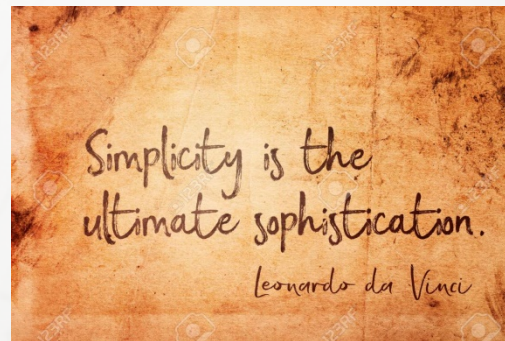


How to write scientific papers correctly, clearly, and concisely



Part-II Writing Clearly

Dr. Sajid Iqbal

Assistant Professor

University of Engineering & Technology

(UET) Lahore

sajid.iqbal@uet.edu.pk



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-II = Writing Clearly

Main Contents

- ❖ Repetition of words
- ❖ Active and passive voice
- ❖ Clarity and complexity
- ❖ Writing with verbs
- ❖ Steps in the writing process
- ❖ Parallel structures
- ❖ Modifiers

Writing Clearly



The great enemy of clear language is **insincerity**.

—George Orwell

Clear writing is writing that
is incapable of being
misunderstood.

— Quintilian
Roman rhetorician



Those who write clearly
have readers, those
who write obscurely
have commentators.



Albert Camus
French Nobel Prize winning author
QuoteHD.com (1913-1960)

Clear writing

When space in journals is at a premium, and when success is measured in terms of publication, it is in the interest of researchers to write **clearly** and plainly, and with **feeling**.

Henry Gee. The write stuff. Nature. 2004
<https://www.nature.com/news/2004/041129/full/041129-14.html>

Clear writing (Cont.)

First, people used to write much better in the 'old days'..... thanks to a grasp of grammar and vocabulary denied to almost everyone **nowadays**, the authors are able to articulate the subtlest issues with deft economy. Their prose is far from the roadkill we get these days (submitted by authors who are trying their best, but find themselves barely able to express the ideas boiling inchoately in their brains).

“Scientists’ convoluted prose produces a general frustration akin to that felt by the boxer who, while still gloved, tries to peel a banana.”

Henry Gee. The write stuff. Nature. 2004

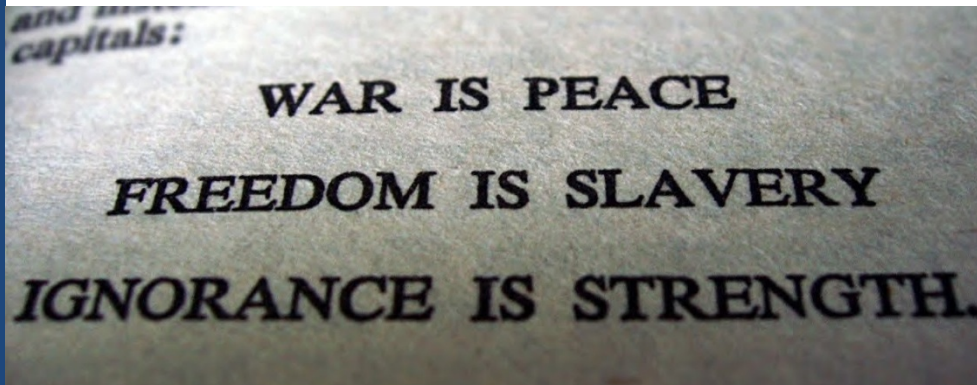
<https://www.nature.com/news/2004/041129/full/041129-14.html>

Doublespeak

Orwell's word for duplicitous language has entered the English language: doublespeak.

In his epic novel, 1984, the propaganda ministry—in charge of all the government's lying, is called the *Ministry of Truth*.

The Nuts and Bolts of College Writing
Michael Harvey



Doublespeak (Cont.)

“When words lose their meaning, people lose their freedom.”

— Confucius, Chinese Teacher

I reminded [the soldiers] and their families that the war in Iraq is really about peace.

— President George W. Bush, April 2003

Clear writing (Cont.)

