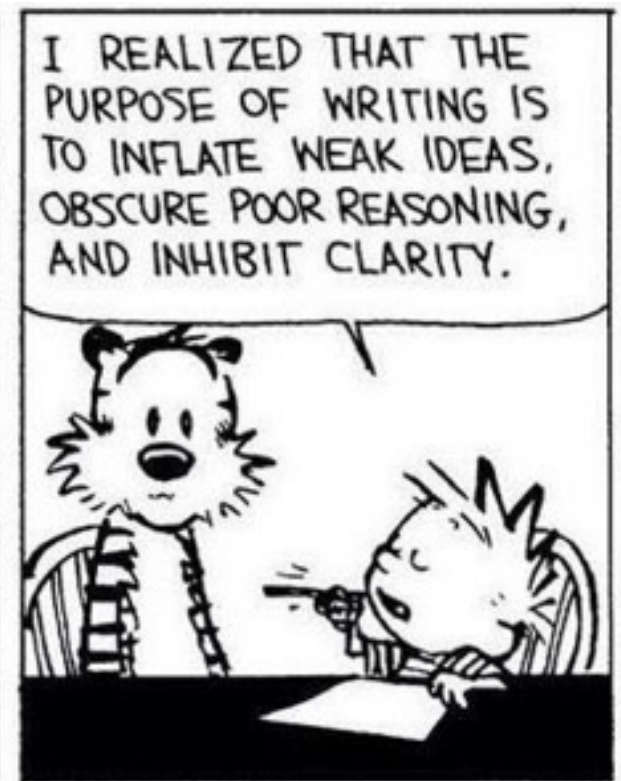
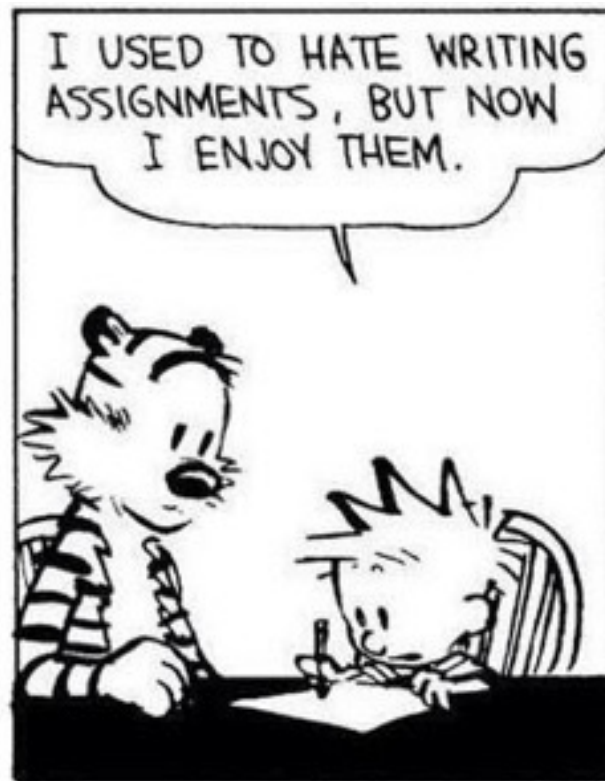
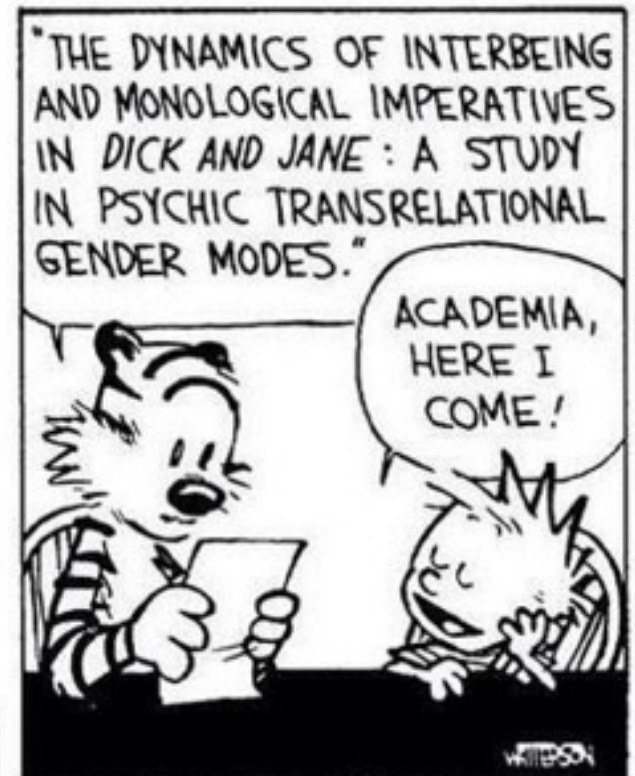
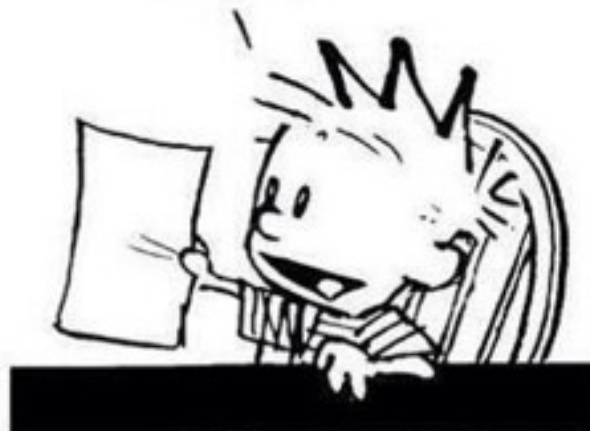


