

Module 2. Writing Sentences: Word Choice and Sentence Structure

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Orientation to this Module

This module offers a simple and practical approach to scientific writing that reflects my years of experience editing the writings of academic fellows and faculty. My writing tips reflect the most common “offenders” in scientific writing. As we go through these tips, I use many examples to demonstrate how to apply them. I avoid discussing doctrinaire grammatical rules where I can, and instead present grammatical concepts in terms that are more easily accessible to scientific writers. At the end, the **Do It Yourself Guide to**

Sentence Revision is a one-page summary of this module that can be posted near your writing space to remind you of what you have learned.

About the sentence examples used throughout this module: I provide for your learning pleasure authentic examples of sentences written by previous participants in my writing courses and workshops. We do not call them "bad," but rather "unperfected" sentences. They are typical of a first draft and clamor for revision as we take them to the second draft phase. I aim to reproduce the editing process that we all can use to improve our documents as they evolve. I thank my previous students for their willingness to donate their work for our edification!

About my revisions: Although I suggest revisions, I never claim to have discovered the **one single right way** to revise any sentence. In some cases, my revisions go a little beyond what the author literally says, in an effort to make the sentence work better. When I am editing documents for colleagues, I always mark these "creative edits" in the margin so the author can verify the intended meaning. Please try to avoid getting bogged down in "literal meaning" as we rework the sample sentences--our purpose here is to practice good writing form, not to pursue scientific truth. Of course, ***in your own scientific writing, accuracy should be the highest priority.***

Practice examples: In Module 2, Appendix 1, you will find an MS Word file that contains all 24 sentence examples used in this module. The sentences are listed without revisions in the first half of the Appendix, so you can use those for practice. In the second half, you will find the same sentences plus my suggested revisions. I have also indicated by number which Sentence Writing Tips I applied. To get the most benefit from this module, download Appendix 1, and as you progress through the module, ***attempt your own revision of each "unperfected" sentence before you study my revision.*** When I teach sentence writing in the classroom, we make these revisions together as an interactive learning experience. To approximate that method, keep the file of sentence examples open as you work through the module, so you can more easily revise the sentences in sequence. Appendix 2 is an MS Word file containing a new set of practice sentences with suggested revisions, to reinforce your learning.



TIP 1. Create sentences around carefully chosen subjects and vigorous verbs. Your subject should be the main “agent” in the sentence and be combined with a vigorous verb to express your central meaning.

Tip 1 describes the first strategy I use to fix a sentence that lacks a clear focus. Choosing a new subject that embodies your central meaning can instantly clarify a rambling, confusing sentence. The “main agent” can be a person, thing, or concept. Your choice of an expressive verb that tells what the subject is doing can often vitalize

the meaning. To activate a sentence, look for verbs that go beyond all-purpose verbs like "is," "has," or "does." For example, see the table after Example 3 for verbs that improve on the bland verb "affect."

EXAMPLE 1. **There is** little quantitative data available identifying the relative importance of the many factors in the NICU that produce housestaff stress.

Rev 1a. Housestaff stress in the NICU has not been evaluated in quantitative studies.

Rev 1b. The sources of stress for housestaff assigned to the NICU have not been quantified or compared.

Rev 1c. Few studies have quantified or evaluated the sources of housestaff stress in the NICU.

Note on Example 1: The author here has thrown away the opportunity for a strong subject and verb by beginning with "There is." Notice that you must read the whole sentence to figure out what it is saying. This is a good clue that a clear subject is missing. In my suggested revisions, I offer three possible choices for the subject. The context of the sentence within a paragraph might indicate which version is better. For example, a paragraph about studies in the NICU might use the last. ***Try to avoid using "there is" and "there are" to begin your sentences!***

EXAMPLE 2. **The effect of withdrawing** CoQ10 and its reversibility on cardiac function **was another observation** that demonstrates the action of CoQ10 having a therapeutic effect instead of mere coincidence.

Rev 2. The therapeutic effect of CoQ10 on cardiac function is further demonstrated by the reversibility of this effect when the drug is withdrawn.

Note on Example 2: This is a good example of a sentence whose structure does little to help the reader capture the meaning. The subject ("effect of withdrawing CoQ10") is a poor choice because it does not begin the action at the beginning. Drug withdrawal happens several steps into the experimental process. It makes better sense, chronologically and logically, to start the sentence with the first finding of the experiment, evaluating the "therapeutic effect" of CoQ10, and then introduce the topic of what happens if you withdraw the drug. The phrase "was another observation" serves no purpose. Bringing an observer into the action just dilutes the central meaning of the sentence. "Instead of mere coincidence" is totally without purpose, too.

EXAMPLE 3. **Loss of revenue** in terms of productivity and medical costs due to human and animal diseases caused by these trypanosomes **has an overwhelming effect** on socio-economic growth of endemic countries.

