Writing scientific papers

10/8/07
Wilkins’ rules for writing a paper

Do figures first. Iterate figures until they display main points.

Do figure captions. Iterate until they tell main story of paper.

Do tables: Iterate until most relevant and smallest set of numbers with fewest digits remain

Do table captions.

Do equations. Iterate until least number capture physics in terms of carefully chosen and already defined symbols.

Do the references. Capture most relevant papers.

Figure out how much room you have left to fit into space constraints.

Prepare sentence outline: iterate until length is OK.

Write rest of paper.
Working with coauthors

Making effective comments
http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWcritique.html

1) remember to give positive commentary where a writer has done well

2) turn negative feedback into productive feedback.
Turning negative feedback into product feedback: example 1

**Unhelpful comment:** "Disorganized!"

**Helpful Comment:** "This section discusses both animal-rearing conditions and experimental methods, but the two are mixed together. Could you separate each into its own paragraph?"
Turning negative feedback into product feedback: example 2

**Unhelpful comment:** "How are these references relevant?"

**Helpful Comment:** "The background and references given in paragraph 2 don't seem directly relevant to our hypothesis. I think we need references on how light has been shown to affect flowering (in sunflower or any species), and less on other factors that promote or inhibit flowering."
Turning negative feedback into product feedback: example 3

Unhelpful comment: "Unclear."

Helpful Comment: "I'm not sure what your interpretation is after these two paragraphs: does the experiment show that mung beans cure cancer, or not? Which are we concluding? If the sample size is too small, we need to discuss that when we suggest future research, but that does not change our results here."
Final revisions

• At final revision stage, suggestions should be very specific:

  *Unhelpful comment:* “I don’t like your suggested wording.”

  *Helpful Comment:* “I suggest the rewording given below.”
Managing references

• Keeping track of references all through a project saves a lot of time when it is time to write the paper and/or thesis

• Using computers helps reference management a lot
Reference management software

• The lowest tech: Bibtex (for people who use latex)
  – A bibtex file has a bunch of fields for each reference, puts appropriate citations in correct order
  – To make info in a Bibtex file more accessible (e.g., put in alphabetical order by author), can use JabRef (free download from http://jabref.sourceforge.net/)
Part of a bibtex file

@article{baker75,
  author = "T.P. Baker and J. Gill and R. Solovay",
  title = "Relativizations of the \{P =? NP\} question",
  journal = "SIAM Journal on computing",
  volume = 4,
  pages = "431-442",
  year = 1975
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@article{kurtz95,
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  title = {The isomorphism conjecture fails relative to a random oracle},
  journal = {J. ACM},
  volume = {42},
  number = {2},
  year = {1995},
  issn = {0004-5411},
  pages = {401--420},
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**Article (cocco01)**

Cocco, S. & Monasson, R.

Analysis of the computational complexity of solving random satisfiability problems using branch and bound search algorithms

Reference management software relevant for both Latex and Word

- Endnote Web (UW has site license, so is free to use)
  - can export to EndNote and to Bibtex (but need to add key to Bibtex file: can use script at http://www.cvrti.utah.edu/~macleod/litbase/endnote.html)
  - can import citations directly from Web of Science
  - entry in Endnote Web database has link to Web of Science entry, but not to actual article
  - database is housed on web, so is accessible remotely
Reference management software for Word

- EndNote (must buy)
- Zotero (zotero.org: free download, Firefox plugin)
  - designed for academics in humanities
  - compatible with e-journals and bibliographic databases like Web of Science, JSTOR
  - download citation + notes + link to article; can also download paper to highlight and make annotations on it at relevant parts.
  - can export to Word
  - database housed on computer; not accessible remotely. Server hosting and sharing capability is supposed to be coming.