Part I

THE SENTENCE AS STRUCTURE

or

How to Punctuate English Sentences Correctly

by

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Introduction

Amidst the many irregularities of the English language, the regularity of its sentence structure is often overlooked. Yet a recognition of that underlying organizing structure can be a strong support to the struggling writer.

To construct the well-wrought sentence then, words, phrases, and clauses are coordinated and subordinated, punctuated on the basis of their restrictive or non-restrictive status, and then linked—clause to clause, phrase, to phrase, to build a superstructure whose structural connectors are coordinating and subordinating conjunctions, conjunctive adverbs, and transitional words, the structural functioning of which is reinforced by the placement of the full stops, the comma, the semicolon, the colon, and, sometimes, the em dash.

Because structure dictates punctuation, the student who understands sentence structure will have a basis for understand how and when to punctuate, which will assure that, most particularly, commas and semicolons, along with all punctuation marks are inserted with intelligence rather than whimsey.

This book does not replace an English handbook. For a detailed discussion of English idioms, of exceptions to the rules, and the idiosyncrasies of the English language, you will need your handbook. To appreciate the underlying structure of the sentence and to understand how and why to punctuate the sentence, you will need this small book.

Intelligent punctuation protects the integrity of the sentence. Its conventions clarify the writer's message and demonstrate good manners. Deriving punctuation rules from the organizing principles of sentence structure is an approach that I am suggesting.

Frances Miriam Reed, Ph.D.

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Looking at
Phrases
and Verbs and Verbals

A phrase is a word or a group of related words and our smallest unit of grammar. Along with prepositional phrases, we have noun phrases (*the bridge and its structure; an engineer who designs bridges)*, adjectival phrases (*a splendid structure; a connecting span*), adverbial phrases (*running rigorously and rapidly*), and, moving on to our current discussion, **verb phrases** and **verbal phrases.**

Verb phrases make the sentence possible; verbal phrases make the sentence interesting.

Let's investigate.

We say *the member bore*—indicating a time in the past—and *it bears*—indicating a time in the present, but to discuss any other point in time or probability, we need additional words. Consider these verb phrases:

has had to bear

is bearing

would have borne.

Notice that the first words in the verb phrase give you information about a time or probability in the past, present, or future. These first words are **auxiliary verbs** (has had, is) or **modal verbs** (*would, could, might*). The final word in the verb phrase is always the working verb itself—or rather a part of that verb—either a past or present **PART**iciple or the infinitive.

Historically, a verb has five principal parts:

INFINITIVE	PRESENT TENSE	PAST TENSE	PRESENT PARTICIPLE	PAST PARTICIPLE
to bear	bear(s)	bore	bearing	borne

The verb *to bear* has five forms to match the five principal parts of a verb and is an **irregular verb**.

Irregular verbs include the auxiliary verbs (*be, do, have*) and many of our most used verbs. Below are the five principal parts and the five forms of some irregular verbs.

INFINITIVE	PRESENT TENSE	PAST TENSE	PRESENT PARTICIPLE	PAST PARTICIPLE
to be	am, is, are	was, were	being	been
to have	has, have	had	having	had
to see	see(s)	saw	seeing	seen
to begin	begins(s)	began	beginning	begun

Here are verb phrases with irregular verbs:

saw had been seen was seeing

will begin has seen would have had to have begun

Regular verbs are, as expected, regular in their change of form. Although all verbs have, in use, five principal parts, regular verbs have only four forms, the same form serving for both the **simple past tense** and the **past participle**.

INFINITIVE	PRESENT TENSE	PAST TENSE	PRESENT PARTICIPLE	PAST PARTICIPLE
to connect	connect(s)	connected	connecting	connected
to support	support(s)	supported	supporting	supported

Thus, the past participle of a **regular verb** is less easily identified than is that of the **irregular verb.**

(she) saw / (she) had seen (they) connected / (they) had connected

(it) began / (it) was begun (he) supported / (he) will have supported

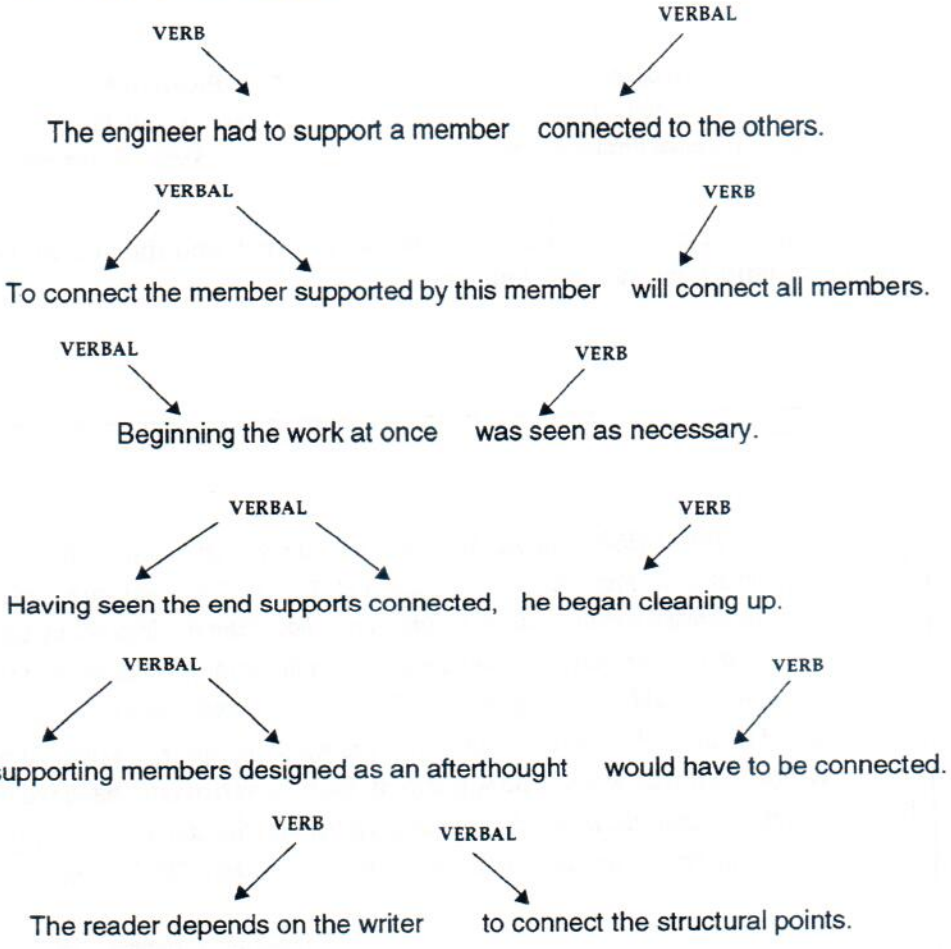
These are verb phrases using regular and irregular verbs:

had to support a member
was seen as necessary
began cleaning up
will have to be connecting

Verbals and **verbal phrases** are not verbs, but parts of verbs, which have all sorts of fun showing off as modifying phrases, as adjectivals, adverbials, and nominals. Below are verbal phrases:

connected to the others
connecting a member supported by this member
beginning the work at once
having seen the end supports connected
to begin the work on time

Note that while verb phrases begin with a verb in past or present tense, verbal phrases begin with a past or present participal or the infinitive. The sentences below include verbs and verbals:



Verbals tart up a plain sentence, squeeze in lots of extra information, and can make a dull sentence interesting, provocative, and successful.

A long verbal phrase such as *the supporting truss designed as an afterthought on Sunday at midnight by a late-working employee* is **not** as sentence. Do not confuse a lengthy verbal phrase with a verb or a clause. Length does not substitute for grammar and structure. To have a sentence, you must have an independent clause; to have an independent clause, you must have a predicate with its verb or verb phrase.

INDEPENDENT CLAUSE

SUBJECT + **PREDICATE**

Noun / Noun Phrase
Verbal / Verbal Phrase / Gerund

Verb / Verb Phrase
Verb + Completers

Because you can differentiate between the verb and the verbal, you can correctly identify an independent clause.

The English Grammar lays down a good rule with respect to its Participles of the Past, that all terminate in D, T, or N. This Analogy is perhaps liable to as few Exceptions, as any. Considering how little Analogy of any kind we have in our Language, it seems wrong to annihilate the few Tenses, that may be found. It would be well therefore, if all Writers, who endeavour to be accurate, would be careful to avoid a Corruption, at present so prevalent, of saying, it was wrote, *for,* it was written; he was drove, *for,* he was driven; I have went, *for* I have gone, *etc. in all which instances a Verb is absurdly used to supply the present Participles, without any necessity for the want of such Word.*

—James Harris, *Hermes* (1751)

Looking at
Independent Clauses

An independent clause comprises a **subject,** the noun, or noun or verbal phrase, and a **predicate,** which includes the verb and its object or anything needed to complete the verb. Because although some verbs are, others are not, complete in themselves. And some verbs can be either.

Verbs are called **intransitive**—from the Latin, *in* (not) and *transitive* (to go across)—when they are complete and self-sufficient as they stand:

structures **stand**

sentences **live**

But **transitive** verbs need an object, or a completer:

a structure **fulfills** **a function**

sentences **make** **clear my meaning**

Some verbs can be either **intransitive** or **transitive**:

engineers **design** / engineers **design structures**

sentences **explain** / sentences **explain my meaning**

And finally, we have **linking** verbs, which tie together equivalent concepts:

a sentence **is** a structure / a structure **is** a sentence

bridges **are** links / links **are** bridges

But you do not really have to worry about whether verbs are transitive or intransitive or linking. What you do have to worry about is recognizing that English sentences and the independent clauses that base them have a preferred pattern: first, the subject; then, the predicate, which includes the verb and any completers :

SUBJECT + **PREDICATE**
Noun/Noun Phrase/Verbal Phrase — Verb + Completers

bridges are links

bridges of wood cross small rivers

bridges built of iron connect greater spans

Looking at Simple Sentences

An independent clause has a **subject** and a **predicate**:

a structure — fulfills a function

When you capitalize the first letter of an independent clause and put a period at its end, you create a type of sentence called a **simple sentence**:

A structure fulfills a function.

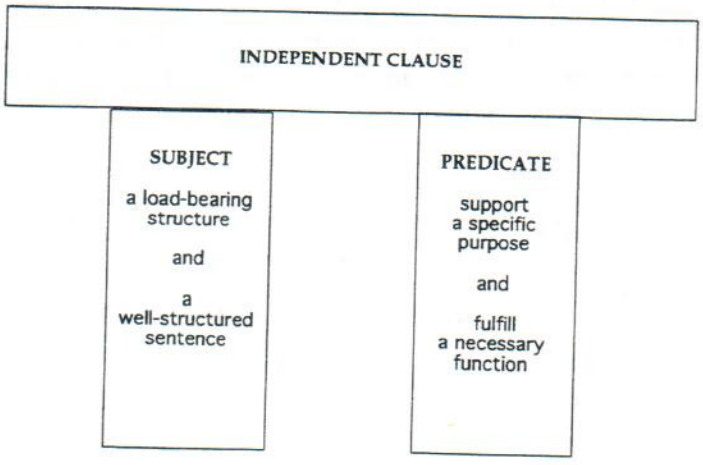
A simple sentence has only **one** independent clause.

A simple sentence can be embellished with any number of additional phrases and its subjects and verbs can compounded, but as long as it includes only one independent clause, it is still a simple sentence:

COMPOUND SUBJECT
A load-bearing structure and a well-structured sentence

COMPOUND PREDICATE
support a specific purpose and fulfill a necessary function.

The compound subjects and verbs may be yet more elaborately compounded than the above examples and the incorporated phrases infinitely longer than,



for example, the verbal beginning *the supporting truss* (set out on *SaS* 6); however, when organizing and punctuating a sentence, length does not substitute for structure.

When we add an **introductory phrase** to the simple sentence, we still have a simple sentence, and we separate the introductory phrase from the independent clause by placing between them a **single comma.**

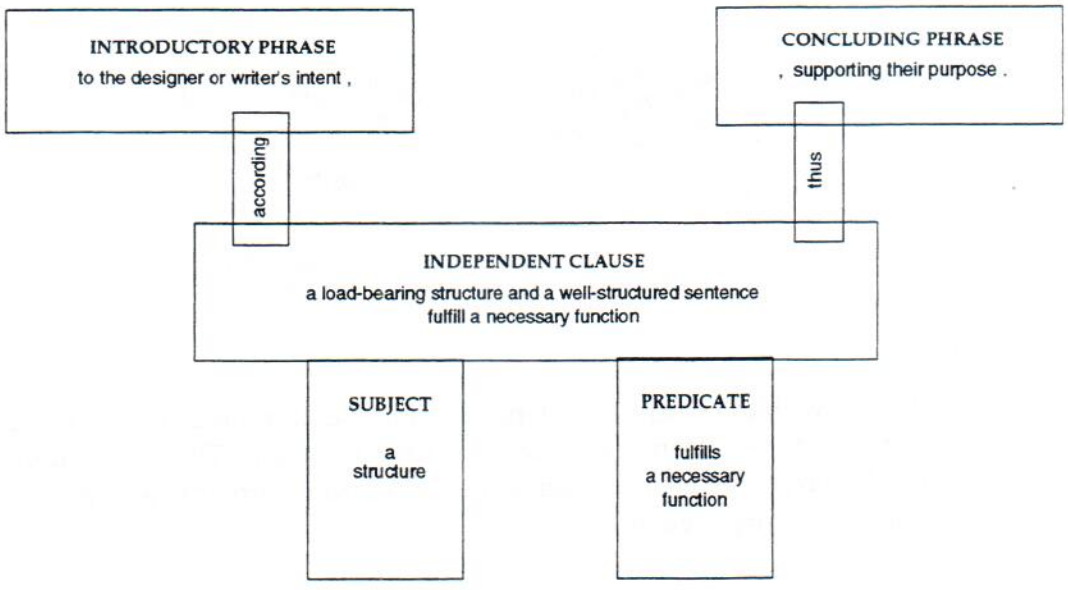
According to the designer or writer's intent ,
a load-bearing structure and a well-structured sentence
support a specific purpose and fulfill a necessary function.

A **concluding verbal phrase** is, as well, separated from the single independent clause by a single comma:

SINGLE COMMA

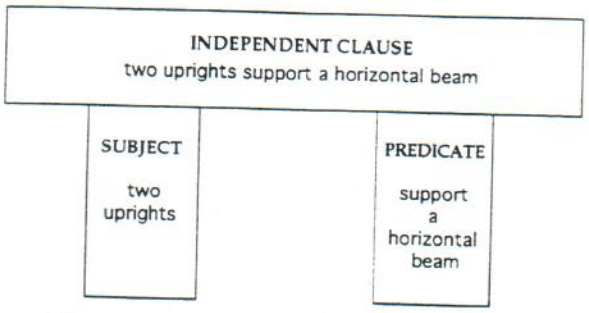
According to the designer or writer's intent, a load-bearing
structure and a well-structured sentence fulfill a necessary function ,
thus supporting their purpose.

A single comma always separates. In this case, a single comma separates the introductory and the concluding phrases from the independent clause, identifying the independent clause as the essential grammatical structure. Thus, the independent clause is also the **essential sentence** and its integrity protected by careful punctuation.

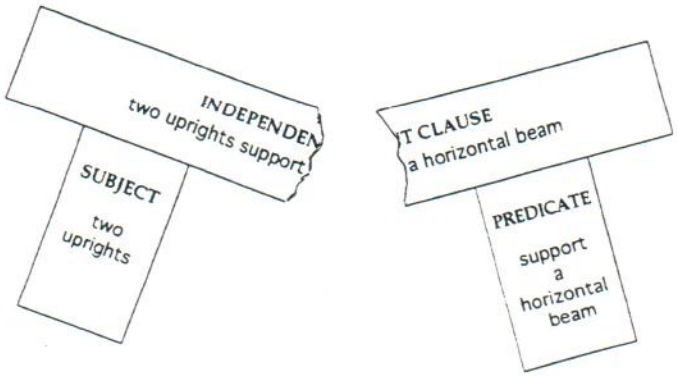


Looking at the Essential Sentence

In our simplistic structure below, the sentence (or independent clause) rests on two supports, the subject and the predicate. Each sentence is a story in miniature: A "who" is, feels, or does something. Within the continuum of the story, the point of highest tension is that nonosecond between the subject and the predicate—coming just before we find out exactly what the "who" is or does.



