dose of estrogen~~ **estrogen dose** **which is** effective in treating postmenopausal women is inadequate in a younger population. Second, whether continued improvement in bone mass ~~can~~ **may** be seen in patients treated for a ~~duration of time longer~~ **longer period of time** than the current study is unknown. ~~A third possibility is that patients were not compliant with hormone therapy....A fourth~~ **third** and **more** likely explanation is that estrogen therapy alone cannot correct the multiple factors contributing to bone loss in women with ~~anorexia nervosa~~ **AN**. In addition to profound ~~estrogen deficiency~~ **hypoestrogenism**, nutritional and other hormonal variables have been implicated in the pathogenesis of bone loss. These factors, including IGF-1 deficiency cortisol excess and decreased androgen production are unaffected by estrogen administration and may have a continuing deleterious effect on bone mass."

Plagiarism example, same paper

Original passage (Klibanski et al. 1995):

"Our data demonstrate that, despite its usefulness in perimenopausal women, estrogen and progestin administration does not reverse the profound osteopenia seen in all young women with anorexia nervosa. Trabecular bone loss is severe and may progress despite estrogen therapy."

Plagiarized passage (Munoz et al. 2002):

"In conclusion, our data demonstrate that, despite its usefulness in perimenopausal women, estrogen and progestin administration does not reverse the profound osteopenia seen in all young women with AN. Trabecular bone loss is severe and may progress despite estrogen therapy."

Plagiarism example, same paper

Original passage (Klibanski et al. 1995):

"There are no prospective studies of trabecular BD in adult women with anorexia nervosa, and it is unknown whether there is a progressive and permanent decline in bone mass. Although the role of estrogen replacement therapy in preventing bone loss in premenopausal women is clearly established, no studies have addressed whether it is beneficial in young women with premenopausal osteopenia."

Plagiarized passage (Munoz et al. 2002):

"There are some published data on trabecular bone mineral density (BMD) in adult women with AN. but it is still unknown whether there is a progressive or permanent decline in bone mass. Although the role of estrogen replacement therapy in preventing bone loss in menopausal women has been clearly established, no studies have been carried out to determine whether it is beneficial in young women with premenopausal osteopenia"



Self-plagiarism and duplication

- Recycling your own writing or data, including:
 - Copying or only slightly rewriting text from your own previously published papers.
 - Adding new data to already published data and presenting it as new results.
 - Submitting identical or overlapping data to multiple journals.



Prevalence of plagiarism?

- In pilot studies, publishers that used CrossCheck to look for plagiarism had to reject 6% to 23% of submitted papers (due to plagiarism or self-plagiarism/duplication).

Reference:

Journals step up plagiarism policing. *Nature* 466, 167 (2010).



Prevalence of plagiarism?

- 2-year study of plagiarism in the *Croatian Medical Journal* (automatic detection software followed by manual confirmation):
 - 8% of papers plagiarized others' work
 - 3% of papers were self-plagiarized

Reference:

Baždarić K, et al. Prevalence of plagiarism in recent submissions to the *Croatian Medical Journal*. *Sci Eng Ethics*. 2012 Jun;18(2):223-39.



Prevalence of plagiarism?

- Study of plagiarism in residency applications:
 - Using plagiarism detection software, researchers analyzed about 5000 personal statements in applications to five residency programs at Brigham and Women's Hospital.
 - 5% of essays had clear evidence of plagiarism (confirmed on manual review).

Segal S, et al. Plagiarism in Residency Application Essays. *Ann Intern Med.* 20 July 2010;153(2):112-120.

Another example:

- Original paper (2004): "Although earlier registry-based analyses of second neoplasms after breast cancer (BC) did not detect an increased risk of cutaneous melanoma (CM), [1][2] several more recent registry-based [3][4] and hospital-based [5] studies have documented a statistically significant increased risk of CM after BC with standardized incidence ratios (SIRs) ranging from 1.4 to 2.7."
- Second paper (2009): "Recent registry-based [1,2] and hospital-based [3,4] studies have documented a statistically significant increased risk of CM after BC with standardized incidence ratios (SIRs) ranging from 1.4 to 2.7."
- References 1,2,3,4 are identical!



