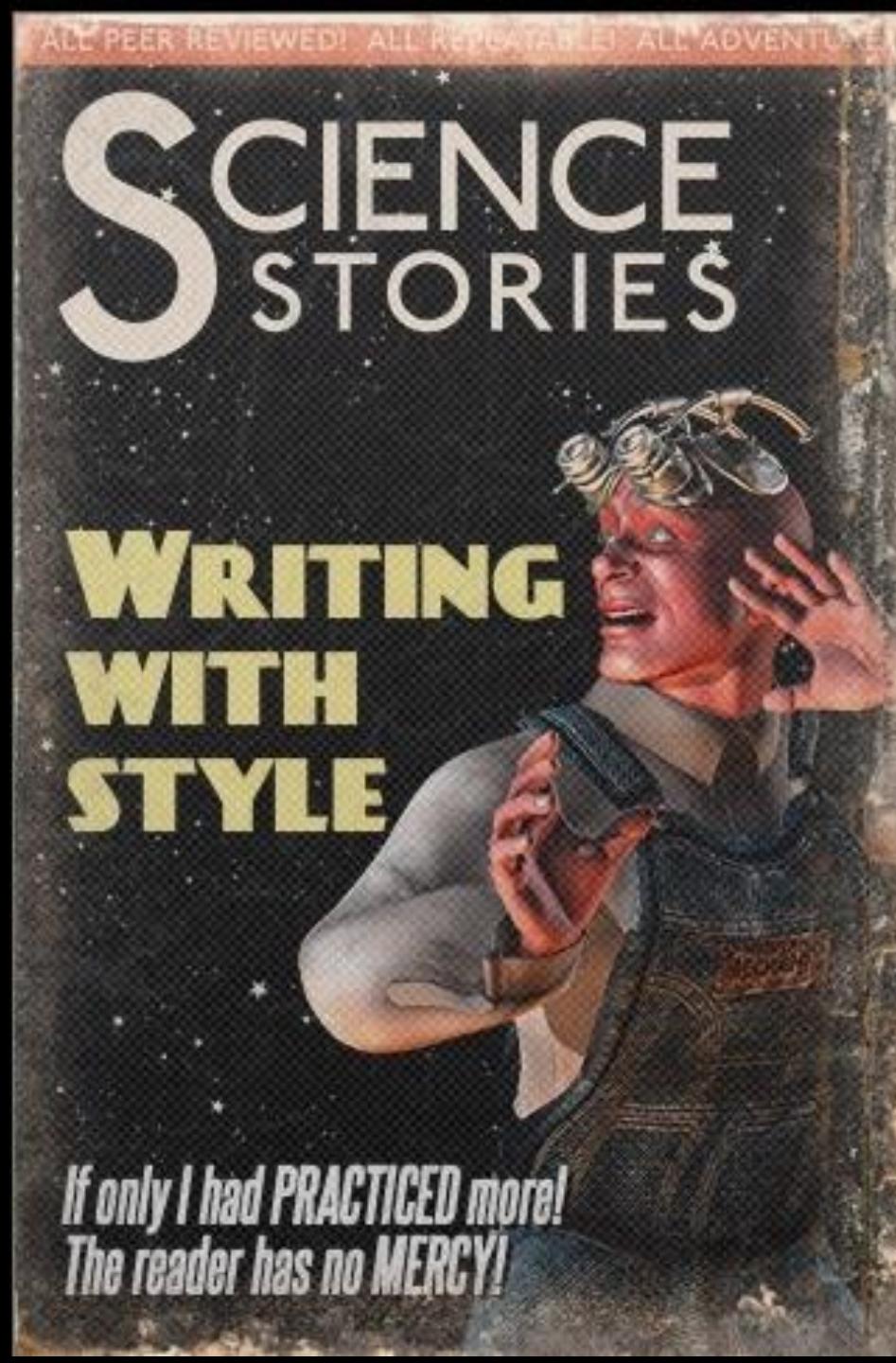


Writing Papers

Henri Boffin
ESO





P.K. Page

Stargazer

The very stars are justified.
The galaxy
italicized.

I have proofread
and proofread
the beautiful script.

There are no
errors.

Quiz: True or False?

- Always begin your introduction with a specific statement of the goals of your study.

FALSE. You need to provide minimal background information so readers can understand the justification for your study. HOURGLASS!

- Your introduction should provide as much background information as possible, including a minireview of the literature on your subject.

FALSE. Provide only the information that is strictly necessary to explain why your study was necessary.

Quiz: True or False?

- The methods section talks about what YOU did, so you should never cite other authors.

FALSE. Sometimes it is useful to cite other papers rather than going into details about specific procedures.

- The experimental design of the study must be clearly explained in the methods section.

TRUE. Readers need to understand the experimental design as early as possible.

Quiz: True or False?

- The text of the results section should highlight information from tables and figures that is directly related to the objectives of your study.

TRUE.

- Your introduction needs to justify why you did your study.

TRUE.

Quiz: True or False?

- You should be sure not to omit discussing any of your results in the discussion section.

FALSE. Discuss only relevant and interesting results.

- Always end your discussion with some kind of conclusion.

TRUE, unless of course it is followed by a conclusions section.

What is the primary purpose of the 'revising' stage in the writing process?

- A. To correct spelling, grammar, and punctuation errors
- B. To become a reader of your own work, deleting what is not needed and adding what is missing to strengthen the story
- C. To incorporate feedback from co-authors and referees
- D. To format the paper according to the target journal's guidelines.

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What does the hourglass to illustrate the structure of a scientific paper represent?

- A. The paper begins with a broad introduction, narrows to specific methods and results, and then broadens again in the discussion to show wider impact
- B. The paper starts with specific results, broadens to discuss their implications, and then narrows back to a single conclusion
- C. The amount of time spent on each section
- D. The flow of information should be consistently narrow and focused throughout the entire paper.

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What advice is given for writing the first draft of a paper?

- A. Use a formal, academic voice from the very beginning to ensure consistency
- B. Write quickly and without stopping to edit to maintain a natural flow
- C. Write the abstract and conclusions first to provide a clear guide for the draft
- D. Focus on perfecting each sentence and paragraph before moving to the next one.

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What is the main function of the 'Discussion' section?

- A. To provide a step-by-step description of the research process so that it can be replicated
- B. To present the raw data, and factual findings from the experiments or computations
- C. To introduce the research problem and establish a knowledge gap in the field
- D. To interpret the results, answer the research question, and explain the work's broader implications.

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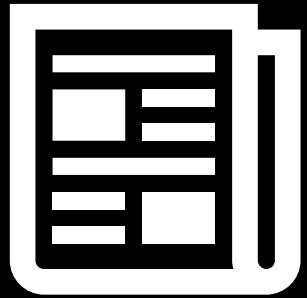
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- D. To interpret the results, answer the research question, and explain the work's broader implications.

What is the 'One paper = One idea' principle

- A. Each paper should only have a single author to ensure a clear voice
- B. A research project should only ever result in the publication of one paper
- C. A paper should be structured around a single, clear, and compelling message or finding
- D. The main idea of a paper should be stated only once.

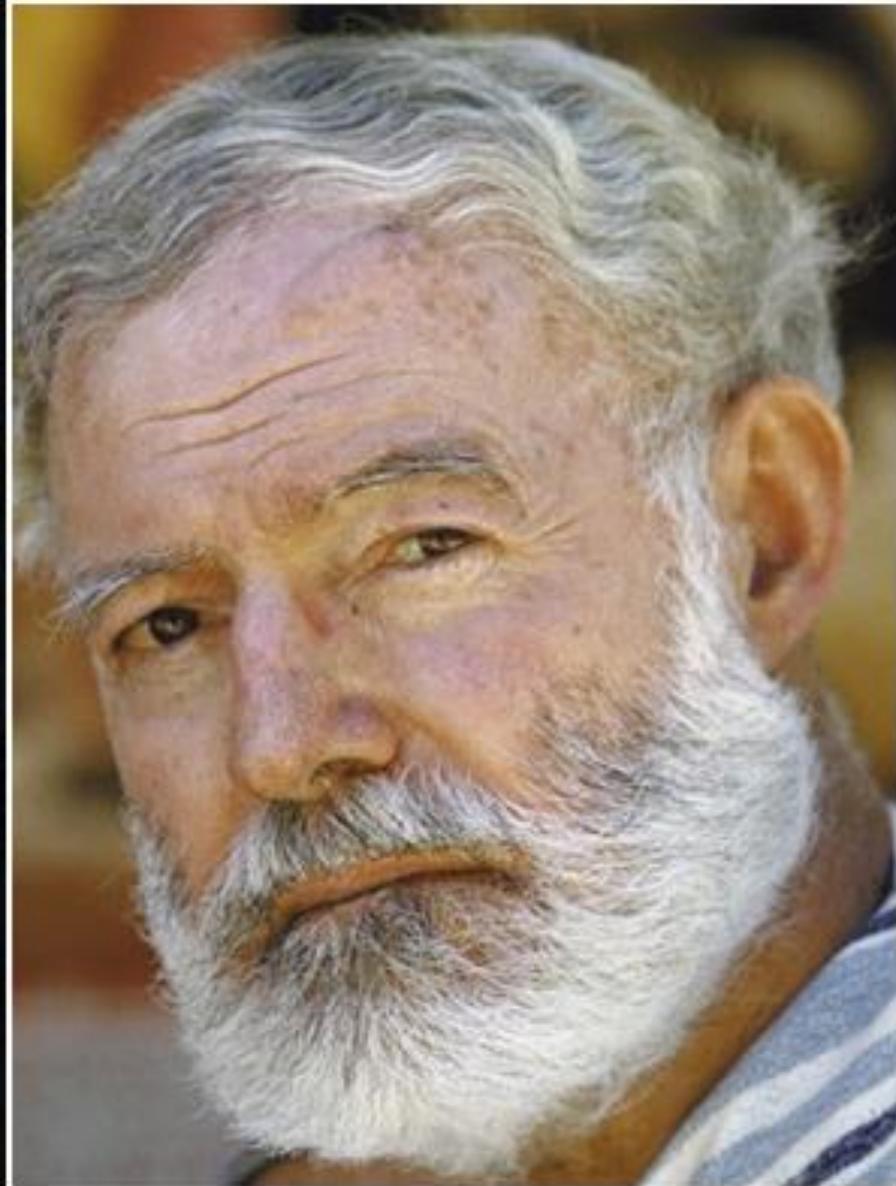
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How to write II

Make your
words count



We are all apprentices in a craft
where no one ever becomes a
master.

— *Ernest Hemingway* —

Tell a Story



Get the best
attention and
get a message
across

Humans have been telling stories since the origins of time, like in these cave paintings. Such stories are at the origin of language.

Tell a story

2009 - Rob Walker



200
objects

stories



\$0.99

→ \$62.95

Tell a story

2009 - Rob Walker



200
objects

\$129

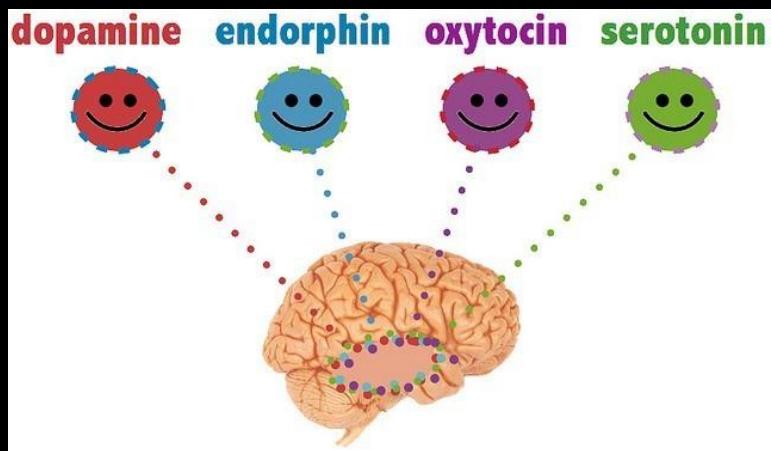
→ \$8,000

POWER of stories!
x 60



Tell a Story

Humans are biological systems
– we answer to chemicals



A story will increase
your levels of
dopamine,
endorphin,
oxytocin,
serotonin

This will lead to a
better focus, better
short-term memory,
more empathy, ...