Rev 3. Trypanosomal diseases can *damage* the economies and social structures of affected countries, *decreasing* productivity of humans and animals and *diverting* resources from economic growth to treatment of disease.

Note on Example 3: This sentence is unnecessarily complicated by the choice of a subject ("loss of revenue") that is secondary rather than primary to the meaning. The primary cause of all the problems described is "trypanosomal diseases," and this makes a much better subject. With this subject, the verbs of the sentence can now vividly describe the effects of these diseases: compare "has an overwhelming effect" in the original sentence to "damage", "deplete" and "divert." These verbs allow the reader to visualize the effects rather than guess at them. My choice of 3 verbs that begin with the letter "d" uses the rhetorical device of alliteration to reinforce the fact that trypanosomal diseases are bad actors.

Notice how much meaning and energy would be lost if we had chosen for our revision the bland verb "affect" rather than the three active verbs that convey the quality, intensity, and direction of the effect. The table below offers a sampling of alternative verb choices that are more explicit than "affect."

DIVERSE VERBS THAT EXPRESS EFFECT*	
affect	involve, entail, require, imply, necessitate, shape, form, mold, manipulate, model, change, alter, modify, vary, transform, adjust, influence, have an impact on
increase	add to, augment, boost, amplify, enhance, improve, enlarge, raise, swell, multiply
decrease (transitive)	reduce, cut, diminish, lessen, deplete, drain, lower, exhaust, tire out, wear out, fatigue, weaken, consume, use up
decrease (intransitive)	decline, dwindle, shrink, drop off, fall, diminish, wear out, fail
injure	damage, harm, spoil, hurt, break, wound, impair, destroy, obliterate, devastate, hinder
help	promote, encourage, advance, foster, bolster, assist, improve, aid, facilitate, support, serve, relieve, sustain, maintain, preserve, retain, save, care for, amend
* Selected with help from MS Word Thesaurus	

EXAMPLE 4. Once thought to be uniformly susceptible to the penicillins, **it is** now apparent that resistant strains of this organism may occur.

Rev 4. This organism, once susceptible to the penicillins, now occurs in resistant forms.

Note on Example 4: This sentence has thrown away the potential power of its subject and its verb by using "it is" for these key elements of the sentence. The sentence also dilutes its meaning by focusing on the observer (who "once thought" and to whom it is "now apparent") instead of the action of interest. If we choose for a subject the main

agent ("this organism"), almost half the words can be eliminated, creating increased clarity with no loss of meaning.

I borrowed this "unperfected" sentence from Strunk and White, *The Elements of Style* (see Course Introduction, A Short List of Resources for Scientific Writers). By the way, in the original sentence, "Once thought to be..., it is now apparent," the verb "thought" is a dangling participle that ungrammatically modifies "it." This is really a double dangler, since the subject "it" refers to nothing specific. See Tip 5 for more on dangling participles.



TIP 2. Omit needless words and empty phrases. They clutter up sentences and distract from the primary meaning.

The table ***Empty Phrases to Avoid*** (next page) offers a long list of phrases to eliminate from your writing. They waste space and dilute meaning. In talking, however, they can be useful! Note all the long-winded alternatives to "because." These give a speaker some extra time to decide what the reason is!

You will often find these empty phrases in your first drafts. Replacing "accounted for by the fact that" with "because" is not only clearer, it is an easy way to reduce word count in your second draft.

EXAMPLE 5. After careful consideration of all the foregoing lines of evidence, it is apparent to us that among all the antibiotics discussed, penicillin is the one that should be chosen for the treatment of infections caused by the streptococcus.

Rev 5a. We conclude that penicillin is the best antibiotic for treatment of streptococcal infections.

Note on Example 5: This sentence (borrowed from Strunk and White) gets my wordiness prize! The reader can assume that we have carefully considered the evidence and are talking about what is apparent to us. The first 21 words of the sentence can be conveyed succinctly by "We conclude," and then the sentence can simply state its real point in a third the number of words.

EXAMPLE 6. Persons aged 5 to 14 years are perennially more likely to have acute HAV than those older than 15 or less than 4 years of age.

Rev 6. Acute HAV infection is most common in children between 5 and 14 years of age.

Note on Example 6: Notice how efficiently this sentence works with a better choice of subject. The second set of age numbers is redundant, and the word "perennially" adds

nothing. Also, it is preferable to call the patients “children” rather than the impersonal “persons.”

