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Why am I here?

- MIT alums wish they were better at scientific communication
 - To help with your summary essays
 - To contribute to your writing grade

What is Scientific Writing?

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Precise, concise, objective report of research data collected according to the scientific method...

And an intellectual journey that takes time and patience.

Time to Convert...

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.....ready for professional writing?

Old Habit

Begin writing a paper at
2AM that's due at 9AM

Use language that sounds
*scholarly, serious,
and smart*

Meet the page count

New Habit

Write a first draft **early**,
get feedback, and
revise it **more than once**

Use language that exactly suits
your content

Write to communicate

What are Some Methods for Good Scientific Writing?

Model your writing after someone in your field who is **an especially good writer**.

Consult Texts on Scientific Writing.

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Cover of Alley, Michael. *The Craft of Scientific Writing*, 3rd ed. New York, NY: Springer, 1998.

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Cover of Day, Robert. *How to Write and Publish a Scientific Paper*, 5th ed. Cambridge, UK: Cambridge University Press, 1998.

Develop an Outline

Outlines force you to:

- establish the **scope** of your document
- develop a **point of view**
- **partition** material
- **sequence** your topics
- **develop a writing strategy** (even if you don't have an outline, you need a strategy).

Outline can be used to generate feedback, provide the subject headings and topic sentences for your paper.

Work out a general plan first, and then make the outline more specific.

The Mayfield Handbook: Section 1.5.1

<http://web.mit.edu/writing/temp2/home.htm>

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Cover of Perelman, Leslie and Edward Barrett. *The Mayfield Handbook of Technical and Scientific Writing*. Burr Ridge, IL: McGraw-Hill Higher Education, 1997.

When Publishing in a Peer-Reviewed Journal

Read the Guide to Authors

e.g., J. Bac., Materials and Methods

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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.

Consider Three Aspects of Writing Style

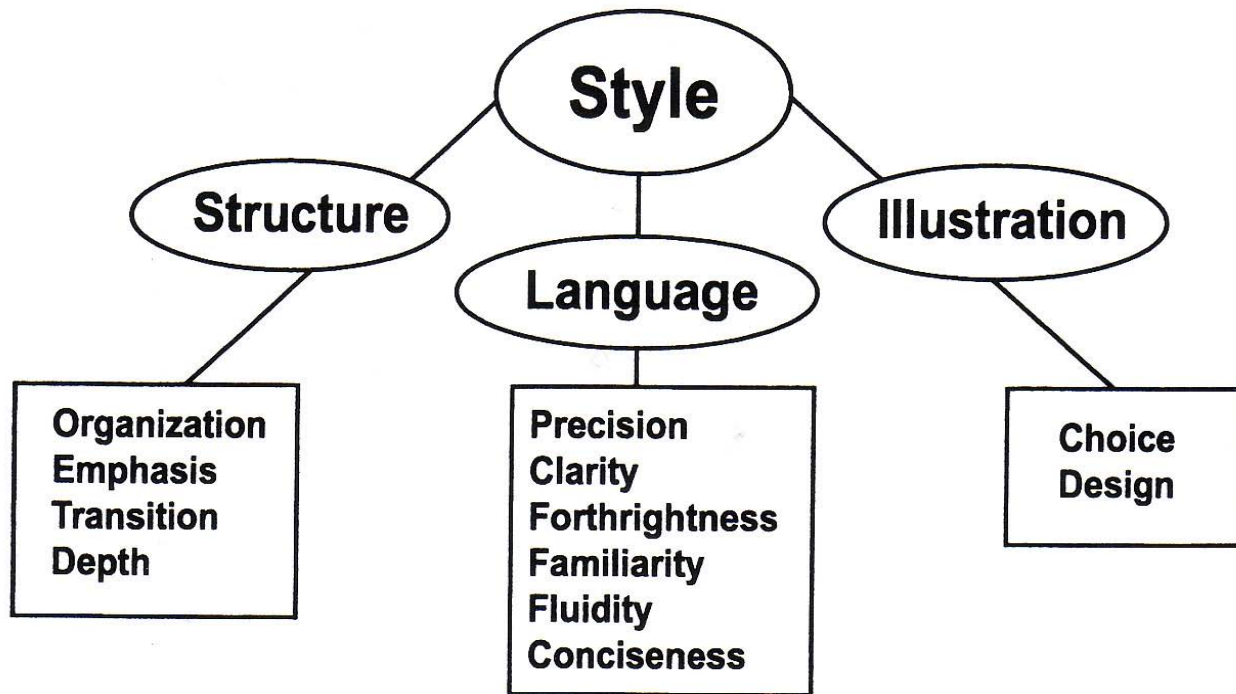


Figure 2-1. Aspects of style in professional writing.