Scientific writing is primarily an exercise in **organization**....With the Doctor of Philosophy degree, should the scientist know some philosophy? I agree with John Gardner who said: “The society which scorns excellence in plumbing because plumbing is a humble activity and tolerates shoddiness in philosophy because it is an exalted activity will have neither good plumbing nor good philosophy. Neither its pipes nor its theories will hold water.”

How to write a scientific paper
Robert A. Day.

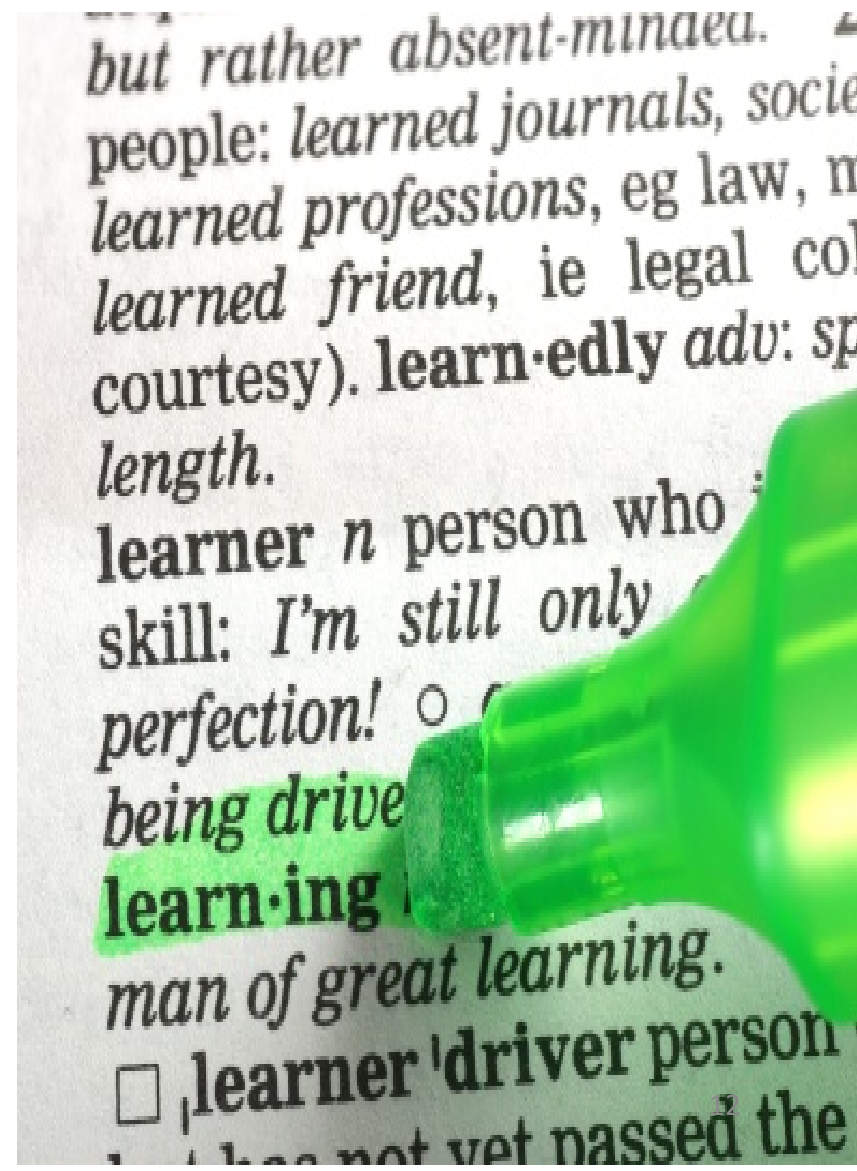
*“Modern English, especially written English, is full of **bad habits** which spread by imitation and which can be avoided if one is willing to take the necessary trouble. If one gets rid of these habits one can think more **clearly**.”*

George Orwell, "Politics and the English Language"

Check for repeated words

- Circle or highlight any repeated words.
- Replace repeated words with different words with the same meaning.

Repetition of **key words** can also create **coherence**.



