# NON-FINITE CLAUSES AND DANGLING MODIFIERS

### Introduction

In scientific papers, we often come across subordinate clauses starting with verb + ing, to + verb and the 3rd form. (Strictly speaking, a clause needs a subject and a verb, but these clauses do not have an explicit subject and their "verb" is not a verb, so they are called "non-finite clauses".)

- **I.** Let us start with -ing clauses.
- **1.** The ending –ing can form an adverbial. In this case, the adverbial **refers to the subject of the sentence**, i.e. the "actor" of the clause is the subject of the sentence. The adverbial can have several meanings, but I will not go into details now.

Examples:

I went home laughing.

I went home and I laughed.

I went home laughing at the clowns in the street.

I went home and I laughed.

He went in, locking the door behind him.

**He** went in and **he** locked the door.

The -ing clause can also be at the beginning of the sentence, in which case, we usually separate it from the rest of the sentence with a comma:

Cleaning the windows, I heard a noise.  $\rightarrow$  While I was cleaning the windows, I heard a noise.

I heard the noise and I cleaned the windows.

Walking in the street, I met Tom.

I was walking down the street and I met Tom.

Being a vet, he was able to cure my dog.

**He** was the vet and **he** cured the dog.

Not knowing the language, she decided to use Google translate.

**She** did not know the language and **she** used Google translate.

The -ing form is negated with not.

Opening the door, I went into the room.

I opened the door and I went in.

2. The clause beginning with -ing can also be an adjective (clause).

For example:

**Sitting** Bull = **Sitting** Bull

The bull sitting in the field is mine.

If the adjective (which I have underlined with a dotted line) is short, it is before the noun. If it is "long" (a clause), it is behind the noun (see the second example).

The book lying on the table is a very good book.

In this case, the book (along with the other underlined parts) is the subject of the sentence.

I can't give you the book lying on the table.

In this case, the book (along with the other underlined parts) is the object of the sentence.

I only wrote these two examples, but the noun to which the adjective (clause) refers can also be elsewhere in the sentence, so if the clause with -ing has an adjectival meaning, it can refer to not only the subject of the sentence.

Let us see a funny example where it is unclear whether the construction with -ing is adjectival or adverbial:

She went to the policeman crying bitterly.

In this case, the underlined part is an adverbial, so the subject of the sentence (the lady) cried. *She went to the policeman crying bitterly*.

In this case, the underlined part is an adjective, so the noun before the underlined structure (the policeman) cried.

Let us see an interesting practical application of the rule (the adverbial applies to the subject of the sentence). Who crossed the street in the following sentence?

Crossing the street, the bus hit him.

Unfortunately, since the subject of the sentence is the bus, the **bus** crossed the road!

We should have the man cross the road, but for that, after *Crossing the street, he* should follow immediately, as the subject. We need to change the word order!

Crossing the street, he was hit by a bus.

Now, the man crossed the street!

In this example sentence, the subject was "incorrect" in the active voice, and "correct" in the passive voice. The reverse case is more common, however (especially in scientific papers), where the subject is "correct" in the active voice and "incorrect" in the passive voice. Unfortunately, many authors automatically use the passive voice in scientific papers because they were taught that a scientific paper "must" be in the passive voice (which is a stupid rule).

There are some expressions (not many) where we do not expect the adverbial to match the subject of the sentence. For example:

To tell you the truth, he is not a policeman.

Speaking of which, could you lend me \$800,000,000,000?

Trusting that this will put things into perspective...

3. The—*ing* form can also be a noun or noun phrase, for example:

Getting up early on the weekends didn't make him happy.

I am not going to forget cycling to Gyöngyös and back.

There is usually no problem with such sentences. It is more difficult if the noun clause starting with *-ing* comes after **a preposition**, for example:

After looking out of the window for a long time, we noticed that the rain had stopped. ©

Even though *looking* is after a preposition, it still refers to the subject *we*, just as we saw above with adverbs! The following sentence would therefore be incorrect:

After looking out of the window for a long time, the rain stopped. (The rain was looking out of the window.)