Tell a Story

No other prose than stories
communicates information so efficiently

So your papers and your
talks should be telling
stories

Even at the level of
sentences or paragraphs,
use stories...



Tell a Story



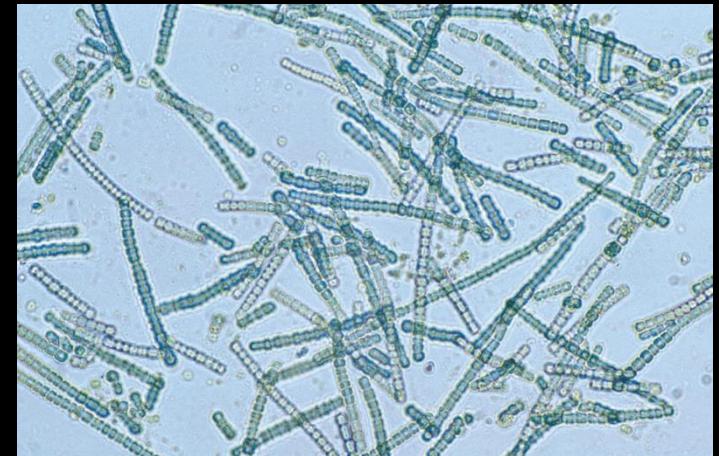
Characters perform Actions

Make characters
subjects and their
actions verbs

Characters:
tangible, concrete
nouns

An example of a story with concrete nouns

Cyanobacteria use water to produce oxygen like hydrogen factories."



Abstract nouns

| Verb | Abstract Noun | Adjective | Abstract Nouns |
|------------|---|------------|----------------|
| understand | understanding | efficient | efficiency |
| observe | observation | accurate | accuracy |
| Interpret | interpretation | applicable | applicability |
| ... | assumption prediction manipulation demonstration development exclusion response | | |

They name intangible things such as ideas, emotions, or qualities

They don't work well as characters

Abstract nouns

Abstract nouns are good to help us say concisely what would otherwise take many words to explain.

For example, *evolution* or *mutation* are well established and widely accepted.

But we often use the abstract nouns to make our writing sound more sophisticated, at least we think so.

To readers, such nouns are confusing,
especially when used as subjects.

With an abstract subject, the reader can't visualise

Language works by triggering within us pictures of how things are in the world

'The palm tree is by the shore'

'I love fairness'

We must use words which enable us to make pictures → **concrete nouns**



Asger Daugbjerg

Sentence

We performed an analysis on the data

Action

Nominalisation



We analysed the data

Verb



Scientific writing regularly disguises
the main actions in nouns, costing
reader energy.

“—There are three ways of finding oneself in the river.

Falling, jumping, and pushing. [...]

—**Accident, suicide, and homicide**, why can't you say so?

—Because you deal in **words**, and abstractions. I deal in facts.”

– Nicolas Freeling

“Write to express, not impress.

Don’t try to sound smart. The science in your paper is the only thing you need to validate your intellect, not long and complicated sentences or words.”

—Meenakshi Prabhune

Abstract nouns

“The behavioural manifestations of stress responses have been shown to vary greatly between individuals in rodents, pigs, fish, and humans.”

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Abstract nouns

“The behavioural manifestations of stress responses have been shown to vary greatly between individuals in rodents, pigs, fish, and humans.”

“Individuals rodents, pigs, fish, and humans behave very differently in response to stress.”

Galactic example

“The presence of NGC 205 in the proximity of the Milky Way has been shown to provide an ideal opportunity for studying at high resolution the distribution of gas in a dwarf elliptical.”

Galactic example

“The presence of NGC 205 in the proximity of the Milky Way has been shown to provide an ideal opportunity for studying at high resolution the distribution of gas in a dwarf elliptical.”

Subject – the presence – is abstract
Verb – has been shown – is passive

Galactic example: possible revision

“Because of its proximity to the Milky Way, NGC 205 presents us with an ideal opportunity to study at high resolution the distribution of gas in a dwarf elliptical.”

Galactic example: possible revision

“Because of its proximity to the Milky Way, NGC 205 presents us with an ideal opportunity to study at high resolution the distribution of gas in a dwarf elliptical.”

Concrete subject – NGC 205
Verb – presents – is active

Another example

The ability of mudrock seals to prevent CO₂ leakage is a major concern for geological storage of anthropogenic CO₂.

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The ability of mudrock seals to prevent CO₂ leakage is a major concern for geological storage of anthropogenic CO₂.

Geologists are concerned that mudrock seals may allow anthropogenic CO₂ to leak from geological storage.

Clarity

To ensure that your writing uses clear subjects and verbs, ask these four questions:

1. What is the action of the sentence? (What's happening?)
2. Is the action the verb? If not, change it to match.
3. Who/What is doing the action?
4. Is the doer the subject? If not, change it to match.

Tell a Story



Use **Strong** Verbs

Strong verbs clearly state an action taking place

They provide a better description than weak verbs

“She was walking through the forest.”

“Was” is a weak verb

“She walked through the forest.”

How did she walk? Slowly? Rapidly?
“To walk” is also relatively weak.

“She strolled through the forest.”

Strong verbs help to create visuals

Verbal verve

Favour strong, specific, robust action verbs (*scrutinize, dissect, recount, capture*) over weak, vague, lazy ones (*have, do, show*)

Limit your use of be-verbs (*is, am, are, was, were, be*, and the nominal forms *being, been*)



Watch out for “there is”

Often “there is” or “there are” is extra weight
and can be removed

“There are many students who like writing.”

→ “Many students like writing.”

“There are three ways we can think of this.”

→ “We can think of this dilemma in three ways.”

Tell a Story (II)

Use Strong Verbs

The ability of mudrock seals to prevent CO₂ leakage is a major concern for geological storage of anthropogenic CO₂.

When we change verbs into abstract nouns, we rob our sentence of strong verbs



“Understanding seasonal habitat ranges and their distribution is critical for Greater Prairie Chicken conservation and management.”

“Understanding seasonal habitat ranges and their distribution **is** critical for Greater Prairie Chicken conservation and management.”

Can we replace "is" by something more powerful?

“Understanding seasonal habitat ranges and their distribution is critical for Greater Prairie Chicken conservation and management.”

“Before we can conserve and manage Greater Prairie Chickens, **we** must understand their seasonal habitats.”



Exercise

Photographs from space taken by satellites are indicators of urbanization and just one of the demonstrations of the human footprint.

Photographs from space taken by satellites are indicators of urbanization and just one of the demonstrations of the human footprint.

Satellite photographs indicate the spread of urban areas and help demonstrate the human footprint.

Tell a Story



Place subjects and verbs close together

Part of our evidence establishing that the nebula must have been harbouring a binary star was obtained by the use of low-resolution spectroscopy.

Isn't this sentence ugly?
14 words lie between the subject and the verb
of this sentence!

Part of our evidence establishing that the nebula must have been harbouring a binary star was obtained by the use of low-resolution spectroscopy.

Using low-resolution spectroscopy, we contributed to establish that the nebula harbours a binary star.

In this paper, the KESPRINT team – a merger of two teams, namely the “K2 Exoplanet Science Team” (KEST) and the “Equipo de Seguimiento de Planetas Rocosos Interpretando sus Transitos” (ESPRINT) team – combines the K2 photometry with ground-based high-resolution imaging and high-precision RV measurements in order to confirm the planetary nature of both transiting objects.

Too much text between subject and verb!

In this paper, the KESPRINT team – a merger of two teams, namely the “K2 Exoplanet Science Team” (KEST) and the “Equipo de Seguimiento de Planetas Rocosos Interpretando sus Transitos” (ESPRINT) team – combines the K2 photometry with ground-based high-resolution imaging and high-precision RV measurements in order to confirm the planetary nature of both transiting objects.

Split the sentence in 2!

Put the subject before the verb



In the survey participated
80 scientists.

We used several
techniques in reducing the
data.

With these values are
associated a series of
measurements.



Eighty scientists participated in
the survey.

Several techniques were used
in reducing the data.

A series of measurements are
associated with these values.

Recap: A story in sentences

- ✓ Characters are concrete and do the actions
- ✓ Use strong verbs
- ✓ Subject and Verbs are close to each others





Clarity: Pronoun Reference

George waved to David when he walked into the classroom.

Clarity: Pronoun Reference

George waved to David when he walked into the
classroom.

George or David?

George waved to David when David walked into the
classroom.

Clarity: Pronoun Reference

Some people text, and some people send letters. This makes me mad.

Clarity: Pronoun Reference

Some people text, and some people send letters. This makes me mad.

Some people text, and some people send letters. Texting makes me mad.



Favour the Active Voice

When the subject of a sentence does the action, the verb is in active voice.

The astronomer counted the stars.



When the subject receives the action, the verb is in passive voice.

The stars were counted by the astronomer.



Favour the Active Voice

Using active voice almost always improves your writing.

This reflects the way we speak to each other every day, so it is easier to follow.

Active sentences also use fewer words.

Let's try: please make it active

“This hypothesis is supported by the observation that the timing of spring runoff is significantly different between natural and modified basins (Moore et al. 2011).”

“This hypothesis is supported by the observation that the timing of spring runoff is significantly different between natural and modified basins (Moore et al. 2011).”

“Moore et al. (2011) support this hypothesis: spring runoff is significantly delayed between natural and modified basins.”

From Strunk & White's style guide

"Use the active voice. The active voice is usually more direct and vigorous than the passive. [...]

Many a tame sentence can be made lively and emphatic by substituting a transitive in the active voice for some such perfunctory expression as there is or could be heard."

Strunk & White

“Use the active voice. The active voice is usually more direct and vigorous than the passive. [...]

Passive!

Many a tame sentence can be made lively and emphatic by substituting a transitive in the active voice for some such perfunctory expression as there is or could be heard.”

“The passive could not have survived in the English language for 1500 years if it did not serve some purpose.”

-S. Pinker

Proper uses of Passive Voice

“Supernovae deposit enormous amounts of energy into their surroundings. They play a key role in the heating of their host galaxies. They have been well studied at radio, X-ray, infrared, and optical wavelengths, yet the actual explosion mechanism is not well understood.”

In order to keep the same subject in a series of sentences, making it easier to read and understand, passive voice is used in the third sentence.

Proper uses of Passive Voice

"The reason why nature selects a particular numerical value for fundamental constants has remained a mystery, and has provoked much interesting speculation. The speculations may be divided roughly into three general types."

The passive voice here helps you move words to strategic parts of a sentence to give them emphasis, or to connect them to words in the preceding sentence.

Proper uses of Passive Voice

"I cooled the samples on ice, returned them to Arizona State University, and froze them until I used them."