Eliminate Repetition

A class of beacon mounts has been designed to allow for all three tracking system beacons to be attached to the rig in a global manner. This consists of machining all of the mounting holes on the rig the same and having a method for each beacon type to mount onto the rig using the holes.



A note on repetition...

When you find yourself reaching for the thesaurus to avoid using a word twice within the same sentence or even paragraph, ask:

(1) Is the second instance of the word even necessary?

(2) If the word is needed, is a synonym really better than just repeating the word?

Repeat key words!

-e.g., names of comparison groups, variables, or instruments.

Delete ambiguous, vague words

Important

Maybe

WHATEVER!

Great

SO

Kind of

Basically

FOR SURE!

Could have

Essential

And like

Sort of

Really

So then

Absolutely

awesome

Good

Very



Needless synonyms!

To avoid repetition, writers have needlessly (and amusingly) come up with synonyms like:

Mustache	Under-nose hair crops
Beaver	The furry, paddle-tailed mammal
Banana	The elongated yellow fruit
Skis	The beatified barrel staves
Milk from a cow	The vitamin-laden liquid from a bovine milk factory

The reader may think you are referring to a different instrument, model, group, variable, etc.

"The Press: Elongated Fruit - TIME." Time. 10 Aug. 1953.



Why use the same term consistently for a specific thought or object?

You will confuse your audience if you use different terms for the same concept.

Using a different term may cause the reader to wonder if you are referring to the same group.

Don't feel that you need to use synonyms to make your writing more interesting.

While using different words may make writing more interesting, it may decrease clarity.



Acronyms/ Initialisms

Math

Mental Abuse To Humans

- ◆ Resist the temptation to abbreviate words simply because they recur frequently! (*miR* instead of *microRNA*)
- ◆ Use only standard acronyms/initialisms (e.g., *DNA*, *RNA*). Do not make them up!
- ◆ If you must use acronyms, define them separately in the abstract, each table/figure, and the text. For long papers, redefine them occasionally.

Emphasize the active voice

WHO does WHAT to WHOM?

- ◆ Active voice identifies the actor and produces conciseness and directness.
- ◆ Passive puts the thing being acted on first.

Remember Acronym:- SVO

Subject +Verb+Object

Why?

For avoiding “to be verbs”

Writing for a Nature journal

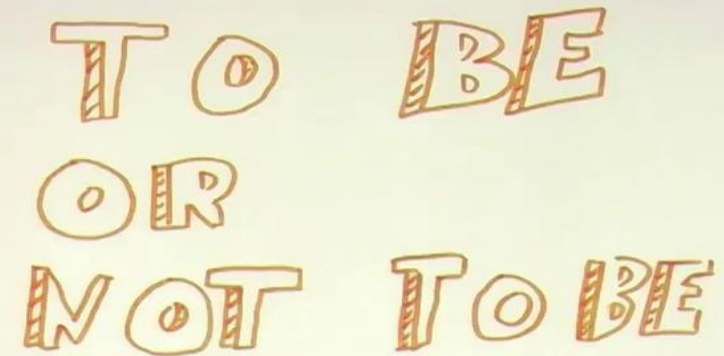
Nature journals prefer authors to write in the **active voice** (*we performed the experiment...*) as experience has shown that readers find concepts and results to be conveyed more clearly if written directly. We have also found that use of several adjectives to qualify one noun in highly technical language can be confusing to **readers**.

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

“to be” verbs

Indicate a state of being rather than an action.

- Is, Are , Was , Were, Be, Been , Am
- could be, shall be, should be, will be, would be, may be, might be, must be, has been



TO BE
OR
NOT TO BE



When is it OK to use passive voice?

The Methods section...

- ◆ What was done is more important than who did it!
- ◆ Readers tend to skim the methods section for key words rather than reading it as prose.



Clarity and complexity

New information, complex phrases and clauses, and technical terms, are easier to process when placed at the **end of sentences**.

Complex: Questions about the ethics of withdrawing intravenous feeding are the most difficult.

Revised: Most difficult are questions about the ethics of withdrawing intravenous feeding.

Clarity and complexity (Cont.)

Another example—the more complex phrase is easier for the reader to process when it comes at the **end of the sentence**.