Style



WITH A LITTLE PRACTICE, WRITING CAN BE AN INTIMIDATING AND IMPENETRABLE FOG! WANT TO SEE MY BOOK REPORT?



Layers of effective writing

1. Appearance (spelling, grammar, formatting)
2. Writing style (sentence flow) ←
3. Organization (connecting the ideas) ←
4. Content (the ideas)



Omit needless words

1. Often achieved by using active verbs.

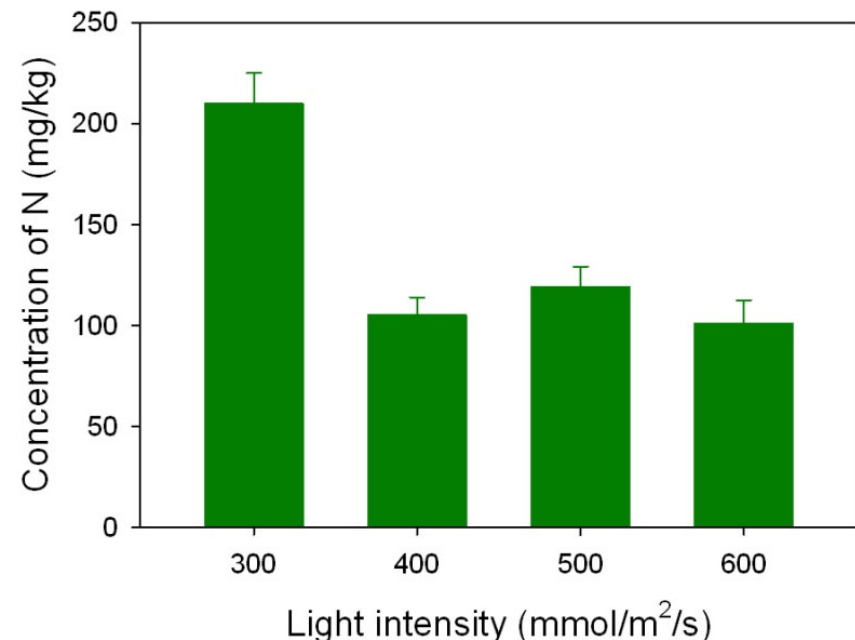
“Brevity is a by-product of vigor” (Strunk and White, 2000).

