Development of Manuscripts for Publication

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GOAL?

to advance science for human development

Why Write?

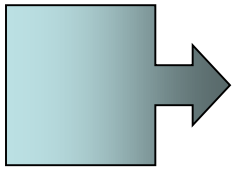
- Writing cultivates
  - discipline
  - clear thinking
  - analytical ability
  - a sense of accomplishment
- Educational gain may be greater for author than reader

But….

- Nothing is added to “science” and no benefits are realized unless your writing is published AND understood

Structure

- Title, Author(s), Affiliations
- Abstract
- Introduction
- Methods
- Results
- Discussion
- Conclusions
- Acknowledgements
- References
- Appendix/supplements
- Links to online information



Results & Discussion

Steps: How do you start, proceed, and complete?

- Before you start, think about

- If you have a good story to tell;
- A paper is written for readers, not for yourself;
- Keep it simple stupid (KISS) model;
- Is there any new knowledge or study is unique?
- Who are your audience and what's the appropriate journal?
- Who are your coauthor(s)?

Be confident, persistent, and professional!

Step 1: have a title, author list, affiliations, target journal, and possibly potential reviewers.

- Who has contributed to the study?
- Who should be the corresponding author (again, be very professional)? Keep in mind that the first author will do most of the work!
- Develop a memorandum so that all involved parties agree!
- Ask your coauthors be critical and constructive (i.e., not only raise questions and make suggestions, but also provide solutions).
- Get a copy of the instructions for authors!
- Set up a timetable and deadlines!

Step 2: state the study objectives, necessary hypothesis, and justifications.

- Forget about the structure of your manuscript for now!
- A list of scientific questions would be of great help!
- This paragraph is usually the last one in the introduction section of a manuscript.

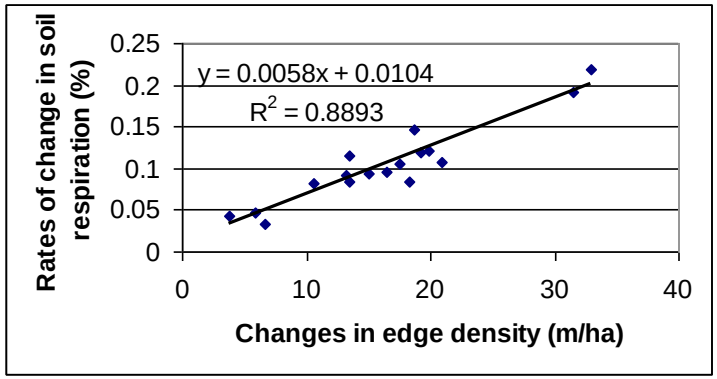
Example:

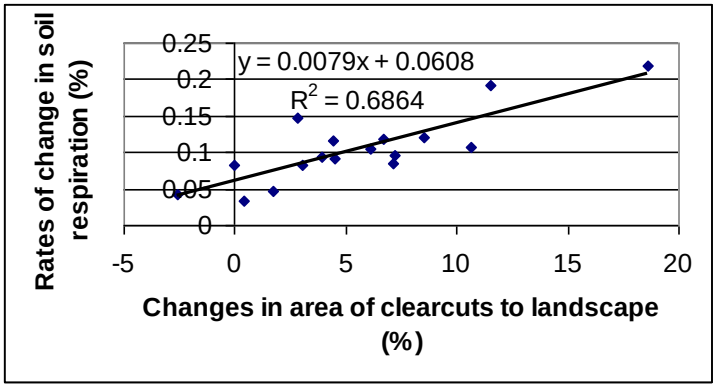
Our overall objective of this study is to … This objective is stimulated by the facts that … Specifically, our study objectives are: (1) … (2) …, and (3) … Based on previous studies (refs), it is well known to the scientific community that… By achieving these objectives, we will…

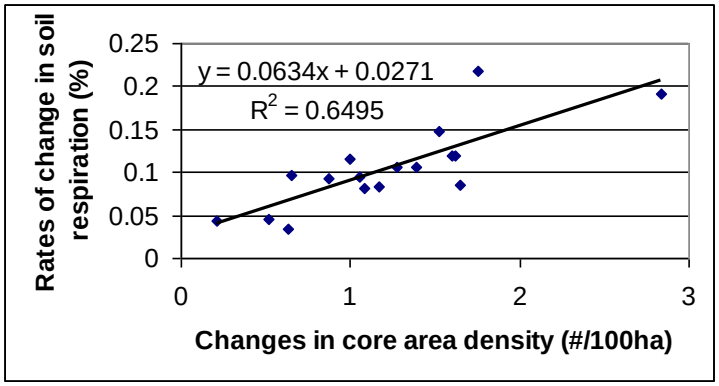
Step 3: develop illustrations (figures, tables, photos, etc.)

