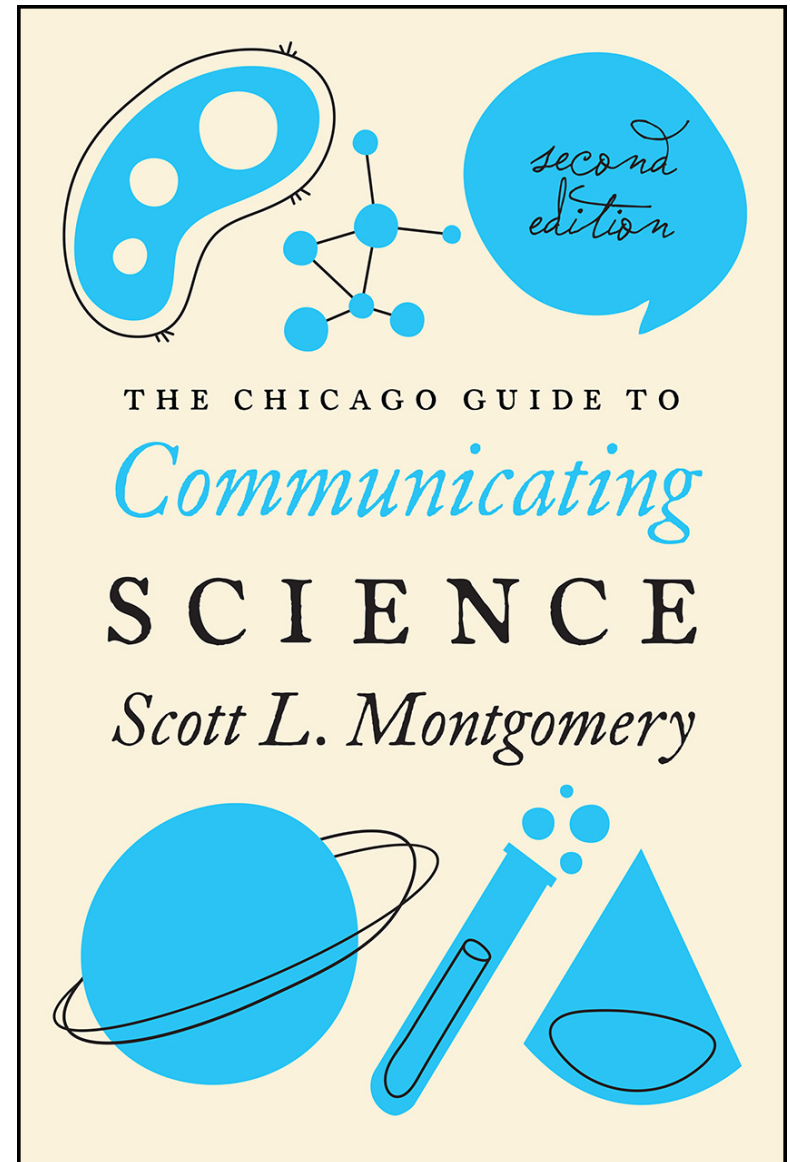
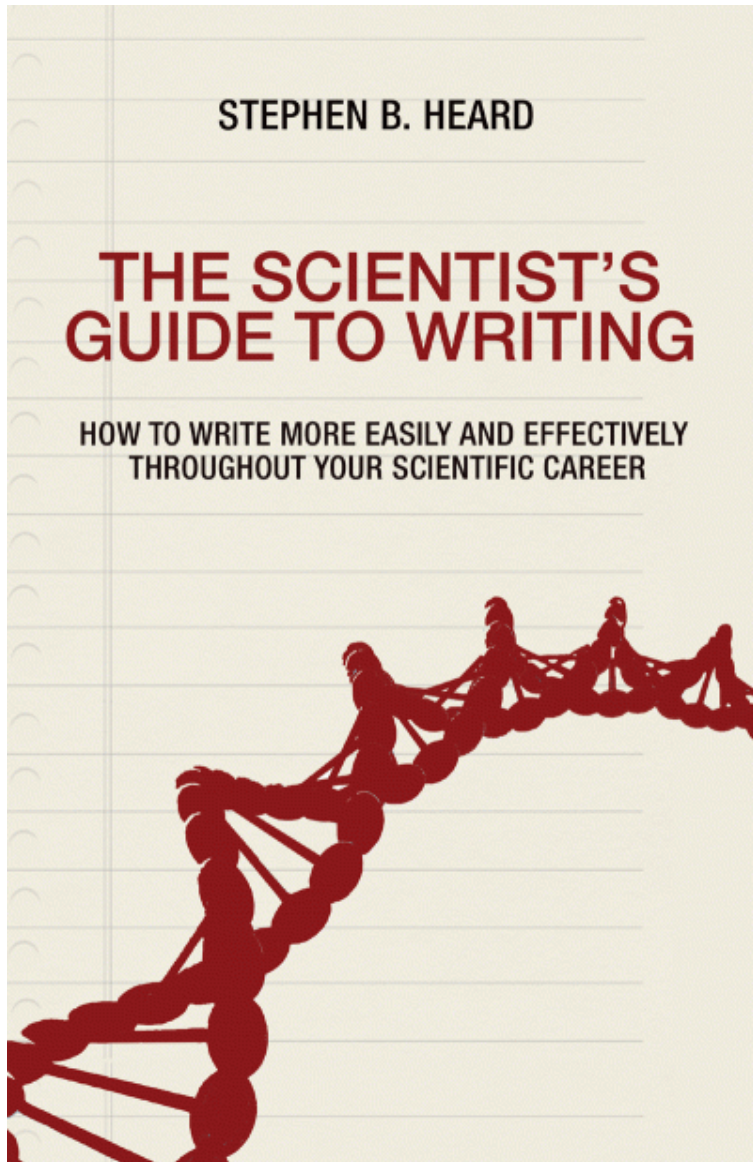


