Interuniversity Style Guide for Writing End-of-Degree Projects in English

This manual has been created by the Xarxa Vives Language Quality Group (English) (Grup de Treball de Qualitat Lingüística de la Comissió de Llengua de la Xarxa Vives d'Universitats).

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First draft edition, October 2021

Web address and errata: https://bit.ly/qualitat-angles

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Preface

In our increasingly international academic community, where English is the lingua franca for writing academic articles and communicating with peers, more and more students are writing their final degree projects for bachelor's and master's degrees (TFGs and TFMs) in English. Therefore, in order to support you in this endeavour, we have created this *Interuniversity Style Guide for Writing End-of-Degree Projects in English*. Catalan universities are multilingual environments by nature, which gives you a great opportunity to gain proficiency in a second or even a third language,in the case of English, and its use in formal academic contexts. Our team of linguists has the knowledge and resources to support you as you finish your degree programme and step into the working world as a multilingual professional.

The *Guide* offers advice on writing TFGs and TFMs in three ambits – the humanities, the natural sciences and the social sciences – focusing on the differences in structure and style in each. Following discussions of the most important aspects of writing a TFG or TFM, we have chosen to focus on topics such as style, structure, references and bibliography, and offer tips on editing. We have also provided real examples of the recommended way to structure each particular section, and we have suggested how to use a simpler writing styleand adapt the tone to the subject matter.

Our intention for this *Guide* is not that you read it from cover to cover, but rather that you use it to answer specific questions about writing a project in your field of study. The fact that it is online means that you can quickly search for the area that interests you andaccess our advice freely and easily from any device and location. We have also provided a bibliography and list of resources to help you deal with doubts you may have during the writing process.

This *Guide* is the result of our universities' joint efforts to address the above objectives and we hope it will help you boost your skills in writing academic documents in English and contribute to your multilingual profile as you move into the professional world upon graduation. We wish you the best of luck throughout this final stage of your university degree.

Part 1. Style

Introduction

Writing is a fundamental part of the research process and writers need to communicate their results to enable ideas to flow freely within and between disciplines, and to contribute to the body of scientific knowledge. However, it is a task that few have been trained to do in English, the lingua franca of the research world today.

This section provides a series of principles that can help all those researchers who may feel unprepared to write in a language that is not their own. These principles, particularly those from Section 3 onwards, are largely the result of the work done by Joseph Williams and published in his book S*tyle: Lessons in Clarity and Grace* (Williams, 2007). If followed, they will enable you to write clearly and comprehensibly. Here, the focus is on writing research in general, and the principles can be applied to all disciplines – the natural sciences, the social sciences and the humanities – and all levels – bachelor's degree, master's degree, doctorate or even professional research. They can also be applied to all forms of informative writing.

A word of warning, however. The principles are merely guidelines, not rigid rules, so apply them judiciously. Also, take care to apply them when you are revising, not when you are drafting. Otherwise, you may have great difficulty in writing anything at all. Inevitably, applying these principles will make the writing process slower because you will be thinking about what you are doing, but they will help you to write prose that is clearer and more readily understood by the reader, and that can only be good for the world of science in general and you as a researcher within it.

1 Sentence variety

Make your texts more interesting to read by varying the sentences you write. If sentences are constantly of the same type and length, and with the same openers, the text will be monotonous and either too simplistic or too complex, so aim to write different types of sentence that are of different lengths and have different openers.

a) Sentence types

There are four types of sentence in English: simple, compound, complex and compound-complex.

- Simple sentences consist of one independent clause (that is to say, at least a subject and a verb and, perhaps, an object, complement or adverbial):

  Slavery was officially abolished in the United States in 1863.

- Compound sentences consist of two independent clauses joined by a conjunction (*and*, *or*, *so*, *but*, etc.):

  Slavery was officially abolished in the United States in 1863 but was still widely practised until the end of 1865.

- Complex sentences consist of one independent clause and one dependent clause linked by a subordinating conjunction (*when*, *if*, *because*, *since*, *before*, *although*, etc.):

  Although slavery was officially abolished in the United States in 1863, it was still widely practised until the end of 1865.

- Compound-complex sentences contain more than one independent clause and at least one dependent clause:

  Although slavery was officially abolished in the United States in 1863, it was still widely practised until the end of 1865 and racial bias still pervades American society today.

b) Sentence length

Well-written texts are made up of sentences of different lengths: short, medium and long. If you write too many long sentences, readers may feel overwhelmed by the excess detail and be unable to identify the important points. If you write too many short sentences, readers again may be unable to identify the important points and your text will sound childish.

c) Sentence openers

Sentence openers are any structures in the initial position of a sentence. They can give writing greater sophistication and help maintain readers' interest. In his book *The Craft of Scientific Writing*, Michael Alley defined seven different types (Alley, 1996).

- Subject-verb

  Slavery was abolished in 1863.

- Prepositional phrases

  In the Deep South, the Ku Klux Klan was set up as a vigilante justice system in 1865.

- Transitional words

  However, the organisation was suppressed in 1872.

- Introductory subordinate clauses

  Although the Civil War led to the abolition of slavery, it did not change the basic power relations between African Americans and whites.

- Infinitive phrases

  To fully understand the influence of racial bias on the 2016 election, we measured anti-immigrant sentiment and racial resentment separately.

- Participle phrases

  Summarising the work of numerous political scientists, the author claims that the decisive factor in the electoral victory was racial resentment.

- Verb

  Note that the victorious candidate never distanced himself from the opinions of white supremacist leaders.

To see the importance of sentence type, sentence length and sentence openers, take a look at the following text (from Alley, 1996), in which there is very little variety.

> Mount St. Helens erupted on May 18, 1980. A cloud of hot rock and gas surged northward from its collapsing slope. The cloud devastated more than 500 square kilometers of forests and lakes. The effects of Mount St. Helens were well documented with geophysical instruments. The origin of the eruption is not well understood. Volcanic explosions are driven by a rapid expansion of steam. Some scientists believe that the steam comes from groundwater heated by magma. Other scientists believe the steam comes from water originally dissolved in the magma. We have to understand the source of steam in volcanic eruptions. We have to determine how much water the magma contains.

All the sentences are of the same type (simple), all are of approximately the same length (short/medium) and all open in the same way (subject-verb). This means that readers pause at very regular intervals and the greater stress that is naturally given to the subject falls in exactly the same place, thus creating an extremely monotonous rhythm. Now compare it to the following revised version.

> Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas and, within minutes, the cloud had devastated more than 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, the origin is not well understood. Volcanic explosions are driven by a rapid expansion of steam and, recently, there has been considerable debate over the source of this steam. Is it groundwater heated by the magma or water originally dissolved in the magma itself? To understand the source of steam in volcanic explosions, we have to determine how much water the magma contains.

The revised text above has a much more varied rhythm because it exploits the variables of sentence type, length and opener. The first sentence is simple, short and has a subject-verb opener. The second sentence is compound, long and opens with a participle phrase. The third sentence is complex, medium length and opens with a subordinate conjunction. And so on.

2 Subjects and verbs

Sentences are easy for your readers to understand if it is clear who is doing what. You can write sentences that are easy to read if you follow a few basic principles.

a) Express characters in subjects and actions in verbs.

In an affirmative or negative sentence

- the grammatical subject is the noun (or nouns) before the verb, and

- the characters are the nouns that express the concepts, people or things you are writing about.

Readers will understand a text more easily if its grammatical subjects are also frequently characters. For example, the following text feels dense for two reasons:

> Between 1980 and 2005, the evolution of the banking industry observed a significant growth of the savings bank sector but has since then witnessed the virtual disappearance of the savings bank.

Firstly, the grammatical subject of the verb is not a character. The author is writing not about an *evolution* (the grammatical subject) but about the *banking industry* and the *savings bank sector* (the characters of the text). Secondly, the actions done by these characters are expressed in the form of nouns (*evolution*, *growth*, *disappearance*). Most readers will understand the sentence more easily if you make the characters the grammatical subjects of the actions they do:

> Between 1980 and 2005, the banking industry evolved in such a way that the savings bank sector grew significantly but since then this sector has virtually disappeared.

This process of expressing the action of a sentence in the form of a noun and not in the form of a verb is known as nominalisation and, although it can be used to good effect on occasion, it should be avoided when it forces an abstraction that is not a character into subject position. Therefore, not

> The separation of the components of a mixture is made with chromatographic techniques and the identification of organic compounds is carried out with spectroscopic techniques.

but

> The components of a mixture are separated with chromatographic techniques and organic compounds are identified with spectroscopic techniques.

b) Keep the subject short.

Readers will understand a sentence more easily if the subject of the verb is short and concrete or a familiar abstraction and if the longer, more complex information comes after the verb. Therefore, not

> Novel nutritional technologies and innovative techniques for optimising yield and increasing profit in a context of increasing production expenses is the subject of the section below.

but

> The section below discusses novel nutritional technologies and innovative techniques for optimising yield and increasing profit in a context of increasing production expenses.

c) Keep the subject towards the beginning of the sentence.

Position the subject of the main verb towards the beginning of a sentence. Too much information before the subject will overload the reader. Therefore, not

> Citing the example of a 17-year-old student who was working 35 hours a week in a well-known burger chain restaurant so that he could pay for a new car while simultaneously studying full-time for his university entrance examinations at the local secondary school, **Dr Smith** urged for greater communication between parents and educational institutions.

but

> Urging for greater communication between parents and educational institutions, **Dr Smith** cited the example of a 17-year-old student who was working 35 hours a week in a well-known burger chain restaurant so that he could pay for a new car while simultaneously studying full-time for his university entrance examinations at the local secondary school.

In the first text above, the subject of the main clause (in bold) is the forty-fifth word. In the second, it is the tenth. Readers find it much easier to understand long pieces of text if they appear after the subject and the verb than if they do so before.

d) Maintain the subject-verb-object connection.

The essential elements of an English sentence are the subject, the verb and the object. Those sentences that keep these elements together tend to be clearer than those that separate them. Therefore, not

> Dr Jan Wilkinson, despite criticism from both within her discipline and without, defended her thesis on notional groups in her next paper.

but

> Despite criticism from both within her discipline and without, Dr Jan Wilkinson defended her thesis on notional groups in her next paper.

e) Respect end focus.

End focus is the principle that the new or most important information in a clause or sentence comes at the end. The following sentence is the last one from a thesis on juice concentration processes:

> The main conclusions are that low values of retention and permeate flux are the causes of the problems in juice concentration processes.

The information is not in the correct order. Juice concentration is the topic of the research, it is announced in the title ("Juice concentration: problems and solutions") and is, therefore, a major

character throughout the text, so the final sentence should position it, as a major character, in subject position and then go on to provide some information about it after the main verb. The aim of the sentence is to communicate what problems juice concentration involves, so this information should be placed in the focus position.

> The main conclusions are that the causes of problems in juice concentration processes are the low values of retention and permeate flux.

Likewise, in the following text the author sets up an expectation in the first sentence – that the number of sensors is important – but then buries the information that responds to this expectation in the middle of the following sentence.

> The tests showed that not all of the sensors helped to monitor the ripening process. In fact, for purposes of classification, with two sensors best results were achieved.

The principle of end focuses requires a second sentence such as the following.

> The tests showed that not all of the sensors helped to monitor the ripening process. In fact, for purposes of classification, results were best with just two.

3 Paragraphs

Texts are conventionally divided into paragraphs, which are marked either by indenting the first line like this:
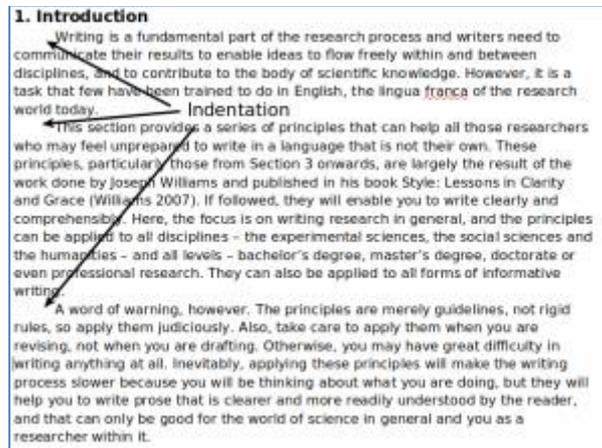
Figure 1. Indenting

or by leaving a complete blank line between one paragraph and the next.
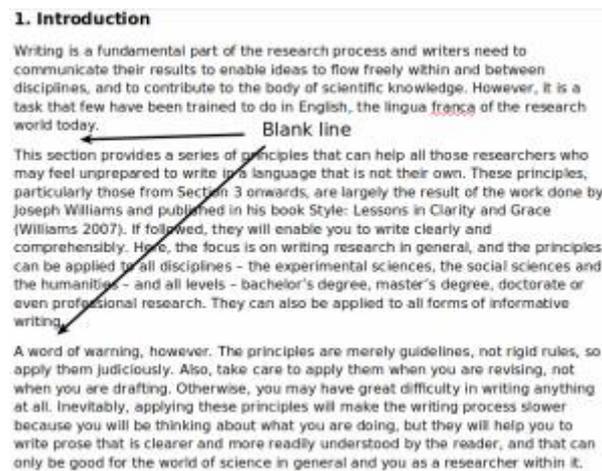
Figure 2. Blank lines

The white space created by the paragraph break has a considerable impact on the visual appearance of text. A page with paragraph breaks can be visually attractive while a page with no breaks can be quite intimidating. There are no hard and fast rules about the length of individual paragraphs because much can depend on medium, topic, audience and purpose; but in academic texts aim for an average of two to three paragraph breaks per page.

More important than visual appearance, however, is the effect paragraphing can have on content. Paragraphs give you the opportunity to group the information you wish to give your readers into manageable, logical units so that they can see how you develop your argument as you move from one topic to another.

Exactly what constitutes a well-written paragraph is not easy to define. Nevertheless, some features are worth mentioning: point sentences, cohesion and coherence.

a) Point sentences

Traditional advice on writing claims that every paragraph must state its topic in its first sentence (the topic sentence). Joseph Williams has refined this notion of the topic sentence and uses the term point sentence to refer to the sentence that states the main idea of a paragraph or discourse block. In some cases, the point sentence coincides exactly with the traditional concept of topic sentence. For example (adapted from Williams, 2007):

> Although most economists believe that business decisions are guided by a simple law of maximum profits, in fact they result from a vector of influences acting from many directions. When advertisers select a particular layout, for example, they think not only of sales expectations but also of current fashion. They may also be concerned with what colleagues and competitors will think, or whether some social groups will be offended. They might even be worried about whether their partner will approve.

In this paragraph, the first sentence best represents the paragraph as a whole. It states the idea that the author wants readers to accept, and the other sentences support this idea. However, what about the following paragraph?

> Many English-language teachers say that paragraphs must have an introductory topic sentence. But in many cases this topic sentence is the second or third sentence. What teachers do not explain is that writers may use the first sentence (or sentences) as a transition from the previous paragraph or for general background information before they decide to state their point.

Most readers understand the point sentence of this paragraph to be the second one, the first one acting as a claim that the author goes on to refute and discuss.

The text below makes its point in the third sentence (adapted from Williams, 2007).

> Writing well involves so many skills that it is hard to know where to begin describing what makes a good writer. Among other considerations, a writer must be sensitive to words, style, organization, subject matter, logic, emotion and audience. Perhaps the most crucial of these, though, is a sensibility to one's audience, to how readers read.

In this case, the first two sentences are generalisations that are narrowed to the point that is made in the third. The author must now decide whether to go on to discuss this point in the rest of the paragraph or start a new paragraph that takes the final sentence as its point (and that, therefore, will not have a point sentence of its own). The decision to do one thing or another will probably depend not on content but on length.

Likewise, some paragraphs may not have a sentence that clearly states the point. Consider the following text (adapted from Shipman et al., 2012).

> A lightning stroke's sudden release of energy heats the air, producing the compressions we hear as thunder. At a distance of about 100 m or less from the discharge channel, thunder is heard as one loud bang or "clap". At a distance of 1 km from the discharge channel, thunder is generally heard as a rumbling punctuated by several claps. In general, thunder cannot be heard at distances of more than 25 km from the discharge channel.

> Because lightning strokes generally occur near the storm center, the resultant thunder provides a method of approximating the distance to the storm. Light travels at approximately 3000,000 km/s and the lightning flash is seen instantaneously. Sound, however, travels at approximately 1/3 km/s, so there is a gap between seeing the lightning flash and hearing the thunder. This phenomenon can also be observed by watching someone at a distance fire a gun. The report of the gun is heard after the smoke or flash from the gun is observed.
>
> By counting the seconds between seeing the light and hearing the thunder, you can estimate your distance from the lightning stroke or the storm. For example, if 5 seconds elapse, then the distance would be approximately 1.6 km away.

These three paragraphs are from an article about thunderstorms. All three can be regarded as forming a block that focuses on the sound associated with thunder.

The first sentence of Paragraph 1 expresses the major idea – the point – that is developed throughout the three paragraphs: lightning produces thunder. Even though this main idea is discussed in all the paragraphs, Paragraph 2 also has a point sentence in initial position. It is more specific than the first sentence of Paragraph 1: it deals with how we can approximate the distance to the storm from the sound it produces. Therefore, Paragraph 1 has a major point sentence while Paragraph 2 has a minor one. Paragraph 3, on the other hand, has no point sentence. It clearly takes it from the preceding paragraph, of which it is a continuation.

To sum up, locate your point, your main idea, at the beginning or towards the beginning of paragraphs or blocks because this is where readers will naturally expect it to be and because by stating a general idea and then going into more specific detail you will make the reading process easier. After stating your point, write a longer segment that completes a paragraph or extends over several paragraphs. Paragraphs are not isolated units. They connect with adjoining paragraphs to form larger blocks.

b) Cohesion and coherence

Cohesion and coherence are similar concepts but not the same. Cohesion refers to the micro-level of the text, the logical connections between words and sentences that give a sense of flow. Coherence refers to the macro-level of the text, the sense that the paragraph or block clearly communicates an idea to the reader. You can use several techniques to ensure that your paragraphs are cohesive and coherent.

1 EXPLOIT REPETITION

One way to make text cohesive is to repeat words, to repeat ideas using different words (synonyms) or to refer back to previous ideas using pronouns or shell nouns (see example text below). Repetition, particularly of characters in subject position, and constant reference back to previous information gives text a sense of unity and focus.

2 USE TRANSITIONS

Transitions are words and phrases that signal relationships between ideas. They can be used to good effect at the beginning of sentences to make text flow but, be careful, they cannot replace good organisation. One of the dangers of transitions is to use too many of them.

Some examples of transition words and their functions are the following:

Addition	Cause/effect	Sequence
Also	Because	First/In the first place
Again	Since	Second/In the second place
Then	Thus	Third
In addition	As a result	Next
Moreover	Therefore	Finally

Contrast	Example	Summary
In contrast	For example	To conclude
However	For instance	To sum up
Although	By way of example	In conclusion
Despite	In this case	In brief
On the other hand	Namely	In the final analysis

3 MOVE FROM OLD INFORMATION TO NEW

Text is more readily understood if writers begin their sentences with old or familiar information and then go on to add something new or unfamiliar. The old/familiar information comes from two sources: (a) the sentences readers have just read, and (b) readers' knowledge of the subject. This principle goes hand in hand with the principles of characters as subjects and end focus. As soon as writers have stated their main characters (normally towards the beginning of the text), readers will accept them as familiar information, so when characters are regularly placed at the beginning of sentences, the information naturally flows from old to new.

c) Example text with commentary

In recent decades, <u>red wine</u> has been associated with many <u>health</u> benefits. According to research, if drunk in moderation <u>red wine</u> can reduce the risk of cardiovascular disease, atherosclerosis and some cancers. This effect is largely due to its content of antioxidants, which reinforce the immune system. [However], antioxidants are also found in fruit, nuts and vegetables so, because of the <u>health</u> risks of drinking <u>alcohol</u>, getting antioxidants from food may be a <u>healthier</u> option. This study discusses the importance of antioxidants for human <u>health</u> and finds that, although <u>red wine</u> is <u>healthier</u> than other <u>alcoholic</u> beverages, antioxidant-rich foods are better sources because they do not have any associated risks.

This text has many of the features of a well-written paragraph discussed above.

The words underlined are the main characters, which are introduced in the first sentence (the point sentence) and repeated throughout the paragraph. In some cases, the words are direct repetitions (*red wine* or *health*), while in others the author uses a pronoun or a hypernym (*its* and *alcohol*) or an adjectival form (*healthier*). Note that the author opts for direct repetition (*red wine*) in the first two sentences to reinforce the importance of the term in the text before introducing variation.

The word in square brackets ([]), the adverb *however*, is the only transition word in the text, but it signals a key point: the limitations of previous research. It is this word that tells readers that the text is about to take a new direction and the limitations described justify the need for the present study.

The author starts the text with a concept that is familiar to all readers (*red wine*) and then moves on to say something about it (it has health benefits) that they may or may not know. The structure of the second sentence is similar to that of the first. It begins by repeating the familiar concept (*red wine*), which is now a character in our text, and then extends the idea introduced in the first sentence by specifying exactly what these *health benefits* are. The third sentence again begins with familiar information, this time because it refers back to the information given in the previous one (*the reduction of risk*) by using a shell noun (*effect*), an abstract noun that summarises a previously stated, more complex idea. The fourth sentence starts with the contrastive adverb *however* and then uses the concept introduced at the end of the previous sentence (*antioxidants*) as the subject of the main verb. The subject of the final sentence (*study*) is neither a character nor a concept introduced previously, but in the context it is easily understandable and the information given in the rest of the sentence repeats the main concepts in the text so far*: red wine* and *health* (introduced in the very first sentence) and *antioxidants*, a concept that will also clearly become a main character.

4 Active or passive

The use of the active or passive voice in research writing is the subject of heated debate. Some claim that the passive voice is ideally suited to scientific communication because it gives texts an impersonal tone that is more objective and formal. Others believe that the active is more concise and makes texts more readable and easier to understand.