Structure is Revealed in:

Organization (backbone)

- **Headings, Subheadings, Topic sentences**
reflect your writing strategy

Heading and Subheadings

STRUCTURAL ORGANIZATION

is hidden in a long list of headings without secondary headings

Performance of the Solar One Receiver

Introduction

Steady State Efficiency

Average Efficiency

Start-Up Time

Operation Time

Operation During Cloud Transients

Panel Mechanical Supports

Tube Leaks

Conclusion

Performance of the Solar One Receiver

Introduction

Receiver's Efficiency

Steady State Efficiency

Average Efficiency

Receiver's Operation Cycle

Start-Up Time

Operation Time

Operation During Cloud Transients

Receiver's Mechanical Wear

Panel Mechanical Supports

Tube Leaks

Conclusion

Topic Sentences

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They're more important than you realize

**Readers rely on a topic sentence
as if it were a “title” for the paragraph**

Structure is Revealed in:

√Organization (backbone)

- **Headings, Subheadings, Topic sentences** reflect your writing strategy

Ordering / Depth

- Establish emphasis

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Transitions

- Link ideas

Language: Needless Complexity

- Familiarization (n)
- Has the functionability (n)
- Utilization (n)
- Facilitate (v)
- Utilize (v)
- Aforementioned (adj)
- Firstly, secondly, thirdly (adv)
- Heretofore
- familiarity
- can function
- use
- cause
- use
- mentioned
- first, second, third
- previous

Language: Needless Words

- Already existing
- At the present time
- Basic fundamentals
- Completely eliminate
- Continue to remain
- Currently being
- Empty space
- Had done previously
- Introduced a new
- Mix together
- Existing
- At present
- Fundamentals
- Eliminate
- Remain
- Being
- Space
- Had done
- Introduced
- Mix

Language: Needless Words

- Never before
 - None at all
 - Now at this time
 - Period of time
 - Separate entities
 - Start out
 - Write out
 - Still persists
 - In order to
- Never
 - None
 - Now
 - Period
 - Entities
 - Start
 - Write
 - Persists

Language: Weak Versus Strong Verbs

- Made the arrangement for
 - Made the decision
 - Made the measurement of
 - Performed the development of
- Arranged
 - Decided
 - Measured
 - Developed

Language: Passive Versus Active Voice

- The voltage **was displayed by** the oscilloscope.
- The feedthrough **was composed of** a sapphire optical fiber,
- which **was pressed** against the pyrotechnic
- that **was used to** confine the charge.
- The oscilloscope displayed the voltage.
- The feedthrough contained a sapphire optical fiber,
- which pressed against the pyrotechnic
- that contained the charge.

Vigorous Writing is Concise

Image removed due to copyright restrictions.

Cover of Strunk, William and E. B. White. *The Elements of Style*.
New York, NY: Penguin, 2005.

GOALS FOR SCIENTIFIC WRITING

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Structure

- **Apparent:** Headings, subheadings, and topic sentences are easily identified and reflect your writing strategy.
- **Instructive:** The paper's headings, subheadings, and topic sentences organizes the reader's thinking (can serve as a summary of the content when converted to an outline).
- **Appropriate:** Structural complexity matches the complexity of the content.

Language

- **Concise:** Sentences are succinct, containing no extra words.
- **Precise:** Word choice reflects a thoughtful process.
- **Engaging:** Sentences are written in active voice with strong verbs and apt adjectives.

GOALS FOR SCIENTIFIC WRITING

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- **Illustrations**

- **Appropriate:** The choice of tables versus figures suits the data and would not be better expressed as text.
- **Well designed:** Illustrations are readable and attractive.

- **Form**

- **Correct grammar, spelling, and punctuation.**
- **Correct formatting.**

Scoring System

- + Thoroughly superior work. A model of good scientific writing.
- √+ Good work. Requires only minor improvements in any of the following areas: organization of ideas; economy of expression; diction (word choice); grammar/punctuation/spelling.
- √ Acceptable work. Requires moderate revision in one or more of the areas above.
- √- Acceptable but rough work. Requires substantial revision in all areas.
- Unacceptable work.
- 0 Assignment not handed in.

Please read

Writing Readable Prose

By

Amin S. Bredan & Frans van Roy

END