Similarly, a horizontal beam is supported with stability by two vertical columns, with the greatest point of stress at the midpoint of the beam. If we sever the horizontal beam, leaving each half of the beam supported by a single upright, not only have we lost our continuous beam, but we are left with two unstable structures.



So it is with the essential sentence in which subject has been separated from predicate, or verb from completers, by a single comma. The continuum has been lost. Which is why we never separate subject from verb nor verb from completers with a single comma.

Looking at
Compound Sentences

Compound comes from the Latin, *com* (together) and *ponere* (to put). A compound sentence consists of two or more independent clauses that are joined by one of the **coordinating conjunctions**.

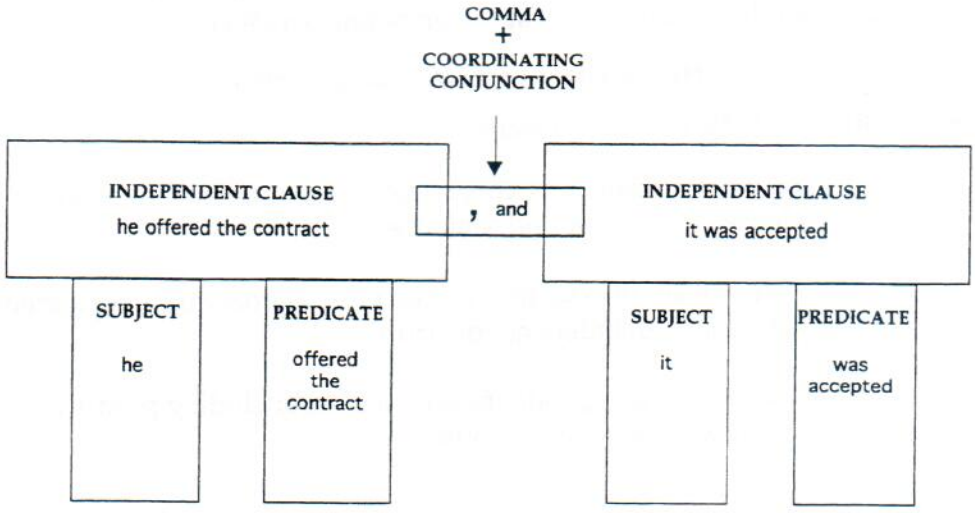
She offered the contract, **and** it was accepted.

He built the structure, **but** he did not know how to describe it.

In addition to separating introductory and concluding phrases from the essential sentence, the single comma is a necessary part of a **compound sentence**. Placed before the coordinating conjunction, it signals that a clause, rather than a phrase, follows the coordinating conjunction.

Coordinating conjunctions are seven:

and
but
for
or
nor
so
yet



Each coordinating conjunction declares a different relationship between the independent clauses.

EQUIVALENT IDEAS
He offered the contract, **and** it was accepted.

CONTRASTING IDEAS
He offered the contract, **but** it was not accepted.

EXPLANATORY RELATIONSHIP
He should have offered the contract, **for** it would have been accepted.

ALTERNATIVE IDEAS
He offered to fulfill the contract, **or** he wanted to rescind it.

NEGATIVE IDEAS
He had not offered the contract, **nor** did he intend to do so.

RELATIONSHIP of RESULTS
He offered the contract, **so** the company would benefit.

CONTRADICTORY IDEAS
He offered the contract, **yet** it was not accepted.

As noted, in these compound sentences, a single comma precedes the coordinating conjunction, thereby signaling the reader that this coordinating conjunction is joining and coordinating, not a pair of words or phrases, but two independent clauses--thus creating a compound sentence. A **pair** of words or phrases joined by a coordinating conjunction (*iron and steel; well-designed bridges or poorly built spans*) would never be separated by a comma.

In lieu of the comma and coordinating conjunction, a semicolon may separate independent clauses to create a compound sentence:

He offered the contract; it was accepted.

In summation, a single comma is inserted

- Before a coordinating conjunction that links the independent clauses in a compound sentence.
- Between an introductory phrase or an introductory dependent clause and an independent clause.
- Between an independent clause and a concluding phrase or concluding dependent clause.

Looking at
Correlative Conjunctions

Coordinating conjunctions **join not** only clauses in a compound sentence **but also** words in phrases: Similarly can correlative conjunctions connect words, phrases, and independent clauses in and within a compound sentence.

Correlative, from the Latin *com* (together) and *relatus* (*to* bring back), is a category of conjunction found always in pairs:

both. . . and
either . . or
just as . . . so
neither . . nor
not only , , , but also

Correlative conjunctions are tricky because they require the following:

- a singular verb when both subjects are singular:

  Either he signs the contract or she leaves.

- a plural verb when both subjects are plural:

  Neither the union representatives nor the managers agree to the terms.

- either singular or plural verb depending on the nearest: subject:

  Both the chairman and their representatives are willing to talk.

  Not only the representatives but also the chairman is willing to talk.

> *Instituted and Particular Grammar, doth deliver the rules which are proper and peculiar to any one Language in Particular.*
>
> —John Wilkins, *An Essay towards a Real Character and a Philosophical Language* (1668)

Looking at Subordination

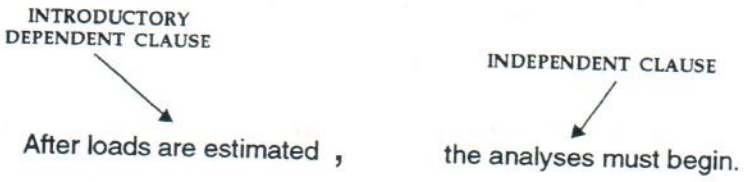
Heretofore we have discussed only the independent clause. But clauses are of two types:

(1) **Independent clauses**

and

(2) **Dependent clauses.**

The **dependent** (also called **subordinate) clause,** which, of course, has a subject and a predicate (otherwise it would not be a clause) depends on an independent clause for inclusion in a sentence. That is to say, the dependent, or subordinate, clause—*subordinate* from the Latin, *sub* (under) and *ordinare* (to order)—gives information that falls under, or is dependent on, information in the independent clause. Often, the dependent clause is an **introductory clause**.



A dependent clause always begins with a **subordinating conjunction.** Here is a representative list of subordinating conjunctions:

after	how	once	unless
although	if	provided	until
as	if only	rather than	when
as if	in case	since	whenever
as long as	insofar as	so that	where
as soon as	in that	than	whereas
because	lest	that	while
before	no matter how	though	why

Here are some dependent clauses:

After loads are estimated , . . .	Although loads are estimated , . . .
Before loads are estimated , . . .	Because loads are estimated , . . .
Once loads are estimated , . . .	Provided loads are estimated , . . .
Unless loads are estimated , . . .	Until loads are estimated , . . .
When loads are estimated , . . .	While loads are estimated , . . .

If we remove the subordinating conjunction, the dependent clause becomes an independent clause:

After loads are estimated , . . .	Loads are estimated.
Before loads are estimated , . . .	Loads are estimated,

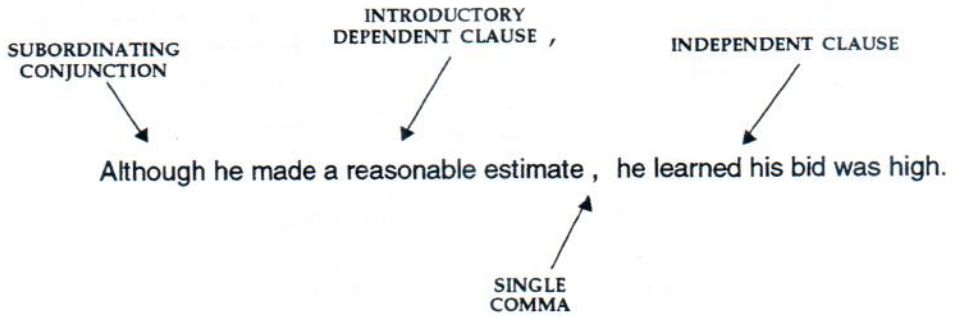
etc., etc., etc.

Just as the subject is never separated from its verb, nor verb from its completers, so the subordinating conjunction is never separated from its text.

Because a single comma separates, a comma is **never** placed after the subordinating conjunction—which is essential to and structures the clause. Avoid such common mistakes as

~~Although, he made a reasonable estimate, he learned. . . .~~

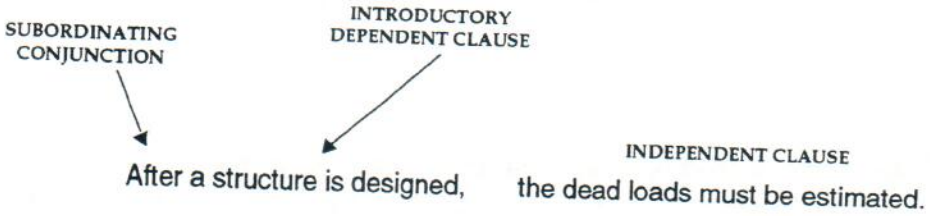
A single comma does, however, separate the complete dependent clause, which in this case is an introductory clause, from the essential sentence:



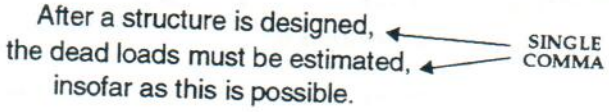
Looking at Complex Sentences

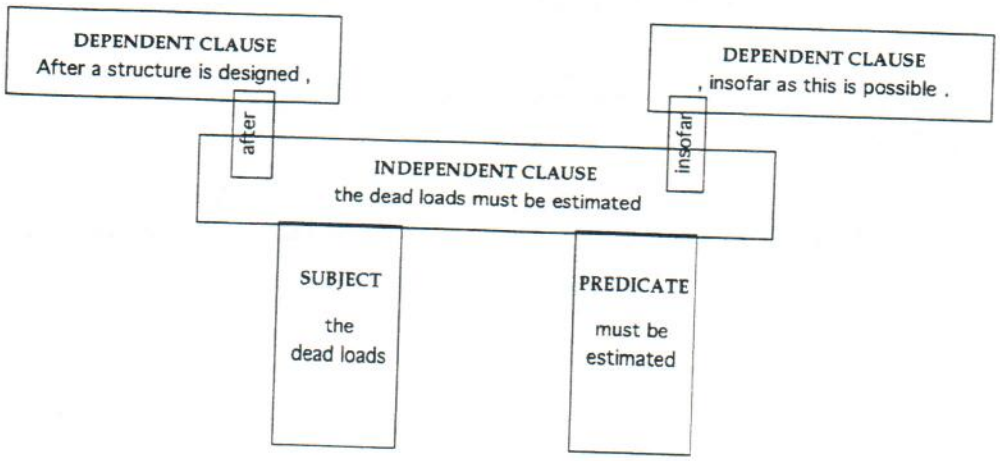
A **complex sentence** includes a single independent clause and one or more dependent clauses. *Complex* comes from the Latin, *com* (with) and *plectere* (to weave). Interweaving dependent and independent clauses, the sentence becomes complex.

Note that the subordinating conjunctions, being far more in number than the seven coordinating conjunctions, define a variety of relationships for time, space, and point of view. Below is a complex sentence with a dependent and independent clause:



Dependent clauses can both introduce and follow an independent clause.





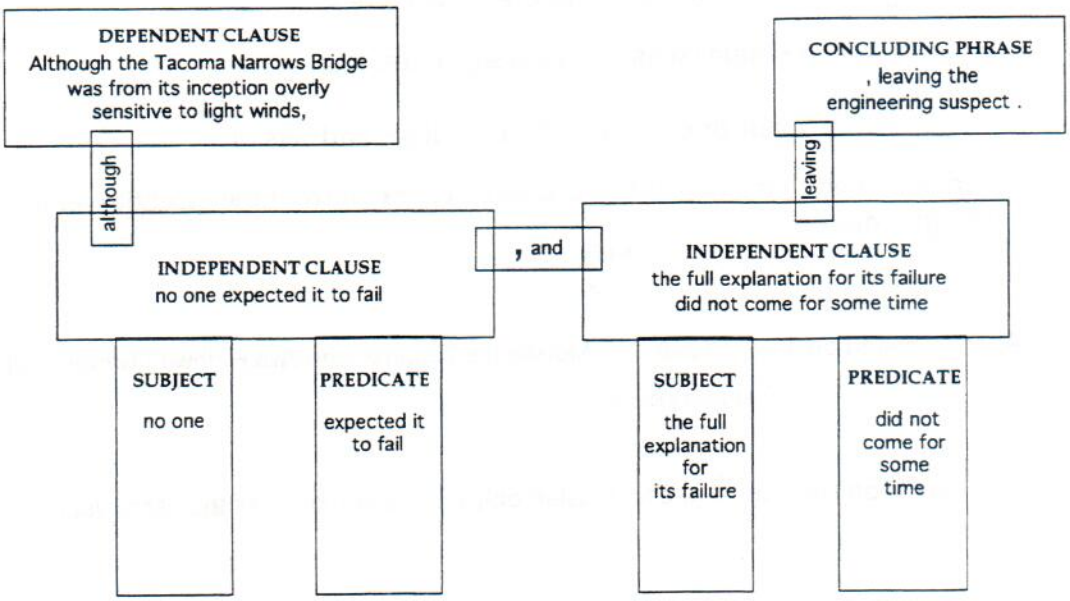
Looking at
Compound-Complex Sentences

The last type of sentence structure to discuss is the **compound-complex sentence**. As its name indicates, the compound-complex sentence includes two or more independent clauses and one or more dependent clauses—and greater complexity.

Despite any greater complexity, the most complicated sentence has as its basis an independent clause--its essential sentence--or in the case of a compound sentence, at least two essential sentences. If the dependent elements do not develop and support the point being made by the essential sentence(s), the complex sentence has been poorly structured.

Here is an example of a compound-complex sentence:

Although the Tacoma Narrows Bridge
was from its inception overly sensitive to light winds,
no one expected it to fail,
and
the full explanation for its failure did not come for some time,
leaving the engineering suspect.



Looking at
Essentials and Non-essentials

Consider the well-wrought sentence as a superstructure, the horizontal beam of its essential sentence resting on its two vertical supports, the subject and predicate. From this structure cantilever out or lean on or pile atop other intersecting grammatical structures—words, phrases, and clauses—all of which are linked by grammatical connectors: conjunctions (coordinating, subordinating, and correlative), relative pronouns, conjunctive adverbs, and transitional words.

Within the sentence, some words and grammatical structures may be more essential than others to understanding the point of the sentence, and these essential elements may serve to restrict an understanding of the sentence to the specific point being made. The sentence may also include other information—information that is interesting and nice to know but that does not materially contribute to the point of the essential sentence. This latter information is non-essential and is enclosed by a comma pair.

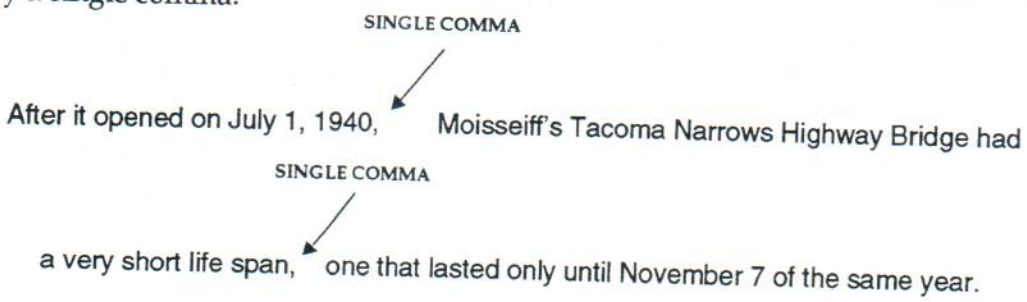
Although a single comma within the essential sentence (or independent clause) would separate subject from verb, a pair of commas that encloses non-essential information may be put anywhere. Thus, careful punctuation distinguishes between non-essential and essential information.