In the seventeenth and eighteenth centuries, research was largely communicated in a highly personal letter format and authors played a more central role because individual skill was a fundamental part of the process (for example, they often had to make their instruments themselves). The general trend was to use an active, personal style. Consider the following text from Isaac Newton's *Opticks*, published in 1730, the tone of which is quite unlike that of modern scientific writing.

> In a very dark chamber, at a round hole […] made in the shut of a window, I placed a glass prism, whereby the beam of the sun's light […] might be refracted upwards toward the opposite wall of the chamber, and there form a colour'd image of the sun. The axis of the prism […] was in this and the following experiments perpendicular to the incident rays. About this axis I turned the prism slowly, and saw the refracted light on the wall. When the image seemed stationary, I stopp'd the prism, and fix'd it in that posture, that it should be moved no more.

The twentieth century saw the advent of the highly structured IMRaD format, and authors were instructed by scientific journals to favour the passive voice and avoid the active, particularly first-person pronouns such as *I*, *we*, *my* or *our*. Thus, the sentence from Isaac Newton's text above

> I turned the prism slowly, and saw the refracted light on the wall.

would become

> The prism was turned slowly and the refracted light was seen on the wall.

More recently, many research journals have been reacting against the notion that the passive is more suited to academic writing and they now encourage authors to favour the active voice. In their instructions for authors, many journals advise authors to use the active because it makes texts easier to read. However, despite such explicit advice as "Please write in a clear, direct and active style" and "Use, direct, active-voice sentences", other advice is not so clear. The *British Medical Journal* tells authors to "Use the first person where necessary" but does not explain where it is necessary and where it is not. The *Journal of Neuroscience* states that "Overuse of the passive is a common problem" but does not define what the difference is between overuse and acceptable use. It also recognises that "The passive has its place" but then only mentions that one of these places is the methods section. And the journal *Ophthalmology* uses the passive to instruct authors to use the active ("The active voice is much preferred to the passive voice, which should be used sparingly.").

To add to the confusion, some recent research suggests that there is little basis to the claims that texts written in the active voice are easier to understand than texts that favour the passive (Millar & Budgell, 2019).

The question thus remains: should research writers use the active or the passive voice? The answer is, of course, that you should use both. Below are some principles that will help you decide when to use one or the other.

a) Respect your supervisor's preferences.

As a researcher, you will adapt your writing style not only to your individual preferences but also to the external requirements dictated by your field of study and your supervisor. If you are given instructions to favour either the active or the passive, follow them. If you are not, follow the principles below.

b) Use the passive voice to focus on the action.

In many cases readers do not need to know who or what did the action because the focus is on the object of the action or the action itself. The important thing is not that someone did something but that something was done. For example:

> The ferroelectric properties of polyvinylidene fluoride were first reported in 1971. These properties were exploited to take giant strides in the field of data storage and retrieval.

In this example, the focus is on a particular polymer and its properties. For the purposes of the text, the person who reported the properties is of no importance.

c) Favour the passive voice in the methods and results sections.

If you favour the active voice in the methods and results sections, you will focus on the researchers. By using the passive you can change the focus to the materials and procedures used or the results obtained, and also avoid a long list of sentences all beginning with *I* or *We*. What is more, in this central section of the research paper, readers know who is responsible for the actions. There is no need to specify the agent of every action because it is obvious. Therefore, not

> We obtained intelligibility quotients by presenting 273 undergraduates in their final year with abstracts from five research articles. We presented the control group with the original texts, and the two experimental groups with texts containing a high prevalence of verbs in either the passive or the active voice. We determined the intelligibility of the three text types by dividing the time taken to read the texts by the number of correct answers given to a series of post-reading questions. We assessed the differences in intelligibility between the three texts with a dependent *t* test.

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d) Use the verb form to organise the sentence content.

As mentioned above, readers find sentences easier to understand if subjects are short and the longer, more complex information is located after the main verb, so your decision on how to express the verb does not depend on your preference for the active or the passive per se but on the position of the verb in the sentence. Therefore, not

> The effect of the temperature lift between low and intermediate temperature levels on COP for the double lift cycles working with TFE-TEGDME is illustrated in Figure 8.

but

> Figure 8 illustrates the effect of the temperature lift between low and intermediate temperature levels on COP for the double lift cycles working with TFE-TEGDME.

e) Use verb forms that keep characters in subject position.

More important than the decision to express the verb in the active or the passive is the decision about what to place in subject position. Readers understand text more easily if writers locate their main characters in the subjects of their verbs and if these subjects are regularly repeated. This principle works both within and between sentences. The sentence below begins with *Digital competence* as the subject of the main clause but then repeats the concept in the subordinate clause not as the subject but as the object (*it*) of an active verb.

> Digital competence is essential for 21st century students, which is why universities must integrate it into their curricula.

By changing the verb in the subordinate clause to the passive, we can keep *digital competence* in subject position and focus readers' attention on one character.

> Digital competence is essential for 21st century students, which is why it must be integrated into university curricula.

The paragraph below introduces its main character (*Ayahuasca*) as the subject of the first sentence.

> Ayahuasca is a psychoactive substance from the Amazon, usually prepared with two main ingredients: the vine *Banisteriopsis caapi*, and the shrub *Psychotria viridis*. Both ingredients are necessary for ayahuasca's psychoactive effect. In the traditional Amazon cultural environment, more than 70 tribes use it for religious, magic and medical purposes.

The subject of the second sentence (*Both ingredients*) is familiar because it is the information introduced at the end of the first. However, the subject of the third sentence (*more than 70 tribes*) has not been mentioned before and it shifts the focus away from the main character of the paragraph, which appears as a pronoun in object position (*it*). By rewriting the sentence using the passive, we return the main character to subject position and improve coherence.

> Ayahuasca is a psychoactive substance from the Amazon, usually prepared with two main ingredients: the vine *Banisteriopsis caapi*, and the shrub *Psychotria viridis*. Both ingredients are necessary for ayahuasca's psychoactive

effect. In the traditional Amazon cultural environment, it is used by more than 70 tribes for religious, magic and medical purposes.

The two examples above use the passive not because it is intrinsically superior to the active but because it helps keep the focus on a particular character by placing it in subject position.

f) Use verb forms that facilitate movement from old information to new.

As mentioned above, readers expect the information at the beginning of a sentence to provide a familiar context after which new information will be presented. They feel confused when a sentence begins with information that is new or unexpected. In the fragment below, the subject of the second sentence gives new information before the more familiar information already presented in the previous sentence.

> Universities must decide whether they want to improve the quality of courses in the most popular disciplines alone or across the whole curriculum. The relative importance attached to commercial competitiveness or a well-balanced educational programme will determine the decision.

The sentence would be easier to read if the active verb *determine* were passive because the information that refers back to the previous sentence (*the decision*), which also has the advantage of being short, would be in initial position.

> Universities must decide whether they want to improve the quality of courses in the most popular disciplines alone or across the whole curriculum. The decision will be determined by the relative importance attached to commercial competitiveness or a well-balanced educational programme.

Again, if we followed the advice given by some journals and style guides to prefer the active to the passive, we would choose the first of the following two sentences (Williams, 2007).

> The collapse of a dead star into a point perhaps no larger than a marble creates a black hole.

> A black hole is created by the collapse of a dead star into a point no larger than a marble.

However, which one would we choose if the context were the following?

> Some astonishing questions have been raised about the nature of the universe by scientists studying black holes in space. _____. So much matter compressed into so little volume changes the fabric of space around it in puzzling ways.

Our sense of flow requires not the first, active sentence but the second, passive one because the last words of the first sentence introduce important information (*black holes in space*). If we follow it with the active sentence, the first information we encounter is collapsed stars and marbles, which does not refer to anything in the text we have just read. If we follow it with the passive sentence, however, the first words repeat the information that we have just read and the last words give information about size and volume, which connects with the beginning of the third sentence.

g) Use the active with the pronouns *I* or *we*.

Some researchers claim that first-person pronouns should not be used in research writing because they are not objective. But consider the first sentence from Watson and Crick's article announcing their discovery of the DNA double helix in the 1950s.

> We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

And later in the paper they continue in the following way.

> It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

It is not true, then, that *I* and *we* are not used in modern research writing. However, and by way of example, just as the passive is preferentially used in the methods section to report research procedures and activities, so personal pronouns are also used in certain ways. In particular, they are used to refer to the authors' own writing and thinking, and when the authors are main characters in contrast to other researchers. This means that *I* and *we* are generally found in the introduction, where authors state their intentions (*I will show that …*, *We start by …*, *I claim that …*, *We argue that …*, etc.) or in the discussion and conclusion where they compare or contrast their work with the work of others.

> Although Larsson and Eklund found moderate support for the theory, we found none. This may be because their population was from Scandinavia while ours was from Catalonia.

First-person pronouns are, then, quite acceptable in research writing as long as you use them in certain limited ways.

5 Parallelism

Parts of sentences are said to be parallel when they are connected by commas (in a list) or by conjunctions such as *and*, *or*, or *but* and have the same grammatical form. Parallelism repeats lexis or structure to make it easier for readers to understand new information because it is given in a familiar form. The first segment establishes a structure that is then repeated so that ideas are expressed through lexical and syntactic parallels. Carried to an extreme, it is a powerful device that is often used for rhetorical effect. Many famous quotes are remembered not only because they were uttered by important people at important times but because they have a distinct parallel structure. For example:

> I would say to the House as I said to those who have joined this government: I have nothing to offer but blood, toil, tears and sweat.

> We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills.

In the first example, Winston Churchill coordinates a series of four one-syllable nouns as the objects of the preposition to give an aesthetically pleasing and powerful message. The force of his argument would have been lost if he had used, for example, just the noun phrase *hard work*. In the second, he coordinates whole verb clauses, the subject and verb of which are repeated and combined with different prepositional phrases, to generate a clear rhythm and a strong emotional effect.

In the quote below, Abraham Lincoln coordinates three prepositional phrases, in which the preposition varies but the object remains the same, to highlight the nature of democracy.

> […] we here highly resolve that these dead shall not have died in vain […] and that government of the people, by the people, for the people, shall not perish from the earth.

But parallel structure is also a useful communicative tool for researchers because it clarifies meaning and makes ideas more comprehensible and memorable for readers. It is particularly important in lists and coordinated sentences. For example, in the sentence below, the subordinating conjunction *because* introduces a non-parallel list.

> Textile companies are now less competitive because their plants are old fashioned, foreign competition is greater than ever before and high labour costs.

The first and second items are verb clauses (subject + verb + complement), but the third item (*high labour costs*) is a noun phrase. Readers will probably have to read the sentence two or three times before they realise that it has no accompanying verb and that the list has three items, one of which is not parallel to the others. Changing the third item to a verb clause solves the problem.

> Textile companies are now less competitive because their plants are old fashioned, foreign competition is greater than ever before and labour costs are high.

Likewise, in the sentence below, two very similar ideas are expressed with two different grammatical structures (infinitive phrase and verb clause).

> Physiological changes in haemostasis are necessary in the first phases of pregnancy to ensure appropriate placentation and in the last phases they have a protective function against possible haemorrhages during delivery.

The message can be more efficiently expressed if the grammatical form of the second idea mirrors that of the first.

> Physiological changes in haemostasis are necessary in the first phases of pregnancy to ensure appropriate placentation and in the last phases to protect against possible haemorrhages during delivery.

Parallel structure can be particularly valuable in results and discussion sections where data, ideas and situations are contrasted, and differences and similarities are highlighted. Parallel structure makes these differences and similarities easier to see because the constant remains constant and only the variable varies. That is to say, when the words are different, the ideas are different; when the words are the same, the ideas are the same. By presenting your data in parallel sentences, you can point readers directly to your findings. For example:

> In the control group we observed no change in the infection rate or the survival of patients. In the experimental group, on the other hand, we observed a decrease in the infection rate and a corresponding increase in the survival of patients.

and (from Zeiger, 2000)

> When the divisor was greater than the absolute value of the peak of a wave, the wave was eliminated. When the divisor was less than the absolute value of the peak of a wave, the wave was amplified.

Finally, a word of warning. As mentioned above, in parallel structures be sure that every coordinated item has the same grammatical form. Therefore, not

> Sequencing approaches are now widely used for the characterisation of organisms and inferring their genealogical histories.

but

> Sequencing approaches are now widely used for characterising organisms and inferring their genealogical histories.

Ensure, however, that readers can clearly discern where parallel segments begin and end. In the following sentence, it is not clear where the parallelism begins.

> Injury to endothelial cells increases sensitivity to vasopressor agents, intravascular coagulation and membrane permeability.

It seems to be saying that *Injury to endothelial cells increases sensitivity* to three coordinated segments. This is not the case. It *increases* three coordinated segments, one of which is *sensitivity to vasopressor agents*. The problem can be solved by repositioning the problematic segment.

> Injury to endothelial cells increases intravascular coagulation, membrane permeability and sensitivity to vasopressor agents.

6 Concision

Good academic writing is concise. Concise writing expresses its meaning clearly in few words and enables readers to quickly identify key points. It increases the impact of the message because it makes it more memorable. However, although concise texts are easy to understand, they are by no means easy to write because they require considerable revision. It is impossible to identify all the ways in which authors inflate their texts, but below you will find some strategies for reducing length without removing necessary information.

a) Reduce relative clauses.

Reduce relative clauses to simpler, shorter constructions. Therefore, not

> *The Last Supper*, which was painted at the end of the 15th century, was commissioned by Ludovico Sforza for his family's mausoleum.

but

> *The Last Supper*, painted at the end of the 15th century, was commissioned by Ludovico Sforza for his family's mausoleum.

or

> Painted at the end of the 15th century, *The Last Supper* was commissioned by Ludovico Sforza for his family's mausoleum.

b) Delete superfluous words and phrases.

Delete all words and phrases that add nothing to the meaning. In all the sentences below, the fragments in **bold** can be removed without affecting the meaning in any way.

> The effect of **the application of** infrasonic pulsing on flux can be seen in Figure 3.
> The lesion was slightly pink **in colour**.
> The results **obtained** are discussed below.
> **It has been shown that** dibucaine inhibits plasma cholinesterase by 80%.
> **We can affirm that** the paper contains no new theoretical information.
> **Use of** a higher voltage increases Joule heat.
> The mobilities were studied **in the range** between 10 and 30 mM.
> This section reports the adsorption of three **different** proteins.

c) Avoid nominalisations.

Researchers often use a higher ratio of nouns to verbs than other writers. Consider the following two versions of the same sentence.

> Spaceflight is now less risky and more economic because technology has improved.

> Improvements in technology have reduced the risk and cost of spaceflight.

The first sentence, which is a verb-style version, uses more verbs (2) and adjectives (2) and fewer nouns (2), so the emphasis is on actions and events. The second sentence, a noun-style version, uses more nouns (5) and fewer adjectives (0) and verbs (1), so the emphasis is on concepts and things. This emphasis makes the writing seem more abstract and formal, and, therefore, more academic.

But beware: if the nouns you use are not the concepts on which you wish to focus, or if you use too many concepts, your texts may become dense and difficult to read. Note that in the two examples, many of the concepts are the same but the focus is completely different: the first one is about spaceflight while the second is about improvements in technology.

Be careful not to express the action of a sentence in the form of a noun, a phenomenon known as nominalisation. If you do, you may

- change the focus (because you remove a character from subject position),

- write sentences with long subjects, or

- need more words to express your ideas.

For example:

Nominalised sentence

> Stabilisation of the compound took place early in the experiment.

Verb-style sentence

> The compound stabilised early in the experiment.

In the nominalised sentence, the focus is on *stabilisation*, the subject is four words long and the whole sentence is 10 words long. In the verb-style sentence, the focus is on *compound*, the subject is two words long and the whole sentence is seven words long.

Likewise,

Nominalised sentence

> Successful separation of four of the five compounds was achieved with a 20 mM borate buffer.

Verb-style sentence

> Four of the five compounds were successfully separated with a 20 mM borate buffer.

In the nominalised sentence, the focus is on *separation*, the subject is eight words long and the whole sentence is 16 words long. In the verb-style sentence, the focus is on *compounds*, the subject is five words long and the whole sentence is 14 words long.

To sum up, express the actions of your sentences with verbs rather than with nominalisations to write more focused, more concise sentences.

d) Use expletive constructions sparingly.

Expletive constructions combine *it* or *there* with the verb *be*. For example:

> There were 50 participants in the experimental group and 47 in the control group.

They can be useful sometimes because they allow you to emphasise information by positioning it after the verb in focus position. However, the verb *be* is often followed by a relative clause that increases the length of the sentence unnecessarily. For example:

> It is this proposal that solves the problem most effectively.

> There are some natural polymers that have cationic properties.

In both examples above, the expletive construction and the relative clause can be removed and the idea expressed with a more concise subject-verb-object structure.

> This proposal solves the problem most effectively.

> Some natural polymers have cationic properties.

e) Avoid vague attributions.

In their texts, researchers often justify their statements by referring to authoritative sources. However, if you wish to refer to a source, do not do so vaguely as in the examples below.

> It has been shown that *Spirulina sp.* and *Aphanizomenon flos-aquae* can be used safely in food supplements.

> Plasma homocysteine levels have been observed to increase with age.

If you are writing about generally accepted scientific knowledge, there is no need to acknowledge a source and you should make a straightforward statement rather than a vague attribution:

> *Spirulina sp.* and *Aphanizomenon flos-aquae* can be used safely in food supplements.

> Plasma homocysteine levels increase with age.

f) Make direct statements.

Avoid unnecessary introductions to sentences.

> As far as plans for overcoming poverty are concerned, they must include cultural development.

> With regard to personal data processing, it has been legislated for in Article 6.

The two constructions used above (*as far as … is concerned* and *with regard to*) call attention to a topic that has probably been mentioned at least once in the preceding text and is repeated later in the same

sentence in pronominal form (*they* and *it*, respectively). Your sentences will be more concise and more easily understood if you make direct statements by using the topic as the subject of the verb in the main clause.

> Plans for overcoming poverty must include cultural development.

> Personal data processing has been legislated for in Article 6.

g) Do not hedge to excess.

Researchers are often uncertain about the significance of their findings and need to use cautious language to make noncommittal statements. This is known as hedging. Common hedges include *probably*, *possibly*, *perhaps*, *may*, *might*, *apparently*, *suggest*, and *indicate*. It is quite legitimate for researchers to use language such as this because it protects them from the consequences of any errors of interpretation and reveals that they are aware of the limits of their findings.

However, despite being common practice in scientific writing, hedging should not be used to excess because it weakens the message. Therefore, not

> There **seems to be some** evidence to **suggest** that **some** of the differences between Japanese and Western rhetoric **may** be due to historical influences **possibly** traceable to Japan's cultural isolation and Europe's history of cross-cultural contacts.

But (from Williams, 2007)

> The evidence **suggests** that **some** of the differences between Japanese and Western rhetoric are due to Japan's cultural isolation and Europe's history of cross-cultural contacts.

The words highlighted in bold in the texts above are all hedges. In the first text, the number of hedges weakens the argument so much that it is probably not worth making. In the second text, the verb *suggest* and the quantifier *some* enable the author to make an argument about which they may not be fully certain but are confident enough to propose. It is also more reasoned and moderate than aggressively stating "The evidence proves that the differences between…".

So, academic writing requires you to use hedges to moderate the forcefulness of your arguments. But do not use too many.

Part 2.   Structure and content

Introduction

This part of the *Guide* offers practical advice about writing your end-of-degree project in English. Focusing on appropriate structure and content, we explain how to write the most typical parts of an academic paper in the humanities, the natural sciences and the social sciences. Our advice is organised into ten sections, each supported by practical examples: *Cover page*; *Acknowledgements*; *Table of contents*; *Title*; *Abstract and keywords*; *Introduction*; *Main body*; *Conclusion*; *Referencing style*; and *Editing your paper*.

Because many academic writing skills are equally important in all disciplines, in some sections our advice does not distinguish between the three ambits. However, where writing practices do differ, we explain this in subsections that highlight the differences and describe appropriate structure and content for one ambit or another. To give just one example, the main body of a paper in the natural sciences generally consists of the three parts *Methods*, *Results* and *Discussion*, whereas the main body of a humanities paper consists of only one part, also called *Discussion* but very different to the part with that name in the sciences. For this reason, the section *Main body* below contains subsections that examine writing practices in the humanities, natural sciences and social sciences separately.

Of course, there are also other differences between the three ambits and not all of the parts we examine here are indispensable in papers in all of them. It is also true that there is no set formula for writing some of the parts, as is the case with the discussion section in humanities papers. To sum up, academic writing is a complex process, but it can be made more manageable if you are sure of two things: first, that the parts, structures and techniques you have chosen are serving your research objectives; and second, that your paper clearly considers the requirements of the specific academic community you are addressing. This, we hope, is what this part of the *Guide* will help you do.