- Illustrations should be VERY high quality and follow journal requirements (e.g., units, spacing, lines, labeling). You want to impress the reviewers with quality artworks.
- Remember that MORE is not BETTER. I don't recommend to have more than 15 illustrations.
- All illustrations should be synthetic and easy-to-read.
- Most journals require each illustration be placed on a separate page.
- Eliminate any extra space, duplicated text (see an example).

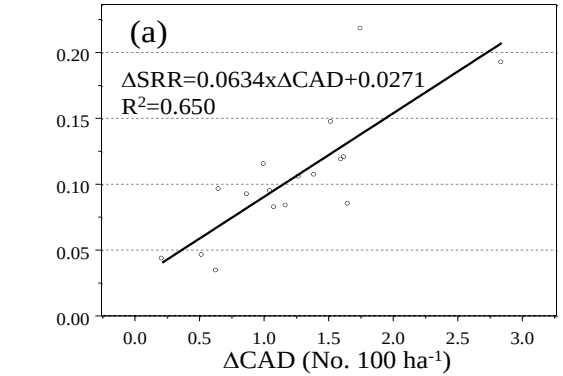
Draft

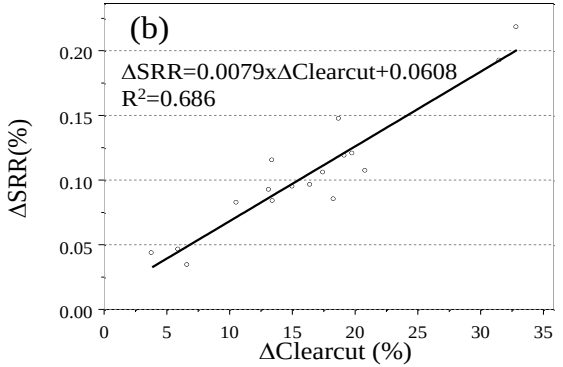






revised





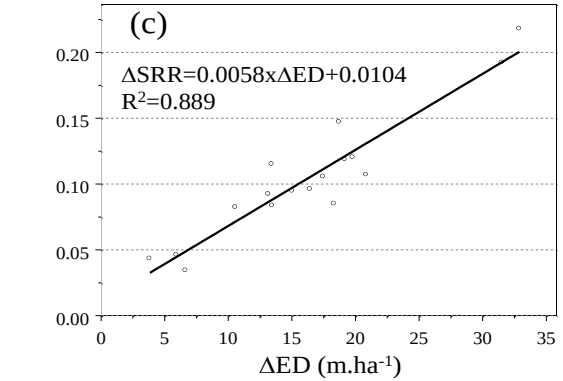


Fig. 3

Step 3: develop illustrations (figures, tables, photos, etc.) -- continue

- Figures should be easy-to-read. For example, do not use too many lines in one figure.
- Do not use color unless it's necessary (cost, copy, etc.)
- Do not duplicate in tables and figures.
- Most importantly, a detailed, self explanatory caption is needed. Many readers are lay and do not have time to read your manuscript carefully. S/he should get the messages by reading your figures and captions. This is the place that you should not worry about duplications (see an example).

Draft:

Relationships between edge influences on soil respiration rates (%) and three, representative class-level fragmentation indices in Chequamegon National Forest.

Revised:

Relationships between net changes in SRR (%) from edge effects and changes in three, representative class-level fragmentation indices between 1972 and 2001: a) Core area density, b) Clearcut area, and c) Edge density.

Step 4: Results -- state your scientific discoveries objectively, i.e., no comments!

