

# Duke Graduate School Scientific Writing Resource

≡ Menu

## Lesson 3: Concision and Simplicity

Length and complexity alone don't make a sentence difficult to understand: some long sentences are perfectly understandable, and specialized terms may be necessary to explain complex problems. Sometimes short sentences with simple words are more difficult to follow because of the way they are written. It follows that structure of the sentence may be more important than length or complexity.

However, scientific writers sometimes needlessly inflate their writing in length and complexity in an effort to "sound scientific" or convey intelligence. In truth, it takes a deeper understanding to explain a complex topic simply and succinctly. It was best put by Shakespeare: "Brevity is the soul of wit." The best scientists can communicate complicated results to intelligent readers outside their field. Long, complex writing doesn't imply good science.

This lesson will give you some techniques for keeping your writing brief.

### Principles

1. Omit needless words (excessive hedging, ineffectual phrases)
2. Prefer simple words
3. Use simple subjects
4. Use adjectives/adverbs frugally

### Principle 1: Omit needless words

Examine your writing and consider what each word adds; you may be surprised at how many are unnecessary.

#### Ineffectual Phrases

The biggest category of needless words comes from ineffectual phrases (phrases that add no meaning). Robert Hartwell Fiske writes in *The Dimwit's Dictionary*:

The intent of those who use ineffectual phrases is to make it appear as though their sentences are more substantial than they actually are, but not one sentence is made more meaningful by their inclusion (p. 17).

If you start to pay attention, you may be amazed at how often you read the words "it should be noted that." Think carefully about what they mean: nothing. Here is a list of ineffectual phrases:



### About This Guide

This guide to scientific writing was originally created in 2010-2011 by [Nathan Sheffield](#) for the Duke University Graduate School and funded by a Duke University Graduate School Teaching mini-grant. This current site is maintained by the Duke Graduate School. If you have questions about this site, please contact [gradschool@duke.edu](mailto:gradschool@duke.edu).



The content in this guide carries an Attribution-NonCommercial-ShareAlike Creative Commons license. You may share or adapt the material according to the [terms of the license](#), including providing attribution to "Duke University Graduate School" and providing a link to this site ([sites.duke.edu/scientificwriting/](https://sites.duke.edu/scientificwriting/)).

- Note that
- It should be noted that
- Respectively
- It is important to realize
- So-called



## Wordy Phrases

Another source of needless words are multi-word phrases that mean nothing more than a simple word. For example, I routinely read “a large number of” instead of “many,” or “due to the fact that” instead of “because.” John Ludbrook included a list of such phrases in [an article](#) in 2007. Strunk and White’s Elements of Style also includes [such a list](#). Here, I’ve compiled and adapted these lists:

### Elements of Style

| Instead of  | Consider  |
|---|---|
|  |  |
| the question as to whether  | whether   |
| there is no doubt but that  | doubtless   |
| used for fuel purposes  | used for fuel   |
| in a careful manner   | carefully   |
| this is a subject that  | this subject  |

### John Ludbrook

| Instead of  | Consider  |
|---|---|
|  |  |
| a large majority of   | most  |
| has the capacity to   | can   |
| whether or not  | whether   |
| are in agreement  | agree   |
| prior to  | before  |
| subsequent to   | after   |
| at this point in time   | now   |
| due to the fact that  | because   |
| in the event that   | if  |
| a new initiative  | an initiative   |
| nearly unique   | unique/rare   |
| plays a key role in   | is essential to   |

**Instead of****Consider**

both cultures were equally affected

the cultures were equally affected

You can do a find-replace for these phrases in your manuscript and permanently eliminate such phrases from your writing. Here's a real example that is quite long (118 words), but it makes the point. I've highlighted the areas that include ineffectual words:



As discussed, the second reaction is really the **end result of a very large number** of reactions. **It is also worth emphasizing that** the reactions do not represent a closed system, as r appears to be produced out of thin air. In reality, it is created from other chemical species within the cell, but we have chosen **here** not to model at such a fine level of detail. One detail not included here **that may be worth considering** is the **reversible nature** of the binding of RNAP to the promoter **region**. **It is also worth noting** that these two reactions form a simple linear chain, whereby the product of the first reaction is the reactant for the second.

Rewritten without useless words and phrases: 92 words (about 20% less reading)



As discussed, the second reaction is really the result of many reactions. The reactions do not represent a closed system, as r appears to be produced out of thin air. In reality, it is created from other chemical species within the cell, but we have chosen not to model at such a fine level of detail. One detail not included is the reversibility of the binding of RNAP to the promoter. These two reactions form a simple linear chain, whereby the product of the first reaction is the reactant for the second.