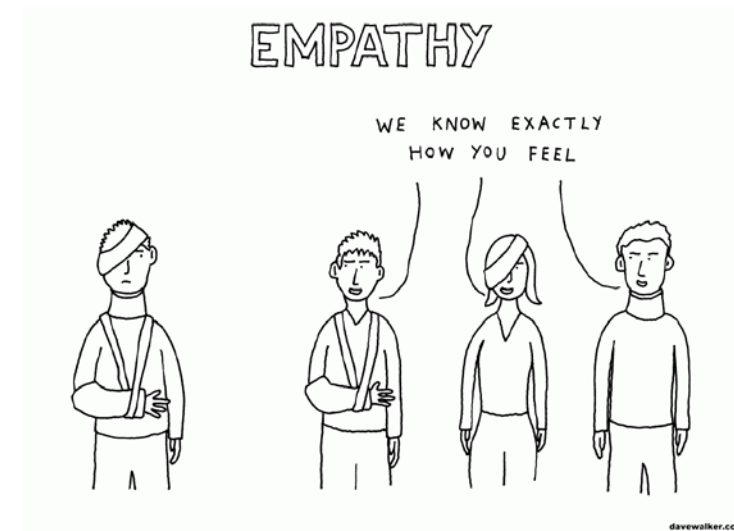
Complex: Lincoln's claim that the Civil War was God's punishment of both North and South for slavery appears in the last part of the speech.

Revised: In the last part of his speech, Lincoln claims that God gave the Civil War to both North and South as a punishment for slavery.

Have empathy for readers!

Treat
others as
you want
to be
treated

sp



Write with verbs!

- Use strong verbs
- Avoid turning verbs into nouns
(Avoid Nominalization)
- Do not bury the main verb
(Avoid remote verb)

The word 'VERB' is rendered in a bold, blue, three-dimensional font. Each letter has a slight shadow and a gradient, giving it a blocky, modern appearance.

It's what you do

1. Use strong verbs

Verbs make sentences go!

COMPARE:

Loud music **came** from speakers embedded in the walls, and the entire arena **moved** as the hungry crowd **got** to its feet.

WITH:

Loud music **exploded** from speakers embedded in the walls, and the entire arena **shook** as the hungry crowd **leaped** to its feet.

1. Use strong verbs (cont.)

Use “to be” verbs (is, are, am, was, were, been...) purposefully and sparingly.



2. Don't turn verbs into nouns

Avoid Nominalization.



Do not kill verbs by turning them into nouns.

2. Do not turn verbs into nouns (Cont.)

Obtain estimates of

Provides a review of

Take an assessment of

Provides a description

estimates

reviews

assess

describes

Weak verbs

Do not convert **spunky verbs** into boring (clunky) nouns.

3. Do not bury the main verb

- The “remote verb” is one of the most common errors in scientific writing.
- Keep the subject and main verb (predicate) close together at the start of the sentence...

Why?

..... Readers are waiting for the verb!

3. Do not bury the main verb (Cont.)

Example: -


All children (n = 99, 54 boys and 45 girls) born between 1990 and 1995, adopted during 1993–1997 from Poland, Romania, Russia, Estonia, and Latvia through authorized adoption agencies in Sweden and living in the region of Vastra Gotaland, were invited to participate in the study.

3. Do not bury the main verb (Cont.)

Subject



All children (n = 99, 54 boys and 45 girls) born between 1990 and 1995, adopted during 1993–1997 from Poland, Romania, Russia, Estonia, and Latvia through authorized adoption agencies in Sweden and living in the region of Vastra Gotaland, were invited to participate in the study.



Predicate

3. Do not bury the main verb (Cont.)

The case of the buried predicate...

Revised sentence: -

We invited to participate in the study all children ($n = 99$, 54 boys and 45 girls) born between 1990 and 1995, adopted during 1993–1997 from Poland, Romania, Russia, Estonia, and Latvia through authorized adoption agencies in Sweden and living in the region of Västergötland.