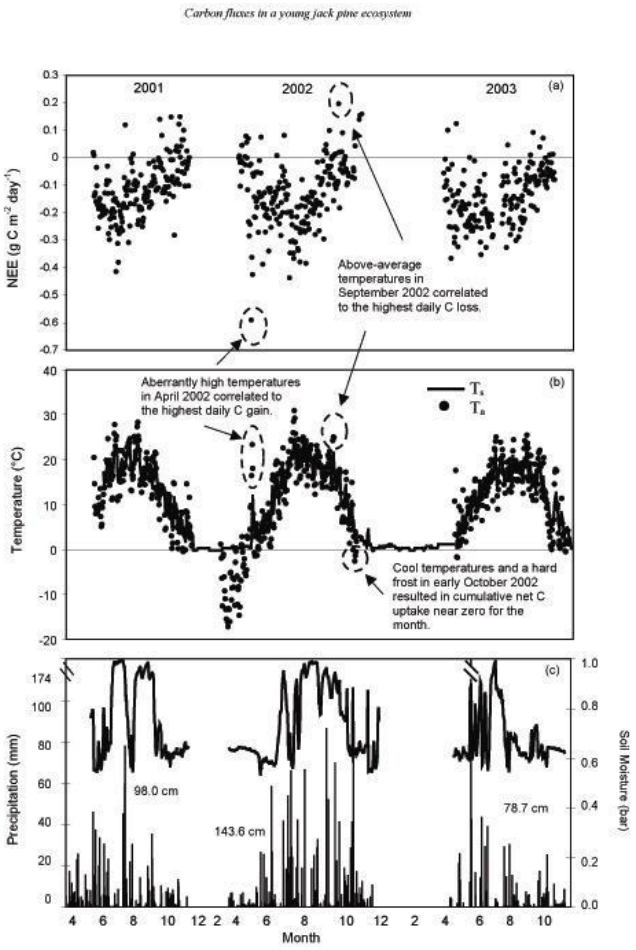
- Tape your illustrations on the wall (to see) and directly, objectively describe each figure/table.

- Do not cite any reference. If you have any text relating to other studies, move it to the discussion.

- Start a paragraph with a topic sentence (most important) – a comprehensive sentence summarizing the results of the entire paragraph. If a read can get the messages by ONLY reading the topic sentences of the manuscript, you succeed! (see example later followed by an exercise)

- Make sure your statements are backed by statistics!

Figure 3. Time series of daily total NEE (a), average daily air and soil (5 cm depth) temperatures (b), and daily total precipitation with the precipitation amounts summed over each measurement period (c) during the 2001, 2002, and 2003 measurement periods. Negative NEE values indicate a C sink while positive NEE values indicate a C loss.



Example:

On a day-to-day basis, the ecosystem usually behaved as a weak C sink (e.g., negative NEE), but there were some days when the ecosystem acted as a C source, most of which occurred in spring and fall (e.g., positive NEE; Figure 3a). From May 21-October 21, the ecosystem was a C source for 10 days in 2001, 16 days in 2002, and 9 days in 2003 (Figure 3a). In the spring, during the period from April 1 to May 20, the ecosystem acted as a C source for 8 days in 2002 and 2 days in 2003. During the fall, from late October to early November, the ecosystem behaved as a source of C for 10 days in 2001, while during this same time period in 2003, the ecosystem was a C source for only 2 of these days (Figure 3a). The ecosystem reached a minimum value of daily NEE (-0.6 g C m^{-2} day^{-1}; Figure 3a) in April 2002 during a period of anonymously high temperatures and well before bud break (Figure 3a,b). Also during 2002, the ecosystem reached the maximum measured daily NEE (+0.2 g C m^{-2} day^{-1}), an event that occurred directly following warm temperatures in late September (Figure 3b).

Backing up by statistics

3.3.3 Empirical modeling of CO_2 uptake and PAR

On a seasonal basis, the Landsberg model was a significant predictor of daytime NEE during the mid- to late summer periods (R^2 = 0.72-0.77, $p < 0.001$). In the early to late spring and fall, the model was also significant, but not as strong a predictor (R^2 = 0.32-0.55, $p < 0.0001$; Table 2). Over the entire measurement period (all seasons, all years combined), the Landsberg model still provided a decent fit to the data ($R^2 = 0.54$, $p<0.0001$). The saturation coefficients (P_{max}) ranged from 0.68 in fall to 1.34 in early spring. The light compensation point (I_{comp}) was lowest in early spring (15.62), and highest in late summer (82.57). The shape factor (α, an indication of the rate of change of daytime NEE per unit of PAR) varied from 1.59×10^{-3} in summer to 6.86×10^{-3} in early spring (Table 2; Figure 4a-c).