PHY 495

SYLLABUS

Course Text Options



Plagiarism

Plagiarism is a big deal.

Plagiarism includes:

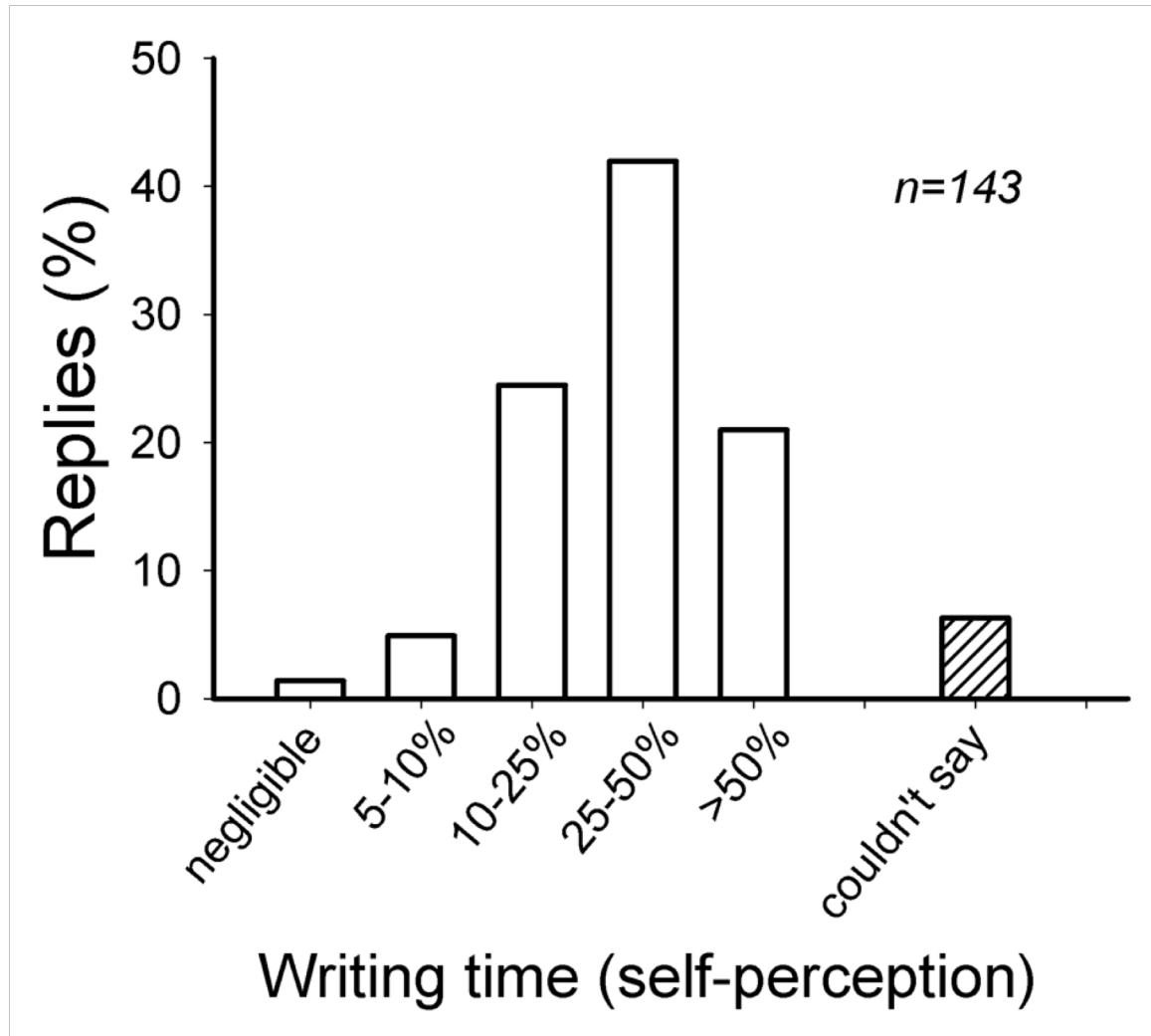
1. quoting verbatim or almost verbatim from any source, including all electronic sources, without acknowledgement;
2. adopting someone else's line of thought, argument, arrangement, or supporting evidence without acknowledgement;
3. submitting someone else's work, in whatever form, without acknowledgement;
4. knowingly representing as one's own work any idea of another.

Science exists because...

...scientists are writers and speakers

- What it takes to learn a skill - “Ishi no ue ni, san nen”
- Have you ever read Newton? Feynman?