Writing in the Sciences

Unit 6.2: Authorship



Authorship

1. Who gets authorship?

- Any author listed on the paper's title page ***should take public responsibility for its content.***

2. In what order?

- Order implies authors' relative contributions (with exception of the senior author position)
- The senior author (head of the lab or research team) often appears as the last-listed author
- Papers may have dual first authors
- For fairness, alphabetical or reverse alphabetical order may be used if researchers have contributed equally.
- Large working groups may be cited as a group



Acknowledgements

- Funding sources
- Contributors who did not get authorship (e.g. offered materials, advice, or consultation that was not significant enough to merit authorship).



Ghost authors and guest authors

- Ghost authors: Writers-for-hire who draft manuscripts (usually for companies), but are not listed as authors.
- Guest or “honorary” authors: Academic researchers who are minimally involved in a paper, but “lend” their name as an author (often first author!) to bolster the paper’s credibility.



Prevalence of guest/ghost authorship?

- Anonymous survey of corresponding authors of articles from top medical journals:
 - *Annals of Internal Medicine, JAMA, Lancet, Nature Medicine, New England Journal of Medicine, and PLoS Medicine.*
- Results: 17.6% reported honorary/guest authors; 7.6% reported ghost authors



Case study: Merck and Vioxx

- Researchers systematically reviewed 250 court documents obtained through the Vioxx litigation (against Merck).
- Included internal company emails and documents related to publishing clinical trials papers or review papers.



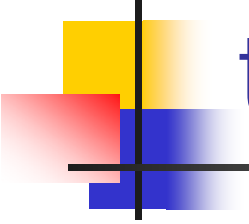
Results

- For clinical trials papers (n=24): “Documents were found describing Merck employees working either independently or in collaboration with medical publishing companies to prepare manuscripts and subsequently recruiting external, academically affiliated investigators to be authors. Recruited authors were frequently placed in the first and second positions of the authorship list.”



Results

- For review papers (n=72): “Documents were found describing Merck marketing employees developing plans for manuscripts, contracting with medical publishing companies to ghostwrite manuscripts, and recruiting external, academically affiliated investigators to be authors. Recruited authors were commonly the sole author on the manuscript and offered honoraria for their participation.”
- Only half of the review articles disclosed Merck sponsorship!



From an internal company email to a potential guest author:

- “ I would like to invite you to be an author on the abstract and manuscript for this study. We are currently preparing both for submission before the end of this year. Could you please let me know if you would be interested in authorship on both the abstract and manuscript, 1 of the 2 planned publications, or none? In making your decision, you may want to take into consideration that the results of this study were negative at first glance.”



More in the NY Times

- Medical Papers by Ghostwriters Pushed Therapy
 - “The court documents provide a detailed paper trail showing how Wyeth contracted with a medical communications company to outline articles, draft them and then solicit top physicians to sign their names, even though many of the doctors contributed little or no writing. The documents suggest the practice went well beyond the case of Wyeth and hormone therapy, involving numerous drugs from other pharmaceutical companies.”—Natasha Singer, NY Times, 2009
- Ghostwriting Is Called Rife in Medical Journals
- Medical Editors Push for Ghostwriting Crackdown



Writing in the Sciences

Unit 6.3: The Submission Process



Submission process

1. Identify a journal for submission (ideally before writing!)
2. Follow the online “instructions for authors” for writing and formatting the manuscript
3. Submit your manuscript online (corresponding author)
 - All authors must fill out and sign copyright transfer and conflict of interest forms (often done offline)
4. Possible outcomes: accepted; accepted pending minor revisions; rejected but re-submission possible; no resubmission possible
5. Revision and resubmission: re-submit with cover letter that addresses reviewers critiques point by point
6. Once accepted, carefully review final proofs!



Reject, but resubmission possible

- “Your manuscript is not acceptable for publication...However, if you feel that you can suitably address the reviewers’ comments, then I invite you to revise and resubmit your manuscript.”



Resubmission Cover Letter/Response to Reviewers

Dear *Dr. Editor*,

We appreciate your helpful comments and those of the reviewers.
We feel that the manuscript is now greatly improved.

We have made revisions based on the comments/suggestions of Reviewers I and II. The comments of each reviewer are numbered below, with our response (clarifications and changes) following.



