

How to write scientific papers correctly, clearly, and concisely

Simplicity is the
ultimate sophistication.
Leonardo da Vinci

Part-III Writing Concisely

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Sections

- ❖ Part-I = Writing Correctly
- ❖ Part-II = Writing Clearly
- ❖ Part-III = Writing Concisely

Keep It Simple Stupid is a design rule that systems perform best when they have simple designs rather than complex ones.



Use simpler words to express your ideas.



Part-III = Writing Concisely

Main Contents

- ❖ Principles of effective writing
- ❖ Omit wordiness
- ❖ Cut clutter
- ❖ Tips on revision

Writing Concisely



This report, by its very length, defends itself against the risk of being read.

—Winston Churchill

Principles of effective writing

“Vigorous writing is **concise**. A sentence should contain **no unnecessary words**, a paragraph **no unnecessary sentences**, for the same reason that a drawing should have **no unnecessary lines** and a machine **no unnecessary parts**. This requires not that the writer make all his sentences short, or that he avoid all detail and treat his subject only in outline, but that **every word tell**.”

-- W. Strunk Jr. and E.B. White (1979)

Principles of effective writing (Cont.)

“The secret of good writing is to strip every sentence to its cleanest components. Every word that serves no function, every long word that could be a short word, every adverb that carries the same meaning that’s already in the verb, every passive construction that leaves the reader unsure of who is doing what—these are the thousand and one adulterants that weaken the strength of a sentence. And they usually **occur in proportion to the education and rank.**”

-- William Zinsser in *On Writing Well* (1976)

Writing for a Nature journal

Many papers submitted for publication in a Nature journal contain unnecessary technical terminology, unreadable descriptions of the work that has been done, and convoluted figure legends...We ask authors to avoid jargon and acronyms where possible...The acronym is second-nature to the **author** but is not to the **reader**....

http://www.nature.com/authors/author_resources/how_write.html

Principles of effective writing (Cont.)

- Cut unnecessary words and phrases; learn to part with your words!
- Use the active voice
(Remember **S+V+O** construction)
- Write with verbs:
 - ❖ Use strong verbs,
 - ❖ Avoid turning verbs into nouns, and
 - ❖ Don't bury the main verb!

"Omit unnecessary words"

is Rule 17 in Strunk and White,
"The Elements of Style"



Cut unnecessary words

- Be attentive and cruel
- After investing much effort to put words on a page, we often find it hard to part with them.

But fight their seductive attraction...

- Try the sentence without the extra words and see how it is better—conveys the same idea with more power.

Kill your darlings

*“To begin with, let me plead that you have been told of one or two things which Style is not; which have little or nothing to do with Style, though sometimes vulgarly mistaken for it. Style, for example, is not – can never be – **extraneous Ornament**. You remember, may be, the Persian lover whom I quoted to you out of Newman: how to convey his passion he sought a professional letter-writer and purchased a vocabulary charged with **ornament**, wherewith to attract the fair one as with a basket of jewels. Well, in this **extraneous, professional, purchased ornamentation**, you have something which Style is not: and if you here require a practical rule of me, I will present you with this: ‘Whenever you feel an impulse to perpetrate a piece of exceptionally fine writing, obey it – wholeheartedly – and delete it before sending your manuscript to press. **Murder your darlings.**’*

Common clutter:

- Dead weight words and phrases
 - ❑ It is well known
 - ❑ Needless to say
 - ❑ It can be regarded that
- Empty words and phrases
 - ❑ important
 - ❑ basic tenets of
- Long words or phrases that could be short

“Some words and phrases are blobs.”

- William Zinsser in
On Writing Well, 1976

Common clutter: (Cont.)

- Unnecessary jargon and acronyms
 - ❑ miR
- Repetitive words or phrases
 - ❑ end result
 - ❑ successful solutions
 - ❑ illustrate/demonstrate
- Adverbs
 - ❑ very, really, quite, basically, generally, etc



Exercise: phrases that could be short...