1 Cover page

In all the ambits, the layout of your cover page will depend on your institution, which will also specify which parts of the cover page should be in English or not. If you need to include the name of the type of paper you have written (TFG/TFM), make sure you use the term preferred by your institution:

> treball fi de grau; treball final de grau
> (final) bachelor's degree project; bachelor's thesis
>
> treball fi de màster; treball final de master
> (final) master's degree dissertation; master's thesis

Unless you are instructed otherwise, italicise the title of your paper and capitalise the first word and all nouns, pronouns, adjectives, verbs and adverbs. Do not capitalise articles, conjunctions or prepositions:

> *The Prodigal Son in Asturian Cinema*

Capitalise the first word of a subtitle after a colon, whatever part of speech it is:

> *The Prodigal Son: A Recurrent Theme in Asturian Cinema*

Use roman type rather than italics for any works mentioned in the title:

> *The Prodigal Son in Tomás Fernández's* La torre de Suso

If the entire page is in English, preserve all the diacritics in people's names or use none:

> Tutor: Dr Núria González Sarrió
> Supervisors: Dr Birgit Schröder and Dr Bela Vojtěch
>
> Tutor: Dr Nuria Gonzalez Sarrio
> Supervisors: Dr Birgit Schroder and Dr Bela Vojtech

Either way, respect people's preferences with their names by preserving their use of capital and small letters and their treatment of articles, prepositions and conjunctions:

> Maria De La Rosa
>
> James H. Macdonald
>
> Karel Van de Weyde
>
> Sander van Veen
>
> Gemma Puig Davies
>
> Jana Puig i Salas
>
> Oscar Hernández-Ferrero

Finally, when two or more people appear in a single phrase or list, order them alphabetically by family name:

> Supervisors: Dr Juli Caubet-Puigverd and Dr Laura Ciminelli

2 Acknowledgements

The acknowledgements page names the individuals and organisations who helped you write the paper. Including this page is therefore regarded as good academic practice in all the ambits because it establishes your integrity as a researcher. Like the cover page, your institution may have guidelines about how to present the acknowledgements page and where it should go in the overall paper; whatever the case, it should be brief and contain the full names of all the individuals and organisations you thank, listed in the order that best represents the nature and importance of their contribution.

Because the text is short, aim for variety in the way you express your thanks to avoid sounding repetitive, and distinguish between more formal acknowledgements (teachers, other professionals) and informal ones (family members, friends):

> This paper and the research behind it would have been impossible without the support of my tutor and supervisor, Dr Sandra Puig Martín. I am indebted to her for the patience and painstaking care with which she guided me through the writing. Next, I wish to thank James Eberhart Jnr. and Natalia Lucchetti of the Fundació Antoni Tàpies Library, who offered me practical advice during the last two months of writing, and express my gratitude to Iñigo Montoya at Readymade Books, whose insightful observations helped put the finishing touches to the paper. Finally, I also want to say thank you to my brother Jaume Armengol, whose moral support helped me get the project finished. In short, the generosity of all of these people improved my paper in many ways and saved me from many errors; those that inevitably remain are entirely my own responsibility.

3 Table of contents

In all the ambits, the table of contents lists the different sections of the paper together with the page numbers, which you can create automatically in Word using the Titles styles for your section titles. Use sentence-style capitalisation for the section titles, meaning only capitalise the first word and all the proper nouns.

Here is the table of contents of a humanities paper called *Rauschenberg's* Bed *as an Examination of Portraiture*:

Table of Contents

Digital appendix
Robert Rauschenberg by Louwrien Wijers for Art & Design Profile No. 21, Art meets Science and Spirituality, 1990 (interview, .mp4)

Here is the table of contents of a computer science paper called *Protein Classification from Primary Structures in the Context of Database Biocuration* (Terpugova, 2017):

Table of Contents

And here is the table of contents of a social sciences paper called *Jazz Chants for Vowel Reduction and Language-Learning Motivation in Spanish High-School Learners of English*:

Table of Contents

Finally, if you need to include an index of tables and figures, put this on the page following the table of contents. If you use illustrations, there is no need to include an index.

4 Title

In all the ambits, the title summarises the main ideas of your study. A good title contains the fewest possible words that adequately describe the contents and purpose of your research. The title is the part of a paper that is read the most, and usually the part that is read first.

a) Humanities

1 GENERAL CONSIDERATIONS

In miniature, the title of your humanities paper should reflect four aspects of your academic writing skills that will continue to be important in the rest of the paper: your summary skills, your ability to write for a specific community, your authorial voice and your intention to make an original contribution to the field.

The title shows your summary skills by describing the subject of the paper clearly and concisely. When your paper is an analysis, you may be able to do this in just a few words.

> *Cycles of Neglect in Hideo Tanaka's* Dark Water

But when it reports on a procedure or describes a specific project, the title may need to be longer:

> *Subtitling Flamenco for Netflix: Creating the Subtitles and Pivot Language Dialogue List for the Documentary* Flamencas: mujeres, fuerza y duende

Whatever its length, aim for a title that avoids unnecessary words. For example, start by writing a simple noun phrase that describes the paper:

> Robert Rauschenberg's use of the painting *Bed* to examine the concept and practice of portraiture

> The relationship between moments of sadness and pleasure in the novels of J. P. Donleavy

Then, shorten the phrase by removing any unnecessary words to get the title:

> *Rauschenberg's* Bed *as an Examination of Portraiture*

> *Sadness and Pleasure in J. P. Donleavy*

After summary skills, your title should reflect your ability to address your particular academic community, also called your discourse community. This means showing you are familiar with the concepts customarily discussed by members of the community and successfully including the academic terms they use. To indicate this knowledge and ability, the second title above might be slightly revised:

> *Sadness and the Notion of* Jouissance *in J. P. Donleavy*

Second, show you know what is expected of you by the community in more general terms. For example, because research indicates that papers with shorter titles can get more citations and are easier to understand (Letchford et al., 2015), short titles are valued by academics in general. You may only be

planning to publish this paper as a final project in your university repository, but the reader will value your short title as attention to good academic practices.

After summary skills and familiarity with your discourse community, the title should reflect your authorial voice: the style and features of your writing that distinguish it from other people's. This may sound daunting if you are just beginning your academic career, but in practice you can start simply by adding a detail that is originally yours but also fits with what your discourse community would expect. For example, you could give authorial voice to the title above by rewording it to remind the reader of something that was typical of Donleavy, namely his habit of giving novels alliterative titles (*The Beastly Beatitudes of Balthazar B*, *The Destinies of Darcy Dancer*, *Gentleman*, etc.). Your own title could therefore be:

> *The Joyless* Jouissance *of J. P. Donleavy*

Speaking directly to your discourse community and working on your authorial voice are also closely connected to the fourth and last aspect that your title should reflect: your intention to make an original contribution to research. In fact, the three often go together, as they do here:

> *From Charlie to Evan and Bach Again: Improvisation as a Constant in Musical Practice*

The title above comes from a paper defending the musical genre known as free jazz. In it, the writer proposes that free jazz musicians today use the same techniques that classical musicians used in other periods of history and that, for this reason, their music deserves similar critical attention. The paper therefore clearly addresses a discourse community (scholars of musicology) and sets itself a task (to convince the sceptics). But to argue the case, the writer will quickly need to assert their knowledge of the subject and find an authorial voice, and this is where the title is important. In the example above, the writer asserts their knowledge by choosing as examples of free players two well-known musicians who happen to have the same family name (Charlie Parker, who will be known by specialists and non-specialists alike, and Evan Parker, who only specialists or enthusiasts will recognise) so that they can omit the name and make the reader call it up from their own specialist knowledge – or to be more precise, make the reader appreciate that they, the writer, know enough to engineer the coincidence in the first place. And second, as in the J. P. Donleavy title earlier in this section, they create a sense of voice by engaging in wordplay (where "Bach" refers to both Johann Sebastian Bach and the word back in the common phrase "and back again").

2 TITLE STYLES

When you start to think about the title of your paper or final project, there are three title styles to choose from: nominal, compound and full-sentence. Some universities recommend their humanities students to use the compound style. Some guides recommend not using the full-sentence title, which may be more suited to research papers in science (see below). If your institution lets you choose, select the style that best suits your purposes.

Nominal titles generally consist of noun or verb phrases and are probably the easiest to write well because their aim is simply to describe the main theme of the study:

> *White Temporality and the Underground Railroad in African-American Poetry of the 1950s*

> Homo Mensura *in Plato's* Theaetetus *to Examine the Relativity of Literary Criticism*

> *Following Hamish Fulton's Solo Walking Works in Valencia and Portugal*

Compound titles comprise two phrases joined by a colon. Never use a full stop to join them. The first phrase can contain a general description of the subject, which the second phrase explains in more detail:

> *The Filmscore in John Zorn's* Filmworks*: A Musician's Attempt to Work outside the Jazz-Frame*

Or you can reverse the order so that the first phrase 'drops' the reader in the middle of the subject while the second phrase pulls back and contextualises:

> *Attempting to Work outside the Jazz-Frame: The Filmscore in John Zorn's* Filmworks

This alternative order can help you develop a sense of authorial voice. In it, the first phrase can name an important concept in the paper:

> *The Space Love Fills: An Examination of Beauty in Agnes Martin's Life and Works*

It can give special emphasis to quoted material, which is then tied to but perhaps not entirely explained by the second phrase:

> *"I am leaving because I am bored": George Sanders and the Aesthetics of Hollywood Suicide*

> *"I could not love thee (Dear) so much, Lov'd I not Honour more": The Literate Gumshoe in Robert B. Parker's Crime Fiction*

Or it can combine with the second phrase to comment on your overall proposal:

> *Why We Cannot Negate Marjorie Perloff's* Postmodernism and the impasse of lyric*: A Critical Reading of Poetry Criticism*

Whichever order you choose, make sure the two phrases are each doing something different. If they are not, the effect is strange:

> *Jordi Savall's Adaptation of* The Song of the Sibyl *for a Solo Female Voice: The Arrangement of the Song for Montserrat Figueras*

To solve this, decide where your priorities lie and edit accordingly, possibly changing style:

> *Jordi Savall's Adaptation of* The Song of the Sibyl *for Montserrat Figueras*

> *Jordi Savall's Adaptation of* The Song of the Sibyl *for a Solo Female Voice*

Or keep all the details but make it shorter:

Jordi Savall's Adaptation of The Song of the Sibyl *for a Solo Female Voice Featuring Montserrat Figueras*

Finally, after nominal and compound titles, there are full-sentence titles. As explained above, these are more common in science papers, for example when a writer wants the title to contain a mention of results:

Anaphylaxis is More Common with Rocuronium and Succinylcholine than with Atracurium (Reddy et al., 2014)

Full-sentence titles are less common in humanities papers, which generally deal with questions for which there are no definitive answers, let alone results, and where the evidence as such is textual (written documents, films, paintings, scores, etc.). But if your title makes it clear that you know this convention and you are using it consciously for a particular effect, it may offer possibilities. The following are titles of a study on the works of musician-actor John Lurie, a commentary on a book by art historian Patricia Emison and an analysis of the uses of violence in the theatre and in popular culture, respectively:

Fishing with John Is Not as Exciting as Watching His Movies

The Old-Style Art Historians are the Smug Frat Brothers of the Academy

My Brother Dave Saw Calixto Bieito's Macbeth *at the Teatre Romea but All I Got Was this Bloody T-Shirt*

b) Natural sciences

Before researchers start work on a new topic, they need to look at the past work done in the same field. Of course, they cannot read all the work that has been published, so they make do with title scanning, a routine activity that involves checking lists of titles and deciding whether the content of the paper as a whole is important or not for their research. Thus, the title acts as a hook, and researchers often decide to read a paper (or at least move on to read the abstract) on the sole basis of the information provided in it.

Although the thesis you write for your bachelor's or master's degree has no need to hook an audience – after all you probably have a captive audience of only a handful of people (your supervisor and your examiners) – you should still respect the function of the title. The title of your work will immediately reveal to your supervisor whether you have understood the demands and conventions of your chosen discipline. A good title attracts readers to your text, informs them of the content of your work and shows them that you are part of their community.

According to Viviana Soler, science titles come in four different types: nominal, compound, questions and full-sentence (Soler, 2007). We shall focus on the three types that are used most in natural sciences: nominal, compound and full-sentence titles.

1 NOMINAL TITLES

Across all genres, nominal titles are possibly the most common title construction. Being the simplest form of title – essentially, a kind of name label – they are efficient and effective. The following is a typical nominal title:

Determining the Effectiveness of Decontamination with Ionized Hydrogen Peroxide

This type of title is a sentence fragment, not a full sentence; it is based on noun phrases and contains no finite verbs. It is 'indicative' in that it merely indicates what the paper discusses but gives no information about the findings. Here are some further examples:

Monitoring the Refractive Index of Tissue Models Using Light Scattering Spectroscopy

Deep Learning Surrogate Models for Spatial and Visual Connectivity

Comparing Perturbation Models for Evaluating Stability of Neuroimaging Pipelines

The titles above are effective because they are specific but also reasonably short. You need to be able to strike a balance between including as much detail as possible while still keeping your title short.

2 COMPOUND TITLES

A compound title offers context and then specific details, for example:

Cognition and Alertness in Medical Students: Effects of a Single Night of Partial Sleep Deprivation

The title is still nominal but, unlike the other titles above, it is also compound: that is to say, it consists of two sentence fragments based on noun phrases joined by a colon. It specifies the nature of the study but remains compact. The first phrase gives a general description of the subject, which the second phrase explains in more detail.

The compound title offers a wide range of possibilities to researchers who are looking for attractive, informative titles for their research texts. It is normal to make some sort of general statement in the first phrase and then qualify that statement in the second. For example, the second phrase can limit the scope of a general research topic announced in the first.

Online peer to peer support: Qualitative analysis of UK and US open mental health Facebook groups

Novel Targets for Fast Antidepressant Responses: Possible Role of Endogenous Neuromodulators

Alternatively, it can identify the methodology or the techniques used.

Gas hydrate in-situ formation and dissociation in clayey-silt sediments: An investigation by low-field NMR

Self-Care for Caregivers of Individuals Living With Multiple Sclerosis: Testing Mediation Models of Caregiver Stress, Health, and Self-Care

3   FULL-SENTENCE TITLES

Studies in some branches of science result in conclusive, evidence-based results. When this is the case, authors may assert their findings in a full-sentence title:

> *Memantine treatment reduces the incidence of flaccid paralysis in a zika virus mouse model of temporary paralysis with similarities to Guillain-Barré syndrome*

> *Neonatal Rotavirus-Associated Leukoencephalopathy Is One of the Main Causes of Fifth-Day Fits*

The present tense is used for the verb. In the words of Haggan, "the use of the present tense here emphasizes the note of confident optimism being projected by the writer that what he is reporting stands true for all time or is not simply a one-off occurrence" (Haggan, 2004).

As well as all the factors discussed above, when writing your title bear in mind that it is the single most important phrase in your study, so make sure you give it the time and effort it deserves. Decide which word is the most important and, if possible, place it prominently in initial position. Writing a working title early in the research process focuses your efforts in much the same way as clearly defining the research problem; by constantly referring back to it, you can keep your research and your writing on track. However, although you may write your title early on, you will probably revise and modify it during the research process and only submit a final version once the research is complete.

Unless you are instructed otherwise, capitalise the first word of the title and all its nouns, pronouns, adjectives, verbs and adverbs; do not capitalise any articles, conjunctions or prepositions. Some but not all of the examples of titles provided above follow this rule; this is because they are from real research papers and in each case the journal in which the paper is published specifies which type of capitalisation to use.

Write terms out in full. In general, avoid using abbreviations, which often have different meanings in different fields (for example, among various other meanings, PCR stands for polymerase chain reaction in molecular biology, pathologic complete response in cancer treatment, phosphocreatine in biochemistry, and principal component regression in statistics). However, where there is unlikely to be any confusion, for example with abbreviations for standard measurements or chemical names, using the shortened form may result in a neater title.

Finally, as for punctuation, as in all other ambits do not finish a title with a point.

c) Social sciences

Before researchers start work on a new topic, they need to look at the past work done in the same field. Of course, they cannot read all the work that has been published so they make do with title scanning, a routine activity that involves checking lists of titles and deciding whether the content of the paper as a whole is important or not for their research. Thus, the title acts as a hook and researchers often decide to read a paper (or at least move on to read the abstract) on the sole basis of the information provided in it.

Although the thesis you write for your bachelor's or master's degree has no need to hook an audience – after all you probably have a captive audience of only a handful of people (your supervisor and your examiners) – you should still respect the marketing/advertising function of the title. As Helen Sword says in *Stylish Academic Writing*, "Like a hat on a head or the front door to a house, the title of an academic article offers a powerful first impression." Work done in the social sciences will only get noticed if researchers can compose a title that is sufficiently attractive to stand out from others and sufficiently informative to encourage potential readers to pick up and read the whole paper. And the title of your work will immediately reveal to your supervisor whether you have understood the demands and conventions of your chosen discipline. A good title, then, attracts readers to your text, informs them of the content of your work and shows them that you are part of their community.

According to Viviana Soler, science titles come in four different types: nominal, compound, questions and full-sentence (Soler, 2007). Nevertheless, questions are rare (only 1% of all titles) and full-sentence titles are generally found only in biology and medicine, so here we shall focus on the first two types.

The following is a typical nominal title:

Physical Exercise and Self-Esteem in Young Male Adults

Firstly, note that the title is given what is known as title-style capitalisation. That is to say, the first word and all nouns, pronouns, adjectives, verbs and adverbs are capitalised, but the articles, conjunctions and prepositions are not. Secondly, it is a sentence fragment, not a full sentence, based on noun phrases. And thirdly, it is 'indicative' in that it merely indicates what the paper discusses but gives no information about the findings or the methodology.

The title is interesting because it is a good example of a standard approach to research in the social and behavioural sciences: the use of dependent and independent variables as a way of discovering meaningful results. In studies of this type, the variables need to be identified in the title so that potential readers get an immediate understanding of which ones are going to be analysed. In this case, the research focuses on one independent variable (physical exercise) that may or may not have an effect on a dependent variable (self-esteem). Note that the opposite effect is not possible; the dependent variable cannot have an effect on the independent variable, so the title is effective because it clearly identifies the two variables that are the object of study.

It is also possible to have a title with just one variable:

Attitudes of Adolescent Girls towards Alcohol Consumption

Likewise, a study may focus on so many variables that they cannot all be named in the title. In this case, name only the type of variable. If you are studying how the attitudes of adolescent girls towards alcohol are affected by whether they live in an urban or rural environment, their socioeconomic status, their ethnic group or their religion, you will have to refer to all these background factors as "demographic variables":

Association between Attitudes of Adolescent Girls towards Alcohol Consumption and Selected Demographic Variables

The titles above are also effective for other reasons. They are specific but also reasonably short. If you are a researcher in the social sciences you need to strike a balance between including as much detail as possible while still keeping your title short. Another positive feature is that they delimit the scope of the research (to young male adults in the first instance and adolescent girls in the second and third).

The titles above are good ones in the sense that they are short and specific, they identify the variables that are the focus of the study, and they define the population analysed. However, it is possible to include even more information that can be useful for potential readers.

Consider the following title:

Self-Esteem in Young Male Adults: Positive Effects of a Three-Month Physical-Exercise Programme

The title is still nominal but, unlike the other titles above, it is also compound: that is to say, it consists of two sentence fragments based on noun phrases joined by a colon. The first phrase gives a general description of the subject, which the second phrase explains in more detail. It has all the good points of the titles discussed above:

- It is short (although not as short as two of the three titles above).

- It is specific (it identifies the variables that are the object of study).

- It limits the scope of the study (to the population of young adult males).

It also has other positive features:

- It locates the dependent variable (self-esteem) prominently in initial position, thus indicating that this is the main focus of the study.

- It indicates what the findings were (positive effects).

- It gives information about the study design (three-month physical-exercise programme).

The compound title offers a wide range of possibilities to researchers who are looking for attractive, informative titles for their research texts. Here are some ways in which you can use compound titles to maximum effect. The general practice is to make some sort of general statement in the first phrase and then qualify that statement in the second. Generally speaking, there are four ways of doing this.

The second phrase limits the scope of a general research topic announced in the first.

The Scientific Research Article: Evolution from 1665 to the Present Day

Novel Ethnographic Methodologies: Use in Medical Education Research

Political Opportunism and the Disregard for Ethical Values: From Brexit to Trump

The second phrase focuses on the work of a particular individual or the repercussions of a particular event.

A Modern Approach to Grammatical Prescription: How Robert Lowth's Letters Reveal a Descriptivist Base to 18th-Century Grammars

A Turning Point in the Modern History of Spain: How Franco Had to Abandon All Imperial Ambition After the Meeting at Hendaye

The second phrase identifies the methodology or the techniques used.

Evaluating Patient-Centred Medical Home Models: An Anthropological Approach

Explaining Self Harm in the Privileged Western World: Evidence from Participant Observation and In-Depth Interviews

The second phrase provides a context or explanation for a provocative, imaginative or literary quote or phrase in the first.

"Do What I Say, Not what I Do": Changes in Parenting Styles in 20th-Century Europe

Women on Top: The Love Magic of the Indian Witches of New Mexico (Sword, 2012)

As well as all the factors discussed above, when writing your title bear in mind that it is the single most important phrase in your study, so make sure you give it the time and effort it deserves. Write a working title early in the research process. It can help focus your efforts in much the same way as clearly defining the research problem can and, by constantly referring back to it, you can keep your research and your writing on track. However, although you may write your title early on, you will probably revise and modify it during the research process and only submit a final version once the research is complete.

You should also decide which word is the most important and, if possible, place it prominently in initial position.

Write terms out in full. Do not use abbreviations or acronyms because they often have different meanings in different fields. For example, CDA means critical discourse analysis in linguistics, child development accounts in sociology, correlated double amplification in electronics, combined damage assessment in medicine, conventional depot antipsychotics in psychiatry and child dental anxiety in dentistry. Searching for this acronym online, then, will not be useful because the search results will include texts on different topics from a multiplicity of disciplines.

Finally, as for punctuation, as in all other ambits do not finish a title with a point.

5 Abstract and keywords

In all the ambits, the abstract should summarise the main aspects of your paper in an order that will generally include the purpose of your paper and the research problems you address; your research or methods; your findings as a result of an analysis; and a brief summary of your interpretations and conclusions.

As for the keywords section that follows the abstract, remember two things. First, a keyword can actually comprise a phrase of two to four words, and a phrase can sometimes be more effective in pointing a reader to your paper than a single word. Second, because the function of keywords is to supplement the information given in the title, try not to repeat any of the words from the title in the keywords section.

a) Humanities

1 ABSTRACT

Like your paper title, in a humanities paper your abstract should reflect your summary skills, your ability to write for a discourse community, your authorial voice and your intention to make an original contribution; also, it needs to bring all these elements together in a brief text that indicates the structure of your paper.

