

How to Write a Scientific Paper

Is the paper worth writing?

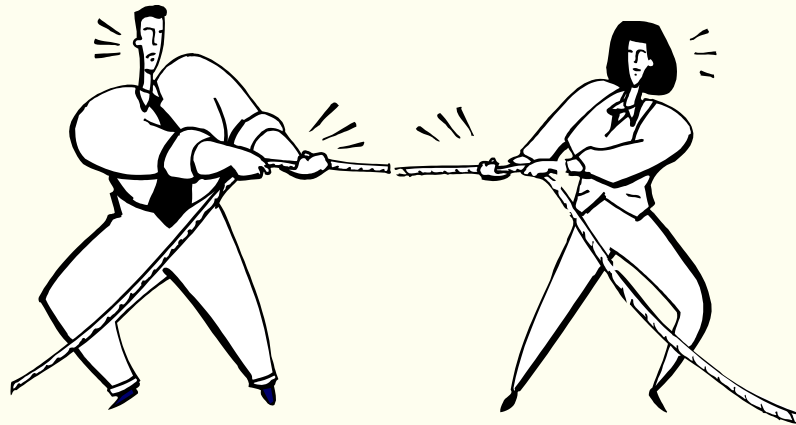
- What's in the literature?
- “So What?”
- It's a lot of work (average 20-30 drafts).
Don't do it unless it's worth it.

What do I have to say?

- A single question clearly stated with adequate evidence for the answer.
- Try stating the question and its answer in one simple sentence.

Is it one or more papers?

- Putting too much in one paper makes it diffuse and less compelling than if its focused



- Salami Science?

OK, So you want to/need to
write a paper → next questions

- a. What is the right format for the message
(original article/review?)
- b. What is the right audience—who cares?
- c. What journal should I choose?

A scientific article as a critical argument

- a. Statement of problem; posing a question
- b. Presentation of evidence
- c. Assessment of the validity of the evidence in the face of ..
 - a. strengths/weaknesses
 - b. other evidence
- d. Conclusions

Literature Search First

- What has been done and what can you say that's new?
- Be thorough in your search:---a high sensitivity/low specificity search.

The Title Page: Do it early

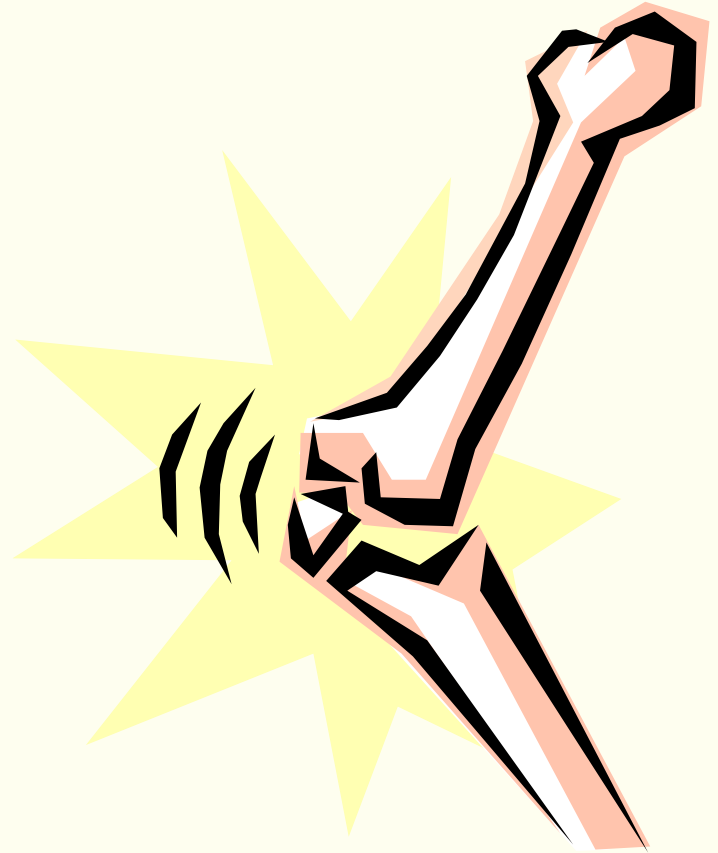
- a. Establishes responsibilities in paper writing
- b. Avoids hurt feelings

The Process of Paper Writing

- Create an outline first
- Plan on multiple drafts:
 - Filename with dates
 - One filename written over with new draft
- Tables/figures early: prompt more analysis
- Deadlines for you and coauthors

The Introduction

- Draw audience in; be provocative
- Target journal specific audience
- Identify gaps in knowledge
- End with question/hypothesis