Steps in the writing process

1. Prewriting

- ✓ Collect, synthesize, and organize information
- ✓ Brainstorm take-home messages
- ✓ Work out ideas away from the computer
- ✓ Develop a road map/**outline**

2. Writing the first draft

- Putting your facts and ideas together in organized prose

3. Revision

- ◆ Read your work out loud
- ◆ Get rid of clutter
- ◆ Do a verb check
- ◆ Get feedback from others



1. Prewriting tips

- ◆ Get organized first!
- ◆ Don not try to write and gather information simultaneously!
- ◆ Gather and organize information **before** writing the first draft.

1. Prewriting tips (Cont.)



- ❖ Develop a road-map/outline
- ❖ Arrange key facts and citations from the literature into a outline **before** writing the first draft.
- ❖ Think in paragraphs and sections...



1. Prewriting tips (Cont.)

- ◆ Brainstorm away from the computer.
- ◆ Write on the go!
 - While exercising (Turn off that ipod!)
 - While driving alone (Turn off the radio!)
 - While waiting in line (Put down the magazine!)
- ◆ Work out take-home messages.
- ◆ Organize your paper.
- ◆ Write memorable lines.



1. Prewriting tips (cont.)

Compositional organization:

- Like ideas should be grouped.
- Like paragraphs should be grouped.



2. Tips for writing the first draft

- ◆ Do not be a perfectionist!
- ◆ The goal of the first draft is to get the ideas down in organized prose.
- ◆ Focus on logical organization more than sentence-level details.
- ◆ Writing the first draft is the hardest step. Minimize the pain by writing it quickly and efficiently!

Parallelism

Lists of ideas (and numbered lists of ideas) should be written in parallel form.

1. Highlight every list in your paper.
2. Label each item in the list:
 - (N) Noun
 - (V) Verb,
 - (G) Gerund (V+ing),
 - (A) Adjective,
 - (P) Pronoun
3. Adjust the items in the series that are not consistent.

Parallelism (Cont.)

Faulty parallelism:

Annie likes to nap, rap,
and eating snacks.

Corrected:

Annie likes to nap, rap,
and snack.

Incorrect:

I like to run, biking, and lake.

Correct:

(a) I like to run, ride bikes, and go to the lake.

(b) I like running, biking, and swimming at the lake.

Parallelism (Cont.)

Pairs of ideas joined by “and, or, but” should be written in parallel form.

What you **see** *is* what you **get**.
[] = []

Being Jim's friend *means* **being** constantly alert.
[] = []

To know her *is* **to love** her.
[] = []

We aimed **to increase** the resolution and **to improve** picture quality.

Subject and verb agreement

Verb	Subject	Example
Singular	Two, sing. subjects	Harry or Ron is arriving by plane today.
Singular	Each	Each of the professors knows how to teach potions.
Plural	Either/or Neither/nor	Neither the History of Magic book nor the wands are sold at the super-market.
Singular	Sums of money	One hundred galleons is too much for a baby dragon.

Noun and pronoun agreement

NounPronoun

Example

Singular Singular

Everyone is bringing his or her wand to class.

Singular Singular

Each of the professors knows his or her most adept fliers.

Singular Singular

The class has its own room.

Plural Plural

The boys have their own dragon.



Misplaced modifiers

A misplaced modifier is too far away from the word it is trying to describe.

Example:

The storage drums showed signs of deterioration that can be seen under severe corrosion.

✓ The storage drum, which were severely corroding, showed signs of deterioration.

The Rule:

Place the modifiers near the words they modify.

Dangling modifiers

A dangling modifier describes a word that is not in the sentence.