Generally speaking, the IMRaD structure suited to natural science papers (introduction, methods, results and discussion) is less useful in the humanities, where the main objective is not to establish scientific facts but to ask and answer interpretive questions about how humans express meaning, and where the raw material for research is not populations or experiments but 'texts' (written documents, films, paintings, musical scores, etc.). Because humanities papers analyse the meaning of people's thoughts, actions and creations, humanities writers' first concern is their own representation of meaning: the way they write and use language and the way others will interpret this.

Therefore, the best structure for a humanities paper is one that keeps your representation of meaning on track for your reader; and generally speaking, the humanities reader is someone who wants to be persuaded by a claim or premise you assert about meaning – about the meaning of your particular text in your academic field – so the structure you choose needs to provide the space and opportunity to strengthen your claim by calling up and commenting on texts that support it.

This 'text and claim' structure, in miniature, is also what your abstract does. Sometimes it becomes clear to the reader that the claim or premise is a modest one that you as the writer should be able to support fairly easily if you maintain your analysis and demonstrate adequate knowledge of the subject area. In this type of paper, you might assert the claim at the end of the abstract:

> This paper examines the role of North American journalists in the years before and after the October Revolution in Russia in 1917. It describes how the press came under pressure from the United States federal law called the Espionage Act, which sought to prevent interference with military operations or the support of US enemies during war

time. As journalists came more under the control of the government, certain prestigious writers lost their legitimacy in the eyes of the general public. To explore the role of the newspapers in the political events of this period, the paper examines a sample of newspapers published in Washington and New York between 1915 and 1920. It proposes that, while at the beginning of this period certain editors and writers could lead initiatives to change the order of American society, by the end of the period these figures had all but disappeared.

Sometimes the claim can appear earlier in the abstract, even though the writer may not elaborate on it in any detail and may even hold back important detail intentionally. Again, like the example above, the reader will understand that a fair part of the paper will be given over to analysis but that your interplay between text and claim may start earlier and occupy more of the discussion section:

This paper examines the guidelines that young researchers are customarily given to write a research paper in the field of film studies and proposes that this advice is often inadequate in three areas. It describes how writers are told to organise the different sections of their paper and considers how well they normally do this. It also evaluates the aspects they are recommended to include in each section and the guidance they are given on developing the subject of the paper. Finally, a description of the conclusion section is offered, focusing on the difficulties writers have relating their own papers to the literature. The paper includes an overview of how to cite references, examining the two most frequently used citation styles, MLA and APA. Reference is also made to how writers should revise their papers before submitting them for publication and to the impact factor in the selection of a journal.

Sometimes the abstract starts with the claim, which is then extended and explained in more detail. The advantage of doing this is that you immediately make your intentions clear to the reader, who can then decide with greater certainty whether you successfully follow through:

This paper argues that Robert Rauschenberg's 1951 collage or combine called *Bed* can still contribute to young artists' and exhibition-goers' understanding of the possibilities of portraiture because the artist did something with the medium that few others ever have. It starts by contrasting the artist's earliest experiments in assemblage with similar projects by other painters in order to identify the moment in Rauschenberg's career when his use of found objects began to differ to his contemporaries'. It then explains this difference, which is essentially that Rauschenberg sees assemblage not just as something painters do but something viewers need to practise, both visually and cognitively, in order to experience an artwork. In this context, the paper ends by suggesting three ways in which Rauschenberg's use of the inanimate may still go far beyond the works of other artists who employ similar materials and themes, like Anselm Kiefer, Rachel Whiteread or Tracey Emin.

The danger with this last style is that your paper does not follow through with what you promised the reader; but then calculated risks are an important part of good academic writing in the humanities and taking these risks is a way of asserting your membership of the writing community.

Finally, alongside titles, abstracts are often the only sections of research papers that are freely available to readers on journal websites, search engines and abstracting databases. Because of this, make your abstract a stand-alone text that does not leave out any important aspect of the paper. You may only be writing for one reader, your tutor, but they will assess the merits of your abstract on these terms too.

2 KEYWORDS

Because the function of keywords is to supplement the information given in the title, try not to repeat any of the words from the title in the keywords section. So, for the third example of the abstracts

offered above for humanities papers and entitled *Rauschenberg's* Bed *as an Examination of Portraiture*, the following might constitute an appropriate keywords section:

Keywords: abstract expressionism; assemblage; assertive-declarative phrasing; combine series; secret language of junk; Southern Renaissance; verticality.

b) Natural sciences

1 ABSTRACT

The purpose of an abstract is to quickly and clearly provide an overview of your work. Begin with and focus on the most important information. Lead with the hypothesis, question or problem that you have been researching. Details that are not of primary importance should be explained in the rest of the paper, not the abstract.

The tone of an abstract for a scientific paper should be objective and relatively impersonal. The language should be "lean and literal", without "superfluous details, colloquialisms, and idioms"; these descriptions were given by Mohammed and Radix (2020) for the abstracts of engineering papers, but the same principles apply for papers in other hard or applied sciences. There is no need to define technical terms; anyone interested in their definitions should look for them in the paper itself. As regards format, the abstract should be written as one single paragraph. It is typically between 200 and 300 words long, but ask your tutor for specific guidelines.

Structure your abstract as follows: background, aim(s), method, results and conclusion. This structure corresponds to different parts of the paper discussed further on in the *Guide*: the background and aim(s) belong to the introduction, covered in Section 6.2; the method is covered in Section 7.2 a; the results in Section 7.2 b; and the conclusion is part of the discussion, covered in Section 7.2 c. Here is an example of an abstract with this basic and common structure (the numbers in square brackets mark the beginnings of the sections, which are discussed subsequently):

Developing an Immersive 3D Data Visualization Engine

[1] As both data and ideas become increasingly complex, they become more difficult to represent. As a result, the field of data visualization is ever evolving. [2] The scope of this project was to devise a new multi-user immersive world using the popular Unity 3D Game Engine that can be used to visualize data in a simple, intuitive, manner given a data set with a number of parameters. [3] By learning C#, JavaScript, and the Unity Scripting Language, a working application was devised. Rather than merely plotting points, the application creates objects of various shapes, colors, sizes, and also contains a parameter for more information on the point (an interactive link which creates a web browser within the 3D world). [4] Evolving from a simple plotter to a complex application that features such abilities as rapidly hiding points of a specific parameter for better viewing, loading multiple CSV or TXT files, and interacting with data in immersive ways, the application has been a success. [5] It can be concluded that the Unity Engine is worthwhile in the development of data visualization software and is capable of handling hundreds of thousands of data points with ease. Further work can be done to improve the current application and more efficient programming methods could be implemented should they be found necessary.

Source: https://ciapps.csuci.edu/conferences/SCCUR/Abstract/ViewAbstract/developing-an-immersive-3d-data-visualization-engine

[1] Regarding the background information, at sentence level, the subjects will be things that predate the project (in the example above the subjects are data, ideas and the field of data visualisation). Use verbs in the present tense, reflecting the current significance of your areas of study. There is no need to explain basic concepts as readers will already have knowledge of the field.

[2] Moving on to the aim(s) of your project, the subjects of your sentences should belong directly to your project. A typical sentence in this part of the abstract might begin "The main objective of this project was to […]". Now that you are referring to your project, use the past simple verb tense (because the text will be read once the project is finished).

[3] As regards the methods, specifying who conducted the experiments is superfluous; therefore, it is natural to use the passive voice (*a working application was devised*).

[4] In the abstract shown above, we might think that the results are lacking in detail, but this is not necessarily true. The abstract lists the ways in which the application was a success (*rapidly hiding points of a specific parameter for better viewing, loading multiple CSV or TXT files, and interacting with data in immersive ways*); and for more details, readers should explore the paper itself.

[5] Although some authors are justified in using the first person in their conclusions, maintaining an impersonal tone using the type of construction seen here (*It can be concluded that* […]) is a safe strategy.

Here is another abstract, annotated below in similar fashion but written in a different style.

> *Distinguishing Primary and Secondary Craters using Uplifted Crater Ejectae*
>
> [1] Five years ago, Dr. Gwen Barnes of the University of Idaho partook in a study that suggested that one could distinguish between a primary crater (a crater formed on a terrestrial surface by a foreign projectile) and a secondary crater (a crater formed by ejected target rock from said primary crater) based solely upon the uplifted crater ejecta. [2] Our main objective was to focus on one specific Lunar Mare, Mare Serenitatis, in hopes that we may more clearly confirm this relation when there is consistency in the target rock. [3] In order to gather a representative data set, we classified and measured over 300 craters using NASA's LROC and a USGS program known as ISIS, or Integrated Software for Imagers and Spectrometers. [4] Ultimately, narrowing our research to one Mare ended up being detrimental to the study and our results did not match that which was found five years ago. [5] However, we were able to explore a handful of reasons as to why that could be and how we might fix this in future research.
>
> Source: https://ciapps.csuci.edu/conferences/SCCUR/Abstract/ViewAbstract/distinguishing-primary-and-secondary-craters-using-uplifted-crater-ejectae

[1] In this case, the background information does not follow our advice to use the present tense. It could have been written as follows: *A recent study by Dr. Gwen Barnes of the University of Idaho suggests that one could distinguish* […]*.* However, written as it is, in the past, it does not create a bad impression.

[2] The single aim of this study has been expressed neatly and efficiently. It breaks with the trend of remaining impersonal by using the first person: *Our main objective* and *in hopes we may find* […]. Although this is slightly unusual for a paper in this field (perhaps because the author was an

undergraduate, and therefore relatively inexperienced), there is nothing wrong with it. If you feel more comfortable expressing yourself in the first person in your abstract, do so.

[3] In this description of the methods, the abbreviation of *Integrated Software for Imagers and Spectrometers* is probably unnecessary.

[4] The main thing to note about the results is the honest recognition of an unexpected and unwanted result. This is good, as progress in science involves discovering the causes of mistaken predictions.

[5] It might have been interesting to include specific details of the conclusions, but this may have been impossible due to the word limit.

Finally, here is one more abstract, annotated in the same way but again quite different in style.

Deep Reinforcement Learning-Based Controller for SOC Management of Multi-Electrical Energy Storage System

[1] The ongoing reduction of the total rotational inertia in modern power systems brings about faster frequency dynamics that must be limited to maintain a secure and economical operation. Electrical energy storage systems (EESSs) have become increasingly attractive to provide fast frequency response services due to their response times. However, proper management of their finite energy reserves is required to ensure timely and secure operation. [2] This paper proposes a deep reinforcement learning (DRL) based controller to manage the state of charge (SOC) of a Multi-EESS (M-EESS), providing frequency response services to the power grid. [3] The proposed DRL agent is trained using an actor-critic method called Deep Deterministic Policy Gradients (DDPG) that allows for continuous action and smoother SOC control of the M-EESS. Deep neural networks (DNNs) are used to represent the actor and critic policies. The proposed strategy comprises granting the agent a constant reward for each time step that the SOC is within a specific band of its target value combined with a substantial penalty if the SOC reaches its minimum or maximum allowable values. The proposed controller is compared to benchmark DRL methods and other control techniques, i.e., Fuzzy Logic and a traditional PID control. [4] Simulation results show the effectiveness of the proposed approach.

[1] The background is relatively lengthy, but this is perhaps necessary due to the specific and complex nature of the object of study. The use of abbreviated terms is appropriate as they are terms that require repetition within the abstract.

[2] The purpose of the study is defined clearly and without unnecessary complexity. Its tone is impersonal*: This paper proposes* […]*.*

[3] As is standard, the methods are written using the passive voice. Based on the length of this part, we can presume that the authors consider the methods to be the area that will be of most interest to fellow researchers. The level of detail shown here contrasts greatly with the results [4]. For this final part, the authors seem to have deemed it sufficient to inform readers of nothing more than the fact that the approach worked, as a simulation.

2 KEYWORDS

All researchers aspire to maximising their readership. You are no exception: the more readers you have, the more your work will be cited, and the greater your academic visibility will be. The keywords section plays a fundamental role in ensuring that other researchers can find your work. To decide which words and phrases to include in this section, think about the main topics of your research and which terms you would type into a search box to find it. Include the following: words related to the main field of study, the most frequently used terms in your document, synonyms for some of the main concepts, acronyms, and any other term you feel may optimise a keyword search.

After your work has been published it may be sent to various databases where it will be indexed on the basis of the words in the keywords section, the title and the abstract. If these sections contain words and phrases that other researchers use to search the literature, then your work will appear towards the top of their search results.

So, for the final abstract above, any of the following terms could be suitable for inclusion in this section:

communication, networking and broadcast technologies; computing and processing; power; energy and industry applications; state of charge; frequency response; frequency control; energy storage; time-frequency analysis; power system stability; electrical energy storage systems; frequency response; state of charge control; reinforcement learning.

c) **Social sciences**

1 ABSTRACT

If potential readers are sufficiently attracted to the title, they will move on to the abstract, a short summary of the document that precedes the full text. If you are a non-English speaking author, be particularly aware of how to write this section because it may be the only part of your research text that needs to be in English. For even if they write their research in Catalan, Spanish or another language, many professional researchers are obliged to provide a version of the abstract in English. Abstracts in the social sciences exist in several different types, although some are more commonly used than others:

- **Indicative/descriptive**
  Indicative/descriptive abstracts are tables of contents more than summaries of the study as a whole. They are usually written as one paragraph, they describe rather than paraphrase and they are often written in the present tense. They tend to be used for documents that are less structured (for example, literature reviews) and longer (conference proceedings), and they give information on the purpose, the scope and the methodology but not on the results (sometimes because there are none). Indicative/descriptive abstracts, then, rouse curiosity about the work that has been done by giving essential preliminary information but do not satisfy this curiosity by giving specific answers. In the digital age, this type of abstract is hardly ever used for research studies. However, before online publication databases, the indicative/descriptive abstract was printed at the top of a paper mainly to

encourage readers to continue reading and to facilitate the reading process by providing a brief preview. It was not regarded as an independent unit because it was not read without reference to the article itself.

- **Informative**

  Unlike indicative/descriptive abstracts, informative abstracts provide all the important information in a document and can therefore be regarded as miniature versions of the original. They are designed to optimise access to information so that readers get maximum benefit from minimum reading effort. They, too, are generally written as a single paragraph, they summarise all the sections of the paper (thus adding results, discussion and conclusions to the information given by an indicative abstract) and they use a variety of verb tenses depending on whether they are giving background information, describing the work done, or discussing the findings and their possibilities for the future. They tend to be longer than indicative/descriptive abstracts because they give more information, but they are usually no longer than 300 words (and often considerably shorter). Nowadays, the majority of abstracts for research documents in the social sciences are informative.

- **Structured**

  Structured abstracts provide the same information as informative abstracts but in distinct, headed sections (for example, Background, Methods, Results, Discussion), not in a single paragraph. This format was first developed in the 1980s in the health sciences to help professionals locate relevant, quality articles. It is a format that is still largely used only by researchers in the health sciences; but it may be required of social scientists working in overlapping fields (for example, nursing, medical anthropology, etc.), so consult your tutor if you think this format might suit your research text.

Because most abstracts for research documents in the social sciences nowadays are informative, this is the format examined in the example below. As already mentioned, you should structure the abstract as a single paragraph. The numbers in square brackets mark the beginning of the sections discussed subsequently:

Jazz Chants for Vowel Reduction and Language-Learning Motivation in Adolescent Learners of English in Catalonia

[1] A lack of attention to pronunciation in foreign language lessons, together with L1 cross-linguistic influences, can lead to students having a negative perception of their own "foreign accents" partly because of their failure to achieve full vowel reduction. Although textbooks include pronunciation guidelines and exercises, using them has not resulted in significant improvements in student pronunciation or motivation. [2] The hypothesis of this study is that jazz chants – a pronunciation technique that focuses on word-level and sentence-level stress – will have a positive impact on the pronunciation and motivation of adolescents learning English as a foreign language in a Catalan secondary school. [3] The jazz chants technique was used in the daily English classes of a test group of 18 *batxillerat* students (one class group of 17–18-year-olds) over a 3-month period. This test group was contrasted with a control group of comparable size which used traditional materials over the same period of time. Students from both groups were asked to record themselves reading a short text pre- and post-intervention and they were judged to have improved or not on the basis of their pronunciation of the weak vowels in unstressed syllables. [4] It was found that the jazz chants technique was more effective than the traditional materials at improving vowel reduction and motivation. It appeared to change students' perceptions of their own accent and their attitudes towards pronunciation. However, its effect differed according to gender and stated first language, and proved to be more successful in female speakers of the Eastern/Central variety of Catalan. Also, improvements were moderate and the samples small so it remains to be seen

whether longer interventions in bigger groups can give better results. [5] The results support the hypothesis that jazz chants can improve the pronunciation and motivation of English-language learners in the public education system in Catalonia.

From the structure and content of the abstract above we can draw some conclusions about how to write informative abstracts in general.

[1] Briefly give background factual information or describe the situation, problem or gap that has prompted you to focus on your chosen topic. The context you give here will explain why your research is important and why readers should care. It is the reason you asked the research question you did. Note that you have to assume that all those interested enough to read the abstract are specialists in the field, so there is no need to explain commonly used technical terms (for example, vowel reduction). Also note that the verbs are all in some form of the present tense (present simple and present perfect) because you are describing the current state of affairs.

[2] State what your study does, what its purpose is or what problem it is attempting to solve. You might also make an explicit reference to your hypothesis (as is the case here). Make sure you define the scope of the research. In this case, it is not a study on "pronunciation and motivation" in general but on the "pronunciation and motivation of adolescents learning English as a foreign language in a Catalan secondary school".

[3] Describe your methodology. Although you do not have to give all the details in the abstract, give enough information to convince readers that it is sufficiently rigorous to generate reliable findings. Note the use of the past simple tense because you are describing work done.

[4] One of the main functions of abstracts is to highlight new contributions to science, so this is a particularly important part of the text. Be positive about your results and findings without overstating their value because sometimes it is easy to exaggerate the significance of evidence from just one study on a particular issue. Be clear about general trends but use hedges (*may*, *might*, *suggest*, *probably*, etc.) so that you are not too forceful. Careful use of verb tenses can help you to express your findings. The text above uses the past simple tense in this part, which serves to limit the findings to the context of this particular study. If, however, you use the present simple tense, you make the much stronger claim that your results are generalisable and that you have found a general truth. Take care: there is a big difference between "It was found that the jazz chants technique was more effective" and "It was found that the jazz chants technique is more effective."

[5] In your conclusions, the last part of the abstract, make an explicit statement about what your research has achieved, what contribution it has made or whether it supports your initial hypothesis.

You also need to think of other issues when drafting an abstract. Do not forget that there is a strict limit on the number of words you are allowed to write. Respect the word count because if you do not your supervisor may send it back to you and tell you to do it again. Or worse, they may start cutting out text without asking so that the end product is not a faithful reflection of the work you have done or what you think. The word limit for the text above was 300 words and the author has written precisely 300,

not one word more or one word less. This is no coincidence. It is the result of constantly editing, applying the principles of plain prose and investing a considerable amount of time and effort.

One of the main purposes of abstracts is to enable potential readers to decide whether to read the whole study. The words you use should point directly to the topic you will be focusing on, so decide which words are most representative of your study and use them throughout. If you do, other researchers from the same field will be able to locate your work easily because they will use these words in their digital searches and your work will be towards the top of their search result list. In this case, some key words might be *jazz chants*, *pronunciation*, *motivation*, *reduced vowels*, *accent* and *adolescents*.

Remember also that abstracts are published and read by themselves, so they must make sense as independent, self-contained descriptions of research. Readers need to understand the key points even if they never see the whole article. For this reason, abstracts make no reference to the literature; readers should not be required to consult other works to make sense of the text they are reading.

And, finally, although the abstract is one of the first sections of the text you read, after the title, it will probably be one of the last parts you write. It represents the complete document, and you have to know what is in the complete document before you can write it. The existence of a complete document can also help in the process of drafting the abstract because you can select the sentences that best represent each section, modify them and link them to form a cohesive unit.

2 KEYWORDS

All researchers aspire to maximising their readership. You are no exception: the more readers you have, the more your work will be cited, and the greater your academic visibility will be. The keywords section plays a fundamental role in ensuring that other researchers can find your work. To decide which words and phrases to include in this section, think about the main topics of your research and which terms you would type into a search box to find it. Include the following: words related to the main field of study, the most frequently used terms in your document, synonyms for some of the main concepts, acronyms, and any other term you feel may optimise a keyword search.

After your work has been published it may be sent to various databases where it will be indexed on the basis of the words in the keywords section, the title and the abstract. If these sections contain words and phrases that other researchers use to search the literature, then your work will appear towards the top of their search results.

So, for the abstract above you may decide that the following terms are suitable for inclusion in this section.

English prosody [field of study]; *pronunciation* [field of study]; *jazz chants* [frequently used term]; *motivation* [frequently used term]; *schwa* [synonym for reduced vowel]; *EFL* [acronym for English as a foreign language].

6 Introduction

In all the ambits, the introduction should lead your reader from generalisation to your particular field of research. It sets the context for the research you have conducted by summarising the current understanding about the topic, stating the purpose of your paper, possibly as a hypothesis, question, or research problem, outlining your rationale and describing the remaining structure.

a) Humanities

In the humanities, the introduction is where your reader meets you as a writer and first learns how you will talk to them during the rest of the paper, in the discussion and conclusion sections: how you explain problems, value details or use humour; how often you refer to the texts at your disposal, where you stand in comparison to other researchers, what interests you and what does not. The important thing is not to make this less visible, but to make it clear that you know you are showing these things. This is what will establish your authority, in your reader's eyes, to interpret the meaning in other peoples' production in the humanities: to ask and answer in your own writing interpretive questions about how others express meaning.