While listening to music, lunch was cooked. – Unfortunately, lunch was listening to music here. Correctly:

While listening to music, we cooked lunch.

(Although *while* is not a preposition according to the dictionary, it behaves like a preposition.) The prefix *by* is common in sciebtific papers. More on that later.

- II. The third form can also be adjectival or adverbial, similarly to -ing.
- **1** Adjective. This meaning does not usually cause so many problems in papers. It has a passive meaning. *I am excited*.

This is a broken window.

The window broken by Pistike yesterday was an expensive window.

2 Adverbial – this causes a lot of problems

If the 3rd form has an adverbial meaning and is at the beginning of the sentence, the adverbial is separated from the rest of the sentence with a comma. If it is an adverbial, it is less common at the end of the sentence, so I did not write an example of this.

Similarly to *-ing* forms, 3rd form adverbials also refer to the subject of the sentence.

Asked if he thought everything was all right, he said much could be done to improve the situation. (**He** was asked...)

Convinced that his wife wanted to poison him, he always ate at a restaurant.

(**He** was convinced...)

III. To + verb can also introduce an adverb or adverbial clause. The form has other meanings as well, but the adverbial meaning cause most problems.

#### 1. Adverbial of purpose

In this case, *to* + verb also refers to the subject of the sentence! Instead of *to*, you can use *in order to* (more official) or *so as to* (even more official).

I went to the restaurant to have lunch.

I went to the restaurant in order to have lunch.

I went to the restaurant so as to have lunch.

(I had lunch.)

To improve interlayer adhesion, we used a new method.

In this sentence, we wanted to improve adhesion.

I ate little in order not to be fat.

(I didn't want to be fat.)

The negation of *to* +verb is *not to* +verb.

The adverbial of purpose can be at the end of the sentence with the other adverbs, in which case there is usually no comma before it. It can also be at the beginning of the sentence, then there is a comma behind it.

In theory, we could put our own subject in adverbials starting with to + verb (in order to + verb, so as to + verb) if it is different from the subject of the sentence, but this is rare and not typical of scientific English. In such a case, it is much more common to use so that or in order that.

2. Adjective or adjectival clause—in this case it means "must" or "will". This meaning does not cause many problems in scientific papers.

*Joe is the man to do the work.* = *Joe is the man who has to do/will do the work.* 

Joe is the man to be hired for the job.  $\approx$  Joe is the man who has to be hired for the job/who will be hired for the job.

The following sentence means the same thing:

*Joe is the man to hire for the job.* = *Joe is the man who should be hired for the job/who will be hired for the job.* 

This is an interesting example: "hire" is a **transitive** verb. If there isn't an object AFTER it, it tries to take the noun BEFORE it as an object, in which case we see that there has been "cheating", the passive has been "stolen"!

#### 3. Noun

To + verb is often used as a noun after a verb, i.e. as the object of the sentence, for example : I want to play.

In theory, it could also be used as a subject at the beginning of a sentence, but this is rare.

*To swim is nice.* – It is rare.

For a subject the verb+*ing* form is used instead:

Swimming is nice. – It is more common this way.

The form to + verb goes to the end and the subject is it without actual meaning.

*It is nice to swim.* – This is the most common.

Do not forget that although it is the subject of the sentence grammatically, logically it is not the subject!

A common mistake when verb + ing, to + verb and 3rd form adverbial caluses are used is that the subject of the clause is an inappropriate noun phrase (or it has no subject at all). The solution is simple: the subject of such subordinate clauses should always be the subject of the main clause!

Unfortunately, the problem is not that simple. In scientific and academic English (probably as a result of the enormous amount of uncorrected articles, often written by non-native English speakers), it is very common that adverbial clauses starting with verb+ing, a 3rd form or to + verb are not matched with the subject of the sentence. This is unfortunately so widespread that a considerable number of English-speaking authors do not consider it a mistake, nor do they notice it when they read or even write such sentences.