EMPTY PHRASES TO AVOID	
WORDY PHRASE	EQUIVALENT
a majority of	most
a number of	many
accounted for by the fact that	because
as a consequence of	because
due to the fact that	because
in view of the fact that	because
for the reason that	because
on account of	because
on the basis of	because
on the grounds that	because
owing to the fact that	because
an order of magnitude	ten times
are of the same opinion	agree
at the present (moment)	now
at this point in time	now
by means of	by, with
despite the fact that	although
during the course of	during, while
fewer in number	fewer
for the purpose of	for
has the capability of	can
having regard to	about
if conditions are such that	if
in all cases	always, invariably
in close proximity to	near
in connection with	about, concerning
in my opinion it is not an unjustifiable assumption that	I think
in order to	to
in the event that	if
it is clear that	clearly
it is often the case that	often
it is possible that the cause is	perhaps because
it is worth pointing out that	note that
it may, however, be noted that	but
lacked the ability to	could not
large numbers of	many
prior to	before
Adapted from Edward J. Huth, M.D. <i>How to Write and Publish Papers in the Medical Sciences</i> , pp. 102-103. ISI Press, Philadelphia, 1982.	

EXAMPLE 7. When we speak of treatment for heart failure patients, **there are two aspects** to be addressed. One is the necessity to improve the quality of life and the second is the necessity to delay death.

Rev 7. Treatment of patients with heart failure needs to balance two goals: improving the quality of life and delaying death.

Note on Example 7: Subject and verb are “there are,” so we need a real subject and verb. The noun “aspects” is nearly always vague. Like examples 4 and 5, this sentence devotes too much attention to the author/observer (“when **we** speak of” and “to be addressed”) at the expense of the main topic. The first sentence is mostly wasted. In sentence 2, the repeated phrase “the necessity to” is redundant. Note that in my suggested revision, the verb **“balance”** replaces many words and carries a lot of the meaning. It eliminates the problem of two necessities that are often inconsistent with each other. A strong verb can often shorten, simplify and vitalize a sentence.

EXAMPLE 8. While it is the case that responses for many women who engaged in the risk behaviors prior to pregnancy suggested that they stopped for the duration of their pregnancy, it is also the case that there is a strong potential for women to underreport these behaviors during pregnancy.

Rev 8. Although many women reported that they stopped engaging in risky behaviors during pregnancy, women are known to often underreport behaviors that might put their fetus at risk.

Note on Example 8: The phrase “it is the case that” is unnecessary and vague. Use of it twice in this sentence is a double waste of words. The use of “pregnancy” three times is another clue that the syntax of the sentence is inefficient. The revised sentence is not only briefer, but easier to read and understand. Selective brevity often aids clarity, if not carried to the extreme.



TIP 3. Use specific and concrete language. Avoid overuse of abstractions and technical jargon, as well as abbreviations.

How to Deactivate a Perfectly Good Sentence

<i>Clear and simple Anglo-Saxon English in active voice:</i>	The dog ate its food .
<i>Latinate (“scientific”) verbiage:</i>	The dog ingested its allocated daily nutrients .
<i>Passive with latinate verbiage:</i>	Nutrients were consumed by the dog.
<i>Abstract, latinate and passive construction:</i>	Dog food consumption occurred .

Note on writing active sentences: You should aim to activate your sentences by avoiding the use of erudite vocabulary unless it is needed to convey precise meaning. In the box above, the second example is very typical of scientific writing: if you use a

sentence like this, ask if it is really saying any more than "The dog ate its food." Perhaps it really is important to indicate that the dog's food rations were experimentally formulated. In the third example, the use of passive phrasing makes sense only if you want to focus not on the dog, but on the nutrients (or maybe it was the homework?). The fourth example uses a latinate nominalization. A nominalization is a verb converted to a noun: here, the verb "consume" has been turned into the abstract noun "consumption." The new verb "occurred" is passive and lifeless (not the way my dogs eat their food!). It is hard to imagine when one would want to use the last sentence, but in the scientific literature, nominalizations combined with passive verbs are extremely common. Save abstract nouns and passive verbs for times when they are essential; they should not be a routine part of your writing.

EXAMPLE 9. Mothers who reported greater feelings of control over important **aspects** of their life **evidenced** more favorable pregnancy outcomes **in terms of** their infants weighing more and being born closer to term.

Rev 9. Mothers who reported greater feelings of control over their lives gave birth to larger infants closer to term.

Note on Example 9: The words in bold are clues to places where the sentence needs fixing. "Aspects" is vague. Saying that mothers "evidenced more favorable pregnancy outcomes" is turning a human being into a data source. What mother giving birth wants to be "evidencing an outcome" instead of having a baby!!! The phrase "in terms of" is nearly always tacked onto the end a sentence if it has not provided enough information earlier. Hence, in the revision, the information contained in that "in terms of" phrase replaces the abstract phrase "evidenced favorable pregnancy outcomes." This revision makes the sentence briefer, more direct, and more dynamic. Applause for those moms!

EXAMPLE 10. In this group we **observed a predominance** of central apneas **which accounted** for more than 70% of the total number of spells.