Because the reader will have learnt the important details about the substance of your paper in both the title and the abstract, the beginning of the introduction is a good place to introduce some kind of example from the middle of your topic rather than to repeat your objectives or reassert your main claim. In this respect, it is rather like the inverted compound title (see above) which 'drops' the reader into the middle of the subject before pulling back and contextualising. The following are the opening lines of introductions to a study on the importance of fairy tales in children's education and of an analysis on the popular reception of the twentieth-century art movement known as abstract expressionism, respectively:

> If it was late at night and you were going to tell your little sister a bedtime story, would you choose the one about the boy and girl who discovered a beautiful sugar house in the middle of the forest, were trapped there by an old woman who wanted to eat them, but who eventually managed to escape after roasting her alive in her own oven?

> In a well-known cartoon by the French artist Jean-Jacques Sempé, a group of museum-goers are shown standing in respectful silence on the threshold of the twentieth-century rooms of an art museum while their guide tells them they are extremely lucky to have her there because otherwise they would understand nothing of what they are about to see.

The next line of each introduction brings the reader firmly back to the topic under discussion:

> You might well decide not to; but as the English historian Marina Warner has said, to understand the meaning of many fairy tales, one has to look at the context in which they were told, at who was telling them, to whom and why.

> The reader may smile but as abstract painter Nicolas Carone once observed to his friend and contemporary Jackson Pollock, "Who the hell do you know who understands your picture? People understand the painting – talk about the technique, the dripping, the splattering, the automatism and all that, but who really knows the content?"

This is one way of starting the introduction section.

In the following paragraphs, your main objective is to introduce your reader to the concepts you will be discussing (issue, question, research question or thesis statement), show your method of approach to the topic, provide the necessary background information or context and, before finishing, reassert the claim the paper will develop.

The last paragraph of the introduction might return to the detail of the first when it does this, so reminding the reader of the raw material they and you constantly need to re-examine. This might be an appropriate last paragraph in the study on fairy tales:

> Finally, I propose that before we accept what we are sold about children's entertainment, we should remember two things. First, history shows that fairy stories were never escapist tales about magical phenomena that only children could believe in; they are serious stories that deal with life and death in ways that help people become adults. Second, the child who reads, watches or listens to fairy tales deserves the same complexity adults are given when they read, watch or listen to products of fiction, if only because children are people who should be happily and purposefully on their way to becoming adults. The problem, of course, is that some of the adults in charge can't even see it: Walt Disney Pictures may live happily ever after, but more than one child who saw the 2017 adaptation of Beauty and the Beast was actually disappointed by the strange but somehow majestic beast's final transformation into a very unextraordinary prince.

b) Natural sciences

1 GENERAL GUIDELINES

In the natural sciences, the introduction helps the reader understand the paper's wider context, its purpose, and its relevance. It is logical for you to start with the project's general background before developing its specific details. With this in mind, progress towards the specific nature of your project relatively quickly. Avoid writing lengthy explanations regarding basic contextual aspects (things about which the person assessing your work will already be perfectly knowledgeable). Demonstrate your understanding of fundamental aspects, but do not waste time getting to the point, i.e., the original nature of your work.

In English generally, but especially in scientific texts, efficiency of language is valued. In the introduction in particular, cut out anything that is not highly relevant to your central argument; only discuss the most pertinent details, leaving the others to be explained subsequently in your Methods, Results and Discussion sections.

The introduction may contain some (but not necessarily all) of the following:

- A description of the general topic and background

- A literature review

- Definitions of terms

- A problem statement

- The paper's scope and aims

- A hypothesis

- An outline of the planning and/or methodology

When thinking about what you need to cover, consider the type of approach used for a problem statement. This involves answering the five 'W's: who, what, where, when and why. If your introduction properly addresses these five questions, you have probably included most of the necessary content.

2 VERB TENSES

To describe the paper's context, generally use present verb tenses (present simple, present continuous and present perfect), thus situating your project in the here and now:

> Computer vision allows us to automate tasks that would otherwise require human visual capacity. Over the last decade, its uses have increased significantly. Now researchers are seeking to integrate it with deep learning techniques.

However, you may sometimes need to use past tenses when detailing its background:

> The previous research was carried out using the 2011 version of the database, but new and improved versions have since become available.

To state the purpose of the project, you should use the full infinitive:

> The aim of this study is to design a new digital control system for a Taylor–Couette machine.

3 ACTIVE VOICE AND THE FIRST PERSON

In the introduction to a paper, when you are explaining the premises of your study, most of the time you will probably need to state who is doing what, so use the active voice rather than the passive voice, which is more appropriate when the agent performing an action needs no mention or is unknown. Therefore, not

> The topic of digitally controlling pre-turbulent flows is going to be explored.

or

> The topic of digitally controlling pre-turbulent flows is going to be explored by this paper.

but

> I am going to explore the topic of digitally controlling pre-turbulent flows.

The last sentence above is clear and direct, and it is the best option. In the first sentence, although the identity of the person who will be exploring the topic seems relatively obvious, it is better to be wholly unambiguous; furthermore, the first sentence fails to respect the principle of end focus (see Respect end focus.). The second sentence also fails in terms of end focus, finishing on a dull note.

If you, the writer, are the agent performing the action in the sentence (this is likely to be the case very often, as you are the person conducting the project), simply use the first-person pronouns *I* or *my*. Only use the third-person plural *we* or *our* if you performed the actions as part of a group or, possibly, if you are referring to people or society in general (for example, "most of us do not expect to experience space travel"), although it is unlikely you will need to do this very often.

4 THE IMPERSONAL *IT*

In spite of the above, sometimes the subject of a sentence is best left unstated, making it impersonal. One way of doing this is to use a passive construction beginning with the word *it*. Therefore, not

> People may subsequently prove that such transitions are possible.

or

> Someone may subsequently prove that such transitions are possible.

but

> It may subsequently be proven that such transitions are possible.

Nevertheless, if when revising your draft you find many sentences with this structure, consider whether there are better options that can accurately specify the subject using the active voice.

5 ARTICLES (*THE*, *A*, *AN* OR NO ARTICLE)

To talk about a general truth relating to any given entity, you should normally use either no article, the indefinite article or, if the entity is countable, the plural. In the following examples, this is the case with the words *water*, *ice*, *conductor* and *object* and with the phrase *electrical charge*:

> Water is denser than ice.

> A conductor is an object or material that allows electrical charge to flow in one or more directions.

6 NOMINALISATION

Many verbs can be nominalised by using a noun based on the same root word as the verb:

Noun	Verb
analysis	analyse
test	test
investigation	investigate
study	study

As explained previously, it is generally better to avoid nominalisations (see Avoid nominalisations.), i.e., use a verb form rather than the nominalisation of the verb. Therefore, not

> My aim is to conduct an analysis of how temperature regulation is affected by this process.

> They did tests on three samples of each material.

but

> My aim is to analyse how temperature regulation is affected by this process.

> They tested three samples of each material.

However, this is not always possible. In the second example just above, if you were referring to a specific type of test, you might need to use the nominalised form:

> They did uniaxial tensile tests on three samples of each material.

7 DEGREES OF CERTAINTY AND HEDGING

Choose the words that best reflect how certain you are. If you are certain that something is true, you can probably state the facts in just a simple sentence following the basic pattern of subject + verb + object:

> Specimen A never grows as quickly as specimen B.

If you think something is true but cannot prove it beyond all doubt, your words need to reflect this:

> It is almost certain that specimen A can never grow as quickly as specimen B.

> This evidence indicates that specimen A will never grow as quickly as specimen B.

> It appears that specimen A will never grow as quickly as specimen B.

If you have an idea about which you are uncertain, use an expression similar to one of the following:

> It is possible that specimen A will never grow as quickly as specimen B.

> It may be that specimen A will never grow as quickly as specimen B.

Nevertheless, establish as much certainty as possible. For more examples of hedging as well as explanations of why it is best kept to a minimum, see Do not hedge to excess..

8 LITERATURE REVIEW

In the introduction, you may find it appropriate to mention previous works in the same field. You should certainly mention works that underlie your study, i.e., works without which yours would not be possible. If there are not many relevant works, include your references to them in the main body of your introduction. However, if there are numerous works to highlight, create a literature review section for this purpose alone.

When explaining relevant details of past works, use the past tense:

> Chapman and Crumplin (1992) demonstrated the effectiveness of this method.

If you need to use the present tense – perhaps because other authors in your field do – then do so throughout your text. In all other cases, just use the past tense.

For general recommendations on citations and references, see Referencing styles.

c) Social sciences

The introduction is the first section of your text that is not regarded as front matter (titles, authors, affiliation, abstract, keywords, etc.) and is the first letter of the acronym IMRaD – meaning introduction, methods, results and discussion – which is currently the most common structure used by scientists to organise their research reports. This structure was first adopted by researchers in the field of biomedicine in the 1940s and gradually became widespread as it was adopted by more and more biomedical journals. Despite its biomedical origins, however, it is now commonly used by academic journals from a wide range of disciplines and it is recommended for empirical research studies by the *Publication Manual of the American Psychological Association*, the style manual of choice for many writers in the social sciences.

In the introduction you take your readers on a journey from the general description of a particular subject area to the announcement of a particular research topic. First you summarise current knowledge and give background information, and then you go on to state the problem that has prompted the research and for which you intend to provide an answer. Finally, you move on to describe exactly how you intend to provide this answer by giving details of the scope of the research, the methodology, the findings and the structure of the rest of the paper.

This general organisation of the introduction for research papers was first reported by John Swales in *English in Academic and Research Settings* (1990) and is known as the Create A Research Space (CARS) model. The model is a general one, can be applied – with some adaptation – to all levels of research and all disciplines, and is still valid today. Essentially, the CARS model describes three main moves that you should make when writing an introduction. These three moves go from the general to the specific and are divided up into a series of steps. By way of these moves and their constituent steps, you summarise the key features of previous work in the field, identify some sort of gap, problem or shortcoming and, on this basis, announce the topic you have chosen for your own research, which you then go on to describe.

Swales's model, with its three moves, sub-steps and some comments, is outlined below. Note that the model is a general one and must be adapted to particular situations. The numbering of the individual steps does not indicate a compulsory order. Authors can choose to follow the order of the steps given, use a different order to adapt to their particular needs or even decide not to include a particular step. Also note that some steps are marked with a letter as well as a number. In these cases, the steps are mutually exclusive, and authors must decide to use only one. One final consideration is that the model

gives little indication about length. Each of the steps can be just one or two sentences or one or two paragraphs.

1 MOVE 1: ESTABLISHING A TERRITORY (THE SITUATION)

- *Step 1. Claim importance.*
  Describe the research area and discuss why it needs to be studied.

- *Step 2. Make generalisations about the topic.*
  Discuss the current state of knowledge or practice, or describe a particular phenomenon.

- *Step 3. Review previous research.*
  Summarise the research done in the field to date. This is not a complete literature review, just a brief mention of major studies.

The information given in the first of the three moves of a typical introduction section identifies and describes an area of research with reference to the existing literature. It indicates the origin of the issue you have decided to focus on and provides context in terms of theory, research and practice. Likewise, it shows how other studies have approached the same or similar issues, although it does not attempt to make a full review of the literature, merely situate the present research in its proper context. In general terms, it answers the question "What did I know about the topic before I started this study?". The information you give shows readers that you have a general understanding of the research problem you have decided to investigate and that you have sufficient knowledge for them to trust your judgement, analysis and findings.

2 MOVE 2: ESTABLISHING A NICHE (THE PROBLEM)

- *Step 1a. Counter-claim.*
  Announce a point of view that goes against current thinking or identify a weakness in previous research that undermines prevailing theories.

- *Step 1b. Indicate a gap.*
  Identify a gap in previous research or an area that has not been studied.

- *Step 1c. Raise a question.*
  Like identifying gaps, in this step ask questions that have not been answered by previous research.

- *Step 1d. Continue a tradition.*
  Take over where previous research has left off, thus advancing science by making a contribution to existing lines of research.

The information in Move 2 makes a clear statement about a theoretical or practical issue in the scholarly literature that requires attention, improvement or further investigation. On the basis of this statement, readers see the significance of your study and will judge its relevance. This problem statement is the origin of all subsequent hypotheses and assumptions.

3 MOVE 3: OCCUPYING THE NICHE (THE SOLUTION)

- *Step 1a. Outline the purpose.*
  Clearly state the objectives of the study.

- *Step 1b. Announce the present research.*
  State what you did and what you intended to accomplish.

- *Step 2. Announce principal findings.*
  Provide a brief summary of the significance of the main findings (for example, "Our findings suggest that there is a need for…").

- *Step 3. Indicate text structure.*
  Describe how the rest of the text is structured.

The information in Move 3 tells readers how you intend to provide new understanding that builds on the work done by previous research and adds to the existing body of knowledge. Essentially, you explain how you filled the gap, answered the question or continued the research tradition that you outlined in Move 2. It can also reveal your findings, although some researchers and journals prefer not to give this information here since it has already been disclosed in the abstract. Ask your thesis supervisor for advice on what to do.

If you are writing a standard IMRaD text, Step 3 of Move 3 may not be required because, as the acronym suggests, the structure is totally predictable. However, if you are writing a text with a structure that does not adhere faithfully to the IMRaD format, readers may find it useful if you indicate the sections and the order in which they will occur. This will facilitate the reading process and help readers to find relevant information.

7 Main body

The main body of the paper is where the different ambits reveal their contrasting research goals. In the natural sciences, this part of the paper generally comprises three separate sections: *Methods*, *Results* and *Discussion*. In the humanities, this part of the paper is given over to just one section, also called *Discussion* but very different in nature to the section with that name in the natural sciences. Finally, in the social sciences, the general tendency is to adopt a methods-results-discussion structure, like the natural sciences, although the results section is often called *Findings* and a number of other differences may also be important. In all three ambits, however, the main body of the paper is obviously a part where you need to exercise great care, making sure its content and the content of the other parts remains consistent and coherent.

a) Humanities

1 THE IDEA OF THE DISCUSSION

When you have your title, your abstract, a structure for your writing project and your introduction, that is a great start: a good title should help keep your writing relevant, as long as you stay on-topic; an abstract is a sort of mini-dissertation that provides an effective overview of what you are doing; a structure (in the form of a table of contents, for example) acts as a kind of plan on which you can build your discussion; and – as we have seen – the introduction sets out the foundations of how you will be talking about your topic, how you approach it and so on. Now, of course, you need to write your discussion.

But what exactly is a discussion in academic writing of this kind? Well, very importantly, it is certainly not a conversation (which is one of the main meanings of the word); there is no informal give-and-take of views; no sudden changes of topic; no improvised opinions. In your TFG/TFM, an academic discussion needs to be a well-constructed, carefully written and suitably referenced section of the overall paper.

In fact, the word *discussion* is a little misleading if it makes you think of simply talking about a subject. In academic writing in the humanities, it means something more like the section of your text in which you expand on the research question or thesis statement set out in your introduction, or the part that provides your own analysis and interpretation of your topic, engaging with critical/secondary sources, developing the arguments presented, according to your basic thesis. In effect, it is the part of your project that sets out the main arguments, thoughts and ideas that you have produced on your chosen topic.

2 GETTING STARTED: SOME GENERAL POINTERS

a) **Who are you writing for?**

Address yourself to your particular 'public', often called your discourse community (see above). This is basic advice that is often ignored. You would not write a class essay in the same way as you would write

a message to a friend or a review on a social network; you would modify important aspects of your text, such as level of formality, choice of vocabulary, the structure of sentences and paragraphs, possibly even the use of what are called apparatus (footnotes, endnotes, bibliographies). In other words, you would make decisions based on who you are writing for.

Your TFG/TFM is aimed at a specific academic community and so it needs to respect and conform to certain requirements. These include the obvious questions just mentioned, but they also include making reference to the main ideas that are current in your own field regarding your topic and locating your subject in an ongoing current of critical debate.

> There are over 16000 academic studies on Abraham Lincoln, covering a broad range of topics such as his life, his political and historical contexts and his own social views. However, as this TFM concerns Lincoln's political difficulties during the US Civil War (1861-65), the arguments made here are based, fundamentally, on three major studies of this subject: Herman Belz's *Abraham Lincoln, Constitutionalism, and Equal Rights in the Civil War Era* (1998); Jonathan W. White's *Abraham Lincoln and Treason in the Civil War* (2011); and T. Harry Williams' now dated but still essential *Lincoln and His Generals* (1967). These three works, above all others, have set down the main lines of discussion in this area.

b) Basic organisation

There is no set formula for how to structure a discussion. But that does not mean you should not think carefully about how to do this. Your specific area of study will possibly require a particular general structure (for example, a project on history might call for a chronological organisation), and your specific topic might require you to organise the discussion in a way that reflects this topic (for example, a study of several poems might require you to have a subsection on each work). Whatever the case, some kind of division will help you to present your work effectively and make it easier for your readers to follow it clearly.

In humanities papers, the most common divisions within the discussion are subsections ("1.1 The Rise of the Novel"; "1.2 The Condition of England Novel"; "1.3 The Modernist Novel", etc.) or chapters ("Chapter One: The Georgian Garden"; "Chapter Two: The Georgian Market Town"; "Chapter Three: The Georgian Slums").

Subsections are units that are more closely interconnected; chapters are units that are more stand-alone in content. You will almost certainly have decided on this by the time you come to write your discussion (as you will have already drawn up your table of contents); but, during your writing, look carefully at your work and keep in mind that your chosen general structure might need changing.

c) Jargon

Unless you are specifically referring to certain technical aspects of your topic (for example, analysing the metric structure of a poem), generally avoid jargon or overly complex words or expressions. For example,

> To illustrate the ways in which late-Victorian textual production subliminally conveyed social preoccupations connected to the atrophying of British power, Bram Stoker's *Dracula* (1897) forwards a narrative of 'invasion' expressed through polyphonic epistolarity.

might be more effectively expressed as follows:

> As an example of the ways in which late-Victorian writing reflected social worries about the decline in British power, Bram Stoker's *Dracula* (1897) presents a story of 'invasion' told in letters, journals and newspaper articles by many different narrators.

d) **Too much informality**

On the other hand, remember that you are addressing your discussion to an academic community, so while it is a good idea to opt for a clear and uncomplicated style of writing, do not be too informal either. Avoid colloquial language and make sure that elisions such as *it's*, *don't* or *you'll* are written out in their more formal, non-elided forms. For example,

> It's pretty safe to reckon that even the most mad-keen researcher won't find any really interesting new stuff on the Peasants' Revolt

might be more effectively expressed as follows:

> It is reasonable to assume that even the most dedicated researcher will not be able to discover significant new material on the Peasants' Revolt

e) **Give your opinions**

This project is an opportunity for you to develop and discuss your own ideas. Unlike other disciplines, such as the pure sciences – in which the expression of personal opinion is not conventionally expected or even accepted in written texts – in the humanities you should feel free to state your own opinions clearly and unambiguously (by using forms such as *in my view*, *I think*, *I believe* or *my opinion is*). In fact, if you do not put forward your own opinions, it might appear that you are simply summarising other people's views.

> The arguments set out in the above articles, in my own view, do not provide an entirely satisfactory analysis of this question. Unlike these authors, I believe that it is essential to look closely at the painter's very early works if we are to fully understand her influences.

f) **Give the specialists' view too**

But, as an important part of academic discussion, you also need to present your ideas with reference to the critical opinions expressed in the literature of your own field (e.g., published academic studies such as monographic works, chapters or journal articles). You do not have to agree with these studies; in fact, you might want to express your absolute disagreement with them, but you do need to present your ideas in the company of these recognised sources.

> Specialists such as Keegan (1984); Carpenter and Elliot (2007); and Reeves (2010; 2012) have argued that Neanderthal wall paintings have little or no aesthetic function. However, this TFM will propose, in keeping with Wragg Sykes (2020), that this is no longer a sustainable position.

g) **Summary is not analysis**

Contextualising your discussion – making clear what it is that you are actually writing about – is, of course, fundamental. This may well involve a certain amount of summarising (events, ideas, plot, etc.). But be aware, first, that your examiners will probably be entirely familiar with the information that you are summarising, and second, that summary is not analysis. All contextualisation should be kept to a minimum as it takes up space for presenting your own ideas. Where summary is necessary, it can be supplemented by providing comment on the information. For example,

> Jane Austen published *Pride and Prejudice* in 1813; it narrates the story of Lizzy Bennet and Fitzwilliam Darcy and ends in their marriage.

might be more effectively expressed as follows:

> When Jane published *Pride and Prejudice* in 1813, the love plot (which typically resolves in marriage, as is the case with the novel's protagonists, Lizzy Bennet and Fitzwilliam Darcy) had established itself as the major form of novelistic fiction.

3 WRITING CRITICALLY

The principal type of academic writing in the humanities is critical writing. Critical is another misleading term, as it might appear to suggest that it expresses a negative view of its subject, that is, that it criticises things. This is not exactly the case, but it does highlight an important aspect of critical writing, which is that it closely analyses its topic in order to understand it more fully. So, although the term does not imply taking a negative view of things, we can say that it involves close and careful examination.

In academic writing in the humanities (as in all academic writing, of course), you need a topic and an opinion on that topic. For example, you might believe that Protestantism contributed to the growth of capitalism. But it is not enough to simply have this opinion; you need to develop it through argument that takes into account other recognised ideas or sources on this topic, and to use these ideas, with which you will show your agreement or disagreement, as a way of building up your own point of view. By doing so, you will be reviewing the evidence on this subject in order to reach a reasoned conclusion. This is critical writing.

There are many different approaches that can be taken in writing critically, but essentially it has two important aspects:

● Critical writing takes into account not just one but a range of sources.

● Critical writing examines and assesses its sources.