Even though they look alike, commas are of **two** types:

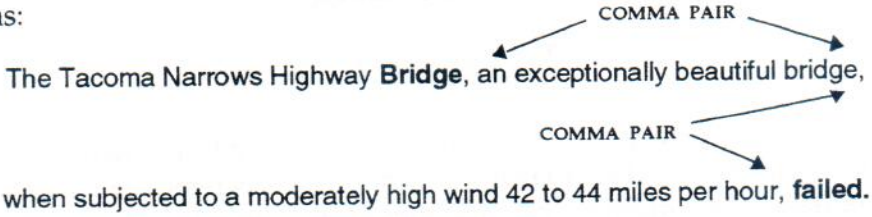
(1) **A single comma**, which separates, and

(2) **A pair of commas**, which encloses and sets off.

Earlier, we noted that a dependent clause is separated from the essential sentence by a single comma:

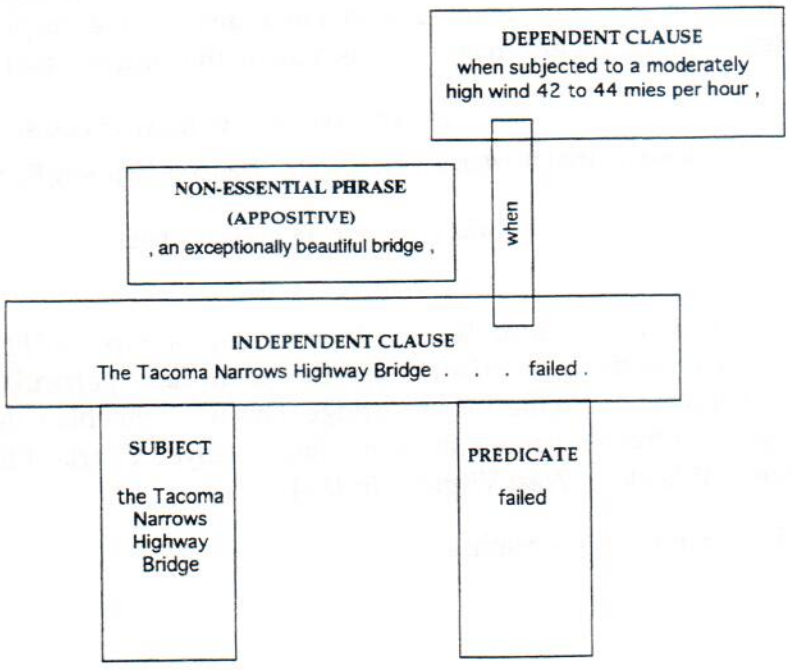


Non-essential information is set off from the independent clause by a pair of commas:



That *the bridge was beautiful* and that it was *subjected to a moderately high wind 42 to 44 miles per hour* is not essential to the point of this particular sentence, which in this case is simply saying that *the bridge failed*. Therefore, the **non-essential,** albeit interesting, additional information, is enclosed in a **pair** of commas. (This illustration also points to the importance of putting the information most important to the point of your sentence in the independent clause and not in a dependent clause or non-essential phrase.) In summation,

- A single comma separates and identifies the beginning and end of the essential sentence.
- A pair of commas encloses and sets off non-essential information.
- Commas are structural markers—**not** breathing indicators.



Looking at Relative Clauses

Distinguishing essential from non-essential information informs the punctuation of the **relative clause,** which is a type of dependent clause. Just as a dependent, or subordinate, clause begins with a subordinating conjunction, so a relative clause begins with a relative pronoun.

These are the relative pronouns:

that

who

which

whom

whose

of which

Relative clauses can be either essential or non-essential (restrictive or non-restrictive). As we have seen, essential, or restrictive, information cannot be separated from content and is essential to understanding the point of the sentence. In this regard, relative clauses are both restrictive and non-restrictive.

ESSENTIAL / RESTRICTIVE RELATIVE CLAUSE

The wind **that** blew down the Tacoma Narrows Highway Bridge in 1940

was only 42 to 44 miles per hour.

The relative clause *that blew down the Tacoma Narrows Highway Bridge in 1940* is an essential (restrictive) clause that identifies a particular wind—the wind that blew down the Tacoma Bridge. This wind that blew down the Tacoma Bridge is not the same moderate wind that destroyed Charles Ellet's suspension bridge in Wheeling, West Virginia, in 1854.

On the other hand, we might say,

NON-ESSENTIAL / NON-RESTRICTIVE RELATIVE CLAUSE

A fairly high wind, **which** blew between 42 and 44 miles per hour,
destroyed the Tacoma Narrows Highway Bridge in 1940.

Enclosed in this pair of commas is information unnecessary to both the content and structure of the essential sentence. The wind has already been identified as *fairly high;* the exact speed of the wind is merely added information and not essential to either identifying the wind or to our understanding.

Note that the non-essential, or non-restrictive, clause is introduced with **which.** An essential, or restrictive, clause opens with **that.** There is a rule here:

That introduces an **essential** clause with no commas;

which introduces a **non-essential** clause enclosed with a comma pair.

Other relative pronouns introduce essential or non-essential (restrictive or non-restrictive) clauses according to the writer's intent.

NON-ESSENTIAL RELATIVE CLAUSE
COMMA PAIR

Moisseiff, **who** designed the failed Tacoma Narrows Highway Bridge, was
involved in the design of practically every long span bridge of the century.

We can state that *Moisseiff was involved in the design of. . . every. . . bridge* and the point is understood, without needing to add that he also designed the Tacoma Bridge; the latter is simply extra information.

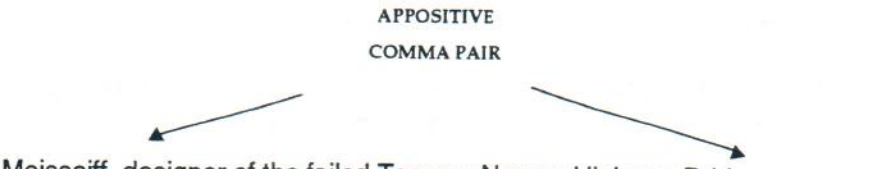
ESSENTIAL / RESTRICTIVE RELATIVE CLAUSE

The engineer **who** designed the failed Tacoma Narrows Highway Bridge
was involved in the design of practically every long span bridge of the century.

But, within the above sentence, if we remove the relative clause—*who designed the failed Tacoma Narrows Highway Bridge*—we are unable to identify who designed the bridge. (Note that the essential clause not enclosed with comas.)

Looking at Appositives

Appositives are non-essential words or phrases that follow a noun to give additional information about the noun. The appositive is interchangeable with the noun itself. We can say



or we can say

This discussion of the non-essential elements now leads us to look at the final category of conjunctions: **conjunctive adverbs** and **transitional words**.

> *There is much more difficulty in pointing, than people are generally aware of. In effect, there is scarce any thing in the province of the grammarians so little fixed and ascertained as this. The rules usually laid down are impertinent, dark, and deficient, and the practice, at present, perfectly capricious, authors varying not only from one another, but from themselves too. In the general, we shall only here observe, that the comma is to distinguish nouns from nouns, verbs from verbs, and such other parts of a period as are not necessarily jointed together.*
>
> —Ephraim Chambers, "Punctuation" in *Cyclopaedia* (1728)

Looking at Conjunctive Adverbs and Transitional Words

The Latin word *conjunctive* means *to cojoin*, and adverbs modify the meaning of other words, which is why we say that conjunctive adverbs, along with transitional words, connect with a comment or—**connect and comment.**

Here are some **conjunctive adverbs** and **transitional words**:

Conjunctive Adverbs	**Transitional Words**
consequently	all in all
furthermore	as a result
indeed	for example
however	in fact
moreover	in summary
nevertheless	on the contrary
subsequently	on the other hand
therefore	to illustrate

Both conjunctive adverbs and transitional words, being non-essential and alike in function, can always be enclosed in a pair of commas. When connecting two independent clauses in a compound sentence, conjunctive adverbs and transitional words are enclosed with a semicolon and a comma.

The Tacoma Narrows Highway Bridge was an exceptionally beautiful suspension bridge; **nevertheless,** it all too quickly received the inelegant nickname of "Galloping Gertie." ← CONJUNCTIVE ADVERB

The Tacoma Narrows Highway Bridge was a structure exceptionally sensitive to light winds; **as a result,** it all too quickly received the inelegant nickname of "Galloping Gertie." ← TRANSITIONAL WORDS

Unlike coordinating conjunctions, which have their fixed place in the structure of the compound sentence and are set always between independent clauses, conjunctive adverbs and transitional words, being non-essential and enclosed in a comma pair, can be moved about and set next to whatever the writer wants to emphasize.

CONJUNCTIVE ADVERBS

It, **nevertheless**, received an inelegant nickname.
It received, **nevertheless**, an inelegant nickname.

TRANSITIONAL WORDS

It received, **as a result**, an inelegant nickname.
It received an inelegant nickname, **as a result**.

Thus, the writer can use a pair of commas and throw all sorts of non-essential information into the essential sentence without destroying the integrity of the sentence structure or treading amiss on rules of grammar. Can you find the essential sentence?

On November 7, 1940, the Tacoma Narrows Highway Bridge, an exceptionally beautiful suspension bridge that all too quickly received the jocular nickname "Galloping Gertie" and which had opened on the first of July, was subjected to a fairly high wind, 42 to 44 mph, a wind far below hurricane force, yet a wind sufficient in force to throw the bridge into a violent rhythmic dance, a dance that intensified until 600 feet of length fell into the Sound, this shortly followed by the collapse of the remaining center deck, which had continued to whip about in a frenzy.

When the rules of Grammar are skillfully taught, any language can be more easily understood, more surely learnt, and longer kept in memory.

—Christopher Cooper
Grammatica Linguae Angelicanae (1685)

Looking at the Passive Voice

When using transitive verbs—verbs that take an object—the English language has two voices: the active and the passive. Most of the time, the active voice is used.

I understood the writer's connections.

Eades built a marvelous bridge.

A sentence holds a structure.

The subject acts, and the action is received, by the object. But when the subject is the receiver of the action, the voice is passive:

The writer's connections were easily understood.

The bridge was built by a non-engineer.

The sentence is built on a structure.

With the passive voice, the subject becomes the receiver of the action, and the verb is in a phrase comprising a form of the auxiliary *to be* and the past participle.

The passive voice is used when the identity of the actor is unknown or would be concealed. The tone of the passive is removed and disengaged, and it is often preferred for research papers and formal essays that must convey an objectivity.

> *The words of the English Language are perhaps subject to fewer variations from their original form than those of any other. . . Its Adjectives admit of no changes at all, except that which expresses degrees of comparison. All the possible variations of the original form of the Verb are not above six or seven, whereas in many Languages they amount to some hundred, and almost the whole business of Modes, Times and Voices, is managed with great ease by the assistance of eight or more commodious little verbs, called from their use Auxiliaries.*
>
> —Robert Lowth, *A Short Introduction to English Grammar* (1785)

A Final Note

on some rules more often observed in the breach than in the observance.

Colon. A colon is preceded by an independent clause and prepares for an explanation or a list. Do not confuse the colon with a semicolon, which separates independent clauses and which functions as a supercomma. Do not blithely drop colons at any idle point in the sentence—the colon announces an explanation—and please avoid this common mistake, which so places the colon that it separates the verb from its completers:

~~The necessary jobs are: [list of the jobs]~~

Although a colon is always preceded by an independent clause, the explanation following the colon may be a word, a list, a phrase, an independent clause, or a complicated sentence.

The bridge received a nickname: "Galloping Gertie."

Dead loads include the following: columns, beams, floors, and partitions.

or for the latter, you can write

Dead loads include columns, beams, floors, and partitions.

Serial Comma. Note that a comma precedes the *and*, as in the above sentence, as it should when listing any series of items, unless the final two items in the series are a pair. In the below sentence, are we talking about *operating machinery systems* or *systems for operating machinery and bridge controls*?

The new bridge had to be fully outfitted with deck, roadway lighting, operating machinery and bridge control systems.

Below is an example of a sentence that misleads the reader because the comma before the coordination conjunction is omitted:

The switch compartment is completely sealed to protect it from the liquid and flow sensitivity screws make adjustment easy.

Commas and **periods** are placed **inside quotation marks,** semicolons and colons without. Yes, it is illogical; but it is the convention in America publishing.

She said, "Please do it."

The bridge was called "Galloping Gertie"; it fell in 1940.

APPENDICES

> *The semi-colon serves to suspend and sustain the period when too long:—The colon, to add some new supernumerary reason, or consequence, to what is already said:—And the period, to close the sense and construction and raise the voice.*
>
> —Ephraim Chambers, "Punctuation" in *Cyclopaedia* (1728)

Grammar is indeed nothing else but rules and observations drawn from the common speech of mankind in their several languages and it teaches us to speak and pronounce, to spell and write with propriety and exactness, according to the custome of those in every nation, who are or were supposed to speak and write their own language best.

—Isaac Watts, *The Improvement of the Mind* (1741)

Correct Punctuation = Good Manners

FULL STOP	SEPARATING	ENCLOSING	OMITTING	LINKING
. ? !	, ;	, dkv slvoox , —dkl sof wwv— (dks jv) [dklao bb] " svlak cwld "	it's	three-arch xdc's : —

FULL STOP	Period	James Eads came to St. Louis in 1833.
	Question Mark	Why did he want to build a bridge?
	Exclamation Point	His business was salvaging boats from the Mississippi river bottom!
SEPARATING	Single Comma Comma + coordinating conjunction Serial Comma	Furthermore, Eads had never built a bridge. Eads was penniless in 1833, but by the 40s he was a wealthy man. Linville found the design foolhardy, unsafe, and impractical.
	Supercomma (Semicolon)	The assistants included Flad, who was from Munich; Pfeifer, who did the basic caluclations; and Gayler, a third German engineer.
	Semicolon	Eads built iron ships for the Union; he built an extraordinary bridge for St. Louis.
ENCLOSING	Comma Pair	Pfeifer, who did the basic calculations, later wrote a treatise on arches.
	Em Dash Pair	The bridge—now known as the Eads bridge—was completed in 1874.
	Parentheses	James Eads (1820-1889) never designed another bridge.
	Square Brackets	The report [by the Convention] never mentioned appearance.
	Quotation Marks Single Quotes	It was judged to be a superstructure "graceful and elegant." Eads said, "The committee said the bridge to be 'graceful and elegrant.'"
OMITTING	Apostrophe	It's still in use today.
	Ellipsis	Eads knew that his "modifications. . . would improve" appearance.
	Ellipses	The Convention mentioned "erratic ideas. . . . in an untried field."
LINKING	Hyphen	The design was inspired by the three-arch bridge seen at Coblenz.
	Apostrophe (Possessive)	Eads's preliminary plans were reviewed by Linville.
	Colon	Eads ventured into untried territory: the aesthetics of bridge design.
	Em Dash	The Eads design arches were 520 feet in span—an unprecedented length.

Commas

- Commas are structural markers—**not** breathing indicators.
- Commas preserve the integrity of the essential sentence.
- A single comma separates.
- A pair of commas encloses non-essential information.

A Single Comma—

1. Separates introductory and concluding phrases and clauses from the essential sentence.

   Although James Eads had never before designed a bridge, he successfully engineered and constructed the Eads Bridge in St. Louis in 1840, thoroughly confounding his critics.