Rev 10. Central apnea was associated with over 70% of the events observed in this group.

Note on Example 10: This sentence is focused on the author/observer ("we observed") and a statistical version of events ("predominance," "accounted for"), rather than the real action. A better sentence describes what was observed rather than the process of observing it. The new subject and verb now control the meaning.



TIP 4. Use active voice and active constructions. Active verbs and constructions reduce unnecessary use of the passive voice, and thereby make sentences more clear and vigorous.

ACTIVE VERSUS PASSIVE VOICE

Active voice: *We performed the study.* The subject "we" is actively doing what the verb describes.

Passive voice: *The study was performed.* The subject "study" is acted upon by other, unidentified agents. Using the passive in this sentence puts more emphasis on the study. Use of passive voice is fine if we don't care who is doing the acting (e.g., "The sample was centrifuged for 25 minutes" is appropriately passive.).

EXAMPLE 11. A study was performed on the causes behind the decrease in the identification of child abuse in the ER **by the Social Services staff.**

Rev 11. The Social Services staff evaluated the causes behind the decreased identification of child abuse in the ER.

Note on Example 11: This sentence demonstrates a common problem with passive voice sentences: who is doing what? We could interpret the activity of the Social Services staff to be 1) performance of the study, 2) less frequent identification of child abuse, or even 3) perpetration of child abuse (unlikely, but a grammatically viable interpretation!). When we put the staff in the driver's seat (i.e., subject of the sentence), their role is unambiguous.

The original sentence is also inelegant because it ends with 6 prepositional phrases in a row (on the causes, behind the decrease, in the identification, of child abuse, in the ER, by the Social Services staff). This sequence creates a bumpy sound—my undergraduate thesis advisor called it "cobblestone English."

EXAMPLE 12. Clinical records were abstracted for demographic data, history, the results of **their** diagnostic evaluation, and the subsequent course of **their** hypertension.

Rev 12. We enrolled patients with hypertension, and abstracted information from their clinical records on demographics, history, diagnosis, and clinical course.

Note on Example 12: In this passive voice sentence, the subject is "clinical records," and the verb is "were abstracted." Grammatically, the plural subject should be identified as the "they" in "their diagnostic evaluation" and "their hypertension," but these two "theirs" are floating without an identity. We can assume that the clinicians conducted the

diagnostic evaluations, and the patients had the hypertension, but neither group is specified in the sentence. These ambiguous relationships are clarified through use of a better chosen subject ("we" = the authors) and two active verbs ("enrolled" and "abstracted"). In uncontrolled passive sentences, unidentified sentence elements often float. (In clinical research reports, patients are all too often left as "ghosts" haunting a sentence, playing a role that is assumed but not specified, grammatically or otherwise.)

EXAMPLE 13. End stage renal disease patients with severe disability can continue dialysis in a more convenient and comfortable setting at home, and yet **be relatively cost-effective**.

Rev 13. Home dialysis of end stage renal disease patients with severe disability is more convenient and comfortable for the patient, and relatively cost-effective.

Note on Example 13: Although this sentence does not use a passive verb, it uses a passive construction. The subject gets lost in the second clause. Who/what is cost-effective? Surely ESRD patients are all too expensive. Choice of "home dialysis" as the subject eliminates the confusion, without downplaying the importance of the patients.



TIP 5. Keep related words together. Subjects should be close to their verbs, and modifiers close to the words they describe. Do not interrupt core elements of a sentence with long phrases or lists; put them at the end.

DANGLING PARTICIPLES

A participle is a verb form used to modify a noun. Participles can end in –ing ("walking," present tense), or –ed ("walked," past tense):

PRESENT: **Walking** his dog, the **man** waved at Linda. ["walking" is a present tense participle that modifies "man"]

PAST: If **declared** guilty, **Donald** was going to lose millions. ["declared" is a past tense participle that modifies "Donald"]

It must be clear what noun the participle modifies! Hence this rule: **A participial phrase at the start of a sentence should refer to the grammatical subject of the sentence.** Participles are said to "dangle" if their subjects are unclear.

DANGLING: Driving to work, the autumn **trees** really captured my attention. [“Driving” does not modify “tree,” the subject of the sentence.]

CORRECT: Driving to work, **I** was captivated by the autumn trees. [“Driving” correctly modifies “I.”]

DANGLING: Being in dilapidated condition, I was able to buy the house very cheap. [Surely, I was not in dilapidated condition!]

CORRECT: Being in dilapidated condition, the house was so cheap that I bought it with cash.

DANGLING PARTICIPLES “dangle” if their subjects are unclear. The easiest way to “undangle” a participle is to match it to the subject of the sentence.

[Recall that Example 4 demonstrates another dangling participle: Once **thought** to be uniformly susceptible to the penicillins, **it is** now apparent that resistant strains of this organism may occur. The verb “thought” ungrammatically modifies “it.”]