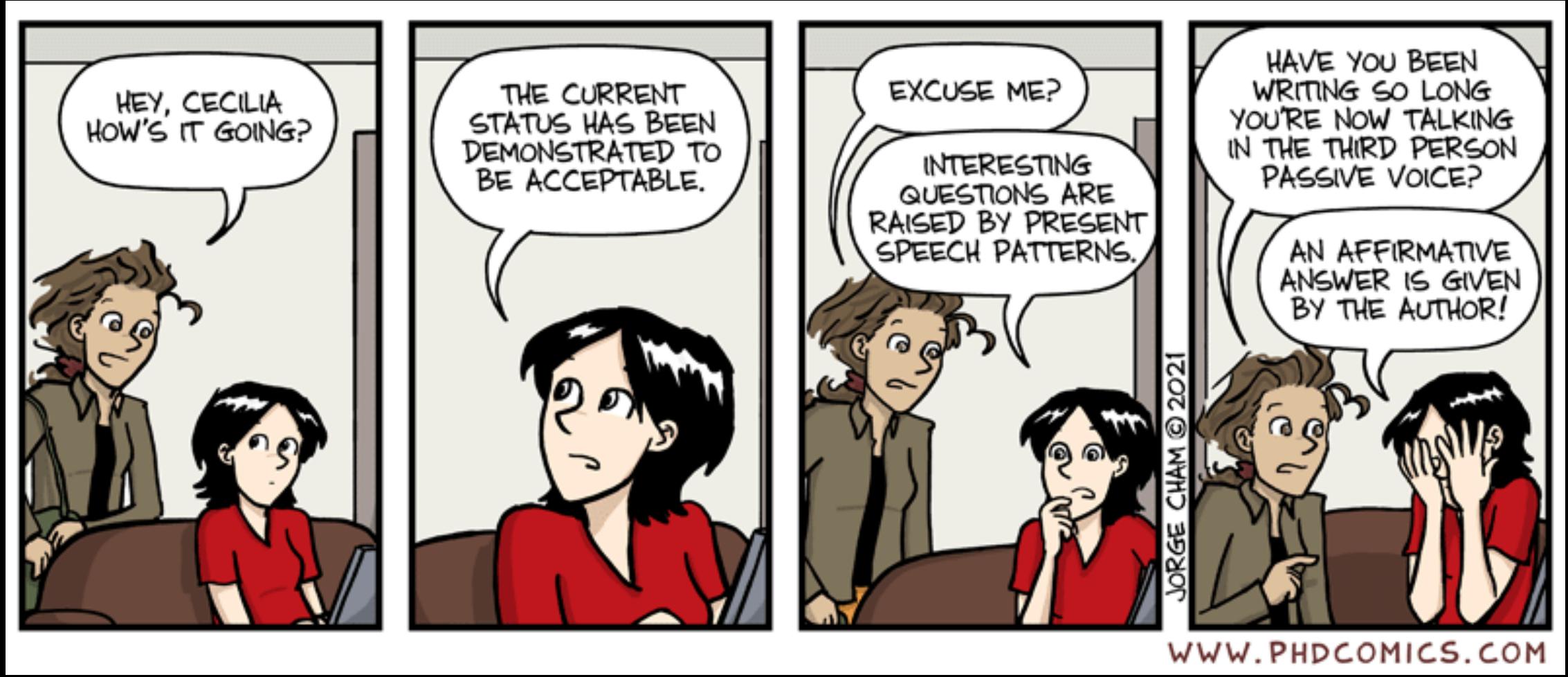
"Samples were cooled on ice, returned to Arizona State University, and frozen until used."

The passive voice helps you compose a sentence where the action that was done is important, but who did it, is not.

Passive voice is used to avoid blame

“Mistakes were made.”

So, sometimes passive voice is fine... but don't overdo it





Recap: Active/Passive voice

Favour the active voice

If a good reason exists to use the passive voice, use it

This will likely be the case in the Methods section of your paper or in a paragraph to keep the same subject



How do you recognise that you are using the passive voice?

How to ID passive voice:

If you can insert "by zombies" after the verb, you have passive voice.



How do you recognise that you are using the passive voice?

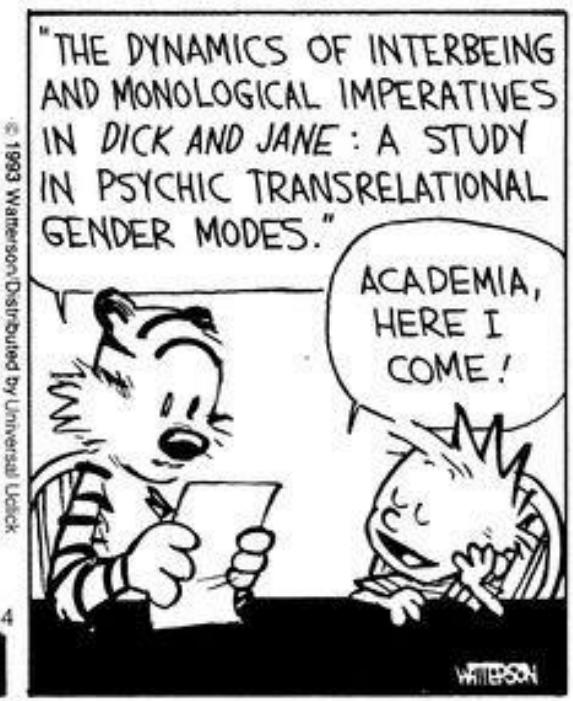
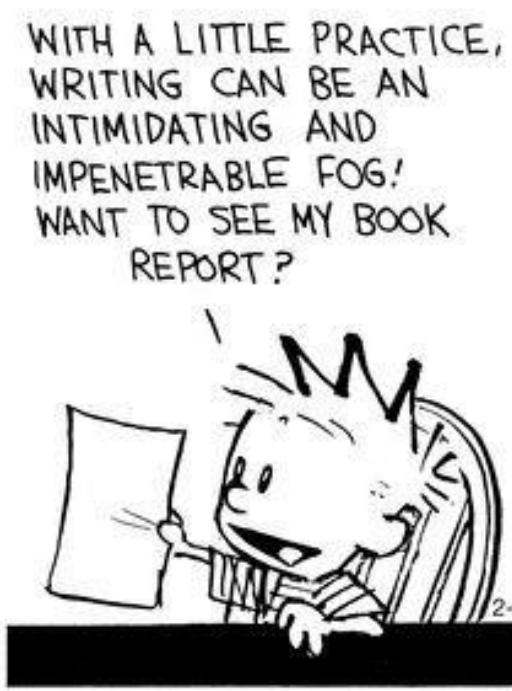
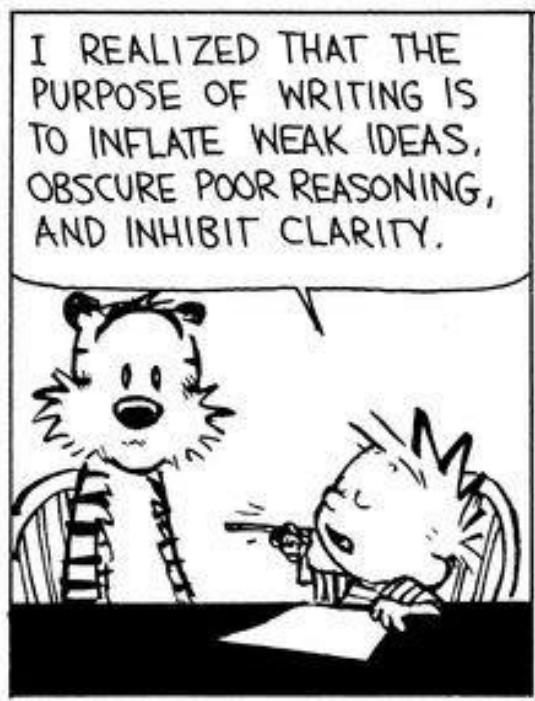
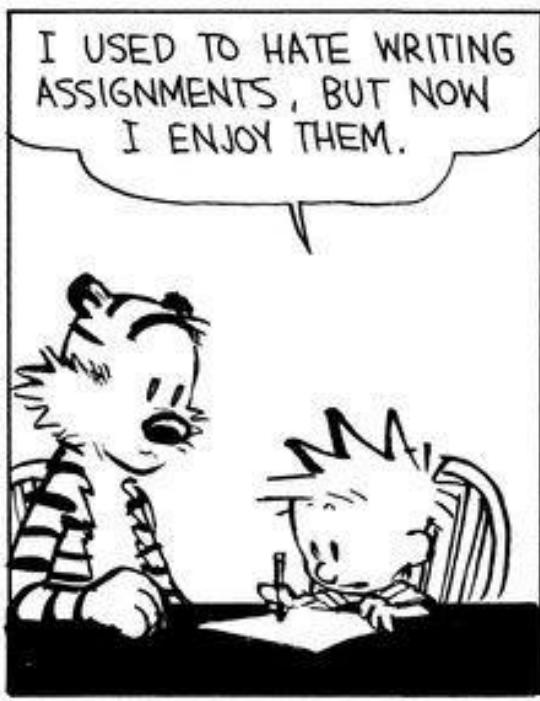
How to ID passive voice:
If you can insert "by zombies" after the verb, you have passive voice.

The car was driven...by zombies.

The princess was frightened...by zombies.







Choose your Words with Care



Words are sacred. If you get the right ones in the right order you can nudge the world a little.

— *Tom Stoppard* —

History

relation...
point of view.
English [ing'lis]
language spoken
and the people
resident of En

English is a mixture of a language:

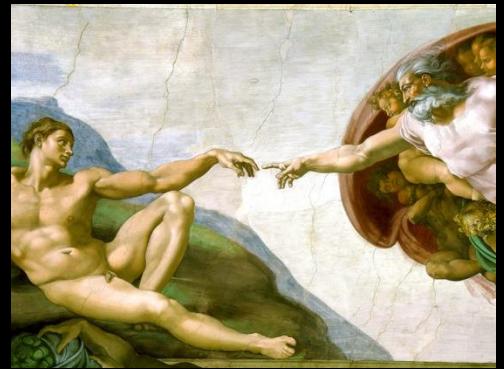


Anglo-Saxon
(Old English)



1066: Norman
French invasion

Educated people,
institutions spoke Latin
and French words, which
became anglicised



Renaissance

English scholars translated
Greek and Latin texts –
they needed to anglicize
many words that had no
English equivalent

History



→ English is one of the most flexible and varied of all modern European languages, but it has a mixed vocabulary



We don't just borrow words; on occasion, English has pursued other languages down alleyways to beat them unconscious and rifle their pockets for new vocabulary.

— *Booker T. Washington* —

AZ QUOTES

English as a mixed language

As a consequence, today you can

rear (English)

or

raise (Old Norse)

a child

You can

ask (Germanic),

question (French),

or

interrogate (Latin)

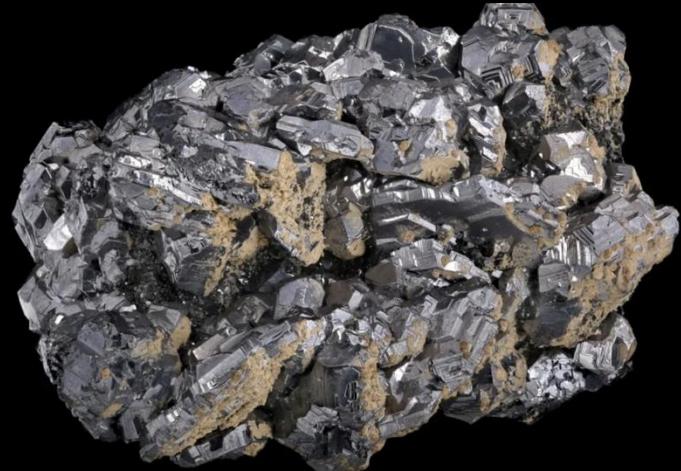
why students don't like writing.

ONE DOES NOT SIMPLY

AMALGAMATE SEVERAL LANGUAGES INTO YOURS OVER
CENTURIES AND EXPECT THE RESULT TO HAVE ANY
FOLLOWABLE RULES

L e a d (homograph)

/lɛd/



Lead is the heaviest of the common metals.

/li:d/



How to lead by example.

ATTENTION!

This led us to think that...