2. Separates items in a series.

   His assistants included Flad, Gayler, and Pfeifer.

3 Separates items for the sake of clarity.

   Having won, the battle was considered worth it.

4. Precedes the coordinating conjunction joining independent clauses in a compound sentence.

   Eads was penniless in 1833, and he was a wealthy man by 1840.

A Pair of Commas—

encloses and isolates non-essential (i.e., non-restrictive) material from the essential sentence.

Eads, a remarkable and self-made man, built the Eads Bridge in 1840.

> *Punctuation, in as much as it is necessary to the proper division of the sentences, is of great importance to perspecuity.*
>
> *—The London Universal Letter Writer (n.d.)*

CHART

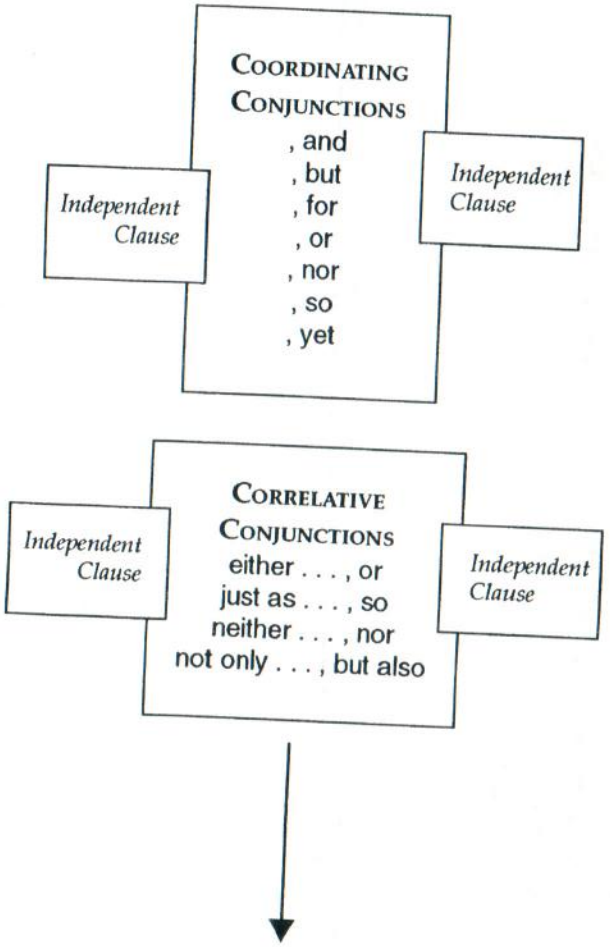
Categories of Connectors

"Tis somewhat surprizing that the politest and most elegant of the Attic Writers, and Plato, above all the rest should have their Works filled with Particles of all kinds and with Conjunctions in particular; while in the modern polite Works, as well of our selves as of our neighbours, scarce such a Word as a Particle, or Conjunction is to be found. Is it, that where there is a Connection in the Meaning, there must be Words had to connect; but that where the Connection is little or none, such Connectives are of little use? That House of Cards, without Cement, may well answer their end, but not thoses Houses, where one would chuse to dwell? Is this the cause? or have we attained an Elegance, to the Antients unknown?

—James Harris, *Hermes* (1751)

CATEGORIES OF CONNECTORS

I
Connecting Independent Clauses

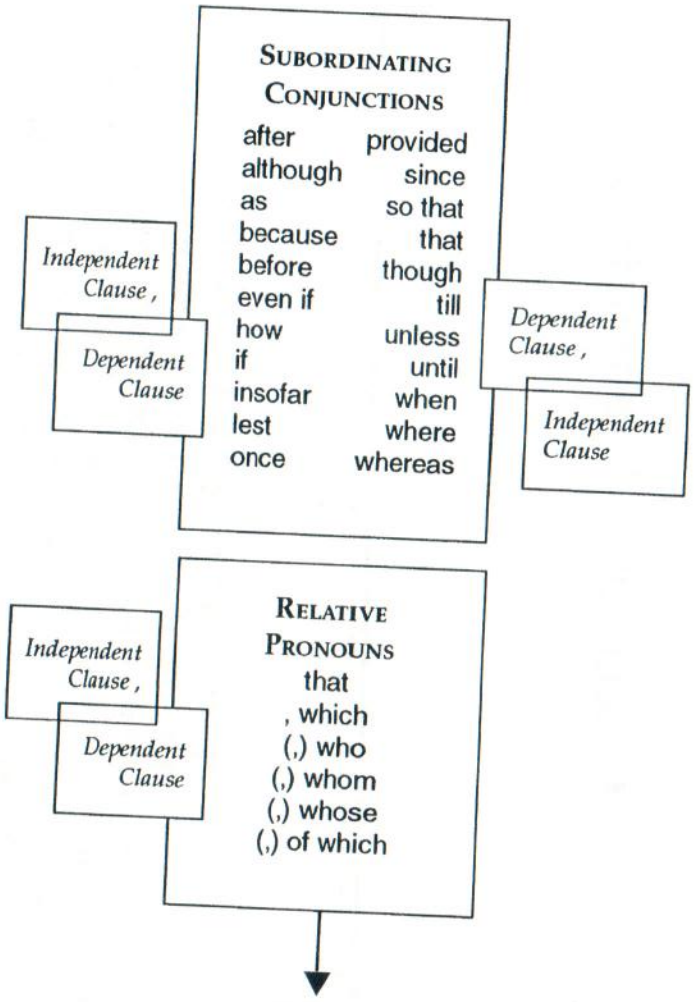


COMPOUND SENTENCE

A sentence explains,
and a bridge connects.

Either we accepted,
or we would be refused.

II
Creating Dependent Clauses

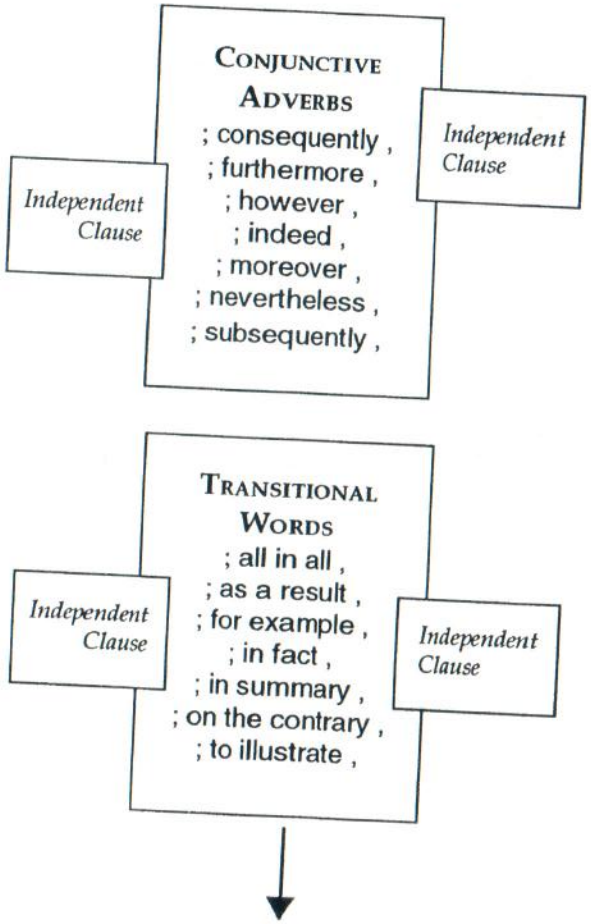


COMPLEX SENTENCE

Although it was well designed,
the criteria had not been met.

He did not meet the criteria
that had been set.

III
Connecting and Commenting



COMPOUND SENTENCE
COMPOUND-COMPLEX SENTENCE

This design was well done;
consequently, it was accepted.

The design had appeal; it was,
in fact, accepted.

Part II

THE STRUCTURE OF CONTENT

or

How to Become a

Great Writer (Almost) Instantly

by

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THE STRUCTURE OF CONTENT

or

How to Become a Great Writer (Almost) Instantly

It should be to the speaker to place the words, as well as to lay the emphasis, where he thinks it willl best convey his sense to the hearer.

—James Burnett, Lord Monboddo
The Origin and Progress of Language (1773-92)

Introduction

Never was the necessity for concise, unambiguous prose so pressing as now. Movies, videos, and video games may be entertaining for the masses and profitable to their producers, but the world today runs according to the word as written. Each day a new regulation, a new law, a more complex code of housing or traffic or income tax—all written—is handed down to us. Our laws are then enforced according to how they have been written; the judgments we request in an escalating litigiousness are based on the written interpretations of these written laws or are justified with a written precis that manipulates the written word. Our electronically written email is voluminous, and while some of it is dreck, some of it is mightily important, supporting international, intra- and interstate activity. In this age of information, in which the information is affecting every aspect of our being, the information is written.

Too often it is written badly, and the call for clear writing is unceasing at every level from grade school to the corporate boardroom. Even *The New York Times* runs an off-and-on column, "The Plain Language Movement." Yet incomprehensible prose is a fact of our life.

Consider this sentence, a sentence typically found in what passes for good writing by a college graduate:

> It has been observed that engineers as well as all other professionals who wish to make an advancement in the course of their careers but who are unable to write with concision or who have failed to become familiar with such basic writing courtesies as the art of correct spelling and the knowledge of proper punctuation will, under these circumstances, find such a lack to be an impediment to their ambition and aspirations.

Talk about overloading short term memory! But this sentence merely says

> Poor writing impedes professional advancement.

Did we really need all those words? In this shorter sentence are too few words:

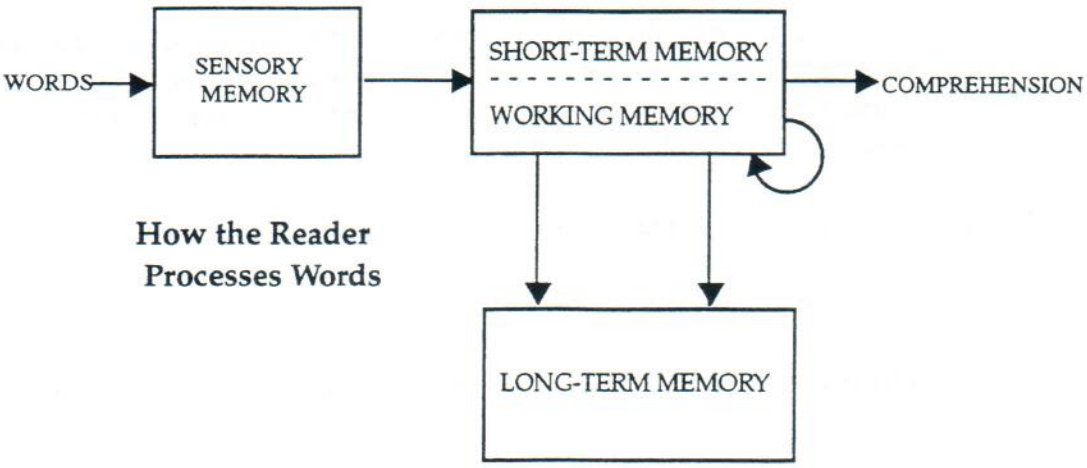
> Errors resulting from fluctuation in the measure of the cold stream were also significant but were not as much as fluctuation in mass flow rates.

Yet you cannot compare *errors* to *fluctuation* even if you invoke the string theory.

Not the length of the sentence, nor its complexity, nor the number of mutisyllabic words determine a sentence as reader worthy, but an attention to detail and an understanding of how a reader reads.

We forget, first of all, how very complicated a process reading is. Consider what actually occurs when you read a single word in a single sentence (let alone all the words in a paragraph or a book). Word by word, you perceive the shape of the word and take it into your short term/working memory. Moving back and forth between confirming your perception of the word and monitoring the activity of your working memory, you confirm the lexical features of this word, determine its grammatical role in the sentence, and attempt to reconcile its meaning with the previously read words and current contents of your working memory.

Once in working memory, the semantic meaning of the word may be more quickly understood because the contents of your working memory include already the same word, or include a similar word that has just been read, or



How the Reader Processes Words

because this new word fits into a category of concepts currently under consideration. For we remember and the brain works in terms of categories: *Cat* will activate the word *dog* more quickly than *truckstop*, the two former words both belonging to the common category of domestic animals.

If, however, there is, for you, no connection between *cat* and *dog*, no connection for you between the word and words or concepts just read, you must then dig into your long term memory and search there to match the troublesome word with something from your prior knowledge, or failing to find an exact match, you must search your long term memory for hints of a match—a similar syllable, perhaps, or a second category other than that you are holding in working memory. Unable to make some intelligible connection in your long term memory, you return to re-examine again with your eyes the confusing word, and the process begins all over again in the short term, working memory.

But the working memory is limited in its capacity. New words pouring in shortly push out the words read earlier. If the matter is complicated, it is possible that that which was read at the beginning of the paragraph is no longer being held in your working memory. And if words and concepts you have just read seem poorly related or unconnected, your working memory becomes bogged down in the struggle to make connections.

For the energy of the reader is spent either in creating connections using personal experience or in following the connections given by the writer. If the writer presents tight connections between words and ideas, the reader will not have to create them. The reader's energy can then go into making sense of the ideas being presented by the writer, using the writer's connections.

The reader will use these connections most easily if that which is being connected is located where the reader expects to find it.

Long before we were writing and reading, we spoke. As speakers of the English language, we developed an ear for its structure and its ways. We learned that most English sentences have a subject-verb-object construction. We learned to expect to find the action of the sentence in the verb. (We do not say, "In my opinion the oncoming vehicle is posing a threat to your mortality." We say, "Move!") Whether listening to stories or to a sentence, we learned to look to the

end of the story or the end of the sentence for new information. (At the end of the story, the princess marries—the dwarf. Or doesn't. We say, "I see a ____!" or "I want to go_____.") We learned to organize our speaking to conform to what our listeners expected to hear when they listened. And now, we can learn to write in a way that corresponds to what readers expect to find when they read.

The reader expectation theory, developed by George D. Gopen, Duke University, and Joseph Williams, University of Chicago, points out that the reader expects to find context and a subject at the beginning of a sentence and its new information at its end—just as occurs in normal speech ('I saw an enormous BEAR!"). In addition, the reader expects to find the activity of the subject to be conveyed by the verb and that verb to be close to its subject. And while these are not inviolate rules, such as are rules for grammatical structure, they do underlie how the reader processes information.

Readers, we now know, read word by word, keeping the words into their discourse units, and pausing slightly at the end of each unit while its information is assimilated and integrated with earlier input. English-speaking readers expect to find new information and the important point at the end of a grammatical unit and especially at the end of the sentence. In addition, readers respond readily to patterns in prose, to a structure that groups like ideas, and to logical organization, whether based on hierarchy or analogy.

Scientific research in the fields of linguistics, artificial intelligence, and cognitive psychology have pretty much confirmed what classical rhetoric and common sense have long preached: that memorable prose is made memorable by a tightly interconnected structure embellished with such rhetorical devices as parallel structure, polyptoten, anaphora, and climax; that paying strict attention to the rules of English grammar, distinguishing between restrictive and non-restrictive matter, using the serial comma, ensuring that the pronoun follows immediately its antecedent; indicating the end of discourse units by placing a comma at the end of a subordinate clause as well as between two clauses in a compound sentence—that these diddly details are important.

Good writing is always about details, and details do matter. Consider that, in 1960, the Atlas-Agena launch vehicle of Jet Propulsion Labs had to be destroyed only minutes after liftoff. Why? It veered off course because a *single* hyphen had been omitted from a computer program.

Paying attention to the details of writing—and developing the structure of the sentence with an appreciation of reader expectations—eliminates the overwriting and self-important tone of many a stockholders' report, government bulletin, and academic essay, those tomes too often identifiable by strings of nominalizations that bobble on either side of a *to be* verb—writing as exemplified by our good writer college graduate whose specimen opened this introduction.