Step 5: describe the methods, including study sites, data collection, statistical analysis.

- Your goal is to make sure readers have a complete understanding of the methods.
- Often, one needs go back and forth many times to refine your methods, especially the stats.
- Do not provide any details for widely used methods that one can find in major textbook (e.g., diversity index, linear regression, etc.).
- Proper citations are needed following journal requirements.

Step 6: thorough discussion

- This is the most difficult section to write.

- Think about
  - what you have discovered
  - why these discoveries are important
  - what are the major points you want to make
  - Are your results supported by the literature
  - What are the implications for science or management
  - What are the shortfalls or limitations
  - What additional (or future) efforts are needed
- References are heavily used in this section. Please make sure you do not copy published text (i.e., plagiaries).

- Pay attention to TOPIC SENTENCES

Step 7: back to introduction

- Assume you have read a lot of relevant papers.
- Begin with the state-of-the-art of science on the topic.
- State what's missing in previous studies.
- What studies are needed on the topic.
- A reviewer will get his/her impression from this section. So make sure you can get reviewers' attention here.
- Again, a paper is written for others, not for yourself.

Step 8: conclusions

- What are the take-home messages?
- What do scientific challenges remain?
- Do not exceed 3 paragraphs, 2 are enough!

Step 9: acknowledgements

- Acknowledge financial support(s)
- Thank those who provided any suggestions for proposal, ideas, technical support, editing, administrative support, anonymous reviewing, and associate editor
- Do not forget those poor field assistants who spend many difficult hours in the fields

Step 10: complete references and conduct internal reviews

- Read the instructions very carefully
- Double check citations – references
- Double check citations – references
- Now you have completed you manuscript, it is very critical for your coauthors and colleagues to review it and provide CONSTRUCTIVE SUGGESTIONS. Ask a favor for an experienced scientist to HAMMER it. It's much better to receive a friendly review.

Step 11: Abstract and submission

- Draft a cover letter to the editor. Briefly state the importance of your study. This is a chance to sell your paper to the editor.

- You can recommend up to 4 reviewers. However there is no guarantee that the editor will use any of them. In addition, it is widely know that recommended reviewers will not always be constructive and supportive.

SUMMARY: 11 steps

Step 1: title, author list, affiliations, target journal
Step 2: state the study objectives
Step 3: develop illustrations
Step 4: results
Step 5: describe the methods
Step 6: thorough discussion
Step 7: introduction
Step 8: conclusions
Step 9: acknowledgement
Step 10: references and internal reviews
Step 11: abstract, reviewers, cover letter, & submission

More Tips:

- Watch for parallel structure
- Junior writers pay too much attention to their methods, however LOGIC and PHYLOSOPHY are much more important. THINK, THINK, and THINK!
- What are the take-home messages? Remember our goal?
- Use written languages! Always have someone else to read your manuscript, regardless of English as a second language.
- Take reviews, especially the negative reviews positively. NEVER TAKE IT PERSONALLY!
- Be confident. Good luck to all!