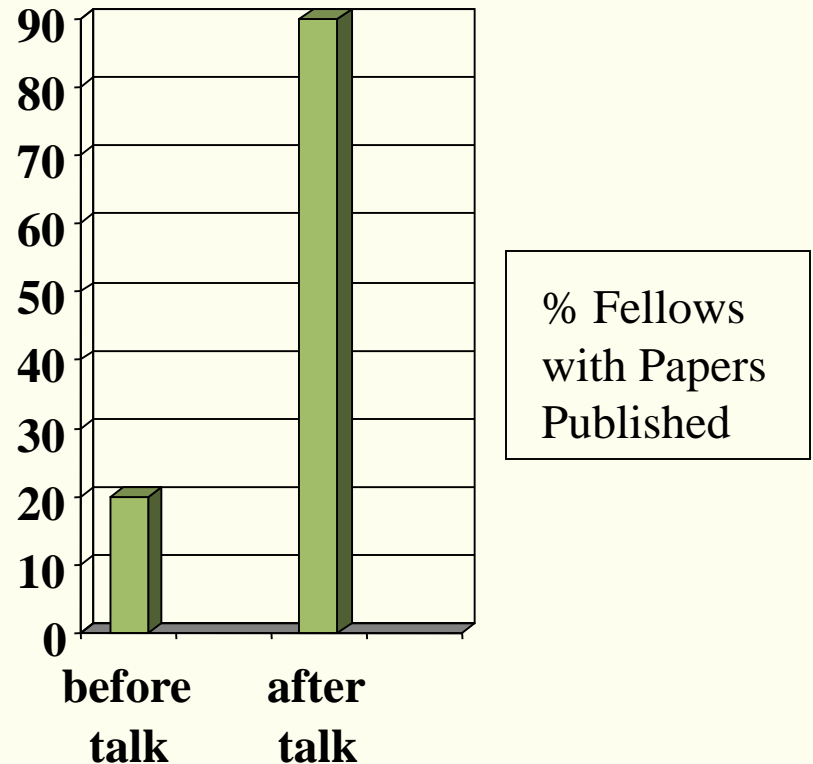
Knee Pain, Why?

The Methods Section

- Should include subheadings
- Write clearly enough to be understood by nontechnical reader and be replicated
- Past tense

The Results Section

- Organize around tables/figures
- Present tabular results selectively in text
- Past tense
- No interpretation; just the facts!
- Tables should stand on their own



The Discussion Section

- 1st paragraph: answer question/hypothesis
- Remainder:
 - Evidence pro and con: literature review
 - Strengths/limitations of your study
 - Implications of findings (be conservative)
 - Other findings of your study
- Last Paragraph: conclusion

Getting Tense!

PAST and PRESENT

- When quoting *previously published work*, refer to it in *present tense* (e.g. penicillin treats strep throat)
- When describing your *own study*, refer to work in *past tense* (e.g. we tested a new antibiotic for strep throat)

The good scientific paper ...

- Ⓐ Is focused on a specific question(s).
 - B. Covers a broad spectrum of disease or methodologic questions
- Less is More.

In a good scientific paper ...

- Ⓐ: Abstract and tables and figures are understandable without reading whole paper.
- B. Abstract and tables and figures are understandable only with reading whole paper.

In a good scientific paper ...

A: Writing is in passive voice (e.g. it was found that...).

Ⓐ Writing is in active voice (we found that...).

C. Writing mixes active and passive voice.

In a good scientific paper ...

- Ⓐ A term defined in the methods section is used again and again (a rose, a rose, a rose)
- B. Various synonyms for a term are used to prevent reader boredom. (a rose, a flower with a thorny stem, a fragrant flower)
- Define a term and use it consistently. Otherwise, you'll confuse the reader.

In a good scientific paper ...

A: Writing is flowery

Ⓐ Writing is concise

➤ Generally, the shorter, the better

Proofread before Submitting

- ✓ Are terms used consistently throughout?
- ✓ Do numbers in abstract match numbers in text and tables?
- ✓ Do citations in text match references?
- ✓ Are Syntax and Grammar acceptable

A brief synopsis of writing an abstract

- It's a minipaper:
 - Introduction (usually 1-2 sentences)
 - Methods (often longest part)
 - Results
 - Discussion is limited to concluding statement
- Like a paper, requires many drafts, most oriented to presenting argument concisely

Getting the Reviews of Your Paper

- “The reviewer is always right.” (whether they are or not!)
- Don’ t respond quickly. Digest reviews.
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