- Rules to follow?
- Good and Bad models
- Simplify to the nth degree - BORING!
- Journal article
- Proposal
- Book
- Speaking

How much time do we spend writing?



Source: <https://scientistseessquirrel.wordpress.com/2016/06/30/how-much-time-do-you-spend-writing-survey-says/>

A year of writing

A typical year for me:

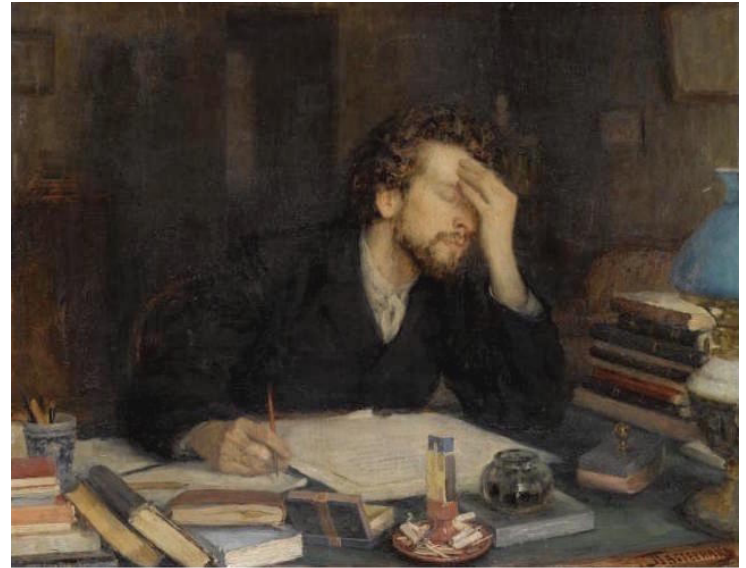
- 2 journal papers (5,000 words each)
- 1 grant proposals (9,000 words)
- 4 peer reviews (1,200 words each)
- 1 annual report (3,000 words)
- 20 administrative documents (avg 2,000 words each)

Total: about 95,000 words

(400 double-spaced pages)

How on Earth can someone write that much?