To return to your theory on Protestantism, to write critically on this subject you would need to research work ('critical sources') that discusses this idea. You would find that some authors (also known, particularly in literary studies, as 'critics') claim that the highly individualistic nature of Protestantism contributed to capitalism because it emphasises the consequences of individual responsibility. Let us say that this opinion is close to your own, so you want to use it in your text. But you need more than just

one source, otherwise your argument will be too limited and one-sided. Then you discover that other critics point out that capitalism also developed in regions where Catholicism has never been displaced (such as Bavaria, for instance, or parts of Scandinavia), which tends to complicate your own view. You could ignore this opinion, as it does not support your own idea; but this would be academically dishonest and would result in an argument that did not take into account a broad range of views. That is, you need to examine and assess the sources that support and that undermine your own idea.

Notice that your main tasks in writing critically, apart from eventually describing your reasoned conclusions, are to evaluate and analyse your sources. You do this by looking at how relevant they are to your topic; how strong or weak their arguments are; and how balanced and reasonable they are (a source that does not take other views into account or that makes too many unsubstantiated claims is not likely to be a positive contribution to your text). But you also need to make sure that your sources are reliable, that they come from recognised specialists or at least from people whose work is accepted by your own academic area. And you need to make sure that you are using sources that are acceptably recent: a rule of thumb in the humanities is that most of your sources should have been published within the last 20 years; anything earlier than that is unlikely to reflect most recent debate (although there are always important exceptions to this, and your supervisor will guide you on this matter).

The kinds of questions you need to ask yourself when writing critically are the following:

- Is my argument sufficiently supported by other sources? Have I (or have any of my sources) made claims that have no evidence?

- Am I limiting my sources and my own analysis to only one point of view? Am I taking distinct and maybe contradictory opinions into account?

- Am I adequately examining my own opinion and those of my sources? Do I clearly indicate the strengths and weaknesses of these views?

- Are these sources reliable? Are they recognised within my own academic area?

- Are these sources and their opinions relevant to my topic?

- Are these ideas sufficiently recent?

- Am I presenting all sides of the argument in a balanced way? Do I give too much emphasis to one point of view?

- Am I being honest about the limitations of my own opinion? (It is valid and responsible to accept that a view, however compelling, might need more evidence or discussion?)

In your own project, you might eventually find that, although certain studies point to ideas that are contrary to your own opinion, on balance your view is supported and justified by the sources you have assessed. Although it is also worth remarking that academic enquiry means accepting that your arguments have been disproved, or at least that your own findings have limitations. Whatever your final

opinion, however, it will have been shaped by a consideration of the sources, and this is basic to critical writing.

4 WRITING CONCISELY

Good academic writing should be clear, relevant and concise, avoiding unnecessary 'padding', even when this might be valued in other kinds of texts such as descriptive or literary writing. In other words, it is writing that aims to communicate its content in a way that is as unembellished as possible; it is writing that is free of wordiness. This obviously refers to vocabulary and expressions, but also to sentence structure and paragraphing.

A good way to make sure that you write concisely is to be clear about what you want to say before putting it on paper. In theory, at this stage in your TFG/TFM, you should no longer be worrying about that (your abstract, table of contents and introduction have covered this), but it is helpful to keep in mind that your discussion needs to contribute directly to this by having a clear purpose and by sticking to that purpose. If your writing becomes irrelevant, it will not be expressing your ideas concisely.

Your paragraphs must each have a clearly recognisable function (see below). If they are not developing your views, if they are not moving your discussion forward through critical argument, then your writing is not suitably concise.

Also, the grammatical way in which you express your ideas (especially the choice of active or passive voice) will have a significant impact on concise writing, by opting for simpler constructions that are, at the same time, clearer and more effective.

a) **The passive voice**

In many types of academic writing (with scientific writing as perhaps the most obvious example) passive voice is expected; it is also seen as a marker of formality and of objectivity, as it removes the personal subject.

But, as we have already seen in *(b) Getting started: some general pointers*, in the humanities it is conventional to express personal opinion and to incorporate subjective responses into academic argument. So, although you may think that using the passive voice adds a note of seriousness to your writing, or even that you might be expected to produce writing of this kind, it is better at all times to avoid the passive where possible.

A sentence such as

> This view has been posited since the beginning of the 1960s by many feminist critics.

is better expressed:

> Many feminist critics have posited this view since the 1960s.

Not only is this shorter (and therefore more concise in a literal sense), but it is also simpler and a more dynamic form of expressing ideas.

b) **Paragraphs**

Good paragraphing is key to concise writing as it creates a flow of related ideas that fit together in an accumulative way, moving the argument forward coherently and relevantly towards its conclusions.

But paragraphing has to be relevant; you cannot simply add a new paragraph because your current section looks a bit long. In other words, paragraphs should not be random. They should contain a series of sentences that discuss a single topic. When that topic changes, change your paragraph.

Good paragraphs should have the following.

- Cohesion: a paragraph should be about a specific topic, announced in the opening sentence and discussed by all following sentences.

- A clear structure: there are many ways of organising the sentences, depending on your own discussion (chronology, order of importance, etc.), but the order should be clear and easily understandable. This will guide your reader through your argument and will force you to stay relevant.

- Coherence: this refers to the ways in which the sentences relate to each other through transition words (for example, indicating order, contrast, continuation, logic, etc.). Other elements of coherence include using the same tense in each sentence and ensuring that the dominant point of view (yours, a critical source, etc.) is the same throughout.

- Roundness: a rounded paragraph is one that clearly establishes its topic and develops that topic through well-connected sentences. But it also means that the sentences suitably perform the function of introducing, discussing, supporting and concluding the paragraph topic, which basically means that a good academic paragraph should have at least four sentences.

For example:

> This discussion considers the marginalisation of the Porter sisters' contribution to Walter Scott's historical novels, a marginalisation arguably caused by Scott himself. It is relevant to remark that, unlike Scott, the sisters have now almost entirely fallen into what Clifford Siskin termed "the Great Forgetting". But this also leads me to consider how literary history is written, how women novelists are silenced and, perhaps, how the traditional subjects of women's fiction are assumed to be strictly domestic.
>
> However, the foundation for the Porter-Scott rift that I am discussing here is actually the nature of childhood, and how its recording and recollection is partisan and partial. This debate ought to be primarily literary; instead, it has conventionally been presented as an overly sentimental reaction by the Porters to perceived slights and disloyalties. Or, to express this in a more nineteenth-century way, "Ladies who assume masculine functions must learn to assume masculine gravity and impartiality" (C. S. M. Phillips, *The Edinburgh Review*, 1849).

Having indicated the general area of this discussion, what exactly is the evidence for the childhood connection among the three writers? Is it open to any challenge? What might be said on this topic if the conventional accounts turn out to be untrue, or at least unprovable?

c) **Small matters**

Concise writing also comes from thinking carefully about the smaller elements involved in writing. These include:

- avoiding redundancy (e.g., "each and every"; "first and foremost"; "true and veridical")

- avoiding repetition (e.g., stating the same opinion more than once in a single section)

- eliminating unnecessary qualifiers (e.g., "very"; "really")

- substituting phrases with a single word (e.g., "in light of the fact that…" vs "because")

- keeping sentences as short as possible, and avoiding complex dependent clauses

A sentence such as:

> The object of this chapter, which forms part of the second section of this dissertation and which begin the more analytical phase of this project, is to look at the evidence for the use of the phrase-initial adverbial 'so' as a marker of academic discourse. This chapter is very important in the overall work presented here due to the fact that it presents the part of the project in which a close analysis of evidence is carried out.

is better expressed:

> This chapter (2.1) begins the analytical part of the project; it assesses evidence for the use of the phrase-initial adverbial 'so' as a marker of academic discourse.

In each of the cases indicated here, think about how your writing can be made more direct and economical by the modifications suggested.

d) **Use of supporting literature**

(For a discussion of supporting literature in referencing and bibliography, see Section 9.)

Writing a discussion for a TFG/TFM in the humanities means much more than simply presenting your own ideas, however relevant, interesting and original these may be. In fact in all academic ambits, the discussion requires writers to frame their own ideas in relation to those of their colleagues so that the ideas expressed can be understood in a general context of academic debate and make an informed contribution to that debate. The key here is informed contribution, which means supporting your ideas by relating them to others. This means referring both to the work of other specialists (secondary sources) but also to artistic works (primary sources), from which – especially but not exclusively in literary studies – you will sometimes want to quote.

i) Primary sources

We tend to think of primary sources as works of fiction (poetry, drama, novels), but in fact the term covers a far wider selection of works. It can also refer to journalism, essays, treatise, diaries, interviews and a range of other material. A secondary source, in contrast, describes or interprets a primary source.

You might want to quote from a primary source to give further support to your own ideas and arguments, to indicate a particular point or – again, especially in literary studies – to analyse the source in question.

Whatever your reason, the following guidelines should be kept in mind when using primary sources in the humanities:

- Avoid lengthy quotations. Summarising the source is a more effective way of using it if you need to refer to an extensive amount of text.

- Be careful if you are incorporating the quotation into the structure of your own sentence. Whatever source you use, it must be grammatically coherent with the sentence in which it appears.

- Avoid using snippets of quotation within a single sentence. This will appear as clumsy writing on your part and suggests that you have not adequately integrated the source into your own text.

- Do not modify the primary text without indicating this. Modification includes modernising spelling, changing capital letters; adding emphasis (italics, bold, underline) or altering the word for grammatical reasons. If the original quotation contains an error, that must also be indicated ("sic"), otherwise it might be assumed that the error is your own.

- Always give precise bibliographical indications of the source material, either in parenthesis or as a footnote. Fuller details must also be given in the bibliography. The reader should be able to access this source material on the basis of the references that you provide.

- Ensure that all quotation – short or long – conforms strictly to the writing format applicable to your TFG/TFM (MLA, Chicago, etc.).

ii) Secondary sources

As we have seen, a secondary source (also called a critical source) provides comment on a primary source.

Secondary sources include monographic studies, book chapters, journal articles, book reviews, encyclopedia entries, dictionaries, textbooks, etc. They also include sources that, conventionally, have not been considered acceptable for an academic project such as a TFG/TFM; this includes SparkNotes (et al.); blog posts (unless from a reliable source that discusses a topic in an academic manner) and Wikipedia, rightly or wrongly. You should always consult your tutor or supervisor before making use of this material.

Just as with primary sources, you should try to follow these guidelines in the humanities:

- Avoid lengthy citation, which will distract from your own text and make it appear less important. Again, summarising is more effective if you need to refer to a substantial amount of text.

- Ensure the grammatical coherence of the citation that you use, if it is incorporated into your sentence.

- Fully indicate any modification that you might make to the cited source.

- Provide complete bibliographical reference.

- Ensure that all citations are correctly formatted.

- Except for sources that are of major and ongoing importance to your field, ensure that your sources are as contemporary as possible. (See the section Writing critically, above, and consult your tutor or supervisor.)

As we have seen, using secondary sources is an essential procedure in a discussion. It allows you to express your ideas in the context of a broader critical debate and is a fundamental part of assessing and analysing the material that you will use in forwarding your own ideas.

But you need to make sure that your use of these sources does not cause your own point of view to disappear. This material supports your writing; it does not replace it. Remember that your discussion is being written in accordance with your thesis question, which is the dominant idea in your TFG/TFM. Secondary material is supplementary to this and, however important it is to contextualise your opinions in light of other work, you should avoid giving excessive space to this material. Ultimately, it is your work that needs highlighting most.

Additionally, using secondary sources requires you to establish a balance in the material used. If you are citing sources that directly support your main ideas, you need to counter this by citing sources that present distinct opinions. If you discuss and analyse one source in depth, you need to do the same for the other sources you use.

Above all, you need to avoid as much as possible the dependency on a single critical source or, indeed, on only a few. This would weaken your own critical writing and would also give the impression that you have not sufficiently researched the literature.

On the other hand, the relevant, well-selected and balanced use, analysis and interpretation of secondary sources will not only provide support to your own ideas, it will also help to give your readers the idea that your writing makes a contribution to the ongoing debate within your field of study. As a result, it will ensure that your views are given fuller attention and respect.

b) Natural sciences

In natural science papers, the main body of the paper generally consists of three parts: Methods, Results and Discussion.

1 METHODS

In the natural sciences, the essential criterion for a methods section is that it must enable people to replicate the work performed, allowing them to verify the results or further develop the same line of research. Therefore, the reader needs a clear explanation of the sequence of actions taken. When writing your methods section, use the past tense to describe what you did in chronological order.

Similar to the General guidelines given for the introduction, you may find it useful to try to answer the five 'W's in relation to your methods: what (e.g., what materials and techniques), where (e.g., in a lab designed for your purpose, or perhaps in a location that may have had an unwanted influence on your outcome), when (how long each process took, the time lapse between each stage), why (e.g., why one method rather than another), who (e.g., people whose techniques you replicated, or participants involved in tests).

a) **Verb tenses**

In your methods write-up, you must describe actions you have already taken. Therefore, write about them using past tenses (past simple, past continuous and past perfect):

> Once the seeds had been planted, the temperature was lowered to 4℃.

To state the purpose of an action, you should use the full infinitive:

> The distributed representations are built to capture the statistical properties of the dataset.

For more emphasis, precede the full infinitive with the words *in order*:

> The distributed representations are built in order to capture the statistical properties of the dataset.

b) **Passive voice**

The advantage of using the passive voice is that you need not state the agent that performs the action. This is desirable if the identity of the agent is not an important factor in the process described or if the agent's identity is obvious and needs no mentioning. This will often be the case in the methods section. Generally, focus on the object of the study, not the person conducting it. Therefore, not

> It was first seen that there were vortex formations at 28 rev/s.

or

> I first saw vortex formations at 28 rev/s.

but

> Vortex formations were first seen at 28 rev/s.

The first sentence above is unnecessarily long; and in the second sentence, the identity of the seer is superfluous information. The last sentence, which uses the passive voice, is best.

In the example above, there is no need to identify the subject. In other cases, however, if the lack of a subject in a passive sentence created ambiguity, it would probably be better to use the active voice.

c) Connectors

Given what has been explained above, that you should describe your method in chronological order, it makes sense to use connector words that clarify the sequence of the process, like *next*, *then*, *once*, *after this*, *after that*, *following this*, *following that* or *subsequently*.

For example:

> Each of the shifted sequences is then used to form training samples.

> Once we had researched the state of the art in computer image recognition, reviewed the literature and selected libraries (OpenCV) and the most appropriate techniques (SIFT and SURF), the next step was to prove, by experiment, the following hypothesis.

d) Figures and graphics

When you display figures such as diagrams, illustrations or graphs, the clearest way to refer to them is to make them the subject of the sentence. Therefore, not

> In Figure 4, we can see the path of the particles in the fluid, with some being projected towards the outer wall by centrifugal force.

or

> The path of the particles in the fluid, with some being projected towards the outer wall by centrifugal force, is shown in Figure 4.

but

> Figure 4 shows the path of the particles in the fluid, with some being projected towards the outer wall by centrifugal force.

Although the first and second constructions above are not wrong, and in this case are not even particularly problematic, as a general rule the simplest, clearest and most advisable construction is the third.

Directly below the figure (or, in the case of a table, above it) you should include a legend, and you can simply recycle the same wording; in this case, for example, we only need to remove the word *shows*:

> Figure 4. The path of the particles in the fluid, with some being projected towards the outer wall by centrifugal force

e) **Flow diagrams and tables**

To ensure that the reader understands the main sequence of events, i.e., the key stages in your process, you may want to include a flow diagram in your methods section. Flow diagrams include a relatively minimal amount of text; a label for each stage in the process should probably suffice. Give more detailed explanations in adjacent paragraphs. However, do not make the labels so brief that someone unfamiliar with the project will find it hard to understand them. The same advice applies for the headings in tables: it is better for the column headers to be long than it is for them to be unintelligible.

2 RESULTS

The results section of a scientific paper is about one thing: the data. You need to present your data as clearly as possible. Indeed, although this guide is about writing, writing is not the only thing you need to do in the results section. There will be some writing involved, but it should refer to the data, data that is presented in tables and figures. (Much of the content in this section is based on the resources produced by Bates College's Greg Anderson in "How to Write a Paper in Scientific Journal Style and Format".)

When you are planning your results section, first decide what information you need to show in your tables and figures, and then decide on a logical order for this information. This order may well mirror the structure of your introduction or methods section as you look to answer the research questions you proposed or present the outcomes of the experiments performed.

Your results should really speak for themselves. The text you write should simply help explain the data, and it should do so objectively. Describing the results objectively means also including any negative results that do not align with your hypotheses. That said, you should focus on what worked, rather than what did not. Any discussion or interpretation of the data should be kept for the discussion section of your paper. As you performed your experiments in the past, use the past tense when talking about the results.

> There was a significant decrease in time per search and memory use. (Adapted from Cuadrat, 2012)

The above example talks about a significant decrease. Take care when using the word *significant*. Only use it when describing results that are statistically significant, i.e., results that are unlikely to have occurred due to chance or sampling error. If this is not what you want to express, then simply describe the change ("There was a decrease in time per search and memory use") or use a different adjective ("There was a considerable decrease in time per search and memory use"). As in this example, results are often presented using "there was/were" or the passive tense; however, you can also use the active voice to make your statements clearer and more concise, e.g., "Time per search and memory use decreased".

a) **Presenting your results**

As mentioned above, the focus of the results section is not the writing, but the data. This subsection will look at the different ways you can present your results in the text, tables and figures.

If your results can be summarised clearly and easily in just a few words, then do this. Give a quick explanation and include the data in brackets.

> The differences between the OSR and the OSMAnd clone routing searches were minimal (14 m and 8 m). (Adapted from Cuadrat, 2012)

b) Tables and figures

Your experiments will have produced a series of data that need organising. The easiest way to organise these data is to prepare tables and figures. Tables and figures should present your data in a way that they are self-explanatory. In other words, they should be able to stand alone without any accompanying text and still be easily understood by your readers.

Likewise, once you have produced your tables and figures, you should be able to see a logical sequence that will help you explain the key results. This sequence can then be used to number your tables and figures. The numbering is separate for tables and figures, i.e., Table 1, Table 2, etc., and Figure 1, Figure 2, etc. (and not Table 1, Figure 2, Table 3, etc.).

You need to identify your tables and figures clearly with legends. They go above tables, and below figures. These legends should be short, but clear and comprehensive. They must explain what data the reader will find.

> Table 1. Values monitored in the testing (CPU load, memory use, time per search, and quality of the route) for each data file, each case, and online/offline status (Cuadrat, 2012)

You must refer to all the tables and figures in your text. If you include a table or figure, it must serve some purpose; do not add a table or figure if it is not going to back up (or refute) your hypothesis. When you refer to them, use *Table X* and *Fig. Y*, respectively. In other words, abbreviate the word *figure*, but not *table*.

c) Tables

Tables are relatively straightforward. They are the easiest way to present your raw data. However, you should not just dump all your raw data into them without first filtering, ordering and categorising them. This categorisation should be clearly marked by giving each column a logical heading. Although you must keep headings short, they must be understandable – in other words, better long than unintelligible. Tables are not designed to show trends or patterns; this is what figures are for.

Table 1. Values monitored in the testing (CPU load, memory use, time per search, and quality of the route) for each data file, each case and online/offline status (from Cuadrat, 2012)

File	Case	Status	CPU	Memory	Time	Quality
Europe_Spain.obf	1	Online	93%	401 MB	8 s	0
	1	Offline	79%	316 MB	5 s	
	2	Online	98%	395 MB	9 s	-14
	2	Offline	-	-	-	
	3	Online	94%	412 MB	15 s	8
	3	Offline	81%	358 MB	13 s	
Lleida.obf	1	Online	91%	384 MB	7 s	0
	1	Offline	89%	315 MB	4 s	
	2	Online	96%	372 MB	5 s	-14
	2	Offline	-	-	-	
	3	Online	85%	425 MB	12 s	8
	3	Offline	79%	374 MB	9 s	

d) **Figures**

Figures, in turn, provide a visual depiction of your data that often makes it easier to highlight trends or key findings. There are a wide range of different types of figures: from photographs and illustrations to pie charts and scattergrams. The best choice in each case will depend on the type of data you have and the point you want to make. If you are not sure which format is best, try presenting the data in a number of formats and then choose the one which presents your data most clearly.

Photographs, illustrations and screenshots can present information quickly and easily; their use should be clear. Maps are an obvious example.

Figure 3. Areas with 3G coverage in Spain (Cuadrat, 2012)

However, generally speaking, you will have a greater need for the typical types of figures used to portray data visually: bar charts, pie charts, line graphs, scattergrams, etc.

Bar charts are best used to easily compare one variable in different categories.