However, in my opinion, this is not a "licence to make mistakes"!

The online material of the Duke University Scientific Writing Resource says the following [13], with which I fully agree:

In modern English usage, dangling modifiers are considered errors.

Unfortunately, they are rampant in scientific writing. I believe this is a result of religious reliance on passive voice. Joseph Williams has this to say about dangling modifiers:

[The] implied subject differs from the explicit subject of the clause it introduces...When that happens, the modifier dangles.

Writers of scientific prose use this pattern so often, however, that it has become standard usage in their community.

In my opinion, we should consider this not a license to make mistakes, but a rebuke of the scientific community. Just because everyone does it, it doesn't make it the best thing to do. I think we should make the effort to avoid dangling modifiers because they confuse readers.

I believe that the image of an author, or even the university they represent, is (greatly) influenced by how correctly and accurately they use the language.

Of course, the problem is more complicated than that. It is much less typical of the English language than, for example, Hungarian, that there are clear rules for correct language use, well defined by linguists and the Academy of Sciences. (England doesn't even have an Academy of Sciences, and the American Academy of Sciences does not really care about such matters), So practically native English speakers use the language as they like, and they are encouraged to do so by the linguists themselves, who do not "require" anything. If someone starts to use a language element "incorrectly" and enough people follow suit, linguists will point out very quickly (much, much sooner than, for example, in Hungarian) that it is also "part of the language", only not everyone uses it that way. They're not saying that it is oncorrect and you shouldn't use it that way. The language problem mentioned above also falls into this category.

## Common errors

#### 1. verb +ing clause.

Consider the following sentence:

The mechanical properties of the metal can be further improved using traditional techniques. ©

Who used traditional techniques here? Either the **mechanical properties** (the subject of the sentence, grammatically this is what the sentence refers to), or if we do not accept this (the author probably did not mean this), then it is not defined, which is also very undesirable. In this case, the clause is an adverbial clause. We can say that it is clear from the situation, but it is very inelegant to abuse redundancy (I wrote about this at the end of this guide). Correction:

Humans used the techniques, so the subject should be a "human", e.g. you, we, scientists, workers, etc., for example:

We can further improve the mechanical properties of the metal using traditional techniques.

Of course, it may be that the passive structure sounds better in the given sentence (as in this specific example as well), so we need to rephrase the sentence to improve it.

*The mechanical properties of the metal can be further improved with traditional techniques.* 

There is no *verb*+ing clause, so there is no problem!

The specimens were injection molded using an ARBURG Allrounder 370S 700-290 machine.

Here, either the specimens used the injection molding machine (presumably this is not what the author meant), or it is not specified who, but that is also terrible.

How can these errors be corrected? If possible, simply change the sencence to be in the active voice, and the problem disappears:

We injection molded the specimens using an ARBURG Allrounder 370S 700-290 machine.

Adjectival clauses cause fewer problems but there may be misunderstanding when adjectival and adverbial meanings are confused (I underlined the adverbial clause with a wavy line and the adjectival clause with a dotted line)

Lydia fed the pigs wearing her raincoat. [9]  $\rightarrow$  Lydia was wearing her raincoat.

Lydia fed the pigs wearing her raincoat.  $\rightarrow$  The pigs were wearing her raincoat.

However, it is also true for such sentences that the adverbial meaning is more likely.

In the sentence below, however, the adjectival meaning is more likely, so I put it first here.

I read the book <u>lying on the table</u>.  $\rightarrow$  The book was lying on the table.

I read the book lying on the table.  $\rightarrow$  I was lying on the table.

If the subordinate clause starting with *verb*+ing is a noun and is preceded by a preposition, it is still true that the subject of the subordinate clause is the subject of the sentence.

After finishing breakfast, we went to the pub.

Even though *finishing* is after a preposition, its subject is still we, as we saw above with adverbials.