To add to the confusion

Present

I lead

I read

pronounced: [reed]

Past

I led

I read

pronounced: [red]



Time Flies Like
An Arrow



Informal speech: 80% of the words we use are from Anglo-Saxon origin; short words with broad meaning

the, a, this, that, in, on , of, by, do, have, make,
head, hand mother, father, sun, man, woman



Informal speech: 80% of the words we use are from Anglo-Saxon origin; short words with broad meaning

the, a, this, that, in, on , of, by, do, have, make, head, hand mother, father, sun, man, woman



Science: learn vocabulary inherited from the Normans and Renaissance scholars with much longer words

anthropogenic, interpretation, attribution, demonstration



| 1 | 2 | 3 |
|--------------------------------|--|--|
| Scare Kind Hate Anger | Frighten Generous Loathing Rage | Terrify Magnanimous Antipathy Consternation |

Which of these columns is easiest to interpret?

| Old English | Old French | Latin/Greek |
|-------------|------------|---------------|
| Scare | Frighten | Terrify |
| Kind | Generous | Magnanimous |
| Hate | Loathing | Antipathy |
| Anger | Rage | Consternation |

Look at the origin of the words

use short words instead of long ones



The short words are best, and the
old words, when short, are the best
of all.

— Winston Churchill —

Long words

implement
adhere
develop
retain
utilise
terminate
ascertain
facilitate
endeavour

Short words

put
stick
make
keep
use
end
find
help
try

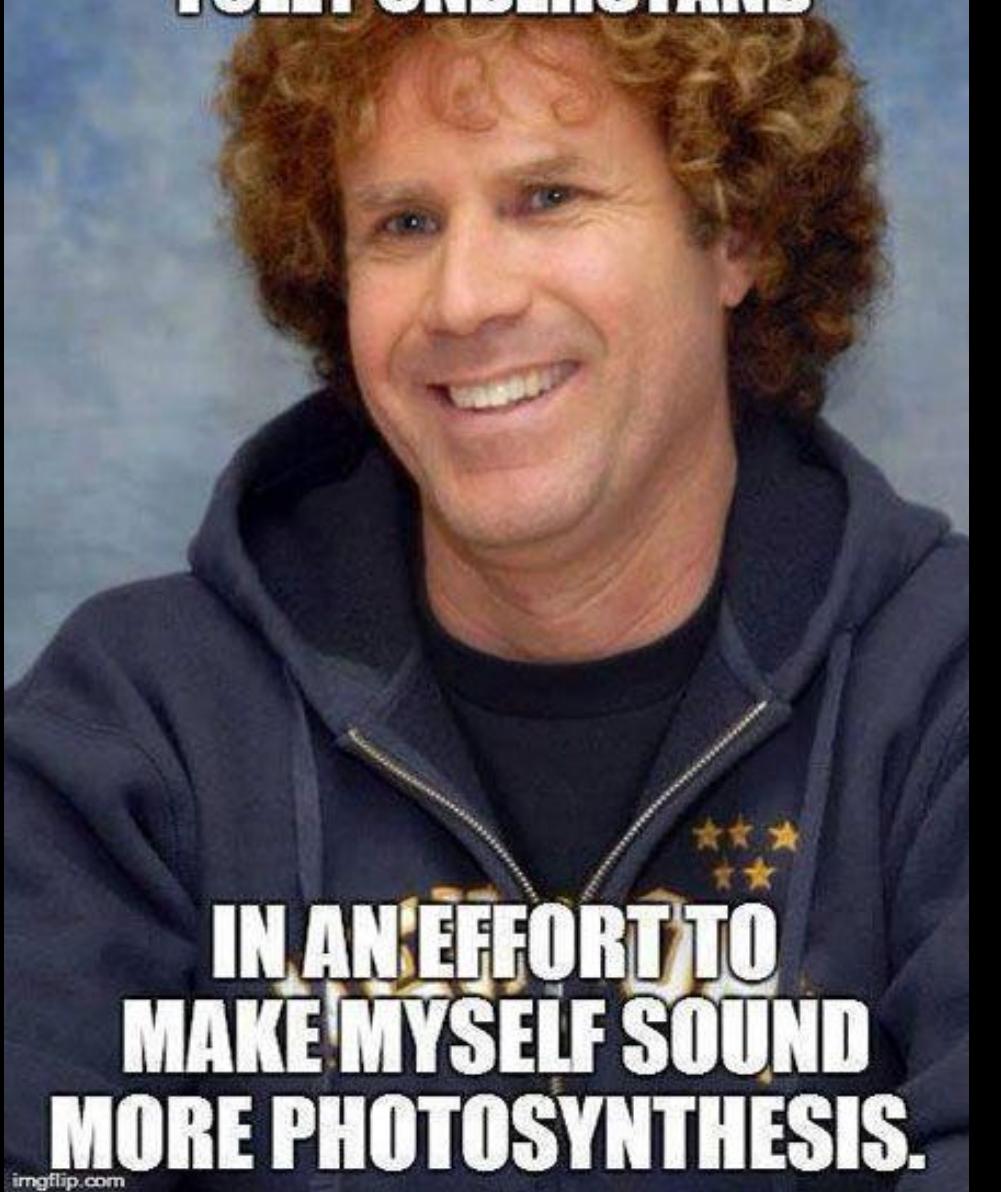
Long words

transmit
initiate
alteration
investigation
prescription
subsequent
heterogeneous
spatial
temporal

Short words

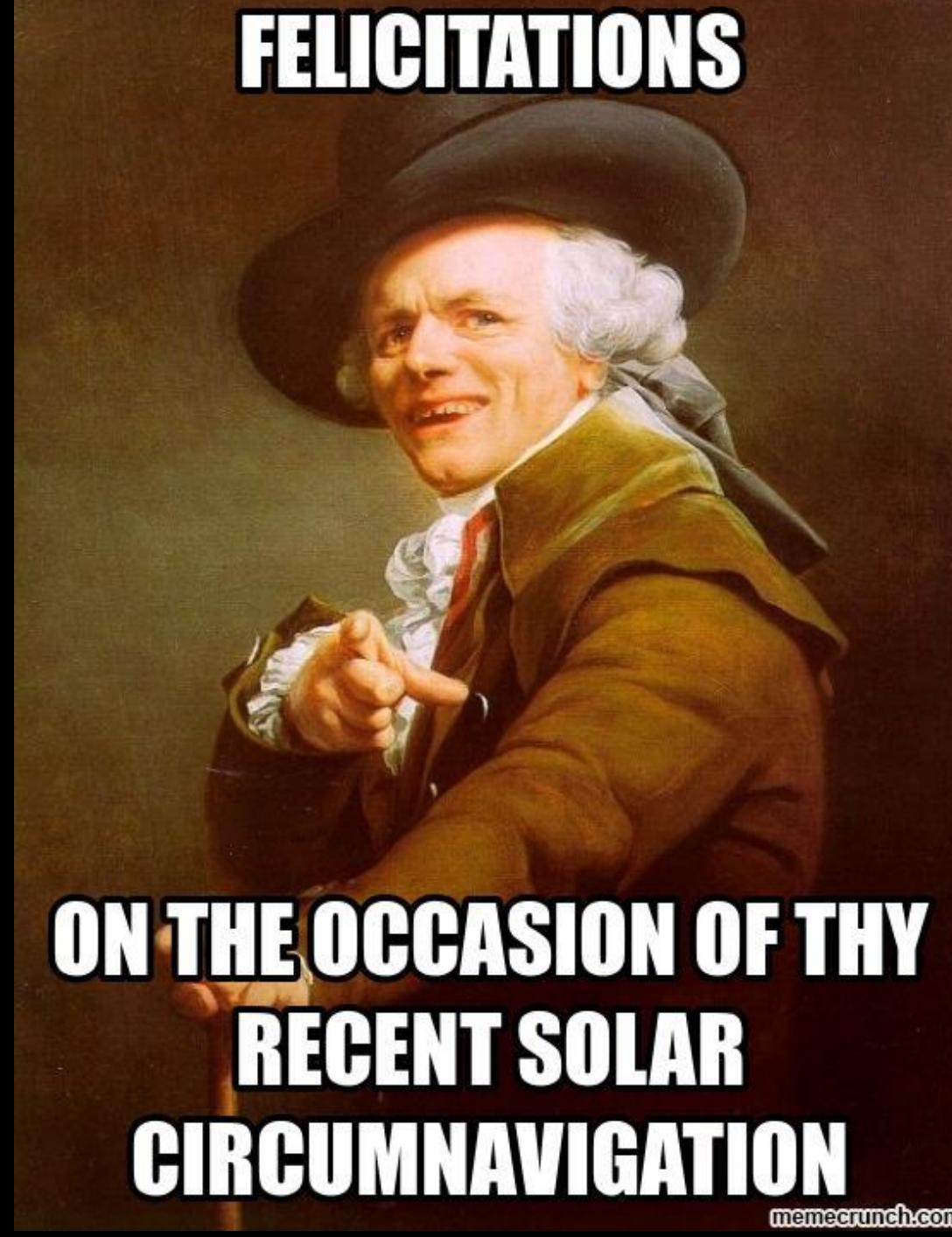
send
start
change
work
plan
next
patchy
in space
in time

SOMETIMES I USE
BIG WORDS I DON'T ALWAYS
FULLY UNDERSTAND



IN AN EFFORT TO
MAKE MYSELF SOUND
MORE PHOTOSYNTHESIS.

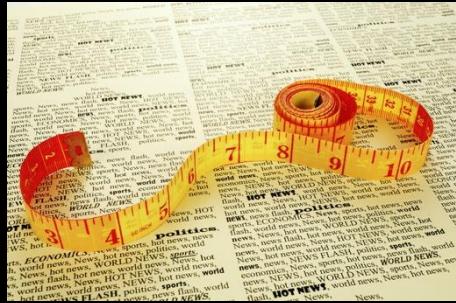
FELICITATIONS



ON THE OCCASION OF THY
RECENT SOLAR
CIRCUMNAVIGATION

Sesquipedalian

Characterised by the use of long words



“The word *sesquipedalian* is in fact *sesquipedalian*. ”



COMMUNICATION



FANCY WORDS



SIMPLE WORDS



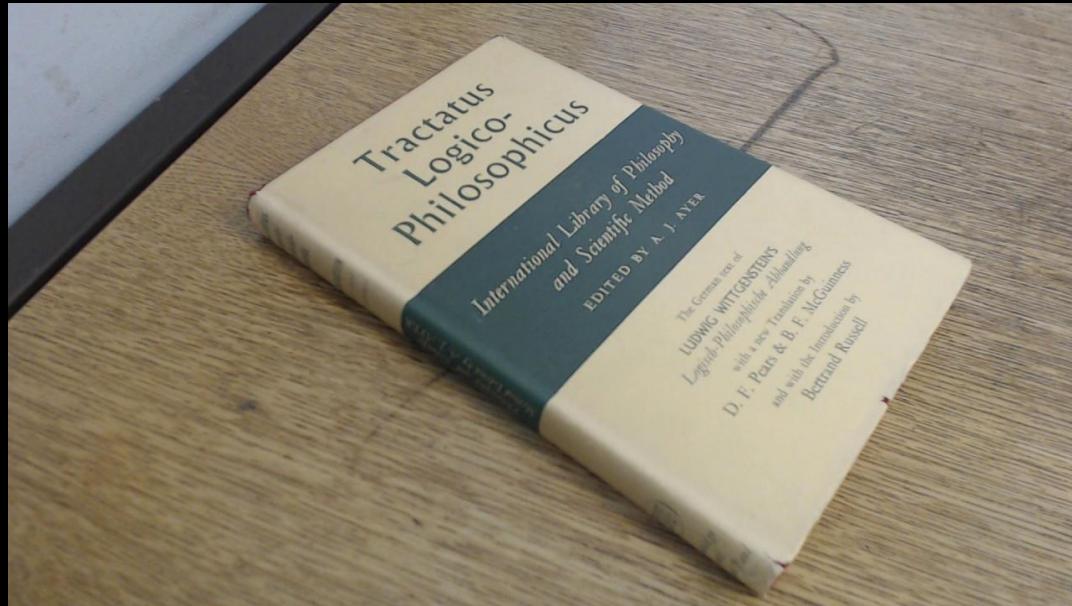
“Although investigations of medieval plague victims have identified *Yersinia pestis* as the putative agent of the pandemic, methodological limitations have prevented large-scale genomic investigations to evaluate changes in the pathogen’s virulence over time.”

