# Course N$^0$= 2: Rules for writing scientific texts in English

## Table of Contents



## I. Abstract

This course points out a few simple but important rules that you should observe when writing scientific texts in English.

## II. Basic writing rules :

### 1. Write texts, not chains of formulas:

More specifically, write full sentences that are logically interconnected by phrases like ‘Therefore’, ‘However’, ‘On the other hand’, etc. where appropriate.

Examples :

1- Viruses only grow and reproduce inside of the host cells they infect. When found outside of these living cells, viruses are dormant. Their "life" **therefore (for the mentioned raison)** requires the hijacking of the biochemical activities of a living cell.
2- Under ideal conditions, 100 bacteria can divide to produce millions of bacterial cells in just a few hours! **However (in whatever way)**, most bacteria do not live under ideal conditions.
3- Viruses are also not considered to be plants, since they do not have a cell of their own, but inhabit a host cell of another organism; **moreover (also and more importantly)**, in many classifications they are not considered a living organism at all.
4- The role of plant immunity in regulating disease development in variety mixtures has certainly been understudied. **Furthermore (also and more importantly),** if priming is a well-established mechanism to anticipate stresses, plant–plant communication in healthy conditions was rarely advocated, especially in conspecific plant populations

The adverbs mentioned in the examples above where used to joint the sentences and accentuate the meaning.

**2. Displayed formulas should be embedded in your text and punctuated with it :**

In other words, your writing should not be divided into 'text parts' and 'formula parts'; instead the formulas should be tied together by your prose such that there is a natural flow to your writing.

You never insert a figure or table in a document without mention it in the text with the appropriate punctuation.

Examples:

(In the text below you will observe that the figure is inserted just after the paragraph where the figure number was mentioned, between the text paragraphs.)

(First paragraph) These terminated, but not polyadenylated, transcripts may be the direct substrates for RdRP proteins, similar to the cleaved mRNAs generated by microRNA/siRNA cleavage (**Figure 4**). This model connects with work from Baeg *et al.* that showed *in vitro* that RDR6 prefers non-polyadenylated RNAs

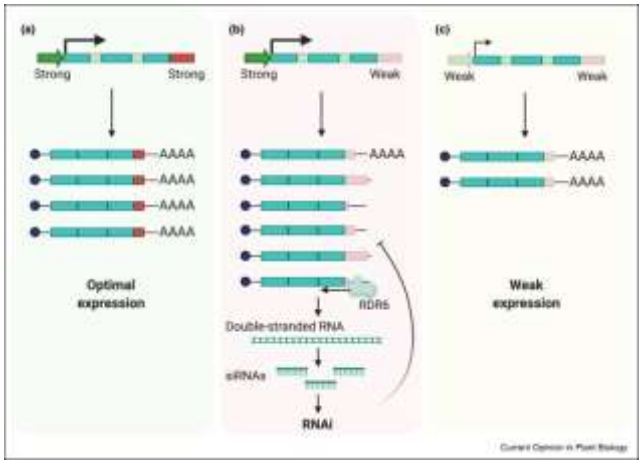


Figure 4. Model of improperly terminated transcripts directly entering into RNAi.

(Second paragraph) **(a)** Strong terminators lead to efficient transcript termination, polyadenylation and translation. **(b)** A weak terminator can be overpowered by a strong promoter and result in inefficient termination and non-uniform polyadenylation. Some of these improperly terminated transcripts are the substrates of RDR6, which converts them into double-stranded RNA, which is the trigger for siRNA production and RNAi. **(c)** A weak terminator does not always produce RNAi.

## III. Being nice to the reader :

Try to write your text in such a way that a reader enjoys reading it.

1. **Be nice to the reader:**

Give some intuition or easy example for definitions and theorems which might be hard to digest. Remind the reader of notations you introduced many pages ago – chances are he has forgotten them. Illustrate your writing with diagrams and pictures where this helps the reader…. Etc.

Exemple :

However, in many of our papers the enzyme concentrations was reported either for the CO2 hydrase or esterase assays (16–18) and they always ranged between 3.5 and 14 nM. The analysis performed by Jonsson and Liljas……

.

.

.

**As mentioned above**, in most of our experiments, we work at enzyme concentrations ranging from 3.5 and 14 nM and sometimes even lower when exceedingly strong inhibitors are analyzed.

2. **Organize your writing:**

   - Think carefully about how you subdivide your document into chapters, sections, and possibly subsections.
   - Give overviews at the beginning of your document and of each chapter, so the reader knows what to expect.
   - In proofs, outline the main ideas before going into technical details.
   - Give the reader the opportunity to 'catch up with you' by summing up your findings periodically.

Useful phrases:

- 'So far we have shown that . . . ',
- 'It remains to show that . . . ',
- 'Thus we can conclude that . . . . Next, we would like to find out whether . . . ', etc.