OTHER KINDS OF MISPLACED MODIFIERS

To avoid confusion, place modifiers as close as possible to the words they modify.

Incorrect: George came over while I was writing my paper with a six-pack of beer.

Correct: George came over with a six-pack of beer while I was writing my paper.

Incorrect: I tried calling to tell you about the grant announcement five times.

Correct: I tried calling five times to tell you about the grant announcement.

Incorrect: Neural responses were recorded for each unit to increasing sound levels of noise burst stimuli.

Correct: For each unit, we recorded neural responses to increasing sound levels of noise burst stimuli.

Example 14. It has also been shown that, on **falling** asleep, the **transdiaphragmatic pressure** rises in adults.

Rev 14a (correct). On **falling** asleep, **adults** experience a rise in transdiaphragmatic pressure.

Rev 14b (better, no participle). When adults fall asleep, their transdiaphragmatic pressure rises.

NOTE on Example 14. This example typifies a dangling participle. Grammatically, the example says that the transdiaphragmatic pressure (subject of main clause) is falling asleep.

Example 15. This series of patients revealed potential long-term **benefits** of hydroxyurea containing regimens **that were unexpected**.

Rev 15. This series of patients revealed a potential for unexpected, long-term benefits of hydroxyurea-containing regimens.

NOTE on Example 15. This sentence demonstrates a misplaced modifier. It is almost impossible to read the sentence without thinking that the regimens, rather than the benefits, were unexpected.

Example 16. By **using** PET, **it** may allow identification of patients who achieved pathologic complete response to radiation therapy before surgery.

Rev 16a (correct). **Using** PET, **clinicians may** identify patients who achieved pathologic complete response to radiation therapy before surgery.

Rev 16b (better). **Use of PET may allow clinicians** to identify, before surgery, those patients who have had a pathologic complete response to radiation therapy.

NOTE on Example 16. First, “using” is a dangling participle because “using” cannot modify the undefined “it.” The subject of “using” (presumably clinicians) is not even in the original sentence. Hence the first revision puts the clinicians in the “driver’s seat” as the PET users (the participle “using” refers grammatically to “clinicians”). The second revision changes the participle “using” to the noun “Use.” This change removes the dangling participle, and also emphasizes that the “clinicians” (subject) are using PET for a purpose: to identify “before surgery” whether the patient has responded to prior therapy. This version makes the sentence more dynamic.

Example 17. We have previously shown that unbound bilirubin (also referred to as non-albumin bound or free bilirubin) is a more sensitive and specific **predictor** than total serum bilirubin or the Bilirubin: Albumin (B: A) molar ratio **of auditory dysfunction** as evaluated by auditory brainstem evoked response (ABR) in premature infants.

Rev 17. We have previously shown that in premature infants, the amount of unbound bilirubin, compared to either total serum bilirubin or bilirubin: albumin molar ratio, is a more sensitive and specific predictor of auditory dysfunction, as evaluated by auditory brainstem evoked response.

NOTE on Example 17. This complex sentence is made more difficult to decipher by the three parenthetical phrases. I removed these, but the biggest problem is that “predictor” and “of auditory dysfunction” are separated by too many words. Also, “unbound bilirubin” is too far away from that to which it is being compared. Reordering the words eliminates both of these problems. The revision also moves “premature infants” nearer the beginning of the sentence, to clarify the clinical context of the study. It is much clearer to state the patient context before giving all the details about those patients.

Example 18. Whether these differences can be exploited for the development of anti-parasite drug therapies would require **the questions** related to vital dependence of protozoans on GPI-anchored molecules, functional properties of the enzymes involved in biosynthesis and attachment of GPIs in trypanosomes and mammalian cells **to be addressed**.

Rev 18. Before these differences can be exploited for the development of anti-parasite drug therapies, **further studies need to address three questions:** 1) Are protozoans critically dependent on GPI-anchored molecules? 2) What are the functional properties of the enzymes involved in biosynthesis? and 3) How are GPIs attached in trypanosomes and mammalian cells?

NOTE on Example 18. This sentence includes an embedded list like others we have studied. Placement of the three-part list between “questions” and “to be addressed” makes the sentence nearly unintelligible by interrupting the syntax of “questions to be addressed.” Lists, particularly complex lists like this one, **must be placed at the end of the sentence**, so they do not interrupt critical sentence elements that belong together.

In the revision, my first change was to move the list to the end of the sentence, thereby eliminating the interruption. Then I introduced the list with “further studies need to address three questions.” I have used several methods to articulate the list: I announced three questions in advance, used a colon after “question,” and added numbers (and question marks) to the list, so the items are clearly separated. Numbers in a list make it more memorable, which is important if the author is trying to set up key questions to be addressed in a research proposal. These three questions are now ready to become three project aims.