After analyzing the samples, we measured the plants daily. ©

After looking out of the window for a long time, we saw that the rain had stopped. ©

Janet comforted Ann by patting her shoulder. ©

Janet comforted Ann by giving her chocolate. <sup>©</sup>

If we were to change the subject of the sentences, for example, put them in the passive, it would be a bad idea. A very bad idea. The sentences would be terribly incorrect...

After looking out of the window for a long time, it was seen that the rain had stopped.  $\odot$ 

Ann was comforted by patting her shoulder.  $\otimes$ 

Ann was comforted by giving her chocolate.

After analyzing the samples, the plants were measured daily. [5] 🟵

Ouch!!!

Some more examples:

*Shortly after leaving home, the accident occurred.* ⊗ [2]

In this case, the grammar suggests that the accident left home. Two possible corrections:

Shortly after we left home, the accident occurred.

Shortly after leaving home, we had an accident. ©

Here I assumed that we left home and had an accident, but to correct the sentence we would need to know who exactly left home and who had an accident.

Without knowing his name, it was difficult to introduce him. ⊗[3]

Here "it" did not know the name of the person. Who is "it"? Maybe Stephen King's clown? © Or we didn't say who, which is also a big problem in this case. A possible correction:

Without knowing his name, I found it difficult to introduce him. ☺

Before adding the compound, it was determined that the solution's pH was 6.4.  $\odot$ [4]

In this case, *it* added the compound, or we didn't say who, but it would be necessary here. A passive structure without thinking? Hmm... Bad idea. A possible fix:

Before adding the compound, we determined that the solution's pH was 6.4. ©

When changing a fuse, the electricity should first be switched off.  $\otimes$ [12]

It would be nice if the *electricity* could replace the fuse itself (or possibly turn itself off – Industry  $4.0 \, \odot$ ). If this does not happen, it is undefined who replaces the fuse  $\odot$ .

Correction:

When changing a fuse, you should first switch off the electricity. ©

The preposition by is common in scientific papers in the sense that it introduces a method or procedure.

We produced the part by extrusion.

The part was produced by extrusion.

The part was produced by injection mo(u)lding.

Although  $injection\ mo(u)lding$  ends in -ing, the problem of matching does not arise here because it is a general method, not a specific action. There are also some common industrial processes ending in -ing that sound just as good in such a sentence as  $injection\ mo(u)lding$ , e.g. milling, turning, casting, etc. If the "method" is a longer -ing structure (so there is a chance that it is not a general method, but a solution or action used in a specific case), we should be very careful when using the passive, because there is a high chance of an incorrect sentence. We can generally say that the good solution is if the subject of the subordinate clause with -ing is the subject of the sentence.

However, it sometimes happens that the sentence has such a **general meaning** that it is not possible to determine exactly who performs the action. In such cases, we do not take coordination so strictly either, so it is "no problem" if the subject of the clause is not the subject of the sentence. This is a simplified rule, reality is a bit more complicated than this, so to be on the safe side, I advise you to make sure that the subject of the sentence is also the subject of the noun clause with -ing. Let us see two examples: Malaria can be controlled by attacking the parasite. ©

Although the subject of *attacking the parasite is not malaria*, the sentence is still correct—it is not clear who attacks the parasites, the sentence is a "general method", it can apply to anyone.

However, let us look at the following example:

*The birds were observed using binoculars.*  $\otimes$ 

Well, I certainly wouldn't say that! No way! On the one hand, if a research group was watching the birds, it is possible to determine who they were, but if people were watching the birds in general and it is not possible to identify who, the use of something is rarely enough to define a method: method  $\neq$  tool! (However, undefined people watching the birds is less likely, since on the one hand the sentence is in the past tense, which we have to define somewhat, and on the other hand, **the birds** is definite, so *we know which birds are involved*, and we probably know who observed these birds with binoculars.)

So, I repeat, make sure to match the *-ing* form with the subject, then (in this respect) the sentence will be correct!