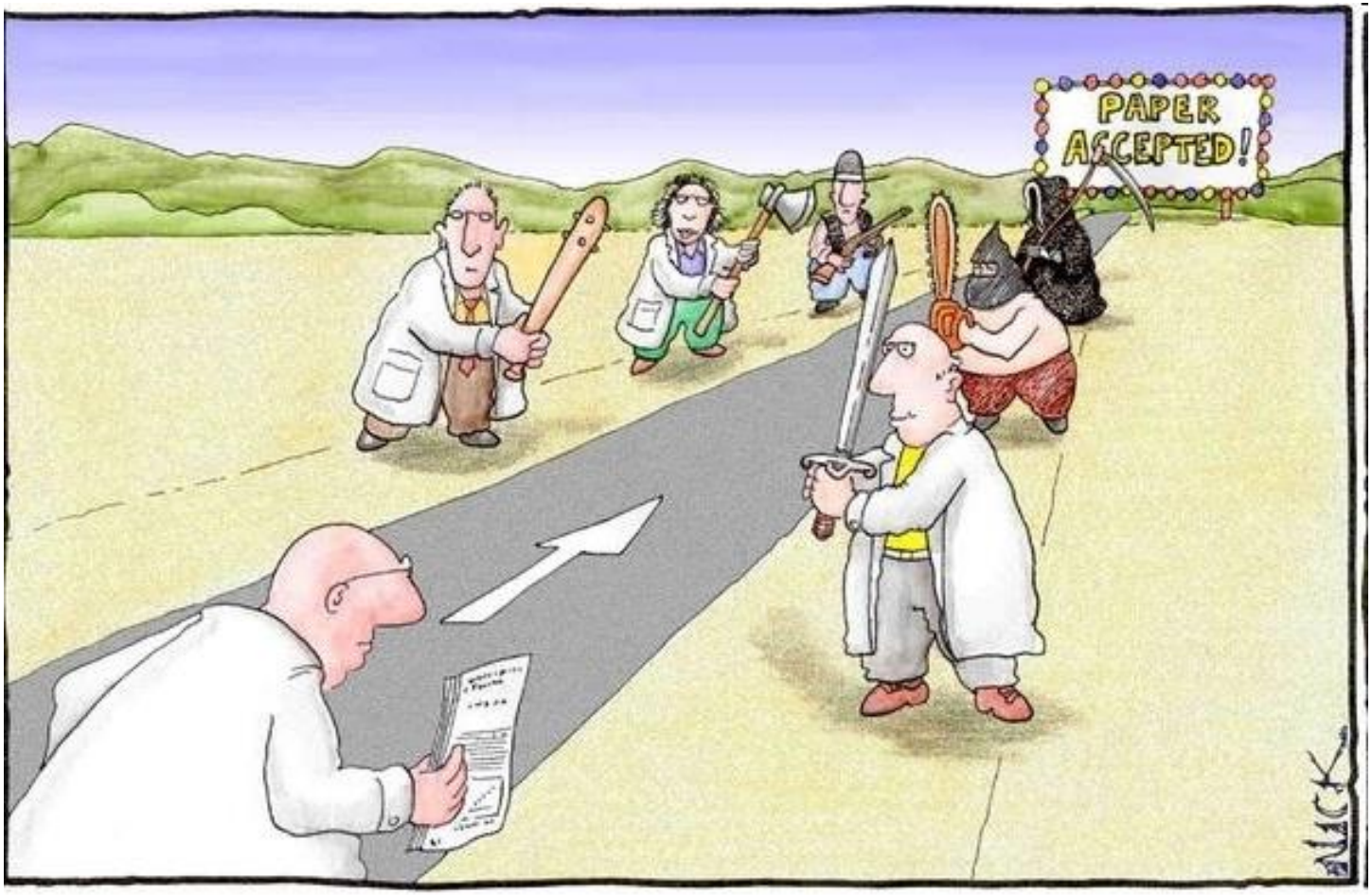
Writing

IMPROVING YOUR PROWESS AS AWRITER

- You can pick up the brains of the writers around you;
- You can bone up through a good reference book or writing workshop;
- You can find a professional editor!

Common Reasons for Rejection

- Poorly written/poor style
- Conclusions unjustified by data
- Flawed or poor design methods
- Faulty statistical analysis
- Hypothesis not adequately tested
- Back luck!



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

After rejection…

Jiquan's Advice: Be Persistent, Positive, & Strong !

Ethical Issues

- Data manipulation/falsification
- Plagiarism and self-plagiarism
- Conflicts of interest

✓ **Friends come and go, enemies accumulate!** (personal communication with Hal Mooney)

✓ **It is almost impossible to identify a true friend in your academic life** (personal communication with Jerry Franklin)

The Fine Art of Scientific Writing: Key Points

Technical writing is **hard** because

- We must know something explicitly about grammar;
- Writers lack some of the benefits that speakers have;
- The ideas most writers are working to convey are a complexly related.

Reference:
Perry, C.R. 1991. The fine art of technical writing. Blue Huron Publishing, Portland, OR

STARTING: BEFORE WRITING THE FIRST WORD

Defining Your Audience

- Students
- Publics
- Researchers
- Administrators
- Managers
- Environmentalists

STARTING: BEFORE WRITING THE FIRST WORD

- Doing “Inner” Work
- Plagiarism is strictly prohibited!

Focus!