TIP 6. Use parallel constructions to create lists with matched elements that sound alike: parallels in meaning are reinforced by parallels in sound and structure.

GOOD EXAMPLES OF PARALLEL CONSTRUCTIONS

The inherent vice of capitalism is the unequal sharing of blessings; the inherent virtue of socialism is the equal sharing of miseries. *Winston Churchill*

If risk and protective factors differed by gender, as some studies suggest, then dating violence prevention programs would need to be designed to be gender specific. However, if risk and protective factors were similar across genders, then a prevention program could be developed for both genders combined. *Class Participant*

Churchill's elaborate parallel sentence is a splendid example of high rhetoric. In the second half of the sentence, every word is either a repetition or an opposite of the analogous word in the first half. Moreover, the sentence is very clever—his apparent praise of socialism is turned upside down when we get to the last word!

The same technique of parallel construction can be used less rhetorically in scientific writing. The second example above is setting up the rationale for a research study that will evaluate one or potentially two designs for programs to prevent dating violence. We can hear that the two sentences are parallel, because they both begin with the same phrase (“if risk and protective factors”). In the two sentences, the “risk and protective factors” are described by phrases opposite in meaning: “differed by gender” vs “were similar across genders.” Next, both sentences continue with fairly parallel “then” clauses: “then dating violence prevention programs” and “then a prevention program.” The two final clauses are not perfectly parallel, but echo each other: “would need to be designed to be gender specific” vs “could be developed for both genders combined.” These two options for program design are differentiated as described in the first clause of each sentence (difference by gender vs similarity in gender). This example demonstrates that when the ear hears a parallel construction, the mind interprets the parallel items as related.

As shown here and in the examples below, parallelism is very useful in scientific writing. It creates a structure that sets up a relationship between two (or three) complex but related ideas. We will begin with two fairly simple examples.

EXAMPLE 19. Plasmin, a protease, plays a significant role not only **in degrading** fibrin, but also as **a regulator** of tissue repair and remodeling.

Rev 19. Plasmin is a protease that plays a significant role not only **in degrading** fibrin, but also **in regulating** tissue repair and remodeling.

Note on Example 19: Here the words “not only” and “but also” mandate the use of parallel forms. However, the author juxtaposes a verb (“degrading”) with a noun (“regulator”). To be parallel, these words need to be in the same part of speech (either two nouns or two verbs). In the revised sentence, we change “regulator” to “regulating” (noun → verb), so regulating is parallel to the verb degrading. I chose not to use two nouns (“as a degrader of” and “as a regulator of”) because “degrader” is not in common usage.

EXAMPLE 20. The urea-induced conductance **completely reversed** upon removal of urea, was **non-selective**, and **the magnitude** was voltage dependent.

Rev 20a. The urea-induced conductance was non-selective, voltage-dependent, and completely reversible.

Rev 20b. The urea-induced conductance was non-selective and varied with voltage. The effect was completely reversed upon removal of urea.

Note on Example 20: The three-part list in the original sentence is grammatical, and works reasonably well. However, we could make the three items listed parallel to shorten the sentence. In the original, "completely reversed" is a verb, "non-selective" is an adjective, and "magnitude" is a noun. My first revision makes the list parallel by changing all three words to adjectives. Parallel constructions work best if the listed items are fairly simple and similar in detail.

The second revision does not attempt to use parallelism. It is longer, but when the topic of reversibility is given a separate sentence, more can be said about it. Note that in both revisions, I placed reversibility logically, at the end of the list.

EXAMPLE 21. Adherence ranges from 10-30% for **simple interventions**; more **intensive interventions** result in higher rates of up to 50%.

Rev 21. For simple interventions, adherence rates range from 10-30%; for more intensive interventions, adherence rates can reach 50%.

Note on Example 21: This rather simple sentence does not demand revision; both parts of the sentence are grammatically complete and clear. However, I have offered a revised version to show you how use of a parallel construction can help to organize the numbers in a sentence. For maximum clarity, the revision gives first position to the broad descriptors (what kind of intervention), then second position to the specific descriptors of the numbers (adherence rates), and last place to the numbers themselves (10-30% and 50%). Virtually any sentence is clearer if a number is placed **after** its descriptor. Hearing the number out of context (before its descriptor) creates opportunities for confusion.

EXAMPLE 22. The predictive value positive and negative for the ORAI were 19.7% and 94.5%, respectively. These compare to a predictive value positive of 19.0% and a predictive value negative of 92.9% for the SCORE instrument.

Rev 22a (correct). For the ORAI, the positive and negative predictive values were 19.7% and 94.5% respectively, while for the SCORE they were 19.0% and 92.9%.