Would you ever say that in
a talk or when discussing
with people?

So why do we write it then?

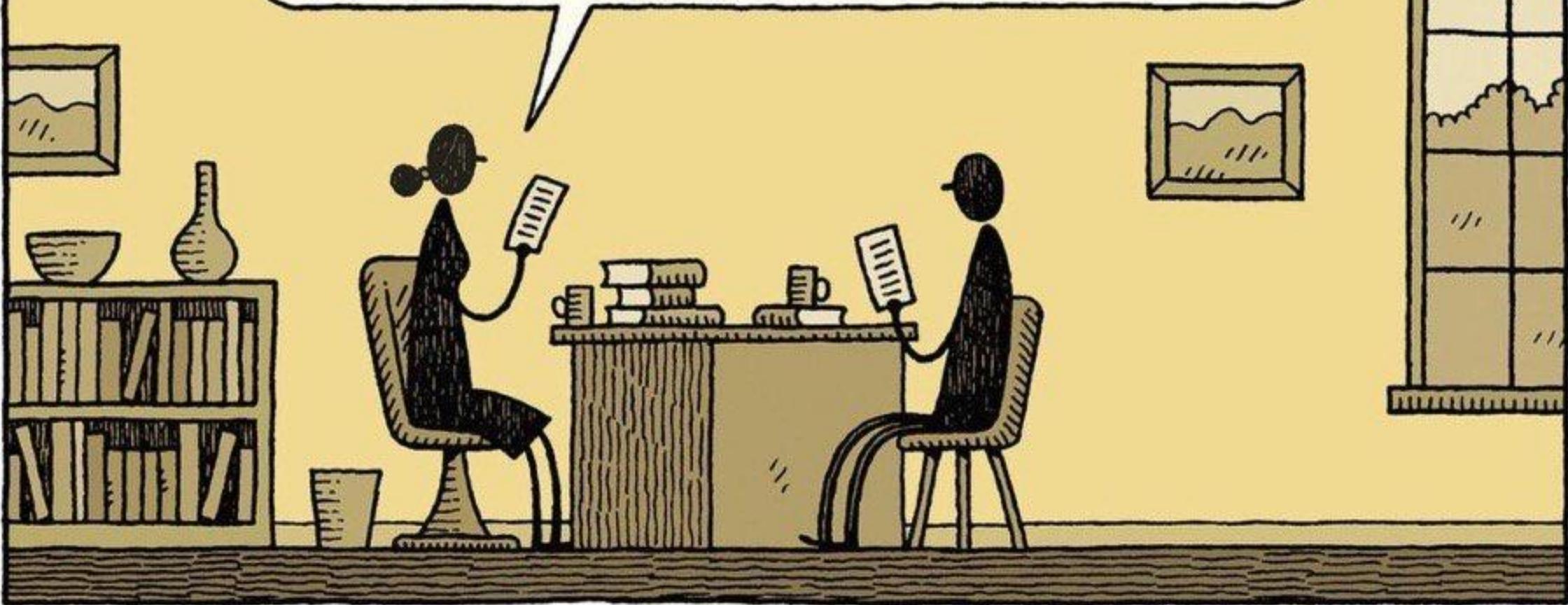
“By studying medieval plague victims, we know that *Yersinia pestis* likely caused the Black Death; however, we don’t know how the pathogen’s virulence changed over time, because large-scale genomic studies are hard to do.”

“What can be said, can be said clearly.”
—Ludwig Wittgenstein



FEEDBACK

THE PREMISE OF YOUR PAPER IS FLAWED, THE DATA IS SUSPECT AND THE CONCLUSIONS ARE DANGEROUS. ON THE PLUS SIDE, THE LANGUAGE IS SO COMPLETELY IMPENETRABLE THAT NOBODY WILL EVER NOTICE.



Intermezzo

“I want to give the reader the information that she needs”

“I want to give the reader the information that he/she needs”

“I want to give the reader the information that she or he needs”

“I want to give the reader the information that (s)he needs”

Intermezzo

“I want to give the reader the information that they need.”



“No American should ever live under a cloud of suspicion just because of what they look like.”

End of the intermezzo

Writing Papers

Henri Boffin
ESO



Be concise

Omit needless words

Hemingway's six word story

“For sale. Baby shoes. Never worn.”



“Inhalation of vapour phase particulate matter chemical contaminants from biomass combustion in domestic settings is a significant contributor to local disease burden.”

“Domestic wood smoke causes local health problems.”

Redundancy

Many needless words are redundant: you can get rid of them with no harm to the message

Repetition – instead of making one clear statement, writers repeat themselves using slightly different words

“Only nine historically recorded supernova (SN) explosions are known in the Galaxy. In only five cases has the remnant of the supernova been identified. For the other cases, the remnant is not known with certainty.”

Redundancy

Many needless words are redundant: you can get rid of them with no harm to the message

Repetition – instead of making one clear statement, writers repeat themselves using slightly different words

Excess detail – If they know this already, then no need to repeat it

Can use a word for a phrase

Avoid redundant modifiers

basic fundamentals
completely finish
consensus of opinion
continue on
each individual
end result
evidently clear
final outcome

free gift
future plans
important essentials
more specifically
past memories
personal beliefs
revolve around
split apart

Origin of word French
Old English Latin
Old German Middle Dutch

Redundancy

In this study we assessed
conduct an investigation of
were responsible for
played the role of
in order to
for the following reasons
a majority of
undertake an examination of
in the absence of
in the vicinity of

we assessed
~~investigate~~ study
caused
were
to
because
most
study
without
near

“However, how these so-called protoclusters evolve from a structure stretching several hundreds of Mpc to a bonafide galaxy cluster and how these distant clusters of galaxies differ from local ones are still open questions in modern astronomy.”

“However, how these so-called protoclusters evolve from a structure stretching several hundreds of Mpc to a bonafide galaxy cluster and how these distant clusters of galaxies differ from local ones are still open questions ~~in modern astronomy~~.”

“However, how these so-called protoclusters evolve from a structure stretching several hundreds of Mpc to a bona fide galaxy cluster and how these distant clusters of galaxies differ from local ones are still open questions in modern astronomy.”

So-called: commonly or popularly but often inaccurately so named; alleged, soi-disant, pretended

Ex.: your so-called friend

Use “named”, “designated”, “denominated”, “labelled”

A black and white portrait of Blaise Pascal, a French mathematician, physicist, and philosopher. He is shown from the chest up, wearing a dark robe over a white cravat and a white shirt. His hair is powdered and powdered. He is looking slightly to his left with a thoughtful expression.

*"I would have written a shorter
letter, but I did not have the time."*

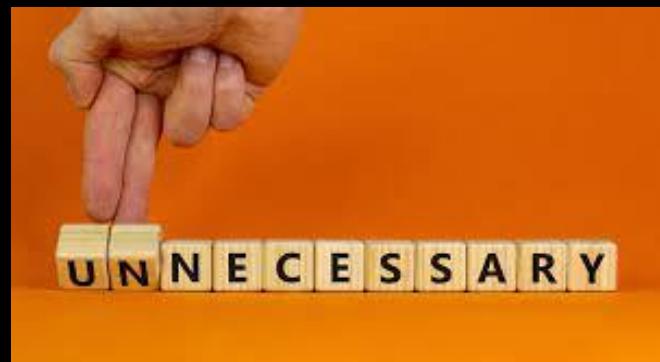
Blaise Pascal,

(Provincial Letters: Letter XVI)

Vigorous writing is concise

Remember:
Make your papers short

Make your sentences and paragraphs concise!
Chase these unnecessary words!



Concise Writing: Unnecessary Relative Clauses

Wordy:

The smoke that comes from factories that are situated in the valley pollutes the air.

Concise Writing: Unnecessary Relative Clauses

Wordy:

The smoke that comes from factories that are situated in the valley pollutes the air.

Relative clauses, but they don't clarify the sentence.

Concise Writing: Unnecessary Relative Clauses

Wordy:

The smoke that comes from factories that are situated in the valley pollutes the air.

Concise:

The smoke from factories in the valley pollutes the air.

Concise Writing: Overuse of Prepositional Phrases

Wordy:

University students are required by the university to make payments of their tuition fees before the time of their registration.

Concise Writing: Overuse of Prepositional Phrases

Wordy:

University students are required by the university to make payments of their tuition fees before the time of their registration.

Concise:

University students are required to pay tuition before registering.

Concise Writing: Lengthy Modifiers

Wordy:

The accident occurred due to the fact that there was nothing to prevent it.

Concise Writing: Lengthy Modifiers

Wordy:

The accident occurred due to the fact that there was nothing to prevent it.

Concise:

The accident occurred because there was nothing to prevent it.

Concise Writing: Unnecessary Nouns

Wordy:

The nature of the crisis situation was such that it called for our immediate attention.

Concise Writing: Unnecessary Nouns

Wordy:

The nature of the crisis situation was such that it called for our immediate attention.

Concise:

The crisis called for our immediate attention.

Get rid of unnecessary words

I would like to assert that the author should be considered to be a buffoon.

The author is a buffoon.

Hunt down and cast out all unneeded words that might slow your reader.

Avoid negative

Affirmative statements are often less wordy than negative ones.

Negative statements are more opaque.

So, ask yourself if you cannot replace a **negative** by an **affirmative**.

Avoid negative

not honest

not important

did not remember

did not pay attention to

did not have much confidence

did not succeed

did not accept

did not consider

does not have

did not allow

not the same

not possible

not many

dishonest

trifling

forgot

ignored

distrusted

failed

rejected

ignored

lacks

prevented

different

impossible

few

The canopy cover of Norway maples does not allow sufficient light to penetrate the understory and native tree seedlings cannot germinate.

The canopy cover of Norway maples blocks sufficient light from penetrating the understory and prevents native tree seedlings from germinating.