STARTING: BEFORE WRITING THE FIRST WORD

Overcoming Writer's Block

- Mark your territory: find a quiet place
- Warm up by starting anywhere
- Grab any relevant thought and write it down

"The majority of the population relocated from rural to urban habitats".

"Most people moved from the farm to the city"

- Keep the flow going
- Throughout: tune into internal feedback

STARTING: BEFORE WRITING THE FIRST WORD

Invoking a Helpful Metaphor

- Think of the skeleton of writing as order
- Think of the body mass of writing as conciseness
- Think of the muscle tone of writing as vigor

ORDER

THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Logic Flow

1. Basis for Organization

2. Categorizing information: the key to outline

ORDER

THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Logic Flow

1. Basis for Organization

- Time
- Sequence
- Progression
- Space
- Importance
- Variables
- Concept

ORDER

THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Logic Flow

2. Categorizing information: the key to outline

- This is conceptually a two-part process. You may rank the information according to its importance;

- You can also sequence the ranked information (see the organization of this book).

The outline isn't "cast in stone". It's something flexible!

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Transitions: A transition is most frequently a single word or phrase but may be an entire sentence or even a paragraph. It's the relationship between the linked parts, rather than the number of words that do the linking.

- Because (because of)
- This time, the seedling…
- Therefore,
- In additional (additionally),
- Furthermore
- But, However,
- Not surprisingly,

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Dynamics: Making the major points "louder" and the subsidiary points "softer" to cue readers and keep writing focused.

- Selectively position information (e.g., placing an idea at the beginning or end of a sentence, paragraph, chapter, or section).

- Delete information. There is no need to tell readers everything you know about a given subject, just what they need to know.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Continuity: the coherence of the whole

- To identify your objectives early to cue readers about where you are headed;
- To reorient you within the document as a whole;
- To remind you of what you said last;
- To prompt you about what you'll say next.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Parallelism: structure of an entire document

A good example is a book's table of content (e. g, this book);

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Parallelism: structure of the internal parts of a document such as lists and descriptions

The instructions are as follows:

- Turn the power on
- Insert a sheet of paper
- Set the margins and tabs and check the line spacing
- Begin typing

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Parallelism: structure within individual sentences

Example:

Seedlings will be planted **to stabilize** stream banks, **to provide** forage for wildlife, and **to improve** aesthetics.

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Parallelism: structure within individual sentences

Not parallel:

The purpose of this little book is as much to show you the artistry of technical writing as helping you with the underlying mechanics.

Parallel

The purpose of this little book is as much **showing** you the artistry of technical writing as **helping** you with the underlying mechanics.

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Parallelism: structure within individual sentences

A word phrase operates much like a musical phrase: it has a certain “sounds” to which the reader’s ear becomes attuned. If you change the order of the words, you effectively change the “sound” – which may falsely signal to your reader a change in emphasis or meaning.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Hidden Dangers: skewed comparisons (i.e., twisting the meaning of a sentence by twisting its form). Form example, inspecting the following:

My idea of what constitutes good writing may **differ from my colleague.**

My idea of what constitutes good writing may **differ from that of my colleague**.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Hidden Dangers: dangling phrases. A dangler is a structural misfit – a group of words that connects illogically to the rest of sentence.

Once diagnosed as a problem, the farmer must rely on existing information from the local extension agent and years of experience working the land to eradicate the microscopical soil fungus.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Hidden Dangers: dangling phrases. A dangler is a structural misfit – a group of words that connects illogically to the rest of sentence.

Once the microscopic soil fungus has been diagnosed, the farmer must rely on existing information from the local extension agent and years of experience working the land to eradicate it. (see additional examples)

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Hidden Dangers: mismatched subjects and predicates

Fine roots is easily stripped when conifer seedlings are carelessly lifted from nursery beds.

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Consistency

1. **Format**

2. **Terminology** (e.g., NEP, NEE, productivity, production, flux, etc.)

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THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Consistency: Format

- Headings: CAPITAL LETTERS? **Boldface**?, Underlined? *Italics*?
- Entries in a displayed list (like this one)
- Tables should look the same

ORDER

THE SKELETON: CONSTRUCTING A STABLE FRAMEWORK

Consistency: **Terminology**

Using inconsistent terminology is one of the worst traps in technical writing – and one of the easiest to avoid once you're sensitized to it.