Rev 22b (better). The positive and negative predictive values for the ORAI and the SCORE were very similar: for the ORAI, 19.7 and 94.5% respectively, and for the SCORE, 19.0 and 92.9%.

Note on Example 22: This is a challenging sentence to compose, because it contains data about two instruments that assess osteoporosis risk (ORAI vs SCORE), and provides for both instruments two sets of data: two descriptors ("positive predictive value" and "negative predictive value"), and two numbers (e.g., "19.7% and 94.5%"). In this kind of sentence, strict adherence to the rules of parallel construction is essential for clarity. We offer two revisions. The first revision lines up the numbers in parallel, like a table built into a sentence. The second revision does the same, but in addition it tells the reader in advance what to expect from the data ("values...were very similar"). When

your main point is that the numbers are similar, why make the reader work to figure that out?

EXAMPLE 23. Abdominal pain, a common complaint in childhood, may be a **symptom** of an acute or even catastrophic intra-abdominal process, an **indicator** of a chronic physiologically based malfunction of the viscera, or a **reflection** of an abdominal organ as the target of psychological stresses perceived by the complaining child.

Rev 23a (parallel). Abdominal pain, a common complaint in childhood, may be a **symptom** of an acute or even catastrophic intra-abdominal process, an **indicator** of a chronic malfunction of the viscera, or a **reflection** of psychological stresses perceived by the child.

Rev 23b (non-parallel alternative). Abdominal pain, a common complaint in childhood, requires both physical and psychological assessment of the patient. Occasionally the pain may reveal an acute (or even catastrophic) intra-abdominal process, or a chronic, physiologically based intestinal malfunction. More often, abdominal pain reflects a child's tendency to target the stomach as the focal point of psychological stress.

Note on Example 23: This sentence attempts to create a parallel construction. It successfully achieves grammatical parallelism with 3 nouns: symptom, indicator, and reflection. However, the author has different things to say about each item, so the parallelism in the list is difficult to track and understand easily. The first revision simplifies the second and third listed items, so they work better in parallel with the first item. The second revision abandons the parallel construction and lets each item go in its own direction.

This example is the first sentence in a chapter. If this were a summary sentence at the end of a chapter, the revision 23a would work well, because the information would be familiar to the reader. As an introductory sentence, however, the revision 23b is preferable.

EXAMPLE 24. The Pew Commission was particularly forceful in its calls for changes in curricula, suggesting that innovations were needed **to redefine** courses of study **to provide** for core instruction and **to emphasize** that educational programs should be organized around competencies.

Rev 24a. The Pew Commission was particularly forceful in its calls for changes in curricula, suggesting that innovations were needed 1) to redefine courses of study that provide for core instruction, and 2) to organize educational programs around competencies.

Rev 24b. The Pew Commission was particularly forceful in its calls for changes in curricula, suggesting that innovations were needed to redefine courses of study that provide for core instruction. They also emphasized that educational programs should be organized around competencies.

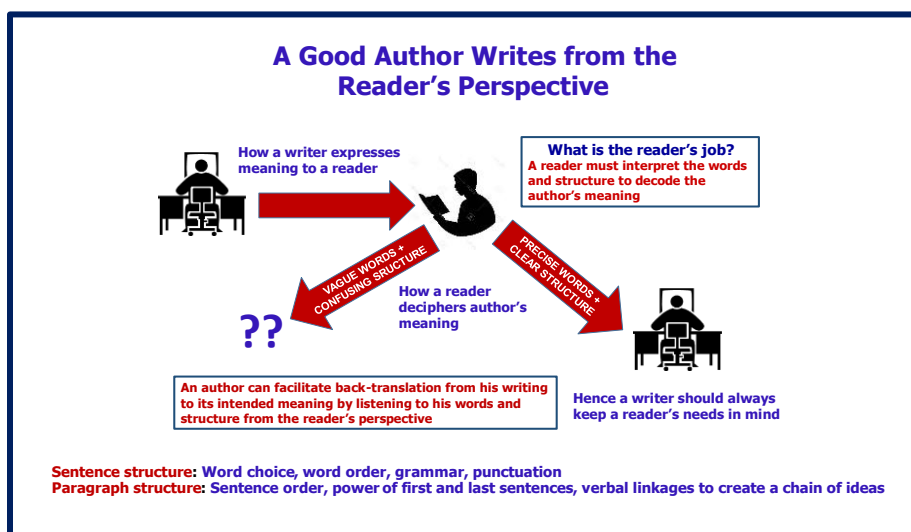
Note on Example 24: This sentence sounds like a three-part parallel construction ("to redefine," "to provide," "to exercise"), but it does not make sense this way. The phrase "to redefine courses of study" sounds parallel to "to provide for core instruction," but this phrase really means "to redefine courses of study that provide for core instruction." The first revision creates a workable two-part parallel construction. I prefer the second revision, which abandons parallelism and divides the example into two separate sentences, one focused on changes in courses and the other on changes in programs.