- It's hard.
- To write, you have to write.
- You can find help in books
- You can think consciously about your writing. This applies to style, content, **and behavior**.
- You can learn from your peers as well as your mentors.



The Throes of Creation, by Leonid Pasternak (1862-1945)

You get better with practice.

History

1672: In the year 1666...I procured me a triangular glass prism to try therewith the celebrated phenomena of colors...It was at first a very pleasing divertissement, to view the vivid and intense colors produced thereby; but after a while...I became surprised to see them in an oblong form; which, according to the received laws of refraction, I expected should have been circular

1760: Beside the horizontal division of the earth into strata, these strata are again divided and shattered by many perpendicular fissures, which are in some places few and narrow, but oftentimes many and of considerable width. There are also many instances, where a particular strata shall have almost no fissures at all, though the strata both above and below it are considerably broken: this happens frequently in clay, probably on account of the softness of it.

History

1868: The extent to which a country suffers denudation at the present time is to be measured by the amount of mineral matter removed from its surface and carried into the sea. An attentive examination of this subject is calculated to throw some light on the vexed question of the origin of valleys and also on the value of geologic time

1965: In arid climates the rocks exposed to the blazing sun become intensely heated, and in consequence a thin outer shell expands and tends to pull away from the cooler layer a few centimeters within. Under perfectly dry conditions, however, the stresses so developed are insufficient to fracture fresh, massive rocks. Experiments leave no doubt about this.

2014: Ancient saline fracture waters in the Precambrian continental subsurface, with groundwater residence times ranging from millions to billions of years, provide a previously underestimated source of H₂ for the terrestrial deep biosphere. Until now, little of the information on H₂ in these settings, accessed via underground research laboratories and mines, has been incorporated into global geochemical and biogeochemical models.

History

Note the transition in the actor in the story for rhetorical purposes

1775: I cannot, at the distance of time, recollect what it was that I had in view in making this experiment; but I know I had no expectation of the real issue of it...If, however, I had not happened...to have had a lighted candle before me, I should probably never have made the trial.

1903: The results of the investigation of radio-active minerals...led M. Curie and myself to endeavor to extract a new radio-active body from pitchblende. Our method of procedure could only be based on radio-activity, as we know of no other property of the hypothetical substance. The following is the method pursued for a research based on this property.

1999: We first searched for neurons exhibiting a relatively high rate of spontaneous activity when the animal's eyes were closed. Next we characterized the orientation tuning properties of these neurons and selected the neurons with sharp tuning preference and robust response. We chose orientation tuning...because the majority of neurons in cat striate cortex are tuned for the orientation of bars or gratings.

History

Modern Scientific Writing: Bacon, Boyle, Newton, Royal Society.

From the Royal Society: Who can behold, without indignation, how many mists and uncertainties, these specious tropes and figures have brought on our knowledge?...We of the Society have therefore been more rigorous in putting in execution the only remedy that can be found for this extravagance;...to reject all the amplification, digressions, and swellings of style; to return back to the primitive purity and shortness...to a close, naked, natural way of speaking...to bring all things as near the mathematical plainness as they can; and preferring the language of artisans, countrymen, and merchants, before that of wits, or scholars.

Transactions of the Royal Society - published lectures

Today's workshop

Peer group get-to-know-you

- Each member will have 5 minutes to talk.
- In your 5 min, you should explain
 - (1) your academic background (where you came from, your degree program, your emphasis within that degree program);
 - (2) your career goals (where you see yourself working in 10 years, and the next step or steps that can get you from here to there); and
 - (3) your current research interests (your 499 or 495 project) – as a science-friendly “elevator talk”: 2-3 minutes, pitched for understanding by a typical freshman undergraduate.
- After each member's talk, each *other* group member should ask a question.