Rambling version

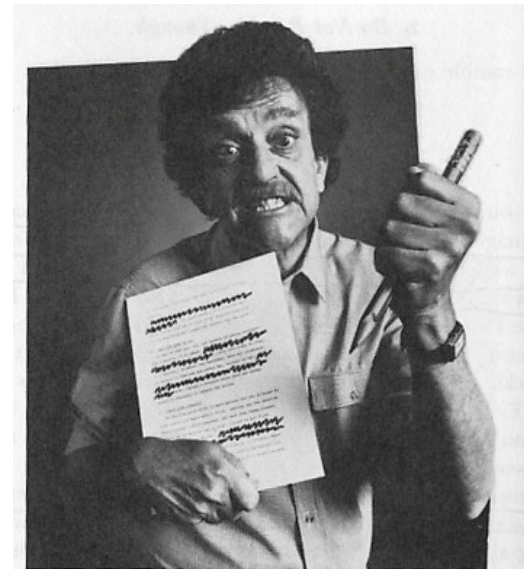
- ☐ A majority of
- ☐ A number of
- ☐ Are of the same opinion
- ☐ Less frequently occurring
- ☐ All three of the
- ☐ Give rise to
- ☐ Due to the fact that
- ☐ Have an effect on

Crisp version

most
many
agree
rare
three
cause
because
affect

Advice from the great American writer, Kurt Vonnegut

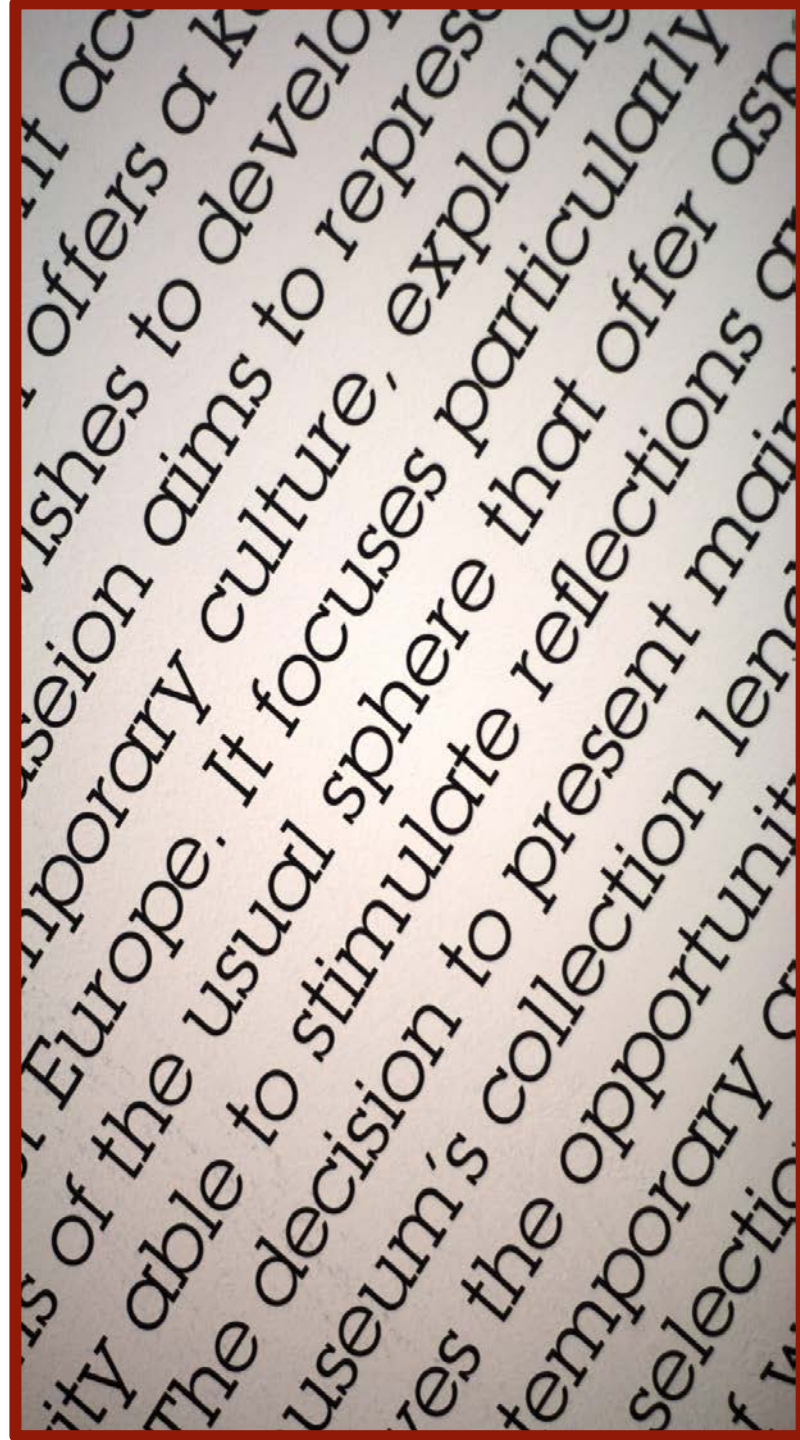
"Be **merciless** on yourself. If a sentence does not illuminate your subject in some new and useful way, scratch it out."