Summary: Writing Lists Within Sentences

1. Placing a list at the **end** of the sentence nearly always makes the structure (syntax) of the rest of the sentence clearer. (Example 18 rev)
2. For complex lists, always label the list with a descriptor before listing the items. If greater clarity is needed, you can say how many items will be in the upcoming list, or you can number the items (or both). (Example 18 rev)
3. If a list contains numbers, place specific descriptors **before** the numbers. (Examples 21 rev and 22b)
4. For parallel items in a list, use matching **grammar**, and **similar word order and word number** to create an audible match between the items in the list. (Example 23a)
5. If you want to include different kinds of information about each item in a list, a parallel construction will probably not hold together. (Examples 23a, 23b)

Summation: Applying Precise Word Choice and Clear Structure to Sentences

Remember that in **Module 1: Think like a Writer**, I said: "As a good scientific writer, you choose **words** that economically express your meaning. Then you place these words in a **structure** that conveys your meaning clearly to reader." Later I added, "In sentences, you create structure by following the rules of good **grammar** and **punctuation**."



Now that you have practiced ***Six Tips for Writing Good Sentences***, I would like to clarify how these tips apply the rules of good word choice and well controlled structure.

Sentence Writing Tips	Relevance to Words and/or Structure
1. Create sentences around carefully chosen subjects and vigorous verbs. Your subject should represent the main “agent” in the sentence, and be combined with a vigorous verb to express your central meaning.	This tip is certainly about good word choice, but the structural purpose of the subject and verb is the driving force here. They dominate the structure of the sentence, and when well chosen, they create its clarity and often its energy.
2. Omit needless words and empty phrases. They clutter up sentences and distract from the primary meaning.	This tip is mainly about avoiding weak words, but remember that the problem with needless words is that they interfere with the reader’s understanding of a sentence’s structure, often garbling its meaning.
3. Use specific and concrete language. Avoid overuse of abstractions and technical jargon, as well as abbreviations.	Tips 3 and 4 are both about using concrete and active words to keep a sentence as straightforward as possible. These words simplify and clarify sentence structure, giving prominence to who (subject) is doing what (verb). In abstract and passive sentences, the reader can be challenged to decipher the agent and the action, because abstractions and passive verbs are both inactive.
4. Use active voice and active constructions. Active verbs and constructions reduce unnecessary use of the passive voice, and make sentences more clear and vigorous.	
5. Keep related words together. Subjects should be close to their verbs, and modifiers close to the words they describe. Do not interrupt core elements of a sentence with long phrases or lists; put them at the end.	Tip 5 is about structure. A sentence is much clearer if grammatical elements are grouped, rather than separated by extraneous words. Remember, your reader hears your sentence while reading it; hearing groups of related words together simplifies interpretation.
6. Use parallel constructions to create lists with matched elements that sound alike. Parallels in meaning are reinforced by parallels in sound and structure.	Parallel constructions are a useful structural tool to organize a complex sentence built around a list. Within a list, these constructions create grammatically matched groups of words that echo each other. Parallelisms use the reader’s ear to audibly capture the multi-part list, hearing how groups of words within the list are related.

We will come back to the lessons of words and structure in **Module 3: Writing Paragraphs**. Controlling structure in paragraphs is more challenging than in sentences, because a paragraph is composed of sentences, each of which requires interpretation individually, and also in the context of the paragraph.

DO IT YOURSELF GUIDE TO SENTENCE REVISION

1. Identify the grammatical subject and verb. Do they describe the main agent and the main action? If not, **choose a strong subject-verb combination** that tells the story more simply, more directly, and more actively.
2. **Eliminate empty phrases and redundant wording.** Often one word will serve the same purpose, with greater clarity.
3. If the sentence is dominated by abstractions and has bland, multi-purpose verbs, try **turning one or more key abstractions into verbs.** (e.g., implication \Rightarrow imply; identification \Rightarrow identify)
4. If the main verb is in the passive voice, consider **rewriting the sentence in active voice.** (Sometimes, however, passive voice is appropriate, as in descriptions of methods. It may not matter who is doing a procedure.)
5. If the sentence is long and hard to follow, try one or more of these additional approaches:
 - **Split the sentence** in two.
 - **Eliminate less important words or ideas.**
 - **Move the subject and verb** closer together.
 - **Move modifiers** (adjectives, prepositional phrases, participles) closer to the nouns they describe.
 - Identify repeating elements and consider **combining them in a list that creates a parallel construction.**

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An evaluation form specific to this module, in MS Word format, is included as Module 2, App 3, Evaluation Form. Please complete it on your computer and email to: constance_baldwin@urmc.rochester.edu. Your input will help me to improve this writing course! C. Baldwin