3. **Don't say the same thing twice without telling the reader that you are saying it twice.**

Repetition of key ideas is important and helpful. However, if you present the same idea,

Definition or observation twice (in the same or different words) without telling the reader, he will be looking for something new where there is nothing new.

Useful phrases:

- 'Recall that [we have seen in Chapter 5 that] . . . ',
- 'As argued before, . . . ',
- 'As mentioned in the introduction, . . . ',
- 'In other words, . . . ', etc.

4. **Don't make statements that you will justify later without telling the reader that you will justify them later.**

This rule also applies when the justification is coming right in the next sentence! The reason for this rule should be clear: if you violate it, the reader will lose valuable time trying to figure out on his own what you were going to explain to him anyway.

Useful phrases:

- 'Next we argue that . . . ',
- 'As we shall see, . . . ',
- 'We will see in the next section that . . . , etc.

## IV. A few important grammar rules:

### 1. There is (almost) never a comma before 'that':

It's really that simple.

Examples:
We assume that ...
It follows that ...
'thrice' is a word that is seldom used.

Exceptions to this rule are rare and usually pretty obvious. For example, you may end up with a comma before 'that' because 'i.e.' is spelled out as 'that is': For $p(n) = \log n/n$ we have ... However, if we choose p a little bit higher, that is $p(n) = (1 + \varepsilon) \log n/n$ for some $\varepsilon > 0$, we obtain ...

Or you may get a comma before 'that' because there is some additional information inserted in the middle of your sentence:

Ex :

Thus we found a number, namely n0, that satisfies equation.

If the additional information is left out (namely n0), the sentence has no comma: Thus we found a number that satisfies equation.

### 2. There is usually no comma before 'if ' :

Example:

**A graph is not 3-colorable if it contains a 4-clique.**

However, if the 'if' clause comes first, it is usually separated from the main clause by a comma:

**If a graph contains a 4-clique, it is not 3-colorable .**

### 3. Defining relative clauses have no commas.

In English, it is very important to distinguish between two types of relative clauses: **defining and non-defining** ones. This is a distinction you absolutely need to understand to write scientific texts, because mistakes in this area actually distort the meaning of your text!

It's probably easier to explain first what a **non-defining** relative clause is. A non-defining relative clauses simply gives additional information that could also be left out (or given in a separate sentence). For example, the sentence

**The WeirdSort algorithm, which was found by the famous mathematician John Doe, is theoretically best possible but difficult to implement in practice.**

Would be fully understandable if the relative clause were left out completely. It could also be rephrased as two separate sentences :

> **The WeirdSort algorithm is theoretically best possible but difficult to implement in practice. [By the way,] WeirdSort was found by the famous mathematician John Doe.**

This is what a non-defining relative clause is. Non-defining relative clauses are always written with commas. As a corollary it follows that you cannot use 'that' in non-defining relative clauses. It would be wrong to write

> **The WeirdSort algorithm, that was found by the famous mathematician John Doe, is theoretically best possible but difficult to implement in practice**.

A special case that warrants its own example is when 'which' is referring to the entire preceding sentence:

> **Thus inequality (7) is true, which implies that the Riemann hypothesis holds.**

As before, this is a **non-defining relative** sentence (it could be left out) and therefore needs a comma.

So let's discuss **defining relative** clauses next. A defining relative clause tells the reader which specific item the main clause is talking about. Leaving it out either changes the meaning of the sentence or renders it incomprehensible altogether. Consider the following example:

> **The WeirdSort algorithm is difficult to implement in practice. In contrast, the algorithm that we suggest is very simple.**

Here the relative clause 'that we suggest' cannot be left out – the remaining sentence would make no sense since the reader would not know which algorithm it is talking about. This is what a defining relative clause is.

**Defining relative** clauses are never written with commas. Usually, you can use both '**that**' and '**which**' in **definining relative** clauses, although in many cases 'that' sounds better.

As a final example, consider the following sentence :

> **For the elements in B which satisfy property (A), we know that equation (37) holds.**

This sentence does not make a statement about all elements in B, only about those satisfying property (A). The relative clause is defining. (Thus we could also use 'that' in place of 'which'.)

In contrast, if we add a comma the sentence reads for the elements in B, which satisfy property (A), we know that equation (37) holds.

Now the relative clause is **non-defining** – it just mentions in passing that all elements in B satisfy property (A). The main clause states that equation (37) holds for all elements in B. See the difference?

## V. Things you (usually) don't say in English – and what to say instead:

The following entries should not be taken as rules – they don't necessarily mean that a given word or formulation is wrong under all circumstances (obviously, this depends a lot on the context). However, in nine out of ten instances the suggested alternative is the better word to use.

It holds (that) / We have
X fulfills property P/ x satisfies property P.
In average/ on average
Estimation/ estimate
Composed number/ composite number
Surely/ clearly
Monotonously increasing/ monotonically-monotone incr.