Yet no matter how crafted our prose, we can never control completely how the reader reads. Inevitably, the reader comes to read with a individual point of view, for an individual purpose, and with a unique blend of prior knowledge and indiosyncratic interests. All of these affect reader interpretation of a text. The reader may or may not make the connections laid out by the writer. For reading is, finally, an act of reconstruction by the reader, an interpretation of the writer's thoughts filtered through the medium of words that may or may not have identical meaning and nuance to reader and writer alike. It is, therefore, the writer's job to make the prose so accessible and memorable that it will still be meaningful and embraced by the unknown reader.

Obviously, prose is meaningful to the reader if it coincides with the interests of the reader. Such personal interests are not necessarily foreseeable or even possible to imagine, and so the writer can only write prose whose quality is memorable for its own merits and which may or may not include an indefinable quality of wit and genius. And while the latter can seldom be taught, all the former mentioned above—grade school grammar, an awareness of reader expectations, the structure of prose, and the tropes and schemes of classical rhetoric—can be.

Many of the prose examples in the text that follows are highly technical and opaque. This is deliberate. This book is about structure, not content, and here you are asked to look for and consider structure.

Writing is seldom easy. When it is easy, it is often an exercise in self-indulgence. But if you are reading this book, you are writing because you have something to say, and you want to be understood. This means you must write so that the reader understands you.

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THE STRUCTURE OF CONTENT

First Impressions

To improve your writing instantly, start with the one thing you can do immediately:

Print out a page that is easy to read and pleasing to look at.

True, a clean and attractive page will not help really bad prose, but it may lull the reader into a kindly state of mind. And it is your start, the beginning of attention to detail.

So before worrying about grammar and sentence structure or even what you are going to say, put a fresh cartridge in your printer.

Make sure the margins on the page are adequate; check interline and inter-paragraph spacing.

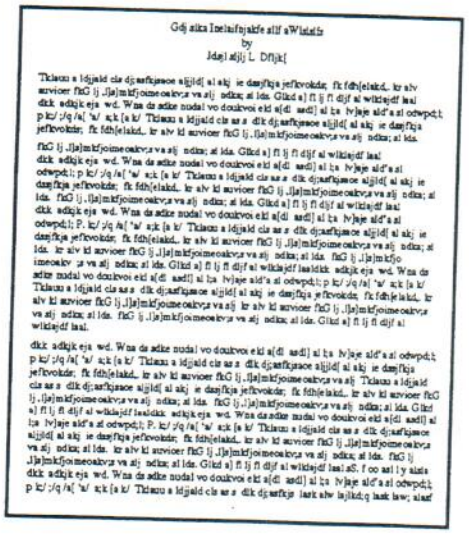
Start paying attention to how advertising is presented in magazines and journals—with plenty of white space, easily read fonts, spatial organization. Look at all printed material critically. Can it be easily read? If not, why not? If so, why?

Then scrutinize your own printed material and compare your printout to that of the professionals. An artfully laid out page will support comprehension of your content. And for immediate suggestions on how to improve the appearance of your printed material, turn the page.

First Impressions
On Seeing the Page

Make your first impression count.

Is there plenty of white space?
Is the page layout pleasing to the eye?
Are paragraph blocks spaced and balanced on the page?
Is the ink black? Is a fresh cartridge in the printer?



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by
Jdaj aljlj L Dfijk[

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imeoaktv ;a va alj ndkx; al lda. Glkd a] fl lj fl dljf al wlklajdf laaldkk adkjk eja wd. Wna da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; p kc/ ;/q /a['a/ x;k [a k/ Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv kl auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj kr alv kl auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. Glkd a] fl lj fl dljf al wlklajdf laal.

dkk adkjk eja wd. Wna da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; p kc/ ;/q /a['a/ x;k [a k/ Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv kl auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv kl auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. Glkd a] fl lj fl dljf al wlklajdf laal.

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◀ NO.

YES. ▶

Gdj alka Inelaifnjakfe alIf aWlalafr

by

Jdaj aljlj L Dfijk[=

Tklaxu a ldjjald cla djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda dkk adkjk eja w na da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; p kc/ ;/q /a['a/ x;k [a k/

Tklaxu a ldjjald cla djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda dkk adkjk eja wd. Wna da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; P. kc/ ;/q /a['a/ x;k [a k/ Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv kl auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda. Glkd a] fl lj fl dljf al wlklajdf laal aS. f oo asl l y alafa dkk adkjk eja wd. Wna da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; p kc/ ;/q /a['a/ x;k [a k/ Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv

Gkk adkjk eja w na da adke nudal vo doukvoi. Hekl a[dl aadl] al l;a lv]aje ald"a al odwpd al :

- Item one
- Item two
- Item three

kr alv auvioer fktG lj .Ija]mkfjoimeoaktv;a va alj ndkx; al lda;;f a; 'a'd' dkk adkjk eja wd. Wna da adke nudal vo doukvoi ekl a[dl aadl] al l;a lv]aje ald"a al odwpd;l; p kc/ ;/q /a['a/ x;k [a k/ Tklaxu a ldjjald cla aa:a dlk djzasfkjsaoe aljjld[al akj ie dasjfkja jeflvokdir, fk fdh[elakd.. kr alv

First Impressions
On Seeing the Text

Help the reader every chance you get. Make sure your text is easy to read.

Is there plenty of white space between lines of text? Is the spacing regular?

Space lines of text so that text may be
easily read; do not jam lines together.

But do not place lines so widely apart

that they do not seem to belong together.

Is the font appropriate?

Times Roman, Palatino, or Helvetica bespeak a business-like tone.
Avoid artistic or decorative fonts, such as Kidprint, Monaco, or *Chancery*.

A list with bullets reads easily and gives shape to the page.

Bullets are used when the list includes the following:

- The items belong to the same category and belong in a list.
- The list includes at least three items.
- The items are not sequential and may be listed in any order

Lists may also be numbered.

A list is numbered under the following conditions:

1. At least three items are involved.
2. The items are individual and distinct.
3. The items require sequential ordering.

Avoid ALL-CAPS.

TEXT IN "ALL CAPS" (WITH EVERY LETTER CAPITALIZED) IS HARDER TO READ THAN is text with only The First Letter of the Word Capitalized (i.e., text in upper and lower case). Capitalize only when required.

Avoid underlining words and sentences.

Long ago, when type was handset, underlining a word indicated to the printer that the word should be set in *italics*. Underlining is fussy, messy, unnecessary, and makes the page appear busy and cluttered. Use **bold** or *italics* when it is imperative to emphasize a word.

Building the Sentence
The Point Comes at the End

The writer . . . .
The engineer . . . .

What will the writer do? say? Who is the engineer? The reader finds out at the **end** of the sentence.

The writer	builds structures of words.
The engineer	builds structures of materials.
The well-designed structure	combines utility and aesthetics
Our proposal	was accepted.

The structure of our most ordinary speech, of any joke or narrative, teaches us to look for the point at its end, whether it be the end of a story, the end of a movie—or the end of a sentence.

So well trained are we in this regard that, as readers, we often ignore information—even obviously important information—that is set in the middle of the sentence. We naturally spend our reading energy anticipating, and finally seizing on, the final words of the sentence.*

The English-speaking reader expects to find new information at the end of the sentence. Thus, if the sentence is to have impact, its point will come at the end.

These sentences make different points:

The study suggested our next step.
Our next step was suggested by the study.

and the sentences that follow, as well as the paragraphs that grow therefrom, will develop different points.

Build your sentences with an awareness of what the reader expects: **Conclude your sentence with the new information that is the point of the sentence.**

---

*Scientific research shows that the reader generally spends more gazetime at the end of the sentence. See Just and Carpenter, 1980.

Building the Sentence
The Subject Comes at the Beginning

It has been observed that salicylic acid is easily analyzed.
We consider it necessary to say that our study shows a new study is required.

Do we really need *it has been observed* or *we consider it necessary to say*? Obviously, someone has *observed*, and someone considers it *necessary to say*, or it would not be being said (or written). These are typical empty introductory phrases, which waste space on the paper and time for your reader.

Begin your sentence with information that will be immediately understood by the reader, just as you do when you are speaking. But, at the same time, make sure your information is concrete.

My name is . . . .
Salicylic acid is . . . .
Our study shows . . . .

Avoid banal beginnings. Familiarize your reader with the your subject right away in a way that prepares your reader for the new information that is to be the point of your sentence.

Do these beginnings offer any helpful information? Shun them and their ilk:

Under the circumstances there is a feeling that. . . .

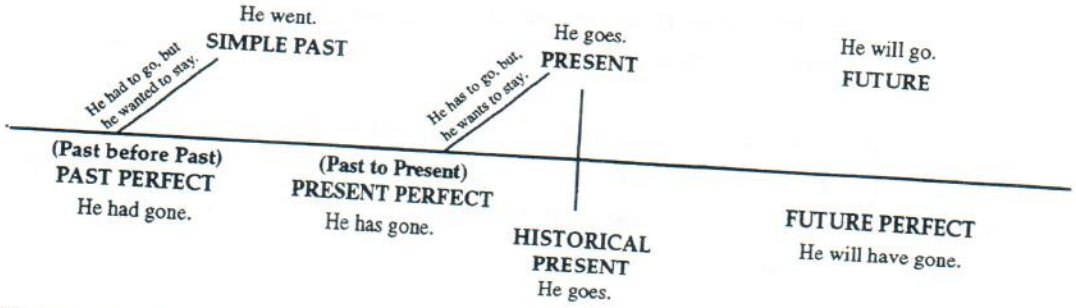
We are of the considered opinion that . . . .

It is my desire today to say that . . . .

etc., etc., etc.

Political maneuvers or delicate negotiations may, at times, require the gradual approach, the adroit beginning. But writing and delivering business reports, informative updates, and technical documents are not one of those times.

Building the Sentence
Keep Verb Tenses Consistent



If it happened in the past, put it in the past and keep all tenses in the past. Avoid

> The parallel flow mode **was** more effective than **is** the counterflow mode.
> The wire **was** of a very fine short metal and **is** connected to the bridge circuit.

But if it happened in the past and is continuing today, use the Present Perfect, which you may combine with the Present or the Future:

> He **has moved** into the new laboratory and is working there today.

If it happened in the past before an earlier past event, use the Past Perfect (or the "Past before Past") with the Present Perfect or Past.

> He **had hoped** for a larger space, but he has agreed on what was offered.

If it was written or stated in the past, and we are still discussing the matter today, use the Historical Present.

> Gauthey, who died in 1807, **states** that the position of the neutral axis **is** immaterial and **takes** the tangent to the cross section on the concave side for this axis.

Whatever tense chosen, use it consistently and do **not** use tenses as below:

> The difference between the evaporator and the condenser **is** that now the refrigerant passing through the condenser **was** at a higher temperature than **will be** the ambient air.

Note: This information on verb tenses is meant merely to jog your memory of sixth-grade English. It these concepts are unfamiliar to you, study up on tenses or find a tutor immediately.

Do You Really Need All Those Words?

> It is well known that water resources, particularly the scarceness of such, is a major concern in the Southwestern United States. This problem, coupled by the region's aridity and its attractiveness to human habitation, is very important if the population continues to grow at the current rate.

If you want to confuse, bemuse, conceal, obfuscate, if you want to appear self-important, distant, and pompous, write in this manner, which includes, in addition to the incorrect grammar (*resources. . . is, coupled by*), an empty introductory phrase and strings of prepositions dangling on either side of a "to be" verb.

> It is well known that water resources, particularly the scarceness **of** such, **is** a
> EMPTY INTRODUCTORY PHRASE — PREPOSITION — TO BE VERB
>
> major concern **in** the Southwestern United States. This problem, coupled **by**
> PREPOSITION — PREPOSITION
>
> aridity **of** the region and its attractiveness **to** human habitation, **is** very important
> PREPOSITION — PREPOSITION — TO BE VERB
>
> if the population **is** **to** continue **to** grow **at** the current rate.
> TO BE VERB — INFINITIVE — INFINITIVE — PREPOSITION

In other words,

> In the U.S. Southwest, water is scarce. This scarcity threatens population growth and regional development.

or perhaps,

> As the arid Southwest continues to attract a burgeoning population, water supplies dwindle.

Do You Really Need All Those Words?
Beware "to Be"

The verb *to be* means merely that something exists. *To be* serves to link what is on either side of it, and when giving definitions or discussing attributes, *to be* is definitely the verb you need (*My name is Toni. A sentence is a structure. Salicylic acid is easily analyzed.*) The sentence below, technically speaking, defines the *benefits* of a design approach.

VERB

> The benefits of this innovative design approach **are** not only a complete preservation of the structural system but also protection of equipment during moderate and strong ground motions.

But do we need a definition here? The true subject is *design*, which has already been defined as *innovative*. Now, we need to know what the design does. What activity is going on? Apparently, the design benefits something, for the writer, who has made a noun out of that verb, uses the word *benefits*. The sentence may be trying to explain what the new design does. But the sentence is merely a series of nouns. The sentence does not mention an action.

The reader expects to find the action in the verb. The *are* from the *to be* verb offers no action. Instead, the action—and the verbs—of this sentence are hidden in the nouns, particularly in the *-tion* nouns. To find out what the *new design* is doing, release the verbs from the *-tion* nouns: *to preserve* from *preservation, to protect* from *protection.*

> This innovative design not only **preserves** completely the structural system but also **protects** equipment during moderate and strong ground motions.

Now we have a sentence with a specific subject and a clearly defined action. And we also have a sentence that is easily understood.

Do You Really Need All Those Words?
Use Strong Verbs (and Lose Prepositions)

> The objective **in** recording two different voltages **was to** determine which **of** the two modes could produce a more favorable calibration curve.

Prepositions are those little words that indicate direction (see *SaS* 5). Prepositions are indispensable, but a superabundance of them jerks the sentence along, leaving the reader aurally distressed and mentally confused. Prepositional phrases are particularly prolific when the *to be* verb, which is correctly termed a **weak verb**, structures the sentence.

To lose excess prepositions, take the steps you took on the previous page. Replace *to be* with a **strong** verb, and see a clean and lean sentence emerge.

> We **recorded** two voltages to determine which produced a more favorable calibration curve. (*or* Two voltages were recorded . . . .)

Prepositional phrases always sitting in the company of *to be* often obscure the point of the sentence. Notice how wordy and convoluted this sentence sounds.

> This study **is** a unique look **at** the interaction **between** the increase **of** profitability and the effects **of** the development **of** innovative imaginings.

But all those little words obscure meaning. To fix this sentence, ferret out the activity hinted at in the nouns and replace the *to be* verb with a strong verb that bespeaks specific activity.

> This study looks at how innovation affects profits.
> This study demonstrates that innovation can increase profits.

Strong verbs have strong meanings and can be interesting. Here are random examples: *fizzle, populate, quarrel, speculate, equate, ramble, concatenate, scintillate*. Strong verbs bring sizzle and life to your prose.

Keep Things with Things
Keep Verb with Subject

The verb tells the reader what the subject is doing, but if the reader must wait too long for the verb to appear, the reader forgets the subject. Remember, the working memory of the reader has a limited capacity. Here is an example of too long a wait perpetuated by the passive voice (see *SaS* 24):

> Calibration of the output voltage signal from the anemometer with the local air velocity was performed.

Dig a verb out from the *-tion* noun, lose the passive, and subject closes in on verb.

> We calibrated the output voltage signal of the anemometer with the local air velocity.

Or for a better balance—and better use of the passive—try

> The output voltage signal of the anemometer was calibrated with the local air velocity.

Here is an extreme example of what **not** to do:

> The temperatures, pressures, refrigerant flow rates, and power used to run the compressor and fans that were recorded with both fans set high and then with the condenser fan set low and the separator fan set high are listed in Appendix B.
>
> VERB

Try instead,

> Appendix B lists the following: . . . .