Does it matter? If you could get more reading done for the same level of effort you exert now, wouldn't that make a difference?

[A]lthough length by itself is sometimes a symptom of poorly constructed writing, it is not often its cause. (George Gopen, *Expectations*, p. 17).

## Revision Technique

This is an easy one: do a search for each of the phrases above. If you find them, try removing or replacing them. See if it changes your meaning.

## Principle 2: Prefer simple words

Never use a complex word when a simple word will do.

Bad writers consider long words more impressive than short ones, and use words like *usage* instead of *use* or *methodologies* instead of *methods* without knowing what they mean.

-John Lynch [emphasis added]

## Methodology vs. method

Just to clarify the difference:

**Method:** A way of doing something.

**Methodology:** The system of methods followed in a particular discipline.

## Utilize vs. use

I always notice the word utilize instead of use in scientific writing. I think some writers like utilize better because it sounds more important. If the words mean the same thing, we should prefer use for the sake of simplicity. But I read the words slightly differently: utilize can carry a sense of employing something not designed for the purpose. It can also mean use to full potential. For example: The family ran out of wood for the fire, so they utilized old cardboard boxes instead. I don't believe use carries these nuances. The point is this: without the subtle difference in definitions of these words, the distinction is meaningless; in either case, prefer the simpler word unless you intend to convey the meaning of the more complex. People also utilize other phrases in the place of use, like take advantage of or employ. Often, this is unnecessary inflation that doesn't improve understanding.

There are lots of complex words that convey simple ideas. There is nothing inherently wrong with these words, but they are overused. Here's a table of such words that regularly appear in scientific writing:

### Word Complexity

| Instead of  | Consider  |
|-------------|-----------|
| elucidate   | show      |
| putative    | (nothing) |
| methodology | method    |
| utilize     | use       |
| etiology    | cause     |

### Revision Technique

Search for these words and replace them if you can use a more simple word to convey your intended meaning.

## Principle 3: Use simple subjects

Scientific writing abounds with complex subjects. The biggest problem this creates is increased distance between subject and verb (covered in lesson 1). Often, science writers want to accomplish too much in a single sentence: define a complex abstract entity (the subject), and then describe something that it does. Instead, it is usually more clear to split these tasks into multiple sentences, some to define the subject and others to describe what it does.

Often complex subjects encapsulate actions in a modifying phrase. Here's an example (the complex subject is underlined):



The sequences that had passed our filtering, trimming, and alignment with ClustalX, were scanned for conserved elements across mammals.

The sheer length of the subject costs the reader energy while waiting for the verb. This underlined subject also includes several actions that aren't verbs in the sentence. To convey these actions in verbs, we can divide this sentence into two; this also enables us to use an appropriate nominalization to summarize the actions of the first sentence, creating a simple subject (alignment) that links backwards. This opens the way for the complex subject (now turned simple) to perform additional actions in an understandable way:



The sequences were trimmed, filtered, and aligned with ClustalX.

**The resulting alignments** were scanned for conserved elements across mammals.

## Revision Technique

You can identify complex subjects the same way you look for subject-verb separation (lesson 1). Find the subject and verb in each sentence. If they are too far apart, the culprit may be a complex subject. Try simplifying the subject in some way, possibly by dividing the sentence in two or eliminating unnecessary modifying clauses. Consider using summarizing nominalizations to simplify the subject.

## Principle 4: Use adjectives/adverbs frugally

One of the most overused adverbs is “very.” Somehow, every experiment is “very innovative,” every result “very interesting,” and every conclusion “very important.” When “very” isn't enough, you'll find “extremely.” Often, these words can be omitted without effect.



This method illustrates the frequency of very high-energy collisions.

The word “very” here is only meaningful if the sentence is making a distinction between high-energy and very-high-energy. The word high implicitly connotes a relative comparison to low. If you use “very” in a way that doesn't convey additional information to the reader, you're just wasting space.

There are lots of other words like “very” — adverbs or adjectives that don't add anything. Here are a few more examples of things to watch out for.

## The repetition problem

Adjectives are particularly prone to the **repetition** problem. The problem is that writers use two words where one suffices. The words could be synonyms, or one could imply another. For example, “completely and utterly alone” means the same thing as “completely alone,” which means the same thing as “alone.” These constructions have stylistic use in some forms of writing, but scientific writing is better off stating the facts. Examples more likely in a science paper might be: an “interesting and intriguing” finding, an “improved and modified” protocol, or a “new and novel” drug. Isn't all fluff unnecessary?