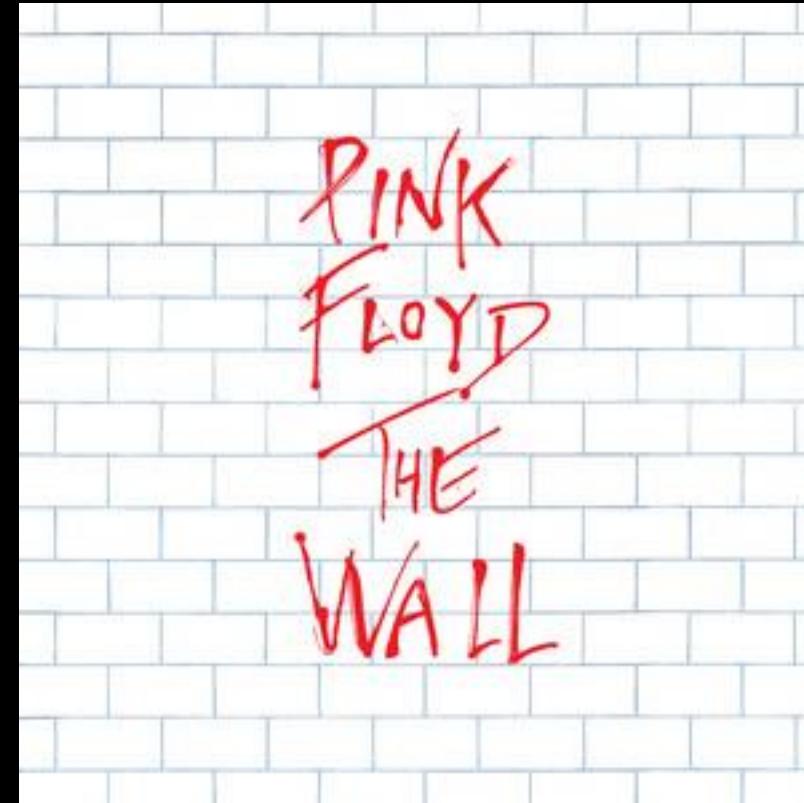
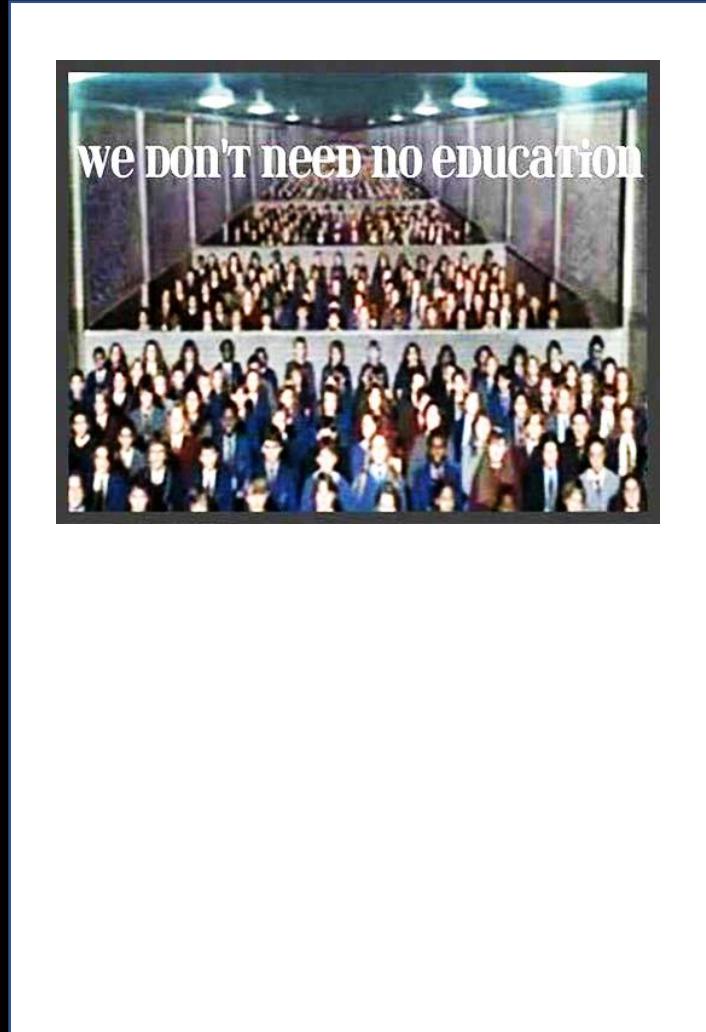
Verbal verve: From lazy to lively

Many people in Portugal have no skills in Internet usage. Those people include the young as well as the older generations.

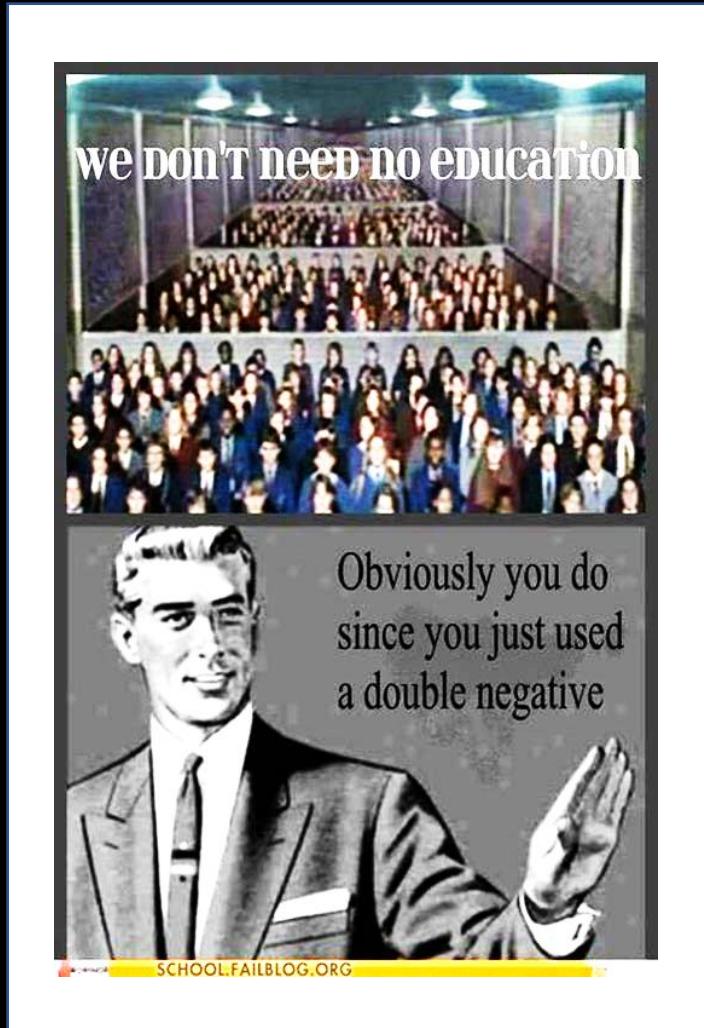
Many people in Portugal lack Internet skills. Those people include the young as well as the older generations.

Young and old alike, many people in Portugal lack Internet skills.

Beware of the double negation



Beware of the overnegation



To watch her write you'd never know that it wasn't something that didn't just come naturally to her the first time.



To watch her write you'd never know that it wasn't something that did just come naturally to her the first time.

Careful with adjectives and adverbs

- (a) The terrible tsunami of 2011 was caused by a 9.1 magnitude earthquake off the coast of Tōhoku, Japan.
- (b) The tsunami of 2011, which was caused by a 9.1 magnitude earthquake off the coast of Tōhoku, Japan, led to 15,782 deaths and 4,086 missing.

Replace adjective with quantities, data, dates

Careful with adjectives and adverbs

- (a) The *terrible* tsunami of 2011 was caused by a 9.1 magnitude earthquake off the coast of Tōhoku, Japan.
- (b) A 9.1 magnitude earthquake off the coast of Tōhoku created the tsunami that **devastated** the northeast of Japan in 2011.

Amplify the intensity of a statement by making
your verbs work harder for you

*“Adverbs, like the passive voice, seem to have been created with the **timid writer** in mind. ... With adverbs, the writer usually tells us he or she is afraid he/she isn’t expressing himself/herself clearly, that he or she is not getting the point or the picture across.”*

— Stephen King

- (a) The tsunami was a relatively large one.
- (b) The tsunami was the fifth largest in world history.

demonstrate your argument using
evidence

Avoid using “really”

This word doesn't really do anything

This word doesn't do anything

You can often remove it.

Avoid using “very”

It doesn't communicate enough information.

There is often another word you can use instead.

Very afraid → terrified

Very angry → furious

Very hungry → ravenous

45 Ways to avoid using the word **VERY**

✗

afraid
angry
bad
beautiful
big
bright
capable
clean
clever
cold
conventional
dirty
dry
eager
fast
fierce
good
happy
hot
hungry
large
lively
loved
neat
old
poor
pretty

✓

terrified
furious
atrocious
exquisite
immense
dazzling
accomplished
spotless
brilliant
freezing
conservative
squalid
parched
keen
quick
ferocious
superb
jubilant
scalding
ravenous
colossal
vivacious
adored
immaculate
ancient
destitute
beautiful

✗

quiet
risky
roomy
rude
serious
small
strong
stupid
tasty
thin
tired
ugly
valuable
weak
wet
wicked
wise
worried

✓

silent
perilous
spacious
vulgar
solemn
tiny
unyielding
idiotic
delicious
gaunt
exhausted
hideous
precious
feeble
soaked
villainous
sagacious
anxious



This is not jargon!
You could find this in a novel
for example...

Develop a thesaurus habit

Search for the right word to be
precise

It is not because you should try to keep it simple that you should not use the proper terms...

In addition to “very” and “really”,
also remove
“quite, basically, generally”

These words seldom add anything useful.
Try the sentence without them
and see if it improves.

“THE WRITER WHO BREEDS
MORE WORDS THAN HE NEEDS
IS MAKING A CHORE
FOR THE READER WHO READS.”

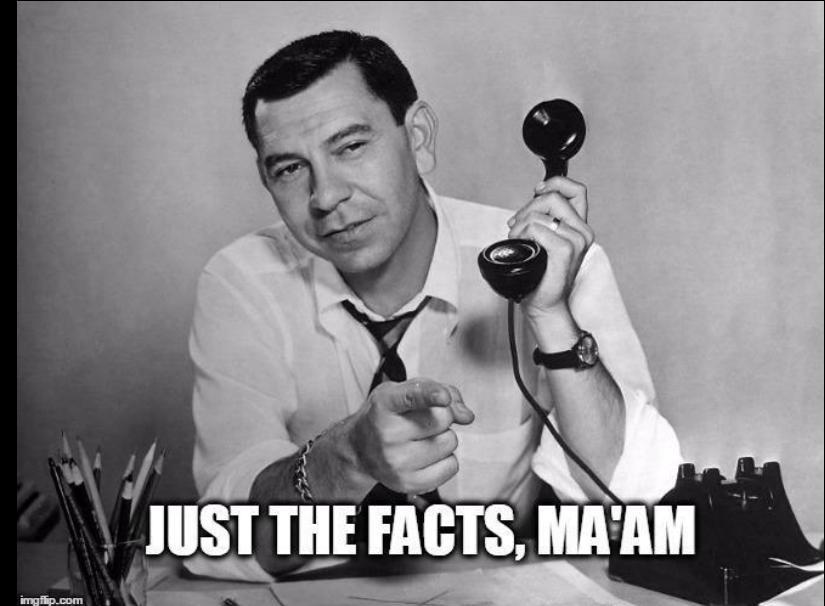
Dr. Seuss

Intermezzo II

Don't say that you believe
There is no 'belief' in science, only
proven facts.

Say that you think, that you are
convinced that, or something similar

Or better, simply don't say it, as using this
makes you sound less confident



There is no ‘belief’ in science, only proven facts.

The researchers believe that habitat destruction is having an impact on panda numbers.

Research has shown that habitat destruction is a key factor in declining panda numbers (Smith 1999).

There is no ‘belief’ in science, only proven facts.

Instead of

I believe Henri is a fantastic teacher.

