

Writing/Speaking Support for BE.109



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Getting to know you, part 2: Letter to Neal and Atissa

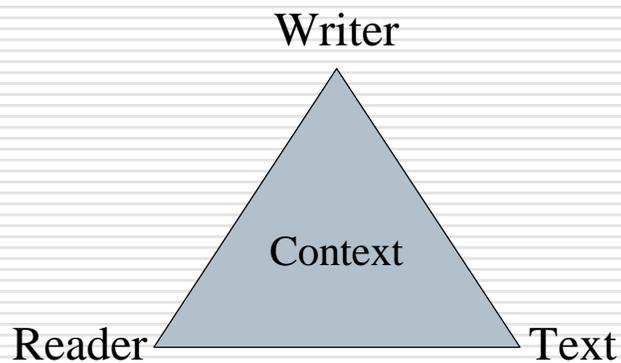
- What have been your experiences with scientific writing (e.g., lab reports, research articles, reviews)? With other writing tasks?
 - What have been your experiences with giving oral presentations (whether scientific or not)?
 - How would you describe yourself as a writer? As a public speaker?
 - What are your writing/speaking goals for BE.109?
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Scientific writers need to control the rhetoric of scientific writing.



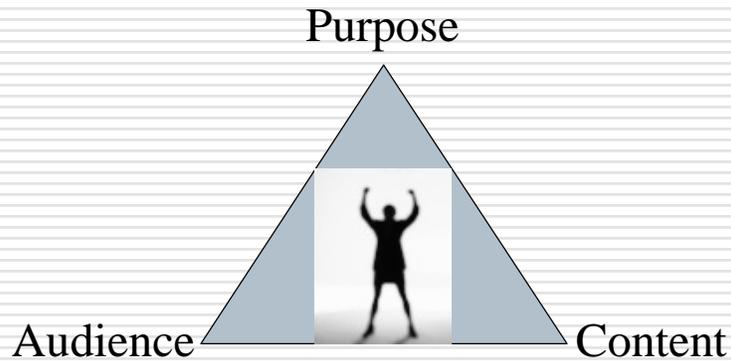
According to Aristotle, rhetoric is “the art of finding in any given case the available means of persuasion.”

Any writing act can be described in terms of rhetorical triangles.



Writers balance the relationship between themselves, their texts, their readers, and the context in which this balancing act takes place.

More Rhetorical Triangles



Reality tends to complicate these triangles.

Multiple

Purposes:

- To explain
- To entertain
- To persuade
- (To get an A)

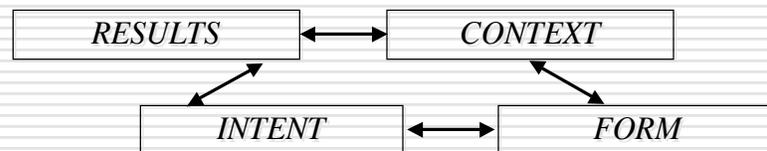
Multiple

Audiences:

- Real reader
 - Imagined reader
 - Peers
 - Instructors
-



Scientific Writing as Juggling Act



Contexts and Complications for Scientific Communication in BE.109

Multiple Tasks and Experiences:

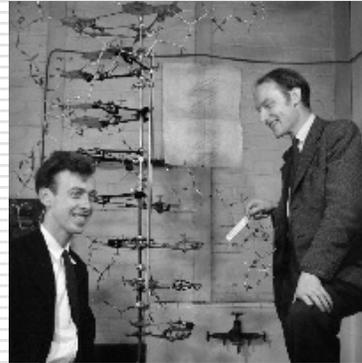
- Lab notebook
- Research/lab report
- Oral presentation 1
- Oral presentation 2
- Systems engineering essay
- Research article
- Professional/conference talk

Each task has different rhetorical demands, constraints, and opportunities.

The goal of scientific writing is to court your audience.

Michael Halloran on Watson & Crick's 1953 "The Structure for DNA"

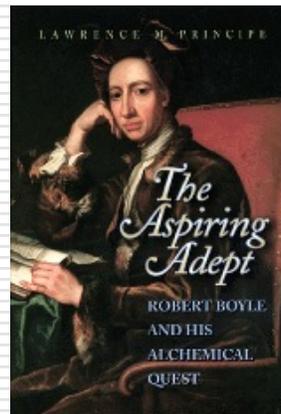
"The April 1953 paper, then, is really just the initial move in a rhetorical strategy aimed at gaining and holding the attention of an audience. As such, it presumes an understanding of *science as a human community* in which neither facts nor ideas speak for themselves, and the attention of the audience must be courted."