Wordiness

Check for . . .

- ✓ Excess Words
- ✓ Repeated Words
- ✓ Ambiguous Words
- ✓ Negatives
- ✓ Active/Passive Voice



More tricks for cutting clutter

- Eliminate negatives
- Eliminate superfluous use of
.....*“there is/there are”*
- Remove excess words
- Omit needless prepositions

1. Omit negatives

◆ She was not often right.

✓ *She was usually wrong.*

◆ She did not want to perform the experiment incorrectly.

✓ *She wanted to perform the experiment correctly.*

◆ They did not believe the drug was harmful.

✓ *They believed the drug was safe.*

I never write **Metropolis** for seven cents because I can get the same price for **city**. I never write **policeman** because I can get the same money for **cop**.



~ Mark Twain
(Famous American author)

1a. Change negatives to affirmatives

not different → similar

not the same → different

not allow → prevent

not notice → overlook

does not have → lacks

not harmful → safe

did not remember → forgot

not many → few

not often → rarely

not stop → continue

not include → omit

not honest → dishonest

did not succeed → failed

not important → unimportant

2. Get rid of 'there are/there is'

There are many engineers who like to write.

Many engineers like to write.

There are many ways in which we can arrange the pulleys.

We can arrange the pulleys in many ways.

3. Remove excess words

Delete redundancies

End result → *result*

true fact → *fact*

free gift → *gift*

red in color → *red*

Past history → *history*

Final outcome → *outcome*



Advice from "*King of Horror*" – Stephen King

“I believe the road to hell is paved with **adverbs**.”





3. Remove excess words (Cont.)

Delete doubles

full and complete

tried and true

each and every

Take-home message: -

Choose your words deliberately.

4. Exclude needless prepositions

For instance, 'that' and 'on' are often superfluous:

☐ The meeting happened on Monday.

✓ *The meeting happened Monday.*

☐ They agreed that it was true.

✓ *They agreed it was true.*

“I have only made this letter rather long because I have not had time to make it shorter.”

— Blaise Pascal



Two most difficult aspects of writing:

- ◆ Getting started, and
- ◆ Finishing well.

*“It is not the writing part that’s hard.
What is hard is sitting down to write.”*

-- Steven Pressfield, *The War of Art*

Tips on revision

1. Read your work out loud
2. Use fresh eyes
3. Do a verb check
4. Cut clutter
5. Do an organizational review
6. Get feedback from others
7. Get editing help

I. Why reading your paper out loud?

The brain processes the **spoken word** differently than the **written word**!



II. Use fresh eyes



➤ Put your paper away for up to a week before you look at it again (*if time permits*).

➤ It is amazing how a few days' distance permits you to see mistakes, weak links, and holes.

III. Do a verb check

Underline the main verb in each sentence.

Watch for:

(1) Weak (dull) verbs

(2) Passive verbs

(3) Remote/buried verbs

IV. Do not be afraid to cut!

Watch for:

- ❑ Dead weight words and phrases
(it is well-known that)
- ❑ Empty words and phrases
(important)
- ❑ Long words or phrases that could be short

IV. Do not be afraid to cut! (Cont.)

Watch for:

- ❑ Unnecessary jargon and acronyms
(miR)
- ❑ Repetitive words or phrases
(teaches clinicians/guides clinicians)
- ❑ Adverbs
(very, really, quite, basically)

V. Do an organizational review

In your paper, tag each paragraph with a phrase or sentence that sums up the main point.



Then move paragraphs around to improve logical flow and bring similar ideas together.

VI. Get outside feedback

- ❖ Ask someone outside your department to read your manuscript.
- ❖ Without any technical background, they should easily grasp:
 - the main findings
 - take-home messages
 - significance of your work
- ❖ Request them to point out particularly **hard-to-read** sentences and paragraphs!

VII. Get editing help

Develop a network of friends, colleagues, editors, and coaches who can offer feedback.

Create a support system for feedback both wide and deep.

The criticism of one helper can be tested against the wisdom of another.

Every great writer needs help – and the best help is hard to find.





“Congratulations, you are now capable of writing technical, impersonal and boring papers like myself and the other gentlemen—welcome to Academia ”.

(Drawing by Sverre Stein Nielsen.)