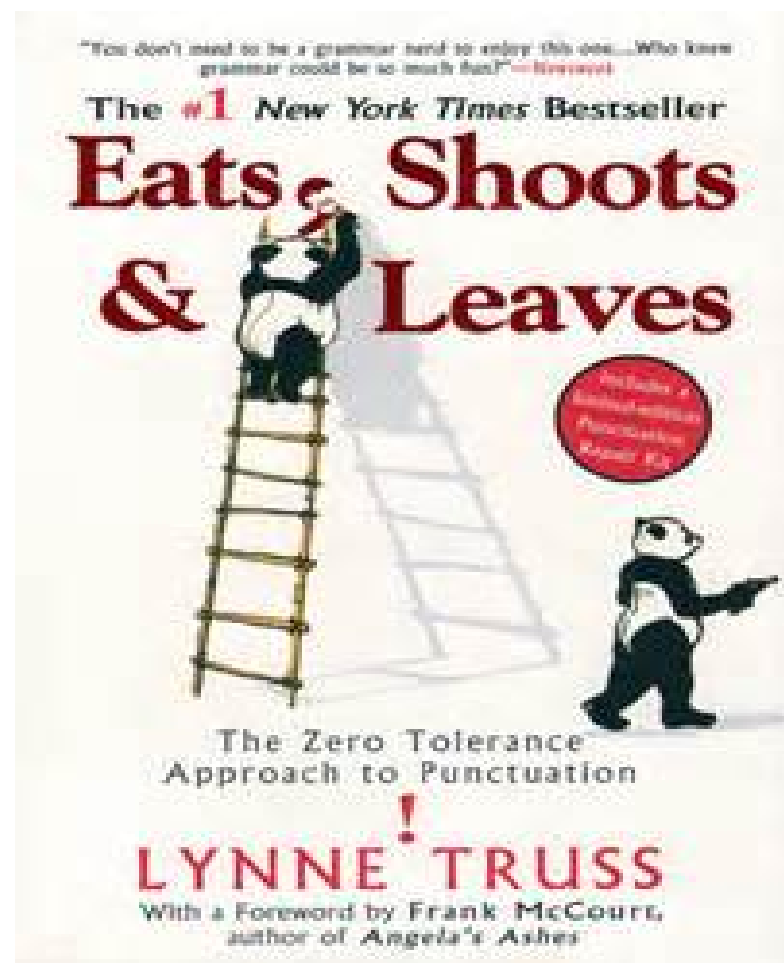
Example:

Plump and juicy, Aunt Gertrude won first prize at the fair.

✓ Plump and juicy, Aunt Gertrude's roasted turkey won first prize at the fair.

Appropriate use of punctuation

“...standards of punctuation in general in the UK are indeed approaching the point of illiteracy; self-justified philistines...”



Punctuation

Check for . . .

- ✓ Apostrophes
- ✓ Commas
- ✓ Semi-colons
- ✓ Colons



Apostrophes

It's (it is)

,

Thomas' book, or
Thomas's book

— —

Delilah's book

Do not use with time eras (the 1970s), plural last names (the Smiths), or possessive pronouns (its, his, hers, etc).

Commas

Correct placement of commas or periods within quotations

“You had me at hello,” she told Jerry.

I’m what they call a “movie buff.”

Commas separate two complete sentences joined by a **coordinating conjunction**:

Tom Cruise can take my breath away, but I had the time of my life with Jackie Chan.

For, And, Nor, But, Or, Yet, So



Commas

Commas separate
introductory clauses

First and foremost, I
am in love with
Leonardo DiCaprio.

Commas on both sides
of interrupting words
or phrases

I do, however, realize
that some prefer
Johnny Depp.

Depp, no matter how
good you believe his
acting to be, doesn't
match DiCaprio for
talent.

Semicolons and colons

Semicolons

Separate two complete sentences (second sentence NOT capitalized).

•
;

Used in lists where there are two commas within the items of the list.

Colons

Set apart a **complete** sentence from an example or list.

•
•


He checked out three books:
Jurassic Park, *Timeline*, and
Airframe.

Paragraph-level tips

- ❖ ONE paragraph = ONE **idea**/theme
- ❖ Give away the punch line early.
 - *We are not writing detective stories.*
- ❖ Paragraph flow is helped by:
 - logical flow of ideas
 - parallel sentence structures
 - if necessary, transition words
(*likewise, however, similarly etc.*) **wisely**.

Paragraph-level tips (Cont.)

Logical flow of ideas:

- Sequential in time
*Avoid the **Memento** approach*
- General  Specific
*Remember **Known-new** contract*

Generally readers remember the **first** sentence and the **last** sentence best.



Final remark

I end this presentation with the immortal words of Karl Marx:

“Engineers of the World, Organize.”