2. Avoid qualifiers (very, basically, actually, virtually, at all, extremely, completely, little, rather etc.)

“Parasitic intensifiers are basically begging to be eliminated”. (Silvia, 2008)

The concentration of N was
very high. . .

The concentration of N was
~~very high~~ two-fold higher . . .



3. Minimize use of this, these, those, that, there, it.

There are a number of studies *that* show *that this* makes *it* more confusing for readers.

A number of studies show *that it* is more confusing for readers.

- Often this/these is ambiguous (this what?),
 - If necessary, use 'this experiment' instead of just 'this'.
- Restate the subject that the 'this' is referring to, without the this.
 - 'The faster reaction times indicated' rather than 'this indicated' or 'this result indicated'.
- OK to use this/these when the reader might not realize that you are referring to the same subject as before; 'this' can emphasize a connection.

3 basic style principles

1. Put actions in verbs
2. Put characters in subjects
3. Keep subjects near verbs

1. Put Actions in Verbs

- Verbs are *action words*:
 - to *explore*, to *examine*, or to *observe*.
- Verbs turned into nouns changes the word from an *action* to a *thing*.
 - A noun formed from a verb like this is called a *nominalization*.
- Nominalizations are nouns with hidden action.
 - (Nominalizations can also be words other than nouns, but they're usually nouns in scientific writing).

Action	Nominalization
to regulate	regulation
to respond	response
to analyze	analysis
to assess	assessment
to occur	occurrence
to measure	measurement
to understand	understanding
to investigate	investigation
to delineate	delineation
to perform	performance

- Nothing inherently wrong with nominalizations,
 - misused to convey action. This disconnects structure and meaning — the intended action is no longer in the verb.
- Readers expect main action of a clause to be in a verb.
 - verbs inherently convey action, nouns do not.
 - If you fail to put your intended action in a verb, your reader must work to determine where the action is.
- We performed an analysis on the data.
 - We analyzed the data.
- We subjected participants to 20 min of tDCS stimulation and made reaction time and accuracy measurements.

Nominalizations

1. The budget cuts from the government for student funding were the topic of our debate.
2. We conducted a study of the progression of reading development.
3. The responses of the participants were collected using a keypress.
4. Our presentation was about a new method for analysis of neuroimaging data.
5. It was expected that the collection of data would be rapid.

- Nominalizations are sometimes useful; for example, when they summarize the action of the previous sentence.
- In such a case, a nominalization forms a backwards link to something already familiar to the reader.
 - (enables 'old-new' sentence structure)

We analyzed the data. This analysis demonstrated the need for additional experiments.

2. Put Characters in Subjects

- The character is the actor (the entity performing the action).
- Readers expect the main character in a clause to be found in the subject.
- Characters are often abstract nouns
 - Activation level
 - Reaction times

- The **movement** of the bacteria through the medium was accomplished by microflagella.

The main character in the subject:

- The **bacteria** move themselves in the liquid medium with microflagella.
- The ABC database has been subject to different improvements, modifications, and extensions in structure and content over the years.
- Significant positive correlations were evident between reading experience and the white matter integrity score in school-age children.

3. Keep subjects near verbs

- two pieces of information a reader looks for:
 - *who* is the sentence about?
 - *what* are they doing?
- The information between the subject and verb is rarely remembered (so don't put stuff there)

Neuroscientists that understand the difference between the statistical requirements of data that are longitudinal and that are cross-sectional are in high demand.

Lists can also cause separation

- Authors provide a long list of stuff with no context, and the verb doesn't show up until the end of the sentence:

Functional magnetic resonance imaging, positron emission tomography, electroencephalography, and magnetoencephalography
all represent methodologies that provide data on the function of the brain.

Example

The number of different mechanisms that may exist for learning of musical structure, and the importance of higher-level features such as harmony or rhythm, is unclear.