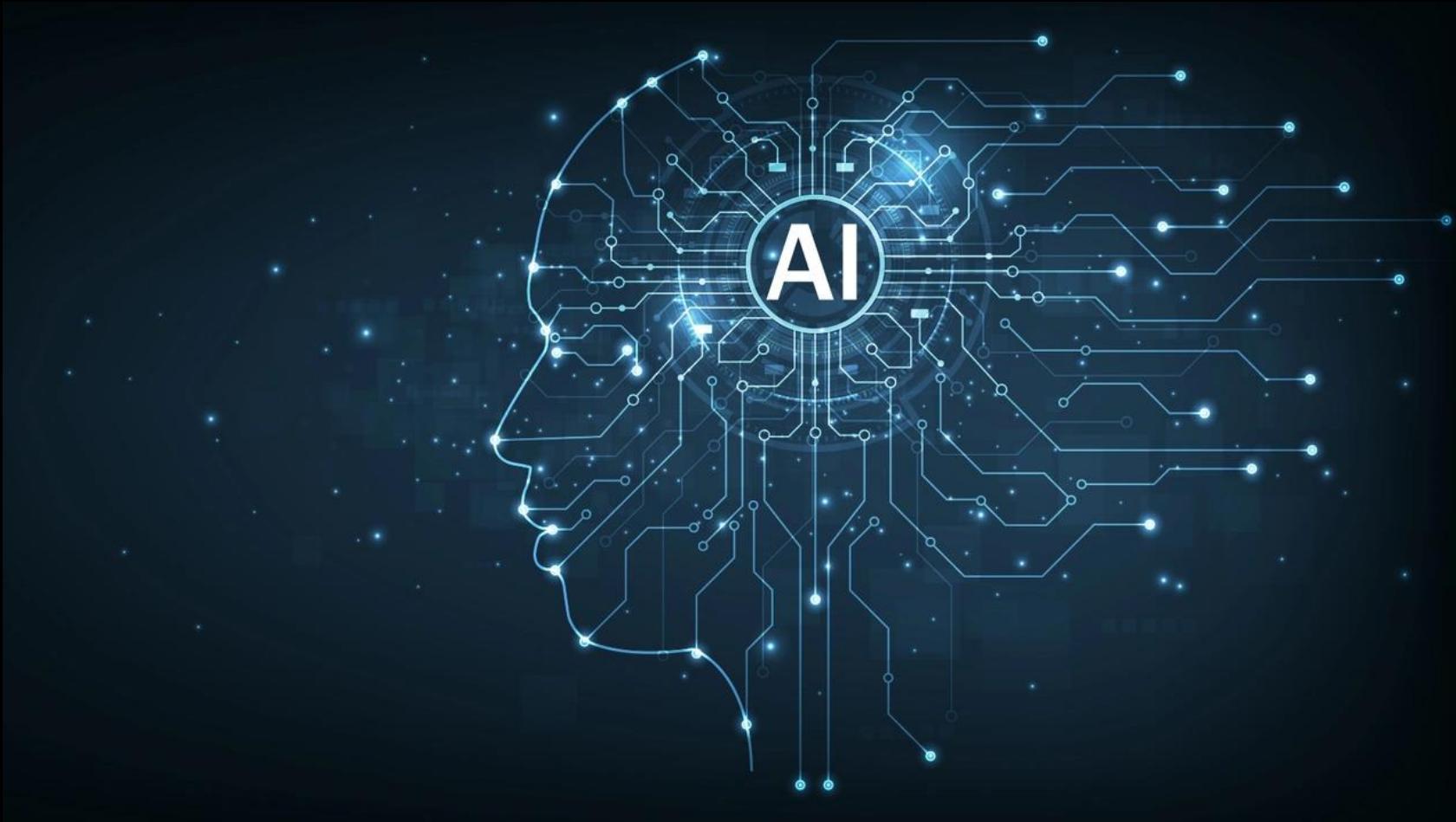
Say

Henri is a fantastic teacher.

End of Intermezzo



Use of A.I.



Intelligent use of articial intelligence

Use LLMs as a tool to enhance your language skills

Ask them for **inspiration** if you are stuck with, e.g., a title, a specific sentence, or even a paragraph

Correct and proofread your own English

Use its audio mode as a conversational partner



Hey GPT! Can you
help me understand
the Universe? ■

A synoptic view at the impact of chatGPT-like
technologies on the future of astronomy

The dangers of using A.I.

The use of LLMs can limit your learning

The dangers of using A.I.

The use of LLMs can limit your learning

Plato's Phaedrus: myth of Thamus and Theuth

Potential drawbacks of relying too heavily on external sources of knowledge (writing & digital media)

By outsourcing our memory and understanding to these tools, we weaken our own critical thinking abilities and falling into the trap of superficial knowledge



Insight Mapping

The dangers of using A.I.

The use of LLMs can limit your learning

Plato's Phaedrus: myth of Thamus and Theuth

The lesson of the myth of Theuth is not that we must reject technological innovations but that we must tame them with wisdom.

These tools are only valuable insofar as we can use them as supports for thinking rather than substitutes for it.



Insight Mapping

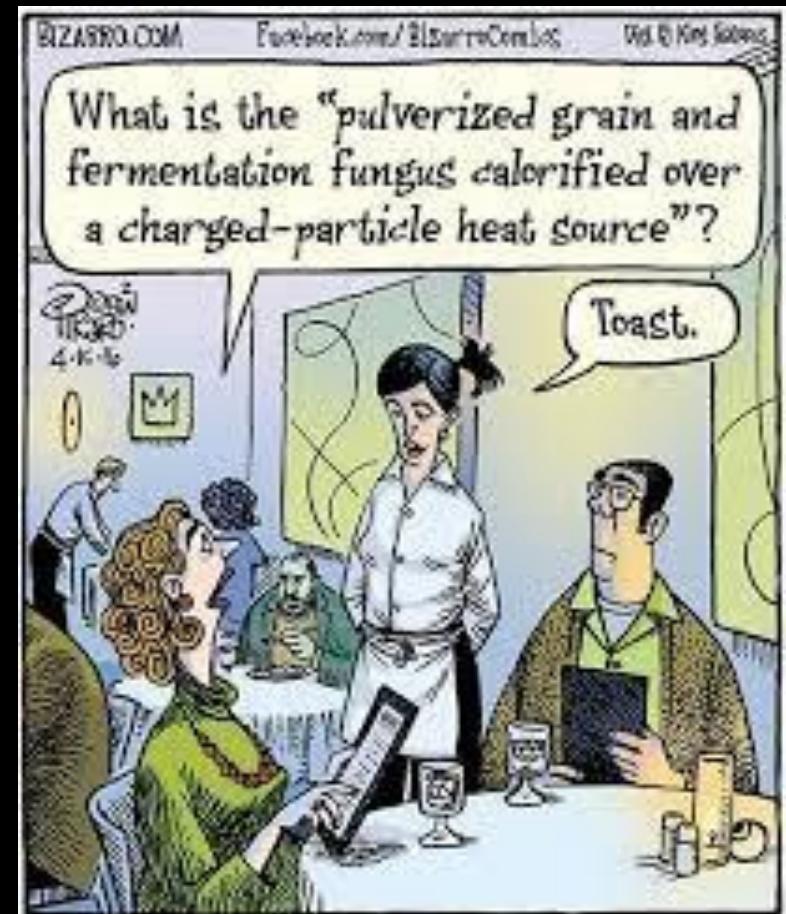
The dangers of using A.I.

The use of LLMs can limit your learning

Using LLMs for certain sections or paragraphs can lead to different writing styles across your proposal

LLMs tend to be verbose

Lacks originality and flavour



The dangers of using A.I.



“We discourage the use of large language models (LLMs; e.g., ChatGPT) in drafting your statement, as submissions that rely on AI-generated content lack the depth and originality critical for admission to the program and are usually disadvantaged in the evaluation process.”

The dangers of using A.I.

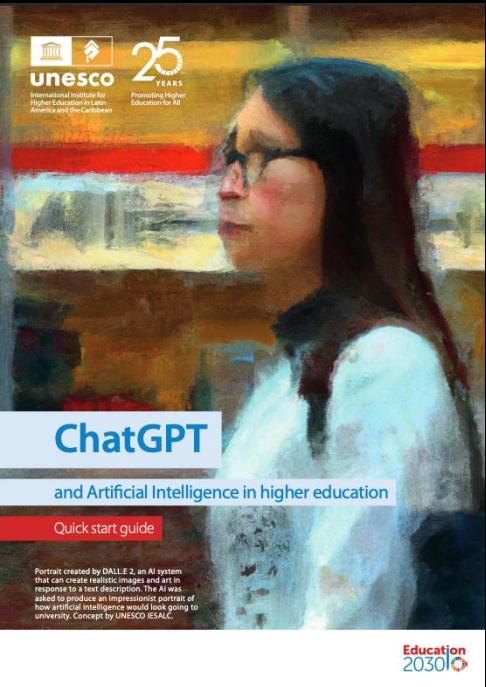
CAREER COLUMN | 14 November 2024

Why AI-generated recommendation letters sell applicants short

ChatGPT can do many things, but writing a personal endorsement is not one of them, says Maroun Khoury.

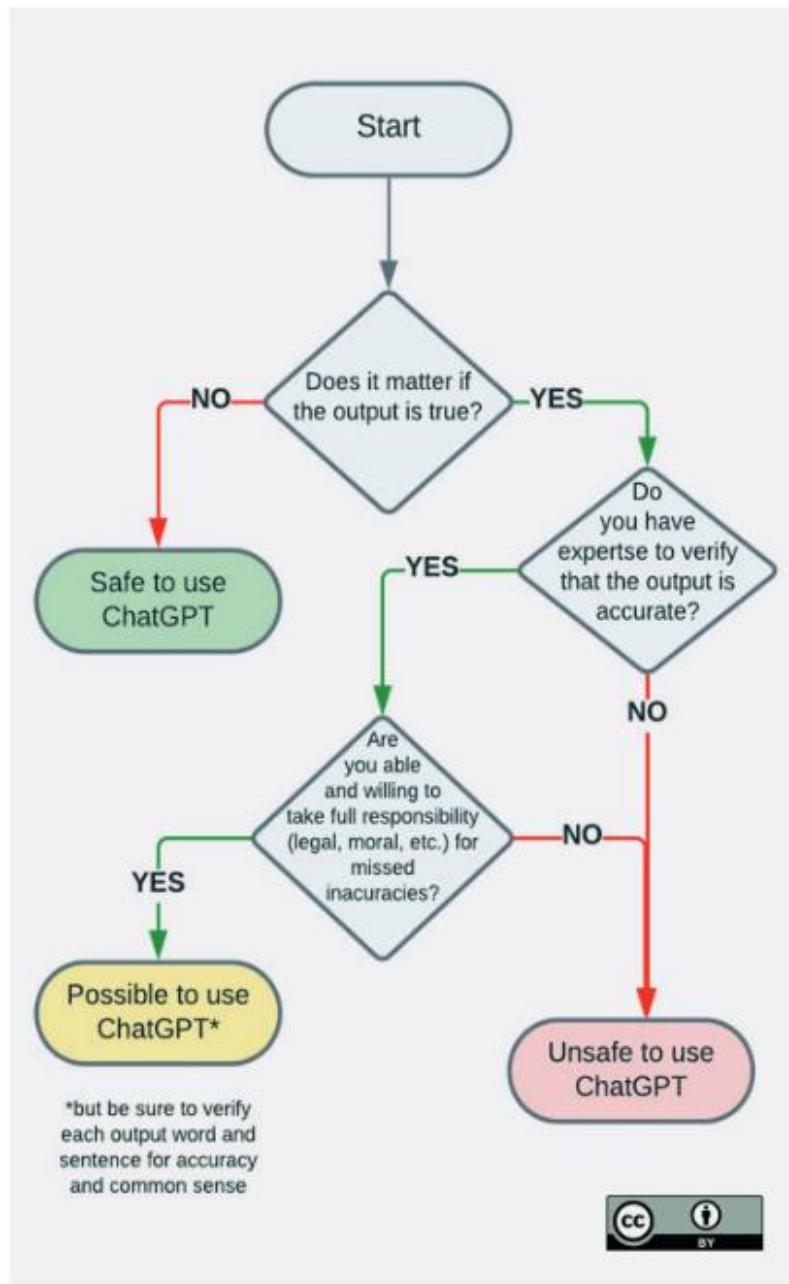
By [Maroun Khoury](#) 

The dangers of using A.I.