Along similar lines, you'll often find a single adjective or adverb modifying a word that implies the meaning of the modifier. For example, in the phrase “new invention,” the modifier “new” is superfluous — “invention” implies novelty.

## Excessive Hedging

Another category of superfluous adjectives is excessive hedging. It's good to be humble, but it's easy to go too far. A single hedge should satisfy your urge to cushion your claims. Excessive hedging erodes the confidence of your results.



These results suggest that our method may possibly identify putative enhancer elements.

The words suggest, may, possibly, and putative are all hedges. If you don't want to come right out and say "our method identifies enhancers," use a single hedge. You aren't adding anything by including them all.

## Demeaning adverbs

Be careful of demeaning words like "obviously", "clearly", or "undoubtedly." Something that is obvious to you may not be obvious to the reader. There is nothing more frustrating than reading a paper that alludes to something "obvious" that you are completely confused about.

Too often they're used when something is unclear and doubtful, but the author simply doesn't know how to make the point convincingly. Clumsy writers want to make an argument but don't know how to bridge some conceptual gap. Instead of painstakingly working out the logic, they simply state their conclusion with an obviously (when it's not at all obvious). There's nothing inherently wrong with the words, but be sure you use them honestly.

—John Lynch

## Self-aggrandizement

Be especially cautious of using words like "very" or "extremely" when lauding the merits of your study. I often find these in my own writing: I am so enamored by the way I've done things that I describe my methods in the most positive terms possible. I think it's reasonable to present your work in a positive light, but I also think some authors go too far to promote themselves. Such self-aggrandizement only reflects them negatively; good science should speak for itself.



Here, we describe an exciting new groundbreaking method to...

Maybe this example is a bit contrived, but you get the point. Let the audience deem how "innovative" or "powerful" or "intriguing" your ideas are.

## Revision Technique

Highlight all adjectives and adverbs. For each, ask if it contributes a meaningful idea, or if it's fluff. Do a specific search for commonly overused appendages like "very", "extremely", or "clearly", and remove them.

## Examples

### Example 1



These approaches use different kinds of methodology.

This sentence isn't unclear, but in my opinion, it does sound a bit pompous. We can make it sound less highfalutin by simplifying methodology and eliminating words that don't add meaning:



These approaches use different methods.

What's the difference between different methods and different kinds of methods? No difference in meaning, but the revision cuts out 50% of the words.

## Example 2



To identify RNAs associated with each putative RBP, C-terminal tandem affinity purification (TAP)-tagged proteins, expressed under control of their native promoters, were affinity purified from whole-cell extracts of cultures grown to mid-log phase in rich medium.

This sentence requires several readings before it starts to make sense. I think one key problem is the subject is too complex. Here, the complex subject is bolded:



To identify RNAs associated with each putative RBP, **C-terminal tandem affinity purification (TAP)-tagged proteins, expressed under control of their native promoters**, were affinity purified from whole-cell extracts of cultures grown to mid-log phase in rich medium.

If I pull the actions of the complex subject into an introductory sentence, I can start to make sense of the method:



To identify RNAs associated with each RBP, we first tagged each RBP using C-terminal tandem affinity purification (TAP) tags, and expressed these proteins under control of their native promoters. We then affinity purified these proteins from whole-cell extracts of cultures grown to mid-log phase in rich medium.

## Example 3



We estimated that as much as 12-18% (depending on the tissue) of inter-species differences in gene expression levels might be explained, at least in part, by changes in DNA methylation patterns.

Here's a great example of hedging. I count 6 hedges in this sentence:

1. estimated
2. as much as
3. 12-18% (a range)
4. depending on the tissue
5. might be

6. at least in part

How about reducing that?



Differences in DNA methylation could explain 12-18% of differences in gene expression.

## Example 4



Epigenetic events contribute to the etiology of diabetes; however, the lack of epigenomic analysis has limited the elucidation of the mechanistic basis for this link.

This is one of my favorite examples. I call it the paragon of scientific esotericism. It includes two of my favorite words: elucidate and mechanism. In English, aren't you really just trying to say this?



Epigenetic problems can cause diabetes, but how?

## Worksheet

[lesson3.pdf](#)

[Continue to the next level](#)

© 2025 Duke Graduate School Scientific Writing Resource. All Rights Reserved. Built with Startup WordPress Theme and WordPress.

Duke

[Sites@Duke Express](#) is powered by WordPress. Read the Sites@Duke Express [policies](#) and [FAQs](#), or [request help](#).