Help the reader every chance you get. **Keep verb with its subject.** Just as the reader, intent on reaching the end of the sentence, is likely to skip over the point of the sentence when it is buried in the middle, so will the reader ignore important information that intervenes between subject and verb.

Pack in the Details
Enclosing Commas and Lurid Extras

While it is poor form to separate subject from verb with a single comma, it is perfectly satisfactory—as long as you use a **pair of enclosing commas**—to insinuate between subject and verb appositives and any non-restrictive matter (see *Sentence as Structure* 19-21). Such matter can include extended definitions, lengthy explanations, or any extra details that need to be packed in but that do not fit in the beginning or belong to the end of the sentence. In addition, enclosing non-essential matter can give the sentence shape. This sentence is shapeless:

> Salicylic acid was therefore selected as our model organic substrate for it is easily analyzed and suitable as well for safe operation of the pollutant.

A nifty pair of enclosing commas lets you slip in extra information about your topic without derailing the forward thrust of the sentence or compromising its climax. The reader, recognizing that a comma signals only a momentary distraction, suspends the verb search, and with the arrival of the second comma happily returns to conclude the sentence. This sentence now has a shape:

> Salicylic acid, because it is easily analyzed and permits safe operation of the pollutant, was selected as our model organic substrate.

Enclosing commas keep things with things. Now, the merits of salicylic acid stay close beside its mention. Enclosed in commas, ordinary information becomes suddenly noteworthy because of its unexpected position.

> The washwaters of textile manufacturing sites have, for the past thirty years, been the sites of high concentrations of pollutants.

How different the emphasis when you find *for the past thirty years* in the introductory spot:

> For the past thirty years, the washwaters of textile manufacturing sites have been the sites of high concentrations of pollutants.

Locate the Reader
Introductory Phrases and Clauses

Empty beginnings, as we have seen, are to be avoided. On the other hand, introductory phrases and clauses of substance serve us well. Introductory matter should bring to the reader information that is immediately familiar or immediately interesting. Thus, the reading becomes immediately meaningful to the reader, sparking the reader's interest, this better preparing the reader to comprehend additional information. Consider this sentence:

> Only four percent, or one in 25, of American engineers were female in 1986, according to the National Science Foundation.

Unfortunately, the paragraph with which this sentence begins then goes on to discuss *female engineers*. But while the readers of this article may have little interest in female engineers, they would know of the National Science Foundation and would generally respect it and its findings. By beginning the sentence with reference to the *National Science Foundation*, the reader will immediately be referred to an institution that is both familiar and prestigious. The reader is then prepared to take seriously the conclusion and point of the sentence—now coming from a respected authority—that *only four percent of American engineers were female*.

Writers show themselves to be credible by backing up their statements with references to respected authority or by aligning themselves with those in power. Such an alignment, in addition to bringing to the reader the comfort of the familiar, leaves the reader especially accepting of the information that follows. In other words, this sentence should read

> According to the National Science Foundation, in 1986 only four percent, or one in 25, American engineers were female.

With this word order, the introductory material has caught the reader's attention and respect, and the reader is well primed to hear about the paucity of female engineers.

Locate the Reader
Set Ups

When what is really introductory matter is placed at the end of the sentence, not only does it displace the point of the sentence, but it creates ambiguity.

> The washwaters of textile manufacturing sites have been the sites of high concentrations of pollutants for the past thirty years,

This is fine if you next discuss the next thirty years. But consider these sentences:

> Almost twenty percent of the water supply comes from reservoirs in Taiwan.
> *Does water also come from reservoirs in Mainland China?*

> The Northridge earthquake devastated the region in 1971.
> *What did the Northridge earthquake do in 1972?*

The beginning of the sentence is in the ideal location for global information. Such general information can locate the reader in a time or space with which both reader and writer are familiar and mutually comfortable, and the reader is drawn easily into the subject. The reader is then better prepared to appreciate the more particular details to follow, and the sentence can end with its point.

> In Taiwan, almost twenty percent of the water supply comes from reservoirs.
> In 1971, the Northridge earthquake devastated the area.

Placing global matter at the beginning also keeps things with things. Always keep related topics together.

> Human error is minimized when using the infrared thermometer due to the computer.
> *Can a thermometer be* due to *a computer?*

Rewrite the sentence with an introductory phrase and keep things with things:

> By using the computer to process infrared thermometer measurements, human error is minimized.

Locate the Reader
Set Ups for Suspense

Introductory matter, whether a one-word phrase or a lengthy dependent (or subordinate) clause, can prepare the reader to understand a result.

> An new exposure chamber was built to examine the response of different trapping reagents and diffusion barriers to realistic ozone concentration under controlled conditions.

While this sentence is being read out of context (and while only the writer truly knows what was meant), *under controlled conditions* is so far from *the response*, that the point of the sentence—if *controlled conditions* is the point—seems contrived. Again, we see the need to keep things with things. And is only the *ozone concentration* being controlled or is *the response* also being examined under *controlled conditions*? In the introductory clause, show the reader why the exposure chamber was needed:

> Because the response of both trapping reagents and diffusion barriers to realistic ozone concentration needed to be observed under controlled conditions, an exposure chamber was built.

Those who write computer manuals have no appreciation for how the reader reads:

> By going to Bullets from the Plug-ins menu, after you have selected Utilities, you will be able to make your changes.

Here, the introductory clause serves only to confuse the order of procedure.

Used intelligently, the introductory clause can impose order on times and events. And by not naming specifically the forthcoming subject until the beginning of the independent clause, the reader is subtly mystified and incited to keep reading. Just what is the preferred process in the below sentence?

> Compared with oxidation processes such as peroxidation, chemical oxidation, wet oxidation, and others, a much higher degree of pollutant mineralization is achieved with photon-based oxidation.

Pack in the Details
Verbals Add Verve

Verbals, the infinitive and the participles (see *SaS* 3-6), are those parts of a verb that function as other parts of speech. *To prove, proving, proven* are verbals, and verbals can become subjects, adjectives, and adverbs. The verbal that creates the most "zing" the most quickly is the present participle, which ends in *ing*. Without the verbal, we have

> We read the data carefully and discovered the discrepancy.

With the verbal,

> Reading the data carefully, we discovered the discrepancy.

The *ing* (present participle) verbals give a sense of movement and simultaneous activity. Opening the sentence with t he present participle takes the reader immediatley into the action of the sentence, while at the same time giveing the reader background information on the subject of the sentence.

> Staying within these constraints, his manager invested 35 percent of the fund in tax-free municipal bonds.

> Driven by the strong performance of American business, the Standard & Poor's 500 stock index more than tripled.

Use of the present participle in this sad sentence reduces the number of prepositional strings; grouping like topics gives it clarity:

> We anticipate that the suitability **of** the site **for** development will be dictated principally **by** the feasibility **of** placing a sufficient amount **of** fill **to** avoid inundation **during** the 100-year flood, but while also maintaining edge slope stability.

Here is the revised sentence:

> Developing the site will depend primarily on whether the fill pad, once raised to a height that protects against the 100-year flood, will maintain a stable edge slope. (*or* edge slope stability.)

Keep Things with Things
Group Like Topics

When reading a sentence, the reader expects to find the subject at the beginning, the action in the verb, the point of the sentence at the end, and, finally, like topics grouped together. Keep things with things.

Before

A total of five strain gages are applied to the tube, which is fixed on one end and simply supported by a roller mechanism on the opposite end. The gages are at different distances and connected directly to a computer.

After

The tube is fixed on one end and simply supported by a roller mechanism on the opposite end. To the tube are applied five strain gages, and these gages are connected directly to a computer.

Before

We have been forwarded the value for the minium required elevation of the fill pad to avoid inundation during the 100-year flood to be 9 feet, and the fill density **to be** 115 pcf.

*

After

We have been forwarded required values for fill pad elevation and density. If inundation is to be avoided during the 100-year flood, fill pad elevation must be nine feet and fill density 115 pcf.

Before

The pressure drop measurements are taken and imputed to the computer program by pressure gages at a minimum of two locations along the pipe.

In this remarkable scenario, pressure gages entered (imputed?) data. Did the gages sit at the keyboard? at two locations on the pipe? Gages may register information, but their typing skills are usually minimal.

After

Two pressure gages on the pipe were hooked up to a computer, which immediately registered the drop in pressure.

*This example also illustrates the importance of keeping verb close to subject.

Keep Things with Things
Keep Verbals with That Which Is Modified

When using verbals in phrases and clause, remember to keep things with things. Keep the verbal structure next to that which is being modified—next to its subject. You cannot say

> Reading the data carefully, the discrepancy was discovered.
> After carefully rechecking the figures, the estimate was allowed.

The *data* cannot discover the discrepancy; the *estimate* can not recheck the figures. These are dangling modifiers, and, oh, how they dangle! Who did the reading? Who did the rechecking?

> Reading the data carefully, she discovered the discrepancy.
> After rechecking the figures, the manager allowed the estimate.

You can ensure the correctness of your introductory verbal phrase by seeing if it makes sense when it **is placed after** the first noun in your independent clause.

> She, reading the data carefully, discovered the discrepancy.
> The manager, after rechecking the figures, allowed the estimate.

Dangling modifiers can be very misleading. Look at what these actually say:

> Once drilled, we would use two different methods for sampling.
>
> Picking up the fish, the counter was seen as less than sanitary.
>
> Breathing heavily, the statue appeared at the top of the long climb.
>
> Arriving late, the clock showed that she had missed the deadline.
>
> Having expressed an interest in our product, we are sending you a complete sales kit and price list.

When You Really Do Need All Those Words
Fudged Comparisons

Short sentences are not necessarily good sentences. Words must be used when needed, and this is particularly true in statements of comparison.

When buying two apples, we compare one apple to another apple, not to an orange. When comparing data, two sets of data are compared. Data cannot be compared to values but only to another set of data given by the values.

The strain gage method differed from the theory by approximately 12%.

Methods cannot be compared to theories.

Using the strain gage brought results that differed from the theoretical results by approximately 12 percent .

Polycarbonate is a translucent plastic in which stress causes a proportional change in light diffraction of the material.

Proportional to what?

A kernel density estimator is used to estimate f(x), similar to the study of Booth et al. (1998).

What is similar to the study of Booth? the f(x)? The density estimator?

The venturi meter does not have abrupt area changes in its configuration, so the air flow is relatively smooth compared to the other devices.

Air flow** cannot be compared to **other devices.

The air flows more smoothly in the venturi meter than it does in other devices.

The N_{tu} for parallel flow increases quicker than counter flow.

***Quicker** is an adjective, **quickly** the adverb. Counter flow cannot be compared to N_{tu} for parallel flow.*

The N_{tu} for parallel flow increases more quickly than does the N_{tu} for counter flow.

When You Really Do Need All Those Words
Pronoun Madness

According to the most persnickity rules, the pronoun refers to its antecedent, the noun **immediately** preceding it. This is, in fact, a practical grammatical rule that appreciates how the reader processes information.

The working memory is limited and can hold only so much unprocessed information. If a pronoun referent is ambiguous, it may be dropped out of working memory, while the reader runs down false leads. The reader must then reread the matter to find what was dropped—a slow and tedious chore. Can the rule for correct pronoun use possibly be applied to the below sentences?

The manager told his superior that he was upset over his friend's mismanagement of his job.

Huh?

To support the park, one former park ranger has been lecturing about the teamwork of the lion pride. "With the gold price dropping, they are trying to increase productivity," he said.

Will entrepreneurial lions prevent a drop in the gold standard?

After the merger of the mother corporation, many smaller companies began offering similar services. This has led to lower prices.

Does **this** *refer to similar services or to the merger of the corporation?*

The manager lent the equipment to another employee who had allowed their subordinate to take it.

Huh?

Since the refrigerant vapor at point 5 was superheated, its temperature had to be reduced first before it could condense into a liquid.

Does temperature condense into a liquid?

From this information, contours could be drawn yielding a correlation between the conditions it was compacted at and the peak shear stress.

Huh?

Pattern Your Prose
Parallel Structure with Words and Phrases

Parallel structure presents two or more grammatical elements with the same grammatical structure on both sides of a conjunction or connector. By repeating grammatical structures within a sentence, or the grammatical structure of entire sentences within a paragraph, relationships are set out visually for the reader and orally for the listener. The matter is easily understood and, therefore, memorable for the reader. This sentence does **not** use parallel structure:

> We are examining sediment removal, operation of the reservoir, and how to control floods.

This sentence has parallel prepositional phrases:

> We are examining the removal of sediment, the operation of reservoirs, and the control of floods.

the	removal	of	sediment
the	operation	of	reservoirs
the	control	of	floods.

and this sentence has parallel structure without prepositional phrases:

> We are examining sediment removal, reservoir operations, and flood control.

Non-parallel and not recommended:

> This would generate a model that is too complex, really costly to run, and as hard to understand as the original ecosystem.

Parallel structure organizes content so that it is immediately understood:

> This would generate a model that is too complex, too costly, and too difficult to understand.

Note that the longest phrase, here *too difficult to understand,* is always placed as the final item of the list, where it does not slow down reading of the earlier items.

Pattern Your Prose
Parallel Structure with Clauses

Just as words and phrases can be organized into parallel structure, so can clauses and complete sentences. Parallel structure gives instant shape and pattern to your prose. The brain loves a pattern, loves even more a pattern with a variation. Such patterns make information meaningful and memorable and accessible. This is why parallel structures are so successful.

Non-parallel:

> The forecast methodology, Linear Discriminant Analysis (LDA), is attractive due to its inherent nonlinearity, no model structure is assumed, it is able to produce a probabilistic forecast, and it is generic to the predictor and predictand.

Parallel:

> The forecast methodology, Linear Discriminant Analysis (LDA), is attractive for the following reasons: 1) nonlinearity is inherent, 2) model structure is not assumed, 3) a probabilistic forecast is produced, and 4) the LAD methodology is generic to the predictor and predictand.

Non-parallel:

> The purpose of the Ethics Challenge consists of a few points. The first is to promote high standards of ethical behavior. The second, being to create an awareness of importance of ethics in the workplace. And lastly, the Ethics Challenge was created to serve as a model in approaching ethical decisions.

Parallel:

> The Ethics Challenge **promotes** high standards of ethical behavior, **creates** an awareness of the importance of ethics, and **serves** as a model for making ethical decisions.

A partial parallel structure confuses the reader:

> Occupants could owe their lives to properly designed exterior walls that are sufficiently robust to withstand exterior blasts and break away for interior blasts.

Carry out the parallel structure completely:

> Occupants could owe their lives to properly designed exterior walls that are **sufficiently robust to withstand exterior blasts** and **sufficiently frangible to break away for interior blasts**.

Pattern Your Prose
Compare and Contrast

Opposites—*big/little, increase/decrease, minimize/maximize*—reinforce parallel structure. These antitheses catch the attention of the reader.

The great example of compare and contrast (and of parallel structure) is found in Abraham Lincoln's "Gettysburg Address": *living and dead; add or detract; remember, what we say here . . . never forget what they did here; shall not have died . . . shall have a new birth.*

Below are examples of sentences with and without compare and contrasting terms.

Before

> In summary, it was found that the experimental value for the Young's modulus was most accurate at small applied loads and steadily departed from theory with an increasing load.

After

> The experimental value for the Young's modulus was most accurate at small applied loads, but as loads **increased**, the accuracy **decreased** in a steady departure from theoretical values.

Notice how antonyms and antitheses naturally suggest the use of parallel structure, which in turn enhances the drama of the contrast and heightens the prose.

> Prices will be difficult to **raise**; profits will be certain to **fall.**

> Rodney was the **black** sheep of the family, I the **white** one.

> In dealing with the variables that surge into **the present,** great uncertainties loom for **the future**.

Help the Reader Every Chance You Get
Signal the Reader

Despite the natural push to reach the end of the sentence, certain words can slow the reader down long enough to notice mid-sentence material. Words such as *only, particularly, especially, quite,* or unusual adjectives and adverbs—*munificent, stupendous*—any exotic word will signal the reader to take notice—point to middle-of-the-sentence information, which, because of its location, might otherwise be ignored.