A Brief History of the Research Article

from Swales (1990)

- Mid-17th century: Robert Boyle presents his pneumatic experiments to the Royal Society, public presentations before "witnesses" in order to seek agreement on the results.
 - 1665: *The Philosophical Transactions of the Royal Society* is established, the first scientific periodical.
 - By 1800 "the definition of experiment moves from any made or done thing, to an intentional investigation, to a test of theory, to finally a proof of evidence for a claim" (Bazerman 1983).
 - By 1900, the current format of research article is largely established.
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Macrostructure of a Research Article

- **Introduction** provides general field or context.
- **Methods** follows a particularized path.
- **Discussion** moves from specific findings to wider implications.

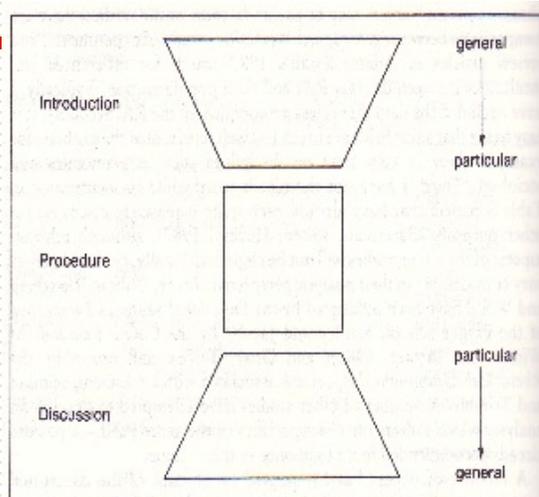


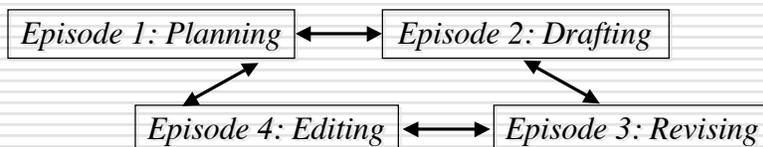
Figure 7 Overall organization of the research paper (Hill et al., 1982).

Modeling the writing process lets us know at which points we encounter trouble.



Goals/Questions for the Writer

- What do I know about my topic?
- What is my purpose for writing?
- Who are my intended readers and how much do they know about my topic?
- How is this task like others I have had before?
- What structure will work best for my topic?



Effective writers are able to self-monitor their composing strategies



1. *Declarative Knowledge*: Knowing what strategies are available
2. *Procedural Knowledge*: Knowing how to use a strategy.
3. *Conditional Knowledge*: Knowing how and when to use a strategy.

The goal is to develop all three types of knowledge about each phase of the writing process.

Experienced Scientific Writers...

Seek Feedback

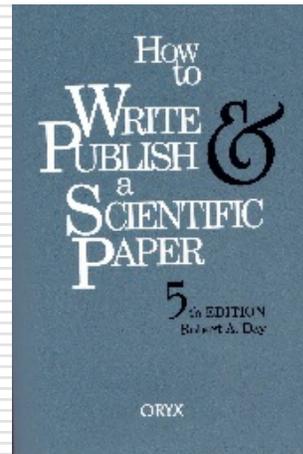
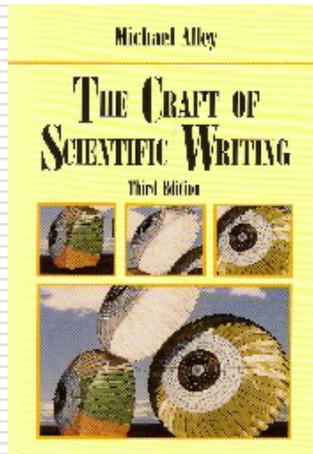
- peer-edit
- self-edit (after a long enough delay)
- expert-edit

Expect to **learn by writing** as well as to inform.

Revise, revise, revise, revise, revise,
revise, revise, revise, revise, revise, revise, revise, revise, revise, revise.



Some Good Resources for Those in Need



Good MIT Resources



The Mayfield Guide On-Line
[<http://www.mhhe.com/mayfield/pub/tsw/home.htm>]

The MIT Writing and Communication Center
Room 32-081; 617/253-3090
Appointment preferred but not required



The research process and writing process share essential stages.

Research involves:

- Posing initial questions
- Exploring questions through discovery
- Revising questions based on findings
- Communicating final findings to a specific audience



Writing involves:

- Starting with an idea
- Exploring ideas through writing
- Revising based on reader's needs
- Presenting final product to a specific audience



In both processes language is a tool of both discovery and communication.

Writing and research are complex processes enabled by language.



“Language, oral or written, is an expressive instrument through which we communicate what we have previously thought [or discovered]. It is also the reflective instrument through which we think, alone or with others, about what we are doing.” Paul Connolly

The benefit of writing instruction in the sciences is better research, better writing.



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Final questions?