Sentence structure

- If you structure your sentences carefully, you encourage readers to interpret your meaning correctly.
- Structure has several other important uses:
 - structure sentences for emphasis, drawing attention to the most important part of the sentence.
 - structure sentences and paragraphs to *flow*
 - cohesion
 - coherence

3 principles of cohesion

1. Put new information last
2. Use passive voice judiciously
3. Make sure the first and last sentences of a paragraph match

1. Put new information last

- Ideas or characters that have not yet appeared in your manuscript are called *New information*.
 - *New* means *unfamiliar*.
 - Old information is familiar to the reader
 - background knowledge or
 - you've already introduced it.
- Your sentences contain both new and old information — think carefully about where you put them.
- **Most readers will find your writing clearer if you consistently begin sentences with familiar (old) information and conclude sentences with unfamiliar (new) information.**
 - Also called “Topic position” (old) and “Stress position” (new)

When new info is first?

- Get a new idea without any context.
- Try (incorrectly) to link this information to the previous sentence.
- After reading entire sentence, have to revise understanding.
- Going backwards slows the reader down and takes energy.

Beginning sentences with old information makes writing cohesive. It also allows you to put new, important information in the position of emphasis at the end of the sentence.

Neuroscientists try to create optimal experimental conditions for data collection by using various ways to accurately measure response timing. Button boxes, or response boxes, are constructed by engineers, and can be used to increase timing accuracy. Laptops, which normally have poor timing capabilities, often require the use of response boxes.

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Neuroscientists try to provide optimal experimental conditions for data collection by using ways to accurately measure response timing. One way to accurately measure timing is to use a box, constructed by engineers, called a button box or response box. Response boxes are often used with computers that have poor timing, such as most laptops.

2. Use Passive Voice judiciously

- Sentences are in passive voice when the subject is the object of the action.

Active: The dog chased the ball.

Passive: The ball was chased by the dog.

Passive: The ball was chased.

This rule does not, of course, mean discard the passive voice entirely, which is often convenient and sometimes necessary.

There were a great number of
dead leaves lying on the ground.

Dead leaves covered the ground

The vasculature in the brain
functions in the transport of
oxygenated hemoglobin through
capillaries.

Increases in interference caused
increases in reaction times in
Experiment I, but not in
Experiment II

Minimize the use of “be” verbs
(be, are, is, am, was, were, been).
Use active verbs instead.

The experiment was done in the
summer of 2012. Children were
tested in soundproof booths.

In the summer of 2012, I tested
children in soundproof booths.

2 consequences of passive voice:

1) The order of the subject and verb are switched.

(The ball was chased by the dog)

Active: Dog → Ball

Passive: Ball → Dog

2) The doer of the action can be omitted.

(The ball was chased)

Active: Dog → Ball

Passive: Ball → ???

Not inherently bad...but

Nature journals like authors to write in the active voice... -*Nature*

Choose the active voice more often than you choose the passive... -*Science*

Pitfalls of passive

- **1. Ambiguous characters**

The DNA was sequenced using the n-terminus method (Smith et al. 2004).

- Who sequenced the DNA? Is the paper being cited because Smith et al. did the sequencing, or because they invented the n-terminus method? Any time you leave multiple possibilities, you divide your readers. Some readers will misinterpret your intent.

Pitfalls of passive

- **2. Dangling modifiers**

- *Science:*

Our chief objection to the passive voice is that it sometimes seems to make authors forget to watch for dangling modifiers.

- A dangling modifier is a modifying phrase whose implicit subject does not match the explicit subject of the clause it modifies.

Having arrived late for practice, an excuse was needed.

After reading the original study, the article remains unconvincing.

Pitfalls of passive

- **3. Wordiness**
- All else being equal, shorter writing is better:
 - takes less time to read (readers benefit)
 - uses less space (often important)

Advantage of passive voice

- it switches the order of a sentence.

Use passive voice when it moves the old information to the front and new information to the back.

Use the passive as needed to keep the flow,
and *always provide the actors if there is a possibility of confusion.*

3. First/Last paragraph sentences match

- **Make sure the first and last sentences of a paragraph match**
 - When writing is *coherent*, it stays on topic in expected units.
 - **Readers usually expect thoughts to be expressed in paragraph units.**

Cohesion vs. Coherence

- Just because your sentences stick together by including appropriate backwards links, it doesn't mean your writing is coherent.

My favorite animal is the domestic cat. Cats were domesticated almost 10,000 years ago in ancient Mesopotamia. Mesopotamia is a name that literally means "the land between two rivers," taken from Greek. The Greek language is one of the oldest written languages, and its alphabet forms the basis of many other writing systems, including Latin. Latin ...

- Great cohesion (one sentence leads to another)! But it wanders through topics. Coherence is a paragraph-level principle.

REVISION TECHNIQUE

- Test for coherence: Read the first and last parts of each paragraph. Do the topics match? To be more thorough, make sure each sentence in a paragraph supports the main point of that paragraph.

Subject-shifting

- Science writing often has the problem of *subject shifting*
 - subjects change erratically throughout a paragraph.
- Fine to change the grammatical subject if you intend to change the *topic*.
- But often, writers intend to discuss a particular topic for several sentences (the *topic* doesn't change), but change the grammatical subjects.

Early language exposure is important for children's reading. Children learn their earliest language skills from their parents. The home environment therefore strongly influences the level of language exposure.

Subject-shifting

- Writing is easier to follow when the string of subjects in a paragraph reflects the topics.
- Paragraphs are most effective when they either
 - 1) discuss a single topic; or
 - 2) discuss a series of related topics that build on one another.
- Fulfill reader expectations by maintaining a *logical flow* of grammatical subjects in a paragraph.
 - 1) Maintain a common subject throughout a one-topic paragraph
 - 2) Shift the subject appropriately according to the story

To understand human evolution, **genomes from related primates** are necessary. For example, several **primate genomes** are needed to identify features common to primates or unique to humans. Fortunately, such **genome-wide exploration** is now a reality; in the past 5 years, **genome sequences** of several nonhuman primates have been released.

To understand human evolution, **genomes from related primates** are necessary. For example, **identification of features** common among primates or unique to humans will require several primate genomes. Fortunately, **scientists** can now do such genome-wide exploration; in the past 5 years, **the community** has released several nonhuman primate genome sequences.

- Compare the subject strings:

genomes from related primates...primate
genomes...genome-wide exploration...genome sequences

genomes from related primates...identification of
features...scientists...the community

Intentional subject-shifting

- Explanations that build from one thing to the next.
 - subjects shift as the topics shift

Technology often drives science. Among the most impressive recent technological advances is **DNA sequencing**. **More efficient sequencing** has reduced the cost of generating sequence data significantly. **Cheaper data** in turn enables more researchers to do data-intensive experiments, which results in a **huge amount of data** being released into the public domain. **Dealing with data** in such large quantity will require a new generation of scientists.

Technology... DNA sequencing... More efficient sequencing... Cheaper data... Huge amount of data... Dealing with data.

Emulate good models

Our academic journals radiate bad writing -- I store my journals on the shelf furthest from my desk to avoid fallout. If you talk to the authors of these disastrously written articles, however, you will find that their spoken descriptions are often clear, lively and interesting.

(modified from Silvia, 2008)

Writing style resources

- Google these:
 - Coherence
 - Cohesion/Flow
 - Old/New sentence structure
 - Subject/Verb separation
 - Nominalizations

<https://sites.duke.edu/scientificwriting/lesson-1-subjects-and-actions/>

Put actions in verbs, Put characters in subjects, Keep subjects near verbs

<https://sites.duke.edu/scientificwriting/lesson-2-cohesion-coherence-and-emphasis/>

Put new information last, Use passive voice judiciously, Make sure the first and last sentences of a paragraph match

<https://sites.duke.edu/scientificwriting/lesson-3-concision-and-simplicity/>

Omit needless words (excessive hedging, ineffectual phrases), Prefer simple words, Use simple subjects, Use adjectives/adverbs frugally

Further reading:

<http://www.uefap.net/writing/writing-paragraphs> Touches on topic sentences, flow, cohesion

http://writing.uwo.ca/undergrads/writing_resources.html