- Minimize the number of different terms
- Limit yourself to two when necessary

CONCISENESS -- THE BODY MASS: MAKING EVERYWORD COUNT

Information Load:

- You can expect your early drafts to be wordy. But when you're revising, you should program yourself to examine words, individually and in groups for information load.

- Eliminating the empties usually involves reconstruction, not just simple deletion.

CONCISENESS -- THE BODY MASS: MAKING EVERYWORD COUNT

Overlap: sets of words which echo one another to no purpose. You can eliminate overlaps by

- Examining individual words and word structures for their proper information load
- Comparing elements that carry a slighter load to slighter structures
- Nesting the slighter structures within grander ones

CONCISENESS -- THE BODY MASS: MAKING EVERYWORD COUNT

REPETITION:

Interpretation of the data collected to this point is somewhat limited because information has been collected only for this first year of the study (Page 79).

CONCISENESS -- THE BODY MASS: MAKING EVERYWORD COUNT

REPETITION:

The data collected so far is only for one year; therefore, its interpretation is limited (Page 79).

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

- SENTENCE TYPE
- VERB POWER
- VOICE
- GROUNDED LANGUAGE

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

1. SENTENCE TYPE

- Simple vs. complex sentences
- Diversity is the key
- No matter how stimulating your content may be, too many sentences of the same type, the same length, or some combination of the two make for deadly dull writing.

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

2. VERB POWER

- Grammatically-correct vs emptiness
- Dynamics
- Cultural in different disciplines
- Popular words
- ?

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

3. VOICE

- Text is livelier and more informative when written in the active voice (i.e., when the subject of the sentence is the doer of the action of the verb).

- When the sentence is written in the passive voice, the subject is instead the receiver of the action.

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

3. VOICE

- After recovering the ball from the wood, the boy threw it to his friend.
- After the ball was recovered from the woods, the boy threw it to his friend.
- After the ball was recovered from the woods, it was thrown by the boy to his friend.

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

3. VOICE

- For the sake of clarity and conciseness, prefer the active voice. But don't use it exclusively.

- Passive voice has its place in language. It doesn't always cause problems.

- Prefer the passive voice when the emphasis is not on the doer of the action.

VIGOR -- THE MUSICALE TONE: EMPOWERING YOUR WORDS

4. GROUNDED LANGUAGE

Technical writes tend to stray from the plainspoken to the puffed because it sounds more impressive, more “specialized” or “scientific”. However,

MORE IS ACTUALLY LESS!

ENDING: AFTER WRITING THE LAST

1. **EDITING YOUR OWN WRITING**

   - Cool-down
   - Outside review
   - Proofreading

2. **IMPROVING YOUR PROWESS AS AWRITER**

ENDING: AFTER WRITING THE LAST

1. EDITING YOUR OWN WRITING

- You will be burned out when a manuscript is completed.
- Shelve it and take a break.
- Let your brain take a break.

Cool-Down first

ENDING: AFTER WRITING THE LAST

1. EDITING YOUR OWN WRITING

Cool-Down first

- Cool down for at least a day or two. Several days are preferred.
- Distance yourself physically to have a fresh start.
- New ideas may show up during the break. Just take notes.

ENDING: AFTER WRITING THE LAST

1. EDITING YOUR OWN WRITING

Outside Review

- Find a friend, colleague to read the manuscript and ask for being critical. Because reviewers are new to the materials, they tend to find problems.

- Take time to conduct such friendly reviews because anonymous reviewers will be likely comment the same, potential flaws.

ENDING: AFTER WRITING THE LAST

1. EDITING YOUR OWN WRITING

Proof Reading

- Typos
- Format
- Other errors

ENDING: AFTER WRITING THE LAST

2. **IMPROVING YOUR PROWESS AS AWRITER**

<u>You can read</u>: The more you read, the more you'll absorb and discern about both technique and artistry in writing. Teach yourself to discriminate!

Read broadly!

ENDING: AFTER WRITING THE LAST

2. **IMPROVING YOUR PROWESS AS AWRITER**

- You can pick up the brains of the writers around you;
- You can bone up through a good reference book or writing workshop;
- You can find a professional editor.

ENDING: AFTER WRITING THE LAST

2. **IMPROVING YOUR PROWESS AS AWRITER**

However, nothing you can do will do more to improve your prowess as a technical writing than to keep on writing!

More references

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