Figure 4. Prices of the healthy food basket in 18 shops in deprived areas with poor access to healthy food (blue) and in 2 large supermarkets (orange) (from Duval, 2016)

Pie charts can be used to compare proportions.
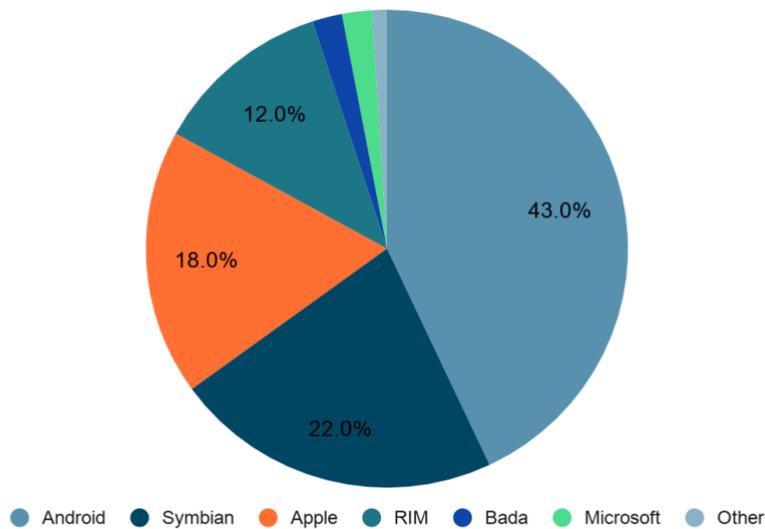
Figure 5. Share of worldwide 2011 smartphone sales to end users by operating system (adapted from Cuadrat, 2012)

Line graphs can be used to illustrate change; they are often used to illustrate change over time, for example.
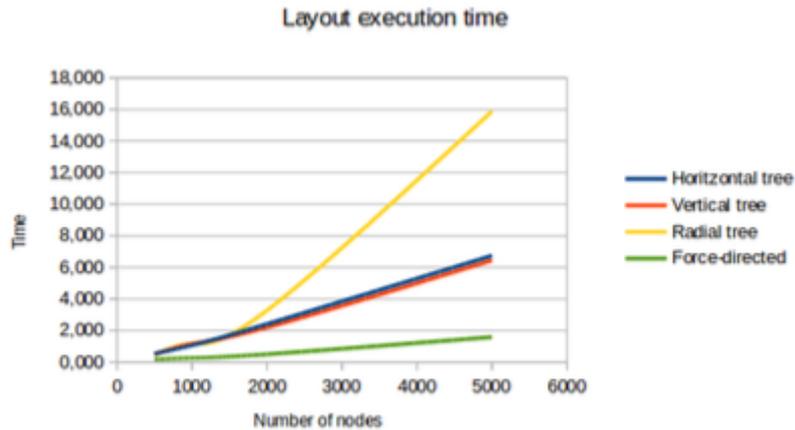
Figure 6. Layout execution time (from Ciberta, 2014)

Scattergrams are used to illustrate two variables simultaneously and are often used to highlight a pattern or trend.
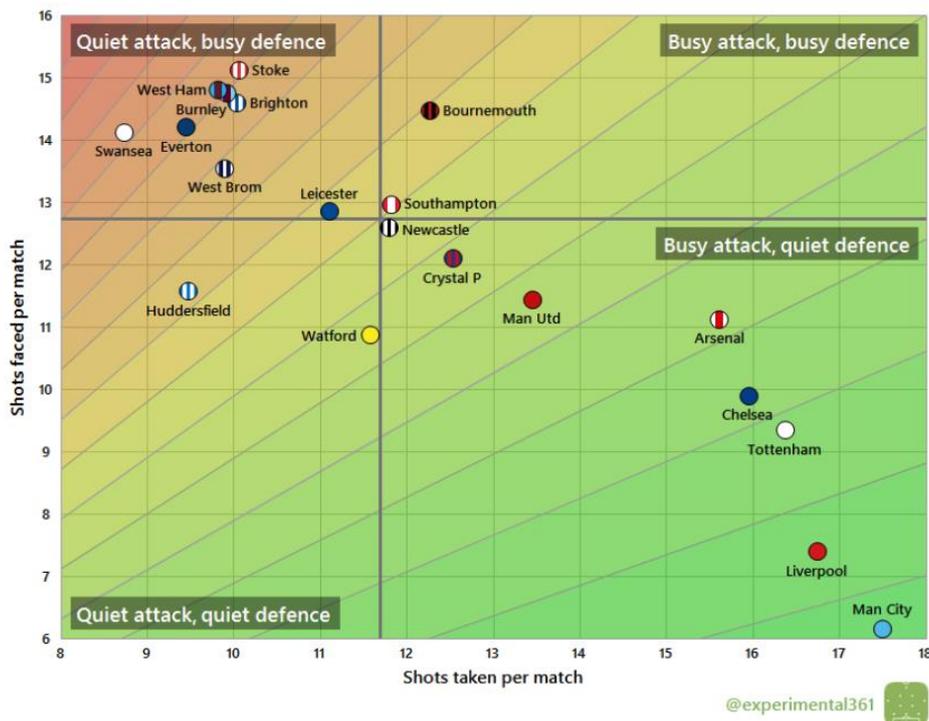
Figure 7. Premier League: shots taken vs. faced per match (2017/18) (from Mayhew, 2018)

These are common types of figures, but there are many other kinds. Take advantage of tools like MS Excel or Google Sheets to experiment with different formats until you find the ideal way to present your data clearly and coherently.

3 DISCUSSION

To recap the three main parts of the paper outlined in previous sections: the introduction presents the context and aim(s) of your study; the methods section explains how you investigated the problem and probed for possible solutions; and the results section is all about the data you obtained. The purpose of the discussion section is to tie together everything that came in the previous three sections, explaining what it all means. Now — and only now — is the time to provide personal interpretations of your research. You must analyse the results obtained, point out any strengths or weaknesses in your methods that reinforce or weaken whatever conclusions you draw from the analysis, and clarify how your findings relate to your objectives.

Rather than using a template, the thread of your discussion section must be based on your own interpretations, translating your ideas into logical arguments that other people can easily understand. With this in mind, develop your ideas as fully as possible before you start writing the discussion section; after writing the previous three sections, spend further time considering the nature and limitations of the arguments you intend to put forward in your discussion.

Despite this need for an individual perspective, there are some relatively standard patterns that you may choose to follow in terms of structure. A variety of moves have been identified (for example, by Hopkins & Dudley-Evans [1988], Swales [1990], Holmes [1997] and Yang & Allison [2003]) that researchers often use when discussing and interpreting their findings. The rest of this section summarises the most common moves used in the discussion sections of empirical research articles.

a) **Move 1: Background information**

Make a brief statement reminding readers of the central problem or aims announced in the introduction. This repeats information given earlier, but it re-focuses the reader's attention on the main issue after two sections (methods and results) that have narrowly focused on the specific work that you have done.

Move 1 is often introduced with phrases such as:

> This study investigated/examined/explored…

> The purpose/aim of this study was to…

> This study hypothesised that…

b) **Move 2: Statement of results**

Recap your most important results. This may seem unnecessary after you have just written a whole section on results, but it helps readers to focus on the main message of the results section.

Move 2 is often introduced with phrases such as:

> We demonstrated that…

Our results prove…

Our study shows…

Our findings shed new light on…

The present study confirmed our hypothesis that…

c) **Move 3: Comment on results**

In this move, tell readers what your results mean in the context of the research field and the questions raised in the introduction.

i) **Step 1: Interpret results**

Make a general claim about what your experimental results mean. If possible, use affirmative statements in the present tense, indicating that your finding will continue to hold true. Only use modal verbs of uncertainty and doubt (*may*, *might*, *could*, etc.) and hedging verbs (*suggest*, *indicate*, *seem*, *suggest*, etc.) if you are unable to prove your results.

Move 3, Step 1 is often introduced with phrases such as:

This proves that…

The implication is that…

This finding clearly shows that…

ii) **Step 2: Compare results with the literature**

Comparing your results with the work of other researchers has several functions: among others, it places your work in a context, which highlights its relevance, and supports (or refutes) current understanding. The language used in this step is often that of agreement and support.

Move 3, Step 2 is often introduced with phrases such as:

The findings of the current study support those by…

The results were consistent with those reported in…

Our findings agree with the findings made by…

Like [name of author], we found that…

Our results go beyond those of previous studies and show that…

Unlike [name of author], we did not find…

iii) **Step 3: Explain results**

In this step, explain what you have found. The language used tends to be that of cause and effect. Most of the key sentences are written in the present simple tense and often in the passive. State whether

your findings were expected or unexpected and, particularly in the latter case, say what you had been expecting and why, and then provide an explanation for the difference. This explanation need not be definitive and may be merely speculative, but readers will be unsatisfied if you leave any surprises unaccounted for.

Move 3, Step 3 is often introduced with phrases such as:

> One possible explanation for this difference is that…

> This can be explained by…

> This may be because…

> This is caused by…

> Surprisingly/Unexpectedly, we found that…perhaps because we were unable to ensure that the [X] variable remained constant.

iv) Step 4: Evaluate results

In this step, give a summary of the main implications of your findings and their significance. Explain whether they support other work in the literature and how they contribute to further the understanding of the research problem. Has your study responded fully or only partially to your research question? Does it raise new questions? Can your answer be related to other research questions or does it support or call into question current hypotheses in the field? Again, if necessary, use hedging language to limit the force of your claim.

For example:

> Overall, these findings are consistent with other research and show that…

> These results may be useful for researchers seeking to innovate in…

> Our findings provide valuable insight into…

> The broad implications of the present research are that…

> These findings provide a potential explanation for…

Likewise, make sure that you point out the limitations of your work. All studies have limitations, and it is important that you recognise them. Remember, too, that the limitations you identify may be an opportunity for future research. A typical source of limitations is the methodology you used: if the sample is too small, it may be difficult to find significant relationships; if there is little prior research on the topic, your study may have a weak foundation; if the data is self-reported, there may be biases due to selective memory, attribution or exaggeration. Another source of limitations is the time you have available. Discuss limitations in the past tense and use subordinating conjunctions such as *although* and prepositions such as *despite* to contrast strong and weak points.

For example:

Although differences were found between the control and the experimental group, they were not significant.

Despite the scalability limitations of our method, it was effective for small batches of samples.

A further limitation of our study is that we analysed a small sample.

Our study does not provide a complete picture of...

One concern about our findings is that…

d) **Move 4: Make suggestions and recommendations**

Suggest how your results can be used to solve the problem raised in the introduction and recommend how your work and findings can be extended by future research. Modal verbs (*may*, *might*, *could*, *should*, *must*, etc.) and key words such as *future research*, *further study*, etc. are often found in this move.

For example:

Further research is required to determine…

Future studies should focus on…

Another interesting avenue for future research would be to…

You may decide to present these moves in the same sequence as they have been listed above, but general writing practice in the discussion section varies considerably from one discipline to another, and even from one text to another, so you have the freedom to be creative. You can present the moves in a different sequence if this suits your purposes. You may even find that you initiate Move 3 and go through the various steps several times with different individual results. Also, the model described above gives no indication about length. By way of example, the following opening of a discussion section from a research paper on memantine treatment deals with Move 1 in one sentence and Move 2 in three:

The primary purpose of this study was to investigate the possible role of N-methyl-D-aspartate receptor in the development of temporary paralysis caused by ZIKV using memantine, an inhibitor of this receptor. In two independent experiments, memantine reduced the incidence of paralysis, which suggests that activation of this receptor is associated with paralysis. A distinguishing pathological event in this mouse model is that pre-synaptic terminals becomes detached or retracted from alpha-motor neurons in paralyzed mice. The synapses are then re-associated upon recovery of paralysis. A hypothesis for future studies, therefore, is that glutamate excitotoxicity mediated by N-methyl-D-aspartate receptors signals synaptic retraction and paralysis, and that resolution of glutamate excitotoxicity might reverse the paralysis of ZIKV-induced Guillain-Barré syndrome.

(Source: Siddharthan V, Wang H, de Oliveira AL, Dai X, Morrey JD. *Memantine treatment reduces the incidence of flaccid paralysis in a zika virus mouse model of temporary paralysis with similarities to Guillain-Barré syndrome*. *Antiviral Chemistry and Chemotherapy*. January 2020. doi: 10.1177/2040206620950143)

One final question that you need to ask is whether your research report requires a separate conclusion section. The answer will probably depend on the scientific discipline in which you are working, personal preference and the complexity of your study. Ask your supervisor for advice.

However, if you have followed all the moves and steps outlined above, a separate conclusion section will probably not be necessary. Essentially, the conclusion of a research report has to restate the research question or problem and summarise the answer; explain the practical or theoretical implications of the answer; and identify the limitations of the study and give ideas for future research. All of this information has already been given in the discussion, so your research has a conclusion whether you write a separate section or not; and if you include a conclusions section, you may run the risk of simply repeating yourself. If you feel (or are told) that a separate conclusion is necessary, consider finishing your discussion after Move 3, Step 3, and using this information, together with the information from Move 4, in a conclusion section.

c) Social sciences

If you are doing experimental work in the social sciences, IMRaD is probably the structure best suited to your research report, so the main body will consist of the same three sections as in the natural sciences: *Methods*, *Results* (or *Findings*) and *Discussion*. The reason social and natural scientists use the same structure is that they are essentially engaged in the same sort of activity: generating and collecting data in order to answer a question. And for all investigations that collect data for subsequent analysis, IMRaD is the most logical and widely accepted report structure.

If your research is not experiment-driven and you are not collecting data for analysis, then IMRaD is probably not for you. Your report may start in the same way with the title, abstract and introduction, but your main body will be quite different. However, it is not easy to say exactly how it will be different, because the form of your report will largely be determined by content. One option often adopted in the humanities is to move straight from the introduction to the discussion. Another is to divide your report into sections that focus on a particular theme, as if they were chapters in a book. If you are a historian, these sections may focus on periods of time or historical events; if you are a sociologist they may focus on different theories; and if you are an ethnographer you may find yourself using storytelling techniques to create aesthetically pleasing non-fiction. If you are a non-experimental researcher, exactly how you organise your report is often up to you. This gives you a lot of freedom but also a great deal of responsibility.

If your research is experiment-driven and you are collecting data for analysis, then you will probably be obliged to use the IMRaD structure, which means you are less free to make your own decisions on structure. It is often said that the standard IMRaD research format has an hourglass or a figure-of-eight format. That is to say, the introduction starts with a very wide focus (importance of the field, subject generalisations and summary of previous research) and then gradually narrows until it focuses on a specific issue. The methods section picks up where the introduction left off and is the first of two sections (the other being the results) to focus exclusively on the research in hand. The discussion then widens the focus again. Although it often starts with the same narrow focus as the results, it finishes by addressing the more general issues you mentioned at the beginning of the introduction, thus showing how your specific research is relevant to society at large.

However, this structure is only a general guideline. As mentioned above, more theoretical studies may not require a methods or a results section; and although empirical research reports must contain information about the methods used and the results found, and discussion of how to interpret these results, you do have some freedom to diverge from this standard format. The information in the main body of your report is usually given in the three separate sections mentioned above, but sometimes the results and the discussion can be combined to form just one section (*Results and discussion*). The discussion often includes the information given in the conclusions section.

One common feature of a research report in the social sciences is that there is often a separate section, the literature review, after the introduction and before the methods. This section is an explicit acknowledgement of the importance of situating every piece of research within the existing literature. Likewise, other reports may contain a separate section entitled *Theoretical framework*, which explains the theoretical background to the study.

Another feature that distinguishes research work in the social sciences from similar work in the natural sciences is that each of the main IMRaD sections can be divided into subsections. For example, if you are studying data from a particular database or focusing on a particular group of participants, your methods section may have subsections entitled *Data* or *Participants*. Likewise, depending on what you wish to highlight and the nature of your research, your results section might also be subdivided.

Below, this guide will focus on the standard IMRaD format of the main body of an experimental research report (*Methods*, *Results*, *Discussion*), plus the *Literature review*. If you wish to add other sections or use subsections, check with your supervisor before you do so.

1   LITERATURE REVIEW

The literature review provides your readers with a summary of all the relevant books, academic articles and other sources you have consulted while researching your chosen topic. This summary is an important function of your literature review because readers need to be able to consult these sources for themselves if they wish to do so. However, this is not its only or even its most important function. Above all, you need to indicate the relative merits of the various studies you have used as sources, show how your work fits into this body of literature and describe the contribution you are making. To do this, you need to adopt a critical approach to the work you are reviewing.

Do not just list all the books and articles you consulted. First, select only those sources that are most relevant and then try to organise the section in a way that best serves your purposes. One way to do this is to discuss your sources in terms of the school of thought or intellectual tradition they belong to. If you are an anthropologist, you may divide the literature into the traditions of functionalism, structuralism and cultural materialism. If you are an economist, you may divide it into Marxian, neo-classical and Keynesian approaches. At the end of the section, state which of these traditions your research belongs to. Another way is to organise the section chronologically so that readers can see how your chosen topic first became an issue of debate and how understanding has developed over time. Situate the work you are reviewing in its historical context, describe strengths and weaknesses, point out whether the

findings can be generalised or are limited to a particular situation, provide solutions to apparent conflicts and ensure that the connection between the literature and your research question is clear. You should also include studies in your literature review that do not support your hypotheses and assumptions. Good critical research must be able to provide explanations for alternative findings and respond to different interpretations in the literature.

2   METHODS

One of the main functions of the methods section is that it should enable other competent researchers to replicate your study. This means that, on the basis of the information in this section, if other researchers decide to repeat your study procedure with the same variables, they should get the same results. It is unlikely that they will do this just to verify the accuracy of your findings, but they might do it in different situations and with different subjects to find out whether your findings can be generalised or whether they are specific to particular participants and circumstances. For example, are the findings of a study on European adolescent girls and alcohol in 2010 applicable to adolescent boys? Or to a comparable sample of adolescent girls in 2020?

Another of its main functions is that it gives readers confidence in your findings. The information you provide should be detailed enough for readers to understand that your procedures rigorously conformed to acceptable scientific standards. If they did, then it is likely that your results mean what you claim they mean.

Studies in the social sciences often collect data from a group of people who represent a larger population, by using some sort of research design. If this is the case of your study, you might have a subsection entitled *Participants* in which you give relevant details about your sample: for example, how many people were in it, the number of males and females, their ages, their socioeconomic status, their education, etc. If you recruited the population yourself, you must also give details about the sampling procedure (random, systematic or convenience sampling, for example) so that readers understand how representative the subset you selected is of the population as a whole. If you did not recruit the subjects yourself, explain the source of your data (perhaps it was collected by other researchers and you will be subjecting it to fresh analysis).

After describing the data or the participants you will be studying, go on to explain what you measured and how you measured it. Be very specific because this is the part of your study that will enable other researchers to replicate it and they have to be able to do exactly what you did. Make sure that you list all the measures you used. If you have administered a standard test, say which one and why you preferred it over other tests. If you have administered a survey, provide the wording of all the questions. You may want to give all this information under subheadings such as *Variables*, *Design*, *Measures* and *Procedures*.

a)   **The language of the *Methods* section**

Some sections of the standard IMRaD text are linguistically more varied than others because of their broad focus. This variety is particularly evident in the use of verb forms. For example, the introduction

and the discussion, which focus on the research field in general, previous studies, the present study and recommendations for future work, can use all forms of the present, past and future (simple, continuous and perfect), and both the active and passive voices. On the other hand, the methods section has a more limited focus and this, in turn, means that the use of verb forms is also more limited.

Conventionally, researchers describe what they did in this section using the past simple passive and not the first-person, active form. Therefore, not

> We asked the participants to respond to the questionnaire and informed them about the aims of the study.

but

> The participants were asked to respond to the questionnaire and were informed about the aims of the study.

There are several reasons for this. Firstly, as Joshua Schimel points out, some people who were not authors may have taken part in the work (Schimel, 2012). For example, data may have been collected or instructions given by technicians, assistants, colleagues, friends or acquaintances. Since *I* or *we* in a scientific text refer to the author or authors, the use of the passive avoids unnecessarily identifying the agent of every action and enables the author to say exactly what readers need to know: that is to say, "Data was collected" or "Instructions were given." Secondly, the methods section is the first section that focuses exclusively on the work in hand. Readers are aware of this and do not need to be told the agent of every action because it is obvious (the authors), is not important (someone the authors asked to help them) or distracts from the really important information (what was done). Thirdly, the methods section often describes a lengthy sequence of actions, and the repetition of the same subject (*I* or *we*) would be inelegant, annoying and ineffective, in the sense that it would emphasise the agent and not the action. And, finally, because you are describing work that you did and which is now complete, the most appropriate tense for your passive verbs is the past simple.

3 RESULTS

The results section is the heart of an empirical research report because it reveals the evidence that will be used to address the problem or question raised in the introduction. The content of the section would seem to be obvious: it is here that you present the data generated by your investigations. However, presenting data is by no means straightforward.

The main problem is to decide which data to present and how. Your investigations may have provided many pages of figures and hundreds of individual numbers (raw data) from dozens of analyses, which cannot all be included in a report, so your job is to organise and summarise. By way of example, let us consider the study on how the jazz chants teaching technique can improve vowel reduction. The researcher put forward three hypotheses: (1) jazz chants would improve students' pronunciation; (2) female students would improve more than male students; and (3) Catalan-dominant students would improve more than Spanish-dominant speakers. If the results section is to help prove or disprove these hypotheses, you must present the data in such a way that it provides insight into them.

One way to do this is to organise the section so that readers clearly see what findings were provided by the tests you described in the methods section. And, like the methods section, using subsections may be the most effective way of highlighting these findings. Our vowel reduction model opted for a four-part results section. The first subsection was entitled 'Descriptive Statistics' and provided information on gender, age, dominant first language and language-learning experience to show that the control and experimental groups were indeed comparable; and then, the model went on to have one subsection on each of the tests, called 'Independent Samples T-Tests', 'Paired Samples T-Tests' and 'Correlations', respectively.

Another way to decide which data to present is to reduce the amount of information to a manageable size by converting the raw data into means (averages). You can then display these means in the form of tables (graphics which organise information into columns and rows) and figures (graphics which organise information into charts, graphs, plots, drawings or any other illustration that is not a table); and you design these tables and figures to highlight changes over time, differences between the sexes, or – as in our vowel reduction model – differences between Catalan- and Spanish-dominant students. It is these observations, not the numbers and figures themselves, that are the response to your research questions. In the text, you will make generalisations about this data and point out significant changes, differences, trends and patterns that shed light on your main research questions. For the moment, merely indicate that they exist; do not interpret them, as that is the function of the discussion section. Also make sure to inform your readers where they can find the information you are summarising by giving an explicit reference to the table or figure in the text. For example, "This data shows that the control and experimental groups were similar in terms of the gender of the students (see Figure 4.1) and their dominant first language (see Figure 4.2)."

Note that tables and figures have different functions. Tables are useful if you have numerous entries or precise numerical values, but they do not easily reveal general trends or relationships between variables. On the other hand, bar and line graphs are very good at highlighting trends and relationships but do not show precise numerical values and can only effectively display a limited number of variables. Note also that readers should be able to understand tables and figures on their own, without the support of the text.