Detailed response to reviewers,

Continued

Reviewer I:

1. *There is little discussion of xxx*

We agree with Reviewers I and II that the section on xxx was too abbreviated. Therefore, we have added a paragraph that highlights xxx (paragraph 33).

2. *Could you comment on xx*

We have added a sentence to paragraph 9 in Methods/Materials that comments on xx



Also include a copy of the paper with changes tracked...

osteoporosis. *Osteoporos Int.* 2003 Oct;14:843-7.¶

11. Lloyd T, Buchanan JR, Bitzer S, et al. Interrelationships of diet, athletic activity, menstrual status, and bone density in collegiate women. *Am J Clin Nutr.* 1987 Oct;46:681-4.¶

12. Kirchner EM, Lewis RD, O'Connor PJ. Bone mineral density and dietary intake of female college gymnasts. *Med Sci Sports Exerc.* 1995 Apr;27:543-9.¶

13. Wolman RL, Clark P, McNally E, et al. Dietary calcium as a statistical determinant of spinal trabecular BMD in amenorrhoeic and oestrogen-replete athletes. *Bone Miner.* 1992;17:415-423.¶

14. Winzenberg TM, Shaw K, Fryer J, Jones G. Calcium supplementation for improving bone mineral density in children. *Cochrane Database Syst Rev.* 2006;CD005119.¶

15. Cranney A, Horsley T, O'Donnell S, et al. Effectiveness and safety of vitamin D in relation to bone health. *Evid Rep Technol Assess (Full Rep).* 2007 Aug;1-235.¶

16. Specker B, Vukovich M. Evidence for an interaction between exercise and nutrition



An interesting tidbit...

- "About 60% of reviewers criticisms pertain to the quality of the writing or tables and graphs; and about 40% pertain to the quality of the scientific work."

Robert Iles. *Guidebook to better medical writing*.



Writing in the Sciences

Module 6.7: How to do a Peer Review



Peer Review

- If you are the reviewer, a few tips...



Peer Review: Tone

- Assume there is some poor graduate student on the other end who did all the work, and whose confidence and career depend on your critique.
- Tone matters!
 - E.g. "The authors should delete table 5; not only is it completely irrelevant, but it also reveals their utter lack of statistical understanding."
 - vs. "Table 5 contains unnecessary information (for example...), and a Pearson's correlation coefficient may not be appropriate here. The authors should consider revising or omitting the table."



Peer Review: Tone

- Avoid criticizing the authors! Criticize the work.
- Avoid generalizations; point out specific errors.
- Use positive instead of negative language where possible: “The paper is poorly written.” vs. “The writing and presentation could be improved. For example...”
- Avoid “lecturing” to the authors.



Types of Peer Review

- Single-blind
 - Most common; authors are blinded to reviewers
- Double-blind
 - Reviewers are additionally blinded to authors
- Open
 - Neither reviewers nor authors are blinded; reviewers names (and reviews) may be publicly available
- Post-publication Peer Review
 - Blogs, online comments, etc. More formal systems for post-publication vetting are emerging, such as PubMed Commons.



Peer Review: Process

My system:

- **1. Scan the abstract.**
- **2. Jump to the data: review the tables and figures first.**
 - Draw your own conclusions.
 - Do the tables and figures stand on their own?
 - Are there any obvious statistical errors?
 - Is there repetitive information?
- **3. Read the paper once through.**
 - Do the authors conclusions match their data?
 - Is the paper clearly written, or did you struggle to get through it? You should not have to struggle!
 - Is the length of the paper justified given the amount of new information that the data provide?



Peer Review: Process

- **4. Read the introduction carefully.**
 - Is it sufficiently succinct?
 - Does it roughly follow: known-->unknown-->research question/hypothesis?
 - Is there a clear statement of the hypotheses or aim of the study?
 - Is there detailed information about *what was done* that belongs in the methods?
 - Is there information about *what was found* that belongs in results?
 - Is there distracting information about previous studies or mechanisms that are not directly relevant to the hypothesis being tested. If so, it should be moved to the discussion.
 - Do the authors tell you what gaps in the literature they are trying to fill in?

Peer Review: Process

5. Read the methods carefully.

- Scan this section to find answers to your questions about the data.
- Were things measured objectively or subjectively? What instruments were used?
- Are there flaws in the study design, such as no control group?
- Read the statistics section carefully.

6. Read the results carefully.

- Read this section with the tables and figures in front of you.
- Does each section roughly correspond to one table or figure?
- Do the authors summarize the main trends and themes from the table, or do they just repeat what is in the tables?
- If there are graphs, do the authors give precise numerical values in the text if it is not given in the graph?
- Are the authors honest or do they try to draw your eye to what they want you to see??
- Do the authors over-interpret statistical significance, by ignoring the fact that the magnitude is small or by ignoring the fact that they have done multiple subgroup analyses?
- Is this section unnecessarily long?

Peer Review: Process

7. Look at each table and figure.

- Did the authors choose the correct statistics?
- Are there multiple tables or figures that tell the same story? For example, Table 1 gives the mean values for two groups and indicates statistical significance from a ttest and Table 2 gives confidence intervals for the differences in means for the same data.
- Is there evidence of cherry-picking or purposefully omitting data?
- Are any graphs misleading, e.g. through manipulation of area or axes?
- Is the “treatment” group always compared with a proper control/placebo group?
- Are there inconsistencies in the data they present from one table to the next?
- Did the authors make transcribing errors when going from the data in tables/results to the abstract?



Peer Review: Process

8. Read the discussion carefully.

- Does the first paragraph succinctly and clearly tell you what was found and what is new?
- Are the authors' conclusions justified or are they overreaching?
- Do they clearly distinguish hypothesis-driven conclusions and exploratory conclusions?
- Is the writing clear and to the point (active voice!)? Is there some sense of order and structure or are they just rambling on aimlessly?
- Could the discussion be shortened?
- Did they address the limitations you care about? (as opposed to any old irrelevant limitations that they threw in just to have some)
- Are the references that they cite current?
- Have they omitted key references?

Peer Review: Content

Comments to authors:

- **1. Start with a one-paragraph “general overview.”**
 - **State what you think is the major finding and importance of the work**
 - **Give 2-3 positive, encouraging statements about the work.** If the methods are problematic, is the writing nice, for example? Is the research question particularly interesting or novel? (E.g., “This is an interesting manuscript, with several strengths.” “The authors should be commended for ...” “The finding that XX is important.”)
 - **State 1-2 major limitations** (if there are any) to the study design, writing/presentation, or conclusions. (E.g., “The study is limited because there is no control group.” “The overall writing or presentation needs improvement.” “The authors may have over-stated their findings.” “The paper provides only weak evidence for its conclusions.” “The study is exploratory, not hypothesis-driven.”)
 - **Do not tell the authors your overall recommendation** (rejection, acceptance).



Peer Review: Content

Comments to authors:

- 2. In a *numbered* list, give 5-15 specific criticisms/suggestions for revision. The number will often correspond to your recommendation (give the most if you are recommending “opportunity for revision.”)
 - Point out specific mistakes.
 - List the issues that you found in your review.
 - Give specific recommendations for revision.



REVIEWER \neq COPY EDITOR!!!

- Do not be spend your time nit-picking.
- Focus on big-picture issues.
- If the manuscript has a lot of copy-editing errors, point this out in a general way and give one or two examples, e.g. "The manuscript contains typos, such as..."



Peer Review: Content

Comments to editors (authors don't see these):

- 1. Fill out journal "grading sheet" (if applicable). **
- 2. Choose your recommendation:
 - Reject
 - Reject with opportunity to revise.
 - Accept with minor revisions
 - Accept
- 3. Give a succinct overall statement to the editors that justifies your ranking. Be frank with the editors about your opinion and concerns.

Peer Review: **grading sheet, example

Impact of Research

TOP 10% —

TOP 25% —

Top 50% —

Bottom 50% X

Bottom 25% —

Bottom 10% —

Originality of Results...

Methodology and Data Quality...

OVERALL MANUSCRIPT RANK...