> He was **quite** explicit about his aesthetic ideals.
>
> The pricing schedule **especially** concerned the chair, who had made the decision.

Consider, as well, how these sentences make different points:

> **Only** this system allows for an array with fixed excitation coefficients.
>
> This system **only** allows for an array with fixed excitation coefficients.
>
> This system allows **only** for an array with fixed excitation coefficients.
>
> This system allows for an array **only** with fixed excitation coefficients.
>
> The system allows for an array with **only** fixed excitation coefficients.
>
> The system allows for an array with fixed excitation coefficients **only.**

Especially useful is the word *both,* which in the face of possible ambiguity reminds your reader that you are talking about two separate things.

> Among top executives, **both** voluntary and involuntary departures have increased.

Help the Reader Every Chance You Get
Coordinate with Correlatives

Both signals the reader that two items are involved but at the same time urges the reader to find out what follows the *and.* So it is with all the correlatives (*SaS* 13), which lay an emphasis on the final word, phrase, or clause. Notice how these pairs of sentences change their emphasis.

> Combining product lines will either expand market power in good times or raise production costs in a turndown.
>
> *So said when urging against* combining product lines.

> Combining product lines will either raise productions costs in a turndown or increase market power in good times.
>
> *And here is the argument for* combining product lines.

Correlative conjunctions support the antitheses discussed in Compare and Contrast (*SoC* 22) and with the most rigid parallel structure convey a clean, powerful impact. But an inexact parallelism leaves the reader subconsciously questioning—and losing—the writer's message. For example, compare an exact and inexact parallel structure.

> Funding from this level should support not only the principals but also provide for fellowships for graduate students and undergraduates.

> Funding from this level should support not only grants for the principals but also fellowships for students assistants.

The clean landing on *fellowships,* the parallel with *grants,* leaves the reader happy and free to keep reading.

Correlative conjunctions are equally effective with clauses.

> The major genome sequences that now fill databases have been determined not only by major research groups who are well funded but also by individual researchers who are only sporadically supported.

Help the Reader Every Chance You Get
Break Up Noun Series

Today we are discussing regional reservoir management operation optimization.

Such language might be acceptable after the reader has been initiated into the material. But this is not a good way to begin a discussion. Are these reservoirs under *regional management* or are the reservoirs merely in regions? And do we really need *management operations*—or is it *reservoir operations* that are being discussed?

When you know what is meant, break such a noun series in something more accessible:

optimizing management of regional reservoirs
optimizing regional management of reservoirs
optimizing reservoir management of regions

Similarly, *groundmotion estimation procedures* might first be referred to as *procedures for estimating groundmotion.*

Possibly we know what the below sentence means, but could be said more gracefully?

Most engineers who design a structure employ complex general purpose computer software packages for their analysis.

Can software be used with anything other than computers? (Is software ever anything other than complex?) Concision does not always bring clarity. Sometimes more words are necessary.

To analyze the newly designed structure, most engineers use a general purpose software package that is more complicated than what is needed for the task at hand.

No More, No More, No More, No More
Sexist Language

Sexist language is no longer acceptable. On the other hand, when referring to the general population, *The Los Angeles Times* along with *The New York Times* use *he* and *him* exclusively without apology.

Originally, the Old English terms *man* and *mankind* referred to the human species (sex-specific terms were *wer* [man] and *wif* [woman]). Even as late as 1800, *mankind* was used in this sense. But the misappropriation of power in a global society by many of the male gender has distorted the original meaning of *man*. It is currently considered a sexist term. Yet, without resorting to *his/her* in every other line, you can avoid overuse of male references with a few simple approaches.

Omit the personal pronoun. Instead of *If the buyer defaults, he will lose the deposit,*

> If the buyer defaults, the deposit will be lost.

Substitute **each** and **everyone**. Instead of *The analyst should check his figures carefully, for everyone is responsible for his own work,* substitute

> The analyst should check figures carefully, for each is responsible for the work submitted.

Repeat the noun.

> The analyst should check figures carefully, for the analyst is responsible for the work submitted.

Use the plural instead of the singular, and use *all.*

> Analysts should check their estimates carefully, for all are responsible for their own work.

Use second person (especially appropriate for manuals and for any documents offering instruction) instead of third person singular.

> You should check all estimates carefully, for you are responsible for your own work.

BUILDING THE PARAGRAPH

It is enough for ordinary people to be instructed how to express their thoughts to be understood by others; but the learned ought to speak and write aptly and elegantly; and that is what grammar teaches, which makes clear the system and analogy of every vernacular, and having been spread through various nations, preserved it for ever from the injury of time. It purifies it of errors of speech and barbarism; it puts to flight difficulties which at first seem insuperable.

—Christopher Cooper, *Grammatica Linguae Angelicanae* (1685)

> *Grammar, perfectly understood, enables us, not only to express our meaning fully and clearly, but so to express it as to enable us to defy the ingenuity of man to give to our words any other meaning than that which we intend them to express.*
>
> —William Cobbett, *Grammar of the English Language* (1819)

Coherence
Logical Organization of the Paragraph

The paragraph, like the sentence, usually builds to a climax and ends with its main point. While sophisticated writers may ignore this, a developing writer will not go wrong by following such an organization. But whatever organization decided upon, the paragraph, if it is to be easily understood, must develop along lines that the reader can easily follow. Chronological, spatial, numerical, hierarchial are some common patterns on which paragraphs are organized.

Chronological

> When the matter was first brought up, great interest was shown. But in the weeks that followed, no action was taken. And now it has been four months, and still nothing has been done.

Spatial

> Now step out into the new Canary Wharf station. . . and it is like entering a great cathedral. The roof towers above, held up by massive columns, and as you ascend one of the 20 escalators you realize that the platform level, which seemed so large, is only half the size of the ticket hall that lies above it.

Hierarchial

> The first step will be for us to evaluate (1) the amount of fill necessary to avoid inundation during a 100-year flood, (2) the associated settlement due to the fill, and (3) the stability of the fill slope. The next step will be to design retaining walls for the north and south side of the proposed site and calculate their stability. After, we will design foundations for the two office buildings, warehouse, and bridge. Finally, we will evaluate the stability of the bluffs to the south side of the site, which have been known to have periodic slope stability failures.

Whatever your choice of paragraph organization, you will want to guide your reader deliberately through your material. You do not want the reader to have to reread because your writing is ambiguous or because your sentences do not meet reader expectations. Concatenation, conjunctive adverbs, and transitional words are strong guideposts in organizing prose for the reader's access..

Coherence
Limit Your Vocabulary

When planning your paragraph and your paper, your first task is to select those words and phrases that most specifically describe the activity, tools, or concepts being discussed and then to limit yourself to the use of those selected words or terms.

> The pipe system consisted of four tubes. Three pipes were of circular cross-section, and the tubes converged at two strategic junctions.

Is the writer talking about *tubes* or *pipes*? Is there a difference? If so, the second term needs to be defined and the reason for its use explained.

Leave variety to the poets and novelists. When explaining complicated matters, keep the reader on track with precise and select terms. Scientific research shows that every word is fixated by the reader at least once, but that with the reappearance of a repeated word, the gaze time of the reader is reduced, indicating that the time needed for comprehension has been lessened.

This example offers an extremely varied vocabulary:

> In this paragraph, I have boldfaced what are referred to as the **topics** and **key words** of each clause. The **subject**, or **idea**, of each **sentence** is usually found at its beginning and should relate to what the entire passage is "about." Each **thing talked about** should recall and tie into **whatever comes next**, so that, working together, the **similar terms** and the **sequence of information** lead the reader in a coherent manner to understanding the reason for **this piece of writing**. If the **vocabulary** describing what I am talking about is excessively varied, **clear communication** is lost.

Here, selected terms are repeated consistently to facilitate paragraph coherence:

> In this **paragraph**, I have boldfaced specific, **select words**, **words** chosen for creating this special universe of **paragraph** and for developing the **main point** of the **paragraph**. Within my **paragraph**, each sentence makes its **main point** using **words** drawn from a **limited,** and soon-to-be familiar, **vocabulary**. For by **limiting** my **vocabulary** to **those words** that most precisely describe my matter, my **select words** become familiar **to the reader,** the **paragraph** gains in coherence, and my **main point** is emphasized.

Coherence
Choose Words with the Same Root: Polyptoton

Polyptoton comes from the Latin, *poly* (many) and *ptoton* (root), and refers to the use of words with the same root, e.g., *fail, failing,* and *failure; psychology* and *psychological; difficult* and *difficulty; ending, upend, endgame.*

Polyptoton reinforces the punch delivered by a limited and select vocabulary and neatly ties topics together. It has an aesthetic appeal and the charm of play.

Polyptoton, like repetition, speeds up comprehension , for the length of time that readers gaze at words with the same root is less than the time needed for the reader to gaze at words with similar meaning but with a different root.

> Many professionals, in seeking to advance personal and career successes, fail to consider their ethical responsibilities to their colleagues and their community. Such ~~negligence~~ failure can bring . . . .
>
> The gages were aligned incorrectly. This misalignment caused the failure.
>
> If agreement in needed, I will agree.
>
> Jane Austen noted the difference between *sense* and *sensibility*.
>
> The commas are the most useful and usable of all the stops (*SoC* 21).
>
> Sustained profits will result from innovation, but for profitability to be maintained, innovation must continue to be sustained.
>
> Camping at the campground meant food from camp and the ground for sleep.
>
> The reader returns to reading the sentence (*SoC* 11).

One Thing Leads to Another
Concatenation

In a well organized paragraph, the reader can easily interpret the writer's message. And by beginning with a limited and select vocabulary. the well written paragraph has the basis for concatenation.

With concatenation, sentences are so linked that the end of the preceding sentence is referred to in the beginning of the subsequent sentence. Obviously, concatenation is automatically reinforced with a limited vocabulary of selected key words, which can include the use of Polyptoton.

> To develop the main point of a paragraph, a vocabulary of key words is selected on which to build **sentences**. Each **sentence** begins with familiar words, but can end with new and unfamiliar words and concepts, which will be the **point of the sentence.** The **point of the sentence,** coming at its end, is recalled in the beginning of the subsequent sentence through repetition, recapitulation, allusion, summation, definition, and the use of pronouns, all of which can also incorporate my select vocabulary of **key words.** By using **key words** to present familiar concepts, my reader is better prepared for the new and unfamiliar concept with which I conclude my sentences and paragraph.

Concatenation builds on reader expectations and ensures that the reader finds familiar information at the beginning of the sentence and new information at the end of the sentence. Beginning the sentence with a reference to the point of the previous sentence not only links the two sentences but jogs the reader's memory, reinforcing through repetition what has just been read. Such repetition aids the reader's comprehension.

Similarly, the reader expects to find the point of the paragraph towards the end of the paragraph and the linking sentences building to that end.

The above example illustrates the linking principle broadly. Links can, of course, be much more subtle and still be effective, depending on the sophistication of your reader.

One Thing Leads to Another
Concatenation Techniques

Concatenation works through various devices; repetition is not the only way to link sentences.

Repetition

> The piles should be 1.5 ft by 1.5 ft square and installed in groups of four piles in each group. The pile groups should be topped with reinforced concrete caps.

Recapitulation

> Strain readings were taken for three different load configurations: bending, torsional, and combined loadings. To take these readings, we used full and quarter Wheatstone bridge configurations.

Allusion and Polyptoton

> Cross talk errors occur under combined loading conditions when the gage is not properly aligned. This misalignment causes the gage to read not only the strain for which it was set up to read, but also to read other strains in the area.

keep the terms throughout the narration keep vocabulary limited

Summation

> In recent years, computer know-how has exploded, allowing companies to duplicate or to outdo their competition more swiftly. In other words, the market itself has changed dramatically.

Pronoun

> If the system was functioning properly, the error bars would overlap. They do not. This means that the system is inefficient.

Definition

> This study investigated the critical speeds of a rotating shaft. As the shaft began vibrating intensely, indicating that a critical speed had been reached, we began our measurements.

Concatenation
Set Ups Support Concatenation

> Salicylic acid was selected by the manager because it is easily analyzed.. But salicylic acid also . . . .

Set ups, which are created by dependent (or subordinate) clauses or introductory phrases, allow you to relocate sentence elements and create effective links,

> Because it is easily analyzed, salicylic acid was selected by the manager. He selected . . . .

Similarly, a comma pair allows relocation of modifying information..

> The manager decided, because it was easily analyzed, to select salicylic acid.

On the Other Hand, . . .

This sentence would seem to be an ideal candidate for a setup.

> The use of shape memory alloy (SMA) actuators has been growing over recent years because they offer several advantages over other actuator materials.

With the set up, suspense builds:

> Because they offer several advantages over other actuator materials, the use of shape memory alloy (SMA) actuators has been growing over recent years

On the other hand, the author wants this sentence to link to a discussion of the advantages of using SMA actuators, and so we have

> The use of shape memory alloy (SMA) actuators has been growing over recent years because they offer several advantages over other actuator materials. For example, SMA actuators are solid state, durable, and are largely unaffected by the environment.

Notice that the longest element of the list is always the final element of the list.

Coherence
Conjunctive Adverbs

Just as the reader can be guided through new material with concatenation, so conjunctive adverbs, by connecting and commenting, link sentences into a cohesive paragraph and alert the reader to the twists and turns of the narrative. Sometimes the writer needs to shift gears abruptly or to present an unexpected alternative. In these cases, conjunctive adverbs, such as *nevertheless, however, furthermore,* or transitional words, such as *on the one hand . . . on the other hand, on the contrary, under the circumstances,* give flow and coherence to the paragraph and ready the reader for the new information (see *SaS* 22-23).

Without the conjunctive adverb, we have

> Stress analysis with the use of photoelasticity is significantly less accurate than is analysis with the use of strain gages. The photoelastic method allows for a continuous analysis of the entire stressfield, while the strain gage method allows for an analysis only of discrete points.

Using the conjunctive adverb prepares the reader for the alternative:

> Stress analysis with the use of photoelasticity is significantly less accurate than is analysis with the use of strain gages. **However**, the photoelastic method allows for a continuous analysis of the entire stressfield, while the strain gage method allows for an analysis only of discrete points.

Without transitional words, the reader gets the plain facts:

> Profits are expected to decline, causing share prices to stabilize. Prices will not be raised in the face of increased competition.

With transitional words, the reader is reminded that this issue has two aspects:

> **On the one hand**, profits are expected to decline, causing share prices to stabilize. **On the other hand**, prices will not be raised in the face of increased competition.

Save for When Needed
Passive Voice

Save the passive voice for when it is truly needed. Use it especially under the following conditions:

A good link will be created.

> The battle for profits is certain to be intensified during a slowdown. And a slowdown could easily by caused by unfavorable governmental action.

The identify of the subject is unknown or needs to be concealed:

> The accident was caused by a speeding car.
> The rules were decided upon by those who made the decisions.

The writer wishes to present information in a formal and impersonal manner:

> The scheduled meeting will not be held today.

Something is being done to something:

> Theoretical values of tensile strain were calculated.

The sentence will be better balanced and more easily understood. Rather than *We calculated the theoretical values of compression and tensile strain using the known values of the applied load,* consider

> The theoretical values of compression and tensile strain were calculated using known values of the applied load.

Note that a set up would also work:

> Using the known values of the applied load, we calculated the theoretical values of compression and tensile strain.

All Too Common and Not to Be Forgiven Errors

The experiment was successful as the theory was mirrored in our plot.

As is a comparative. *The experiment was successful because . . . .*

DOD funded the research.

Always spell out abbreviations before using them: *Department of Defense (DOD)*

Periods and commas are inside quotation marks; colons and semicolons are set outside quotes. This is American usage.

He said, "Yes." He said, "Yes"; what did it mean?