#### 2. Problems with subordinate clauses starting with the 3rd form

Driven by the idea of environmental consciousness, biodegradable polymers have been gaining importance recently.

The subject of the sentence is biodegradable polymers, so **polymers** are concerned with the protection of the environment. This is probably not what the writer meant. This sentence is not so easy to correct, it needs to be reworded a bit so that the problematic part disappears:

As a result of environmental consciousness, biodegradable polymers have been gaining importance recently.

Some additional examples (first the faulty one, then a possible correction – different types of corrections) [12]:

Tied to a post, the sea was tossing the boat up and down. 3  $\rightarrow$  Tied to a post, the boat was tossing up and down on the sea. 3

Written in large letters they read the words 'No Entry'. ⊗ → They read the words 'No Entry' written in large letters. ©

*Dropped by parachute, the country seemed entirely unfamiliar.*  $\ \ \Rightarrow \ \$  *Dropped by parachute, I found the country entirely unfamiliar.*  $\ \ \$ 

Weakened by his last illness, I felt sure that another winter in this country would kill him.  $\ \ \Rightarrow \ \$  Weakened by his last illness, so I felt sure that another winter in this country would kill him.  $\ \ \ \$ 

#### 3. to +verb clauses

Such adverbial clauses tend to cause the greatest problems for authors of scientific texts in their adverbial meaning (adverbial of purpose). Let us see some examples. The sentences can be corrected in several ways, but now I only write one correction everywhere.

To get up on time, a great effort was needed. [2] (the great effort wanted to get up on time)  $\odot \rightarrow We$  needed to make a great effort to get up on time.  $\odot$ 

To improve his results, the experiment was done again. [3] (the experiment wanted to improve his results)  $\Rightarrow$  To improve his results, he did the experiment again.  $\odot$ 

The noun meaning of to + verb often goes together with the adverbial meaning, which is also a possible source for error.

Example of an incorrect sentence:

*In order to improve efficiency, it is necessary to optimize the process.*  $\otimes$ 

The subject of *in order to improve efficiency* is a meaningless *it* (or maybe the clown? ①) or if we do not accept this (we should not), the subject of the subordinate clause is not defined, which is not much better. Some possible corrections:

In order to improve efficiency, we have to optimize the process. ©

If efficiency is to be improved, the process has to be optimized. ©

It is often not easy to correct such sentences, they have to be carefully rewritten, and sometimes it is not even possible to return the original meaning exactly.

#### 4. Other problems

There may be other similar mistakes that can lead to misunderstanding, although they do not include clauses starting with verb+ing, to + verb or the 3rd form.

a) Prepositional structures

As a mother of five, and with another on the way, my ironing board is always up. [6]  $\otimes$ 

This sentence suggests that the ironing board has five children. A possible fix:

As a mother of five, and with another on the way, I always keep my ironing board up. ©

With a sigh of disappointment, the expensive dress was returned to the rack. [8]

The expensive dress gave a sigh of disappointment ©, or it is not defined, which is not good either. A possible correction:

With a sigh of disappointment, I returned the expensive dress to the rack.

b) Adjectives or adjectival phrases

Hungry, the leftover pizza was devoured. [8]

In this case, *hungry* refers to the subject, so the leftover pizza was hungry. Correction:

Hungry, I devoured the leftover pizza.

c) Appositive structure (two identical things)

An expert in the field, the professor's work was the focus of the conference. [11]

The sentence suggests that the professor's work is the expert. A possible fix:

An expert in the field, the professor was the keynote speaker at the conference and his work was the main focus.

d) Mixed structures in funny situations

I know a man with a wooden leg called Smith. [6]

In this case, *called Smith* can refer to both *man* and *wooden leg*. Meanings:

- I know a man called Simth, who has a wooden leg.
- I know a man whose wooden leg is called Smith.

Grammatically, *called Smith* should refer to the structure closest to it, but it is meaningless. This is where the misunderstanding comes from.