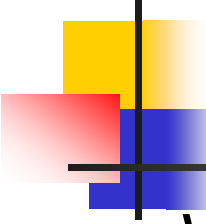
Writing in the Sciences

Module 6.8: Predatory Journals



Predatory Journals

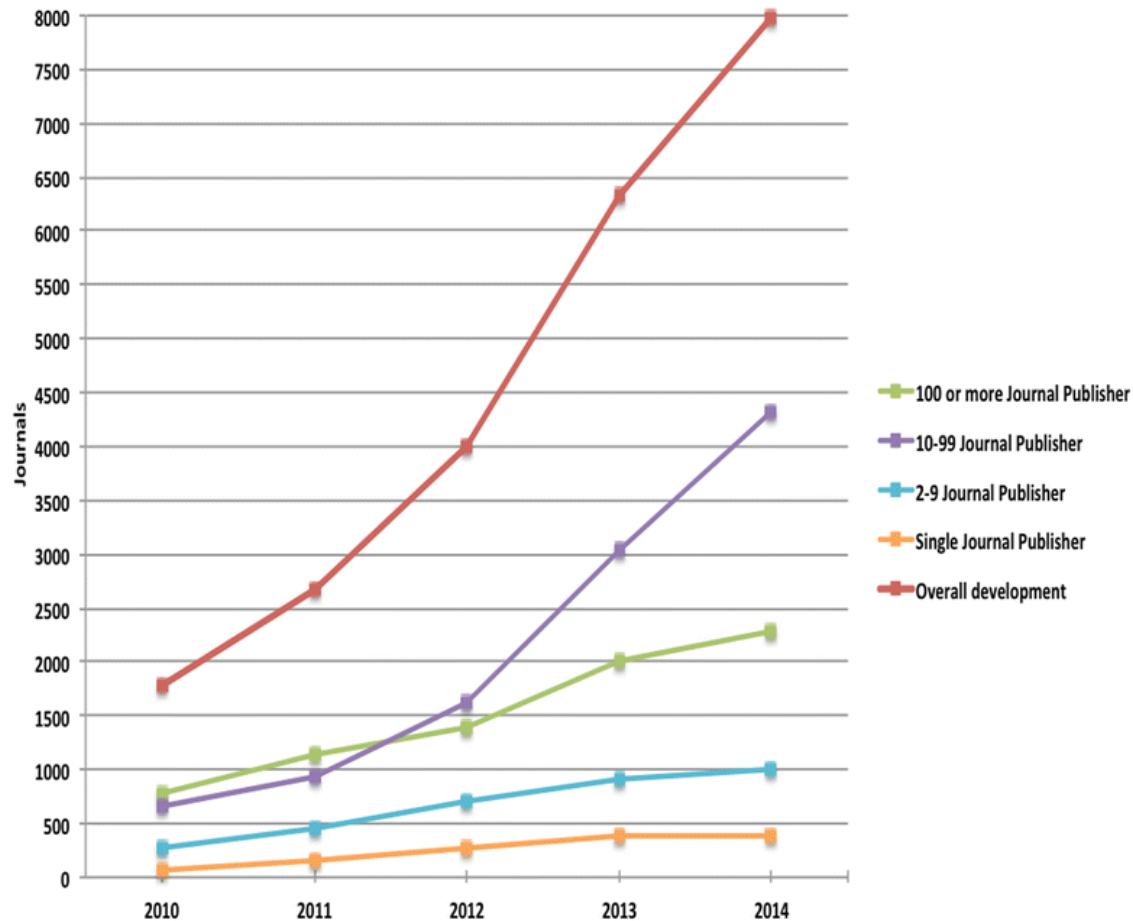
- Predatory journals are bogus journals that are exploiting the open-access model to make money.
- They publish any garbage, without any peer review, simply to be able to collect the publishing fee from the authors.



Case Study: John Bohannon's "sting operation"