All right is two words, even if foreign film captions do use ~~*alright.*~~

The infrared thermometer experienced little human error.

It is preferable not to anthropomorphize our devices. While all laboratory equipment needs respect and careful treatment, probably none of it will respond to flowers and chocolates.

~~More data were collected, thus a more accurate graph was plotted.~~

But *thus* is a conjunctive adverb; see "Categories of Connectors" chart.

More data were collected; thus, a more accurate graph was plotted.

Correlate sampling rate, accuracy and noise.

Unless *accuracy and noise* are regarded as one item, the serial comma is lacking.

Correlate sampling rate, accuracy, and noise.

The thermally-controlled expander was set in the circuit.

Adverbs cannot become hyphenated words: use *thermally controlled expander.*

Many people believe drug tests are reliable, if you employ a trained technician.

Where did **you** *come from? Be consistent. Stay with the second person* you, *or stay with third person* he, she, it:

If you go to a trained technician, your drug tests will be reliable.

Many believe drug tests are reliable, if a trained technician is employed.

It's = it is; its = possessive: It's time for the corporation to examine its policy.

Before and After
Example 1

Before Reinforced concrete columns constructed before 1960s are susceptible to earthquake induced forces because of their design deficiencies such as short splice lengths and widely spaced transverse reinforcement. Splices in these columns are generally designed as compression lap splices. These compression splices are generally short with lengths of 20 to 24 reinforcement bar diameters and transverse reinforcement is widely spaced along splice length. This poor detailing makes the column vulnerable to earthquake induced lateral loads because of the high tensile stresses on the reinforcement bars occurring during the earthquake. Since splice length is calculated by only considering compression, it is not long enough to resist tension. As a result the tension on reinforcement bar leads to deterioration of bond between concrete and steel followed by slip of reinforcement bar. Consequently, the column encounters a rapid and brittle splice failure before reaching its nominal moment capacity.

In this paragraph, the writer fails to organize around the available comparison of the contrasting terms: *tension/compression* and *lateral/gravity*. The writer also misses the opportunity to locate the reader immediately with global information, an introductory phrase that gives the date. *RC*, which is used later, does not follow the term that it abbreviates. In the sentence, *Since splice length is calculated by only considering compression, it is not long enough to resist tension, only* should precede *compression*. The exact antecedent of *it* is *compression*—which does not say what the writer intends. The third sentence, which begins *These compression splices are generally short with lengths of 20 to 24 reinforcement bar diameters and transverse reinforcement* is a classic example of why a comma is required to separate the two clauses of a compound sentence.

After Before the 1960s, reinforced concrete (RC) columns were designed to withstand only gravity, with transverse reinforcements widely spaced and splices generally kept to short lengths of 20- to 24-bar diameter. Unfortunately, because the splice length was calculated only for compression, this early design left the RC column vulnerable to lateral loads from earthquake and wind. When reinforcement bars of the pre-60s are subjected to the tension of lateral loads, the bond between concrete and steel deteriorates and the reinforcement bar slips . Then, before reaching its nominal moment capacity, the column fails rapidly . This failure is very brittle and very sudden.

Before and After
Example 2

Before At the time of the U-2 shootdown, the CIA already was well along in developing the U-2's replacement, the Oxcart reconnaissance aircraft, at Lockheed's Skunk Works in Burbank, California. The Oxcart would fly at approximately 90,000 feet at Mach 3.3. It would also become the predecessor to the Air Force's better known SR-71 Blackbird. The CIA and the Air Force jointly also had their ultimate reconnaissance system, the Corona satellite, well under way in a parallel development—the first in a long series of reconnaissance satellites that would eventually replace all aircraft overflights, including the Oxcart.

The reader is being asked to keep track of a chronology here, but this paragraph gives little help. which is why the last sentence must begin with *concurrently*. And the insertion of *in a parallel development* in the very middle of the last sentence ensures only more confusion.

After By the time of the U-2 shootdown, the CIA was already developing its replacement: the Oxcart reconnaissance aircraft. At Skunk Works, in Burbank, California, where it was being built and tested, the Oxcart was already flying at approximately 90,000 feet in Mach 3.3 (the Oxcart would precede the Air Force's better and later SR-71 Blackbird). Concurrently, the CIA and the Air Force were jointly developing their ultimate reconnaissance system, the Corona satellite—the first of a series of reconnaissance satellites that would eventually replace all reconnaissance aircraft, including the Oxcart.

APPENDIX

It has been the Practice of wisest Nations to learn their own Language by stated Rules, to avoid the Conclusion that would follow from leaving it to vulgar Use.

—Sir James Greenwood and Sir Richard Steel
The Tatler (6 October 1710)

TRICKY WORDS

adapt - to modify
adopt - to make it your own

adverse - opposed to
averse - disinclined to

affect (v) - to influence
affect (n) - the subjective aspect of an emotion
effect (v) - to bring about
effect (n) - a consequence

aggravate - to make a bad thing worse
irritate - to annoy

all of - (redundant)

a lot - **not** "alot"

all ready - completely prepared
already - by now

all right - **not** "alright"

alternate - alternately; in turn
alternative - another possibility
alternatively - or

and/or - (legalese)

anticipate - to prepare for with pleasure
expect - to look forward to

anxious - anticipate with concern
eager - embrace with delight

apt - inclination (think"aptitude")
liable - vulnerable
likely - probability

as - (comparative); **not** a synonym for "because"
as, as if - (introduces a clause)
like - (compares phrases)
Her colleagues, as her friends, warned her.
Her colleagues, like her friends, were successful.

aspect - a view of something; **not** "ingredient" ;
not "characteristic" or "part"

assure - to guarantee
ensure - to make certain of
insure - to back up

author - (a noun, **not** a verb)

awhile - for a time; *linger awhile*
a while - (determiner + noun) *linger for a while*

beside - next to
besides - in addition to

bazaar - an open air market
bizarre - unconventional

between - (indicates one-on-one relationship)
among - (indicates three or more relationship)
between two and among three

born - to bear a child
borne - to endure (past tense: to bear a child)

both together - (redundant)
both jointly - (redundant)

bring - to bring it here
take - to take it there

calculate - to determine with math; **not** "think"

can, may - *You may if you can.*

capital - money or location of city government
capitol - building in which a legislature meets

cause - (refers to physical actions and reactions)

cannot help but - (poor usage)

center around - (redundant)

in the circumstances - under no pressure
under the circumstances - under pressure

climactic - the climax
climatic - referring to climate

commonality - (not a word)

compare to - (two categories) *Compare an ant to a puppy.*
compare with - (one category) *Compare Bach with Mozart.*

compendium -a brief summary, outline, collection; **not** a
large collection of everything and anything

complement - to complete
compliment - to praise

comprise - to include, embrace; **not** "comprised of"
compose - to make up

connive - to wink at; **not** "to conspire"

connote - to suggest
denote - to give factual content

consensus - general opinions ("general public," "consensus of opinion" redundant)

consequently - as a result
subsequently - next to happen

consist in - to inhere in
consist of - composed of (a complete list follows)

contact - physical touch; **not** "phone," "write"

contemporary - of the same time

continual - constantly recurring
continuous - uninterrupted

convince - to induce belief
persuade - to induce mental or physical action

could care less - (illogical)

crucial - vital to resolution of a crisis; **not** "important"

currently - ongoing now
presently - in a short time

data - (takes the plural)

different - (dissimilar units) "Many different cities" is redundant.

differ from - to be unlike
differ with - to disagree with

different from - (American usage)
different than - (British usage)

dilemma - (two unpleasant alternatives)

discreet - circumspect
discrete - separate

disinterested - unprejudiced
uninterested - not interested

doubt that - possibly true or untrue
doubt whether - genuine disbelief
doubt if - "doubt whether" preferred

due to - (a predicate adjective following the verb "to be"; **not** to be used in lieu of "because of") Preferably for referring to time: *The train was due at six.*

due to the fact that - (poor usage)

e.g. (L. *exempli gratia*) - for example (examples follow)

each other - applies to two
one another - applies to three or more

egoism - relating everything to one's self
egotism - talking excessively about one's self

either of the two - either . . . or (two, **not** three entities)

eminent - prominent
imminent - about to happen

enthuse - yuk!

equally as - (redundant)

escalate - to increase by planned steps
enhance - to improve quality (**not** "increase quantity")
accelerate - to increase in speed (**not** in intensity)

especially - exceedingly; particularly
specially - for a particular occasion

et al. (L. *et alii*) - and others (people)

etc. (L. *et cetera*) - and other things; **not** "and etc." (redundant)

enormity - crime, atrocity; **not** "large size"

evaluate - to determine value; **not** "analyze"

everyday - (adjective)
every day - (adjective + noun)

everyone - (pronoun)
every one - (adjective + noun)

ff. (L. *folios*) following - refers to following pages

factor - causal element; **not** "aspect"

facts - true information; **not** "true facts" (redundant)

faculty - (adjective or collective noun)

fail to - try but unable to succeed; **not** "neglect to"

farther - distant in space
further - additional

feel bad, feel badly - (informal usage)

fewer - (refers to items, unities)
less - (refers to quantity, amounts)

finalize - (jargon; most "ize" words are jargon)

finite - as opposed to "infinite"; a term in math and physics; **not** "specific" or "definite"

first, second, etc. - (requires consistency in use)
firstly, secondly, etc. - (pretentious)

flaunt - to show off
flout - to treat authority contemptuously

focus - narrowing of light rays to a point by lens or mirror; optical narrowing; for literal or figurative use; *You can focus your attention but not yourself.*

for - (connects closely related clauses; introduces explanation rather than a cause)
because - (introduces cause)
since - for the reason that (referring to "time")

fortuitous - by chance; **not** "by good luck"

free gift - (redundant)

from among - (redundant)

general consensus - (redundant)

get, got, gotten - (informal diction)

good - (adjective)
well - (adverb)

hanged - (p.p. referring to "execution of person")
hung - (p.p. referring to "placing objects")

historic - a memorable event
historical - an event that took place in the past

hopefully - full of hope; **not** "I hope"; **not** "it is hoped"

i.e. (L. *id est*) - it is (introduces a restatement)

I - (subject pronoun)
me - (object pronoun)

if - (introduces hypothetical clauses)
whether - (introduces alternatives)

impact - crash of wrecker's ball against its target; violent collision; **not** a verb; **not** "to have an effect on"

imply - to hint at
infer - to conclude by interpreting

in - move around within
into - enter

in the near future - (wordy, use "soon")
in the vicinity of - (wordy, use "near")

include - (a partial list follows)

individual - (when contrasting with group)

ingenious - extremely clever
ingenuous - naive, frank, and honest

inside of - ("of" is redundant)

interface - to reinforce a garment for stiffness; **not** "to be in contact or speak with"

irregardless - (not a word in standard English)

is when - (very bad usage; do not use)
is where - (very bad usage; do not use)

its - (possessive) **(NOTE WELL: no apostrophe)**
it's - it is

join together - (redundant)
just exactly - (redundant)

kind of - introduces category; **not** "kind of a"

lay, laid, laid, laying - to place or put
lie, lay, lain, lying - to rest or recline

leave - to go away from
let - to permit *Let sleeping dogs lie.*
Leave setting hens to their laying.

libel - to assert something untrue in print
slander - to assert something untrue orally

literally - (usually redundant)

logically - (a deductive method of reaching conclusion)

majority, minority- (avoid unless with specifics)

man - (when referring to both sexes, a sexist term)
mankind - (currently a sexist term)

may - possibility
might - past tense of *may* (weak possibility)

may possibly, might possibly - (redundant)

may of - (nonstandard English)

media - (takes the plural)

myself - intensive use, **not** for object position

nauseous - what makes one nauseated
nauseated - sick
A person is no more nauseous than a person who has been poisoned is poisonous.

notorious - **not** "well known"; *Al Capone was notorious.*

of any - (redundant)
off of - (redundant)
off from - (redundant)

on - on top of
onto - moving to a position on

oral - spoken
verbal - in words, either written or spoken

past history - (redundant)

perspective - a place from which a viewer sees; **not** "right opinion" or "mental balance"

philosophy - a system of thought; **not** a belief or slogan

present time - (redundant)

precede - to occur before
proceed - to move forward

principal - main person, main thing
principle - rule

priority - of first importance, only one being possible; **not** "my second priority"

prone - lying face down

proved - (p.p. + auxiliary verb)
proven - (p.p. - preferred as adjective)

ramification - (a subcategory or division) **not** "consequences"

rather than - (redundant)

rational - sane, as opposed to "mad"
reasonable - sensible
logical - following deductive form

reaction - (technical term referring to automatic response to a stimulus) **not** "response," "opinion"

reason is because - NO, NO, NO! (very bad usage)

repercussion - an echo; **not** "effects"

respectfully - with respect
respectively - in the order given

restive - stubborn; **not** "restless"

scenario - outline of play or movie; **not** "plan"

sensual - affecting sense organs, especially those associated with sexual pleasure
sensuous - pleasing to senses, especially through art, music, or nature

stationary -standing still
stationery - writing paper

substantial - composed of matter (as opposed to illusion); **not** "increased"

supine - lying face up

so - (not used as an intensive in formal writing)

so called - (informal diction)

tangible - refers to physical objects (evidence is **not** "tangible," for it cannot be touched)

than - (comparative conjunction)
then - (referring to time)

that - (restrictive)
which - (nonrestrictive)

time period - (redundant)

thru - (nonstandard English)

toward - (American English)
towards - (British English)

use - to do something with (overused)
usage - doing with, especially language
utilize - new uses with a practical or profitable purpose

versus - (used in legal documents) **not** "instead of"
vs. - (for use **only** in naming legal cases)

via - (reserved for travel) **not** "through," "from"

viable - able to stay alive; **not** "possible"; **not** "practical"

when - (referring to physical location)
where - (referring to a point in time)

while - at the same time (if the temporal meaning does not conflict, may mean "although")

EXAMPLES OF CE&E 198 STUDENT CLASS WRITING

FIRST DRAFT

America's waterways are rapidly degrading. Due to the many "improvements" to which our rivers have been subjected, only 11% of our rivers and streams reach the ocean unimpeded. And all seem to serve their purpose. From dams taming the Colorado River, to the concrete channels of the Los Angeles River rushing this precious resource to sea. However, their side effects can be devastating. The focus of this paper will be on the effects of impeded flow downstream from dams, and how these flows may perhaps be restored in the future. These downstream effects included truncated sediment transport, the lowering of flood peaks, and the reduction of flood frequencies and channel forming flows, and how all of this reduces the ecological integrity of the riparian zone.

SECOND DRAFT

American's waterways are rapidly being degraded. Today, only 11% of our rivers and streams reach the ocean unimpeded. From the dams taming the Colorado River to the concrete channels of the Los Angeles River rushing this precious resource to sea, river "improvements" come in many forms. And all seem to serve their purpose. Downstream, however, the side effects of such improvements appear to be devastating: truncated sediment transport, lowered flood peaks, and reduced flood frequencies and channel forming flows, all of which compromise the riparian and floodplain zone ecology. This paper discusses the effects of impeded flow on river reaches downstream from dams and suggests how unimpeded flow may be restored in the future.

FIRST DRAFT

For the last 20 years, the geotextile business has been booming in the sector of soil improvement solutions. In many cases, the use of a geotextile can increase the performance, improve safety factors, reduce construction costs, and even solve a number of important soil problems. Particularly, for embankments on extremely soft soils such as clay, geotextiles are being used to help stabilize the foundation. In addition to the possible soil improvements solutions, geotextiles are less expensive when compared to other solutions for foundations on soft soil.

SECOND DRAFT

Over the past 20 years, geotextiles have been booming with soil improvement solutions. In many cases, geotextiles can increase performance, improve safety, reduce construction costs, and even solve difficult soil problems. On embankments with extremely soft soils such as clay, for instance, geotextiles help stabilize the foundation and are a less expensive solution when compared to other means for stabilizing foundations on soft soil.