She put the sparkly red stilettos on her feet that she bought in Oz. [11]

Here, too, the problem is that "that she bought in Oz" should grammatically refer to the structure closer to it, but then it would mean that she bought her feet in Oz. A possible fix:

She put on her feet the sparkly red stilettos that she bought in Oz.

In an "emergency situation", the rather strict "Subject-verb-object-adverbs" word order can be modified a little ©.

Fresh out of college, the job market did not hold many opportunities for this year's graduates. [11] Fresh out of college also refers to the subject, but then the job market has recently graduated from university. A possible correction:

Fresh out of college, this year's graduates did not have many opportunities on the job market.

In the following sentence, the adverbial meaning can be confused with the adjectival meaning. [6] This, as the example shows, can occur not only with verb+ing, 3rd form or to + verb.

One morning I saw an elephant in my paiamas. (I was wearing the pajamas).

One morning I saw an elephant in my pajamas. (The elephant was wearing my pajamas).

#### **5. Redundancy**

Someone might think of an objection:

"Maybe the subject of the adverbial structure is not defined, but it is usually clear from the situation who performed the action—if it can be guessed anyway, why bother with matching? Leave me alone Attila. ©" Well then, let's talk about redundancy.

Redundancy means that something exists more than once, happens more than once, and the occurrences after the first one are not used for anything (for now). This can be useful or useless and annoying. It is useless if e.g. someone explains something to me that I understand at first, but they tell me the same thing over and over again (possibly in different words) because they don't know or don't believe that I understood it the first time.

It is, however, useful in technology, where engineers design machines with safety in mind. For example, cars usually have dual-circuit brake systems, which means that two independent brake systems slow the car down, so if one fails, the car can still be safely stopped and driven to the service station, even if it is far away. The same solution is used for aircraft systems, only there's three of everything because in the event of a failure, it may be necessary to fly thousands of kilometers (e.g. over an ocean), and an uncontrollable plane is usually a bigger problem than an uncontrollable car.

There is also redundancy in language, so it often (but not always!) happens that someone speaks incorrectly, but we still understand what they say, because redundancy helps. Take the plural as an example:

There are three apples on the table.

In how many ways did I express the plural? Three ways (I indicated them with green and bold). If I make a mistake in two of these, we still understand that it's plural:

*There is three apple on the table.* (But don't say that!)

As an error it is "okay", but if we do it on purpose, we are abusing redundancy, which is a very ugly thing and a big No-No.

Anyone who says that people will understand anyway, no matter how we say it, so we don't have to bother with "complicated" grammar, is encouraging people to abuse redundancy, which, as I wrote above, is a very ugly thing.

Don't do this in scientific papers either, for example don't write sentences like this, even though they are not at all ambiguous, their meaning is perfectly clear:

Restaurant I tomorrow going lunch eating.

Lunch eat Jack every day restaurant in.

Although the second sentence would mean that the lunch eats Jack (because of the word order), there is enough redundancy in the meaning so there is no misunderstanding. But let us not be complacent. Redundancy can take only a limited number of grammar, vocabulary, pronunciation, spelling, etc. mistakes.

Here is just one example:

If instead of I am eating at the table I say I am eating the table, then what? I missed a tiny little word, sorry. Why do you have to be so hysterical about this? One little word! "The meaning is obvious anyway from the context"!

Yeah, sure... © © © © ©

And indeed, at all levels, it has often happened to me that I was communicating with a student or colleague in English, and I had to ask them to say in Hungarian what they wanted to say because although I udestood all the words and grammar in the sentence (of course ②), the sentence was completely meaningless to me, or perhaps I completely misunderstood it because there were so many mistakes in it. It happened during English classes I was teaching, from beginner to advanced level, but also while reading scientific papers.

So don't be so sure that people will "understand it anyway", because redundancy runs out surprisingly fast and communication breaks down (usually a lot sooner than language learners might think).

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