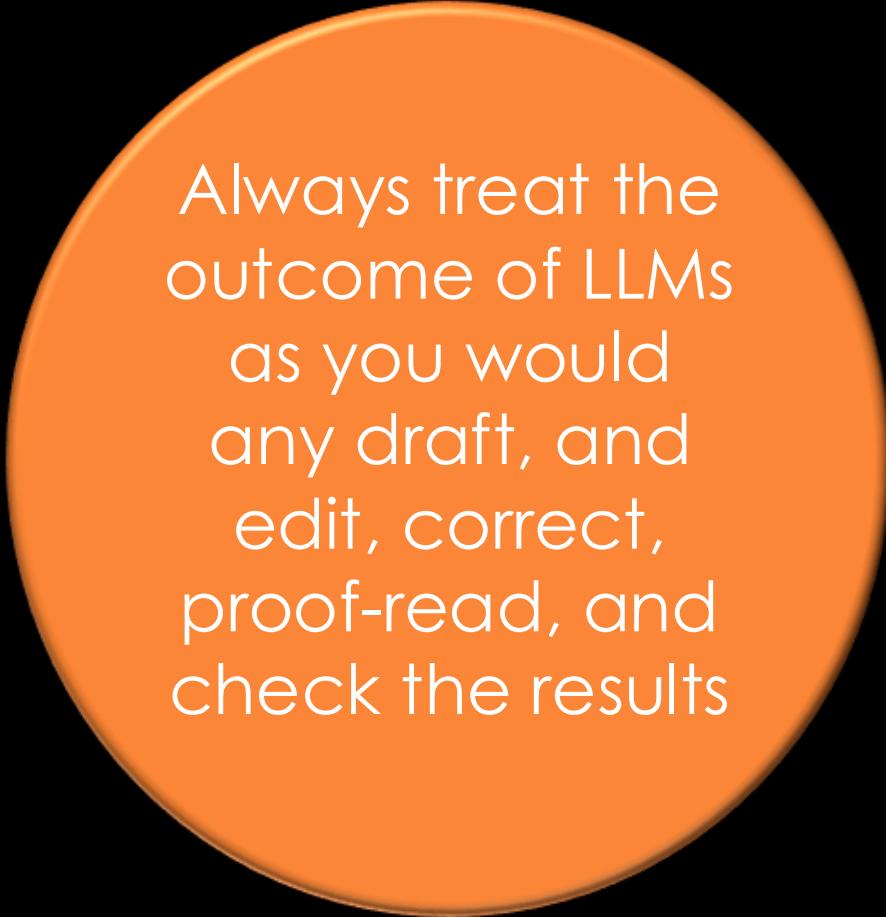


Aleksandr Tiulkhanov,
AI and Data Policy
Lawyer, UNESCO

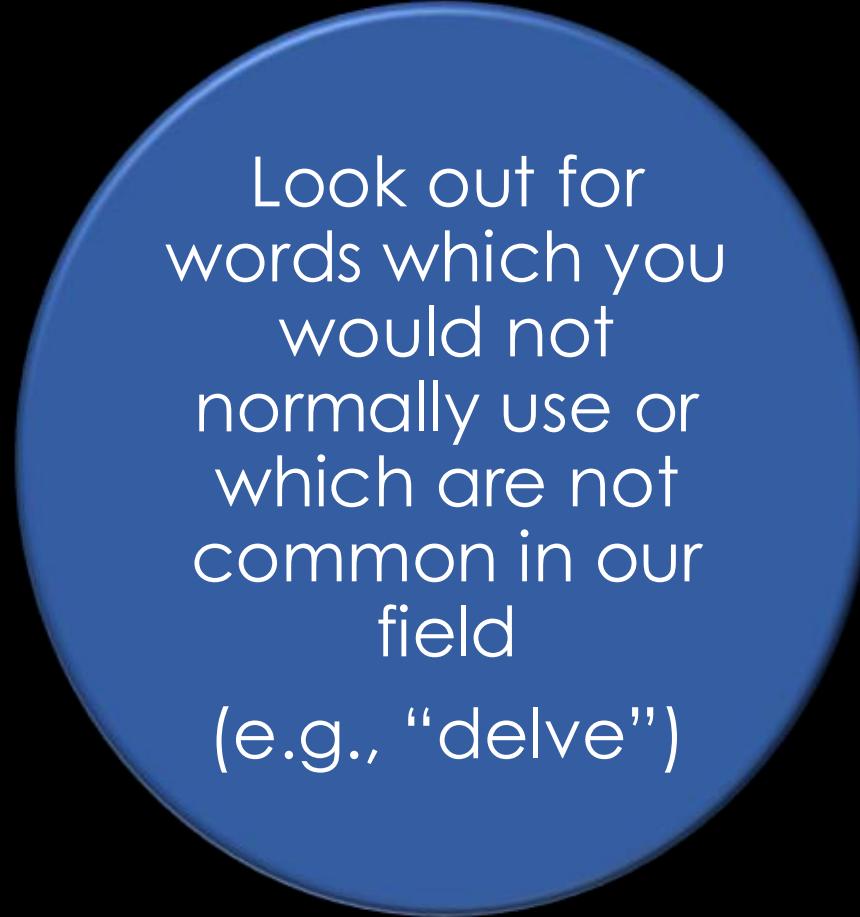
Figure 1: When is it safe to use ChatGPT?⁵



The dangers of using A.I.



Always treat the outcome of LLMs as you would any draft, and edit, correct, proof-read, and check the results



Look out for words which you would not normally use or which are not common in our field (e.g., “delve”)

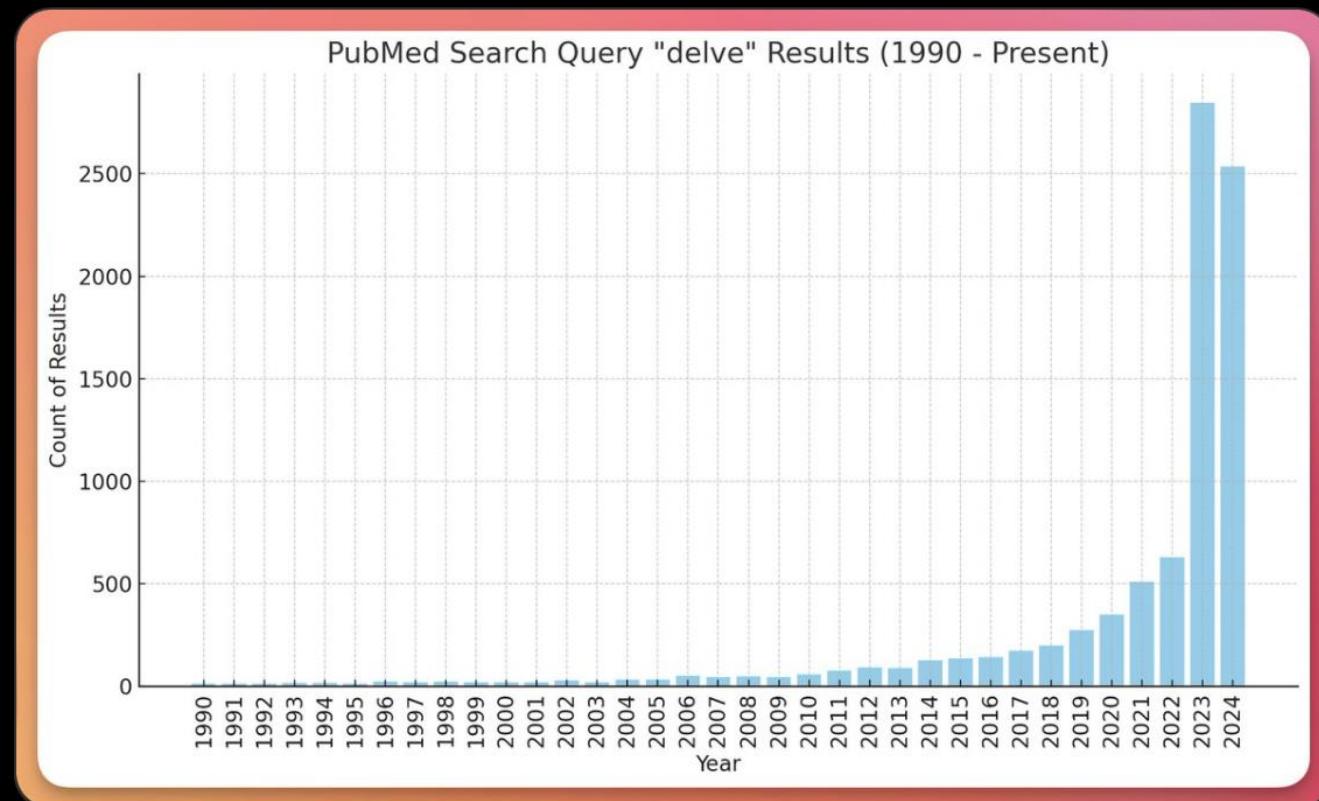
Jeremy Nguyen
@JeremyNguyenPhD

...

Are medical studies being written with ChatGPT?

Well, we all know ChatGPT overuses the word "delve".

Look below at how often the word 'delve' is used in papers on PubMed
(2023 was the first full year of ChatGPT).



The dangers of using A.I.

CAREER COLUMN | 14 November 2024

Nature

Why AI-generated recommendation letters sell applicants short

ChatGPT can do many things, but writing a personal endorsement is not one of them, says Maroun Khoury.

By [Maroun Khoury](#) 

“Whatever your role, don’t let AI ruin an important career opportunity. Both candidates and referees benefit from mastering the art of personalized communication — without relying on algorithmic touches.”

The dangers of using A.I.

When refereeing a proposal or a paper, most journals and funders, including ESO, **forbid** to put the proposal through a public LLM. (confidentiality issue)

The dangers of using A.I.

Trying to make a logo
for the course!



Rather old style and
“cliché” elements

Can't spell!

I did ask for a
simplified version

The dangers of using A.I.

Trying to make a logo
for the course!



Without the text

As this is a statistical
algorithm, it cannot
reproduce what it did
before

Every attempt is a new, not
necessarily better version

The dangers of using A.I.

Trying to make a logo
for the course!



“Can you include the need to
also give a talk in the logo?”

Again, completely different!

Put back text which is misspelled

Giving a talk = mike from 1940s!

The dangers of using A.I.

Trying to make a logo
for the course!



“please replace the
microphone with something
modern and remove the text?”

Again, completely different!

Didn't remove text!

Put wifi symbol!



StoryOrbitary



F Freepik

Page 9 | Calligraphy Pen Logo Pictures | Freepik



YouTube

Cavendish Enterprise LLC. - YouTube



F Freepik

Flat World Poetry Day Artwork | Premium AI-generated image



F Freepik

Flat World Poetry Day Artwork | Premium AI-generated image



F Freepik

Round logo pen for writing and inkwell The best logo for a...



k kanah.al

The Guide to Writing Fantasy and Science Fiction: 6 Steps t...



F Freepik

Flat World Poetry Day Artwork | Premium AI-generated image



The dangers of using A.I.

Trying to make a logo for the course!

No originality



In science, you generally need to stand out!

Can you make
hand on 3 and
be anywhere



the hour
seconds can
be 3:16



Exercises

Simplify

1. “Subjects were tested under conditions of good to excellent acoustic isolation.”
→ “We tested the students in a quiet room.”

2. “The President is desirous of trying to see how we can make our best efforts in order to find a way to facilitate.”
→ “The President wants to help.”

Make it simpler

If there are any points on which you require explanation or further particulars we shall be glad to furnish such additional details as may be required by telephone. (28 words)

If you have any questions, please phone. (7 words!)

Exercise: Please rewrite the 2 following sentences in a simpler way

- a. “Climate change presents a significant problem to the world and there is much evidence to suggest that climate change negatively impacts on environments.”
- b. “In Figure 3, it can be seen that a very good agreement is achieved between experimental and simulation results.”

Exercise: rewrite in a simpler way – sentence a

a. “Climate change presents a significant problem to the world and there is much evidence to suggest that climate change negatively impacts on environments.” (23 words)

“Climate change is a significant environmental problem.”
(7 words)

“Climate change impacts negatively on environments.”
(6 words)

Exercise: rewrite in a simpler way – sentence b

1. Place main information in the main clause

b. “In Figure 3, **it** can be seen that a very good agreement is achieved between experimental and simulation results.” (19 words)

→ “A very good agreement is achieved between experimental and simulation results (Fig. 3).”

Exercise: rewrite in a simpler way

2. Express action with a verb, not with a noun
 - b. “In Figure 3, it can be seen that a very good agreement is achieved between experimental and simulation results.” (19 words)
 - “A very good agreement is achieved between experimental and simulation results (Fig. 3).”
 - “Experimental and simulation results agree very well (Fig. 3).”

Exercise: rewrite in a simpler way

3. Suppress unnecessary words

b. “In Figure 3, it can be seen that a very good agreement is achieved between experimental and simulation results.” (19 words)

Experimental and simulation results agree **very well** (Fig. 3).

→ “Experimental and simulation results agree (Fig. 3).” (7 words)