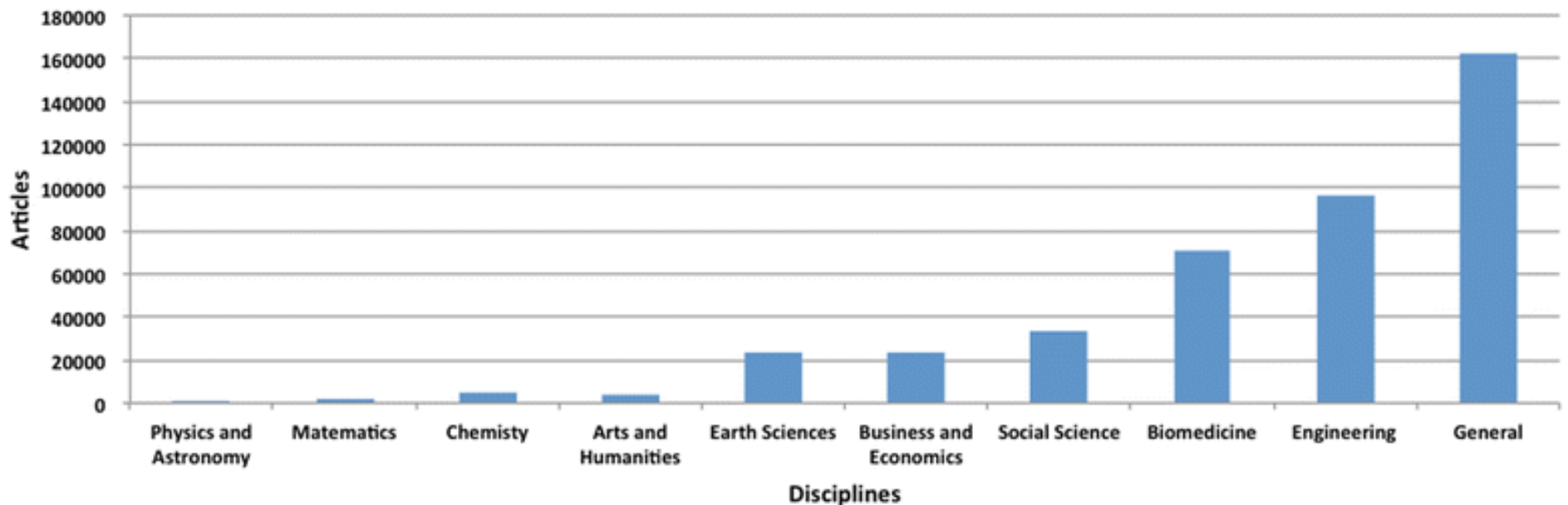
- Who's Afraid of Peer Review? *Science* 04 Oct 2013;342: 6154, pp. 60-65,
<http://science.sciencemag.org/content/342/6154/60.full>
- Bohannon submitted an obviously flawed, bogus cancer paper to 255 open-access journals; the paper was accepted to 157 journals and rejected by only 98
- 82% of the publishers on Beall's list accepted the paper.

The rise of predatory journals



Shen C and Björk B. 'Predatory' open access: a longitudinal study of article volumes and market characteristics *BMC Medicine* 2015 13:230

Predatory articles by discipline



Shen C and Björk B. 'Predatory' open access: a longitudinal study of article volumes and market characteristics *BMC Medicine* 2015 13:230



Checklist for avoiding predatory journals (Declan Butler)

- Check that the publisher provides full, verifiable contact information, including address, on the journal site. Be cautious of those that provide only web contact forms.
- Check that a journal's editorial board lists recognized experts with full affiliations. Contact some of them and ask about their experience with the journal or publisher.
- Check that the journal prominently displays its policy for author fees.
- Be wary of e-mail invitations to submit to journals or to become editorial board members.

Investigating journals: The dark side of publishing. Declan Butler. 27 March 2013

<http://www.nature.com/news/investigating-journals-the-dark-side-of-publishing-1.12666>



Checklist, continued

- Read some of the journal's published articles and assess their quality. Contact past authors to ask about their experience.
- Check that a journal's peer-review process is clearly described and try to confirm that a claimed impact factor is correct.
- Find out whether the journal is a member of an industry association that vets its members, such as the Directory of Open Access Journals (www.doaj.org) or the Open Access Scholarly Publishers Association (www.oaspa.org).
- Use common sense, as you would when shopping online: if something looks fishy, proceed with caution.



Example of good writing!

“The lesson of optogenetics is that the old, the fragile, and the rare—even cells from pond scum or from harsh Saharan salt lakes—can be crucial to comprehension of ourselves and our modern world. The story behind this technology underscores the value of protecting rare environmental niches and the importance of supporting true basic science. We should never forget that we do not know where the long march of science is taking us or what will be needed to illuminate our path.”

—Karl Deisseroth, November 2010, *Scientific American*
“*Controlling the Brain with Light*” (on Optogenetics)