Finally, and as the observations above suggest, some of the most important language you require in the results section is associated with tables and graphs. In particular you need to be able to compare, contrast and describe trends. For example:

> Figure/Table 1 shows/illustrates…
> The x/y axis represents…
> Female students clearly improved more than male students.
> The solid line rises sharply at first but then levels off.
> Almost nine out of ten students improved their pronunciation to some extent.
> The pronunciation of female students improved dramatically in the first month while for male students the improvement was more gradual.
> Overall, there is a clear upward/downward trend.

There was a gradual rise from baseline to the fourth week of the intervention, after which there was a slight fall/decrease.

4 DISCUSSION

The discussion section brings together your initial research questions, the data you have generated and previous research done on the topic. It is at this point, after you have led your readers objectively and systematically through the research process and proved to them that you are a conscientious and rigorous researcher, that you interpret your findings, describe their significance and explain how they provide new insight into the problem or question you raised in the introduction. Also remember that this section should provide no new information but focus only on the findings reported in the results section.

Researchers often say that the discussion is the section of their research report that they find most difficult to write. This is largely because, unlike the introduction, there is no standard, widely accepted pattern to follow, which gives researchers a lot more freedom. Writing practice certainly varies from one discipline to another and even from one paper to another. Nevertheless, like the introduction, a variety of moves have been identified (for example, by Hopkins and Dudley-Evans [1988], Swales [1990], Holmes [1997] and Yang and Allison [2003]) that researchers often use when discussing and interpreting their findings. The rest of this section summarises the most common moves used in the discussion sections of empirical research articles in the social sciences.

a) **Move 1: Background information**

Make a statement or give information about the central problem or aims announced in the introduction (Move 2 or Move 3, respectively). This essentially repeats information from the results section, but it re-focuses the reader's attention on the main issue after two sections (Methods and Results) that have narrowly focused on the specific work that you have done.

Move 1 is often introduced with phrases such as:

This study investigated/examined/explored…
The purpose/aim of this study was to…
The present study hypothesised that…

b) **Move 2: Statement of results**

Briefly summarise your most important results. This may seem unnecessary after you have just written a whole section on results, but it helps readers to focus on the main message of the results section.

Move 2 is often introduced with phrases such as:

We found that…
Our results reveal…
Our study shows…
Our findings shed new light on…
The present study confirmed our hypothesis that…

c) **Move 3: Comment on results**

In this move, tell readers what your results mean in the context of the research field and the questions raised in the introduction.

i) **Step 1: Interpret results**

Make a general claim about what your experimental results mean. Use modal verbs of uncertainty and doubt (*may*, *might*, *could*, etc.) and hedging verbs (*suggest*, *indicate*, *seem*, etc.) in order not come across as too aggressive or forceful.

Move 3, Step 1 is often introduced with phrases such as:

> This suggests/indicates that…
> This could be interpreted as meaning that…
> This finding clearly shows that…

ii) **Step 2: Compare results with the literature**

Comparing your results with the work of other researchers places your work in a context, which highlights its relevance, and supports (or refutes) current understanding. The language used in this step is often that of agreement and support.

Move 3, Step 2 is often introduced with phrases such as:

> The findings of the current study support those by…
>
> The results were consistent with those reported in…
>
> Our findings agree with the findings made by…
>
> Like [name of author], we found that…
>
> Unlike [name of author], we did not find…
>
> Our results go beyond those of previous studies and show that…

iii) **Step 3: Explain results**

In this step, explain what you have found. Your language will tend to be that of cause and effect, and hedging. Most of your key sentences will be in the present simple tense and often in the passive. State whether your findings were expected or unexpected and, particularly in the latter case, say what you had been expecting and why, and then provide an explanation for the difference. This explanation need not be definitive and may be merely speculative, but readers will be unsatisfied if you leave any surprises unaccounted for.

Move 3, Step 3 is often introduced with phrases such as:

> One possible explanation for this difference is that…
>
> This can be explained by…

This may be because…

This is caused by…

Surprisingly/Unexpectedly, we found that [….]

iv) Step 4: Evaluate results

In this step, give a brief summary of the main implications of your findings and their significance. Explain whether they support other work in the literature and how they contribute to the understanding of the research problem. Has your study responded fully or only partially to your research question? Does it raise new questions? Can your answer be related to other research questions or does it support or call into question current hypotheses in the field? Again, if necessary, use hedging language to limit the force of your claim.

For example:

Overall, these findings are consistent with other research and show that…

These results may be useful for teachers seeking innovative methods for teaching pronunciation.

Our findings provide valuable insight into…

The broad implications of the present research are that…

These findings provide a potential explanation for…

Likewise, make sure that you point out the limitations of your work. All studies have limitations and it is important to recognise them. Remember, too, that the limitations you identify may be an opportunity for future research. A typical source of limitations is the methodology you used: if the sample is too small, it may be difficult to find significant relationships; if there is little prior research on the topic, your study may have a weak foundation; if the data is self-reported, there may be biases due to selective memory, attribution or exaggeration. Another source of limitations is the time you have available. Learning a language may take many years, so to what extent can we rely on the results of a three-month research project into language learning? Discuss limitations in the past tense and use subordinating conjunctions such as *although* and prepositions such as *despite* to contrast strong and weak points.

For example:

Although differences were found between the control and the experimental group, they were not significant.

Despite the limitations of our method with adults, it was more effective with younger learners.

A further limitation of our study is that we analysed a small sample.

Our study does not provide a complete picture of...

One concern about our findings is that…

d) **Move 4: Make suggestions and recommendations**

Suggest how your results can be used to solve the problem raised in the introduction and recommend how your work and findings can be extended by future research. Modal verbs (*may*, *might*, *could*, *should*, *must*, etc.) and key words such as *future research*, *further study*, etc. are often found in this move.

For example:

> Further research is required to determine…
>
> Future studies should focus on…
>
> Another interesting avenue for future research would be to…

You may decide to present these moves in the same sequence as they have been listed above but general writing practice in the discussion section varies considerably from one discipline to another, and even from one text to another, so you have the freedom to be creative. You can present the moves in a different sequence if this suits your purposes. You may even find that you initiate Move 3 and go through the various steps several times with different individual results. And like Swales's CARS model for the introduction, the model described above gives no guidelines about length. By way of example, the following opening of a discussion section from a research paper on management science deals with Move 1 in one sentence and Move 2 in three:

> The main objective of this study was to evaluate the cause-and-effect relationship between customer loyalty programmes and customer retention. The study found a strong and positive cause-and-effect relationship between customer loyalty programmes and customer retention. Loyalty programmes that are based on rewards for cumulative purchasing enhance retention. Such programmes encourage repeat buying and thereby improve retention rates by providing incentives for customers to purchase more frequently and in larger volumes. (From Bhakar & Nathani, 2015)

8 Conclusion

In all the ambits, one of the main functions of the conclusion is to restate your main arguments and remind your reader of their strengths, perhaps by reiterating the most important evidence or ideas. But make sure not to simply repeat yourself, either. Depending on the ambit, the conclusion may also contain a reflection on the evidence you presented, or on your thesis.

In the natural sciences and social sciences, a conclusion section may be unnecessary if its purpose has already been fulfilled in the discussion.

a) Humanities

When you have come to the end of your paper, you need to conclude the ideas you have explored throughout your discussion. The aim of your conclusion is to ensure that your readers walk away from your paper with clear ideas about what you have gained from your analysis and where the research might be headed. Here are some tips on how to write a good conclusion and elegantly round off your work.

- Do not simply repeat yourself in an attempt to close your discussion with a list of points you have already raised.

- Avoid introducing new ideas; all significant contributions regarding the subject at hand should have already been mentioned in your discussion.

- Summarise what you have discussed, mention and evaluate the most important points you have raised throughout your analysis and suggest the impact these might have beyond your research and on the wider context.

- Avoid including lengthy quotations. If you want to draw attention to a pivotal critic of the work you are analysing, someone who has heavily featured throughout your paper, try to paraphrase their ideas instead of directly citing them.

- Do not forget about your title. It is easy to get lost in the discussion as you discover new aspects about your chosen topic that are exciting and inspiring. For example, write the paper's title in large letters and stick it above your writing station for the duration of your assessment. This will serve as a visual reminder of what you need to focus on.

These are all important things to remember. But most of all, leave your reader with a clear idea of what you have gained from your research.

The following example focuses on a film from the year 1970 called *Tristana* by the renowned film director, Luis Buñuel. Have a look at the film's IMDB page for some brief background information, which will help contextualise the example.

This is an example of a poor conclusion for a paper entitled *Examining the Trope of the Amputated Leg in the Context of the Wider Themes of* Tristana *(1970)*:

> Buñuel was a communist atheist who opposed the Spanish government, a stance he made obvious through his film *Tristana*. Don Lope's murder represents the fall of the government and power for oppressed peoples. By the end of the film, Tristana is free but she still has challenges to face and overcome. The amputation of her leg is a metaphor for pain and struggle, but the new prosthesis gives her power to recover. The film is one of Buñuel's best.

Why might the following statement be a weak observation for a conclusion?

> The amputation of her leg is a metaphor for pain and struggle, but the new prosthesis gives her power to recover.

It is a very generalist statement, and although it draws upon the film director's use of imagery, it does not explain why the leg is a metaphor and the greater implications of that comparison. It is a one-dimensional conclusion. The writer could expand and talk about why the amputation is a metaphor for pain and what the greater implications of this metaphor are, thus drawing on their earlier discussion. Is it only relevant to the protagonist or is it a much wider metaphor, depicting her as a symbol of society at large?

Consider this sentence:

> Buñuel was a communist atheist who opposed the Spanish government, a stance he made obvious through his film *Tristana*.

How did Buñuel make that stance obvious? This is a good introduction to a conclusion. But the writer should expand upon how they have come to this conclusion, summarising earlier observations from their discussion. The Spanish government is also still an active entity in Spain. The writer might refer to how contemporary films represent depictions of political power today, whether to praise or criticise it, commenting upon Buñuel's brave commentary given the context in which he made his film.

The following is an example of a stronger conclusion that summarises, draws upon and evaluates the most important points from the discussion and refers to the bigger picture at hand in order to respond to the paper's title.

> It is important to recall that *Tristana* is a film made by a communist atheist who stood against everything the patriarchal Spanish order represented for society at that time. Spain was still emerging from a harsh dictatorship during the late 1970s, a situation Buñuel reflected on and referred to symbolically throughout the film, employing different narrative and audiovisual techniques to do so. Whilst extreme, the protagonist's murder of Don Lope is also a figurative dethroning of the oppressor of all individuals under similar circumstances; those oppressed in personal relationships, by institutions or by their surroundings. The young protagonist eventually achieves freedom, but as the film's final montage suggests, society's conditioning is unavoidable and the spectator cannot overlook the societal and political challenges still to be overcome. The amputation, as read through different contexts presented in the film, stands to represent a crippled nation; a country set to achieve emancipation but at the cost of war and loss. However, the prosthesis, that which is gained, represents strength and courage against the oppressor. Buñuel's aim was to challenge his audience to question the world they live in and Tristana exemplifies this call for criticism, reaction and rebellion. The film also serves as a point of reference for political criticism in twenty-first-century cinema, which begs the question as to whether films are still capable of such an artistic commentary. Subtlety is an art form in itself, but in

> today's politically-polarised society where such subliminal messages are no longer necessary, do filmmakers still draw on these powerful artistic techniques to get under their audience's skin?

Mentioning evidence (in this case, cinematic techniques) that backs up your claims and refers to earlier points made in your discussion, without going into too much detail, is a good way to summarise in your conclusion. The writer above also refers to the greater societal issues represented in the film, and the potential impact it had on its contemporary audience. They have also pulled their final assessment of the film into today's world, questioning the use of such a subtle political commentary today, while recognising Buñuel's place in cinematic history as an artistic political commentator and critic. This is a strong conclusion as the reader is left with a final impression of the writer's understanding of the film's themes, which also demonstrates that they have understood and effectively responded to the title.

Even though an academic paper is not necessarily an exercise in creative writing, the use of incisive statements and rhetorical techniques can make reading it a more pleasant experience. For example, the use of three abstract nouns at one point in the text (*criticism, reaction and rebellion*) not only employs the 'rule of three' (a common writing technique that adds emphasis and rhythm to your text); it also refers to the main themes of the film, leaving the reader with a final answer to the paper's title.

b) Natural sciences

The purpose of a conclusion section is often fulfilled by the discussion. In this case, there is probably no need for a conclusion. However, if you have been instructed that you should include a conclusion, refer to the final paragraph of Section 7.2 c for advice on what to do.

c) Social sciences

Whether your research report requires a separate conclusion section or not will probably depend on the discipline of the social sciences in which you are working, personal preference and the complexity of your study. Ask your tutor or supervisor for advice.

However, if you have followed all the moves and steps outlined for the discussion section above then a separate conclusion section will probably not be necessary. Essentially, the conclusion of a research report has to restate the research question or problem and summarise the answer; explain the practical or theoretical implications of the answer; and identify the limitations of the study and give ideas for future research. All of this information has already been given in the discussion, so your research has a conclusion whether you write a separate section or not; and if you include a conclusions section you may run the risk of simply repeating yourself. If you feel (or are told) that a separate conclusion is necessary, consider finishing your discussion after Move 3, Step 3, and using this information, together with the information from Move 4, in a conclusion.

9 Referencing styles

This part of the *Guide* offers practical advice about the bibliography section of your end-of-degree project in English, and how to correctly reference these sources in the body of your text. Some advice is general and some is specifically for students writing humanities papers, papers in the natural sciences or papers in the social sciences.

Often the final stage of writing an academic paper, like your TFG/TFM, is formatting and completing the bibliography and correctly referencing all the sources you refer to in the body of your text. There are many ways to do this depending on the subject of your writing (see Referencing styles).

It might be the last, but it is a vital stage in the academic writing process. As such, it is essential you correctly reference each and every source you refer to in your writing. If you do not, it might be deemed as plagiarism, the act of appropriating someone else's ideas or claims as your own. When done deliberately, plagiarism can lead to very severe consequences that tarnish a writer's academic reputation. Of course, students can sometimes plagiarise accidentally, especially if they are unsure of how to properly acknowledge other academics' work, but it is something you should try to avoid.

When writing in a foreign language, it can often be tempting to 'borrow' (or directly copy) someone else's idea. However, this would be considered plagiarism. You need to find your own voice and writing style. As you read through secondary sources (scientific articles, books, journals, films, music, interviews, etc.) to help develop your argument, focus on the sections that contain key ideas, highlight them, or make detailed notes, but then summarise them in your own words without looking at the source. Not only will you learn to develop your own style, but you will see if you have really understood everything you read!

The structure of your final project will be unique. However, some of the ideas you present in the main discussion will be based on the reading you did during the research stage. Every time you paraphrase one of these ideas (i.e., refer to it using your own words), you will need to reference the original author and their work, especially if you directly quote a fellow academic. This way, you are essentially letting the reader know that this idea is not your own, but that you have read around the subject.

Here is an example of directly quoting a source:

> García Márquez comments on the "discovery of a genuine world that I never expected inside of me" (García Márquez 247) when he read James Joyce's Ulysses, and the immediate impact Franz Kafka's *The Metamorphosis* had upon him, literary proof that translations are vital to the continual development and evolution of style and ideas.

The writer has lifted an idea directly from the original author's work. Therefore, they have introduced the quote between quotation marks and referenced it immediately after, using the Modern Language Association (MLA) referencing style (for more information, see Referencing styles). This reference will also appear in their alphabetised bibliography (or *Works cited*) at the end of their paper:

> García Márquez, Gabriel. Living to tell the Tale, translated by Edith Grossman. New York: Knopf, 2003.

So, one option when referencing another writer's ideas is to directly quote them, as we see above. However, you can also paraphrase their ideas. An example is given below.

Original:

> "...elidida en la novela, la boda cobra una presencia extraordinaria en el filme, donde es escenificada como boda negra —caracterización a la que contribuye la escenografía de funeral— en sintonía con una vinculación entre la boda y la muerte recurrente en el texto buñueliano." (Poyato Sánchez, 2014)

TFG/TFM:

> In contrast to Poyato Sánchez, who suggests the wedding can be seen as representing a funeral and the death of Tristana's freedom (Sánchez 743) given the black outfits and tearful statues, the wedding could also be seen as a positive step for Tristana; a public demonstration of empowerment.

Here, the writer has paraphrased an idea presented by another author. They have used it to support their own argument and woven it smoothly into the text by rewording the academic's contribution to contrast their own argument. Even though the original is in a different language to the paper, the same plagiarism rules apply. The writer has once again used the MLA referencing style for their in-text citations.

Even when paraphrasing, you can still mention the author's name and use introductory phrases to present these paraphrased ideas:

- Smith declares…

- Smith argues that…

- Smith believes that…

- The work of Smith shows that…

- As Smith indicates…

- As Smith implies…

- As Smith suggests…

- Smith thinks that…

- Smith addresses the fact that…

There is difference between a Bibliography and Works cited section. Works cited (or References) is a formatted list of all the sources cited within your text. A list of this kind can also include non-literary sources such as audiovisual media.

A bibliography is a formatted list of all sources that you consulted (but did not necessarily cite) for your TFG/TFM.

Below you will find some advice for the ambits we focus on in this guide.

a) Humanities

There are many referencing styles for academic writing. The most common styles in the humanities are the MLA (Modern Language Association) and Harvard referencing styles, which both use the author-date system to display the basic information for a given source. Other referencing styles use footnotes that include all of the reference information, such as the Chicago Manual of Style (CMOS), which is often used in the field of history.

The MLA Referencing Quick Guide (8th edition) of the University of Roehampton explains how to reference different sources and write your bibliography using the MLA referencing style.

However, style guides are not limited solely to correct referencing; they also encompass a range of writing style and formatting features. For example, does your style guide suggest single or double quotations marks? When should you use footnotes? What system should you use for abbreviations? How should your writing be laid out on the page? Check with your tutor as to whether you should be following these guidelines. Do they think it is important at this stage of your academic career? They are important considerations, as they help the reader stay focused on the content, rather than getting distracted by formatting discrepancies. Should you ever want to submit your work for publication, the journal in question will request strict adhesion to a style guide.

A good way to make referencing (and writing your bibliography) easier starts in the research stage. Before reading or making notes, write down all the information regarding the publication of each text you cite: the author(s), the titles of both the chapter and the book it appears in, or the title of the article and the journal's name, page numbers, date of publication, place of publication, the publisher and the edition:

> Title: *Why Write? A Master Class on the Art of Writing and Why it Matters*
>
> Author: Mark Edmundson
>
> Chapter: "To Catch a Dream"
>
> Pages: pp. 46–61
>
> Date published: 3.11.2016
>
> Publisher: Bloomsbury USA
>
> Edition: 1st

If you have all this information before you even begin to structure your discussion and include citations, referencing should be easy!

b) Natural sciences

The natural sciences follow generally the same premise as the humanities when it comes to referencing your secondary sources. However, given the differences in the format of papers written in biology,

chemistry, physics, earth science and space science (the primary natural sciences), such as results tables, lab reports and methodologies, there are referencing styles more suited and more commonly used for these ambits.

The same general rules apply, that whenever you reference another writer or scientist's work, you need to give them credit where credit is due.

1 LITERATURE REVIEW

You may not need to include this section (check with your tutor), but a literature review can provide a valuable foundation on which to base your thesis and the rest of your TFG/TFM. The aim is to outline the academic context in which you have proposed your thesis/research question and explain how it contributes to the work that has already been done. It should not simply be a list of references, but a synthesis of what you have gained from these sources in order to propose the gaps that still need to be filled.

Start by telling your reader why you selected the sources you reference, which should only be those that have directly influenced your thesis/research question. You should have a diverse range, including primary sources (such as research reports, data, photographs) and secondary sources (such as academic reviews).

The most common referencing styles in the natural sciences are APA (American Psychological Association), Chicago and Harvard.

The APA referencing style uses in-text citations and a bibliography (list of references) at the end of your TFG/TFM. They also use the author-date system (e.g. Johnson, 1975) and point the reader to your bibliography, where they will find all the bibliographic information on the source in question.

There are many good self-help websites on how to correctly reference your sources following APA guidelines. One such is published by the Purdue Online Writing Lab website, which also offers help on other citation systems. Go to https://owl.purdue.edu/owl/purdue_owl.html.

c) Social sciences

Referencing is an important part of academic writing because it shows where you got your information from. When you use someone else's work or ideas, you have to acknowledge their effort by placing a reference in the text and in the reference list at the end. If you do not, you may be accused of plagiarism. The system you use in each case will be different but you must always use the same one: that is to say, you must use the same referencing style.

There are many different referencing styles (MLA, Chicago/Turabian, Vancouver, Harvard, etc.) but the one that is most commonly used in the social sciences is the American Psychological Association (APA). It stipulates the information you must include, the order it must be in and how it must be punctuated. It

also stipulates the differences between referencing in the text and in the reference list, and how to reference different text types.

In the APA style for in-text references, you must include the following information:

- The name of the author or authors.

- The year of publication.

- The page number (optional)

For example:

In-text paraphrase

Women are increasingly deciding not to work in the home in favour of finding remunerated work, although the extent to which this is happening varies considerably between countries (López Puig, 2008).

In-text quotation

"The employment rate of women in Europe is generally showing an upward trend, although there are major differences between countries in the European Union" (López Puig, 2008, p. 21).

The general APA formats for referencing a book or a journal article in the list of references at the end of the text are the following:

Author, A. (Year of publication). *Title of book*. Publisher.

Author, A.A., Author, B.B., & Author, C.C. (Year of publication). Title of article. *Title of journal, volume*, issue, pages.

Examples

Guinovart Garcia, A. (2018). Effect of historical memory on contemporary European politics. Routledge.

Guinovart Garcia, A., & Smitherson, J. (2019). Berlin, Barcelona and Brussels: How historical memory has shaped the cities and their people. *Memory Studies*, *37*(2), 17–32.

For further information on the complexities of the APA referencing style see https://libraryguides.vu.edu.au/apa-referencing/7Home

10   Editing your text

a) General considