



Technical Language

Technical language is much different from everyday vernacular, and it is even different from general academic language. The tone, voice, and mood of your text are all elements that differentiate science writing.

I. Voice: Active vs. passive

One obvious way to keep your tone impersonal is not to mention yourself out of the paper. That is, write with passive voice rather than active voice. Passive voice implies that the subject of a sentence is being acted upon, whereas active voice shows the subject of the sentence directly doing the action.

Example:

Active: *We found that isobutene is a key component in the anabolism of proteins.*

Passive: *Isobutene was found to be a key component in the anabolism of proteins.*

In the first sentence, the subject, *we*, is acting upon the object, *isobutene*. *Found* is the action. In the second sentence, the subject is *isobutene*, and there is no action; *was found to be* is a passive construction that implies an action but does not directly state an action. Classically, the first sentence is considered undesirable because it refers to the authors (*we*). Most of your professors will ask you to use the second example in a lab write-up.

The problem with using passive voice is that it can be weak and boring. Some editors now prefer scientists to use active voice. After all, *you* did the work, and *you* are drawing inferences from it. However, it is important to be able to write in both active and passive voice. Often, scientists use passive voice in the methods and results sections and active voice in the more interpretive introduction and conclusion sections. Varying voice throughout sections is seen commonly in many journals, and keeps the work faceless but attaches a personal voice to the ideas driving the work.

II. Tone

Tone is the sum of the elements in your writing that reveals your attitude to the readers. Many different elements affect the tone of a paper, including whether active or passive voice is used, how technical the vocabulary is, whether sections are started and ended abruptly or with transitions, and what kind of word choice is used overall. Tone in a research write-up should be professional, succinct, and detached, no matter which voice is used. Reading journal articles will help to get a feel for how to craft this tone.

Example:

Vernacular: *Some proteins can't be digested without a chemical, known as isobutene, being available.*

Professional: *Aminase cannot break the covalent bonds of proteins without the presence of isobutene.*

III. Creating a balanced mood

Another problem common to science writing is balancing the mood between grandiose and self-deprecating. This is especially important in the conclusion, where major results are interpreted.

Example:

Grandiose: *Our results lead us to conclude that all children should be given isobutene supplements.*

Self-Deprecating: *Our results are insignificant because they lack more than ten reproducible assays.*

Balanced: *We conclude that more studies are necessary to find the mechanism initiated by isobutene.*



Revision Strategies

These techniques can be used both while revising your own paper and while reviewing a peer's paper during a workshop. Remember to make your comments on peers' papers constructive and meaningful.

Reorganizing, making sure the information is consistent, and cutting unnecessary parts to make the paper concise are the most immediate concerns. Grammatical and formatting errors are important too, but not until the concerns covered here are addressed.

I. Reorganizing:

Within sections: Start from the end of your paper and read the sections from discussion to introduction. This will serve to take the writing out of context so you can see how cohesive each section is by itself. Ask whether the information in each section flows logically with the purpose of the section. For example, are the Methods presented chronologically? Are the Results ordered from most important to least important? Experiment with changing the order of things that do not make sense the way they are.

The Entire Paper: Read the paper through, paying close attention to each section. Underline or circle any information that does not belong in a given section. Write in the margins which section it should be moved to. If you are unsure, review the Standard Format of Primary Literature Handout. If that does not answer your question, refer to the handout on the section you are confused about. If it is still unclear, ask your tutor or faculty.

II. Checking consistency:

Read the entire paper through, checking for cohesion and consistency. Ask yourself these questions:

- Is anything mentioned in the Abstract that is not in the rest of the paper? If so, throw it out or add it to the paper.
- Is the question or hypothesis posed in the introduction answered or addressed by the conclusion? If the experiment did not prove the hypothesis true, you should explain why.
- Do the techniques described in the methods preclude the types of results gained? For example, if you ran proteins on a gel, your results should reflect the information gained from running a gel, not what you might gain from running a column. Similarly, if you studied one species, your results should tell us about that species, not a neighboring species.

III. Cutting for density:

Read the paper backwards sentence by sentence. Cut out any superfluous words and phrases that do not contribute to your readers' understanding. Rearrange whole sentences so that you can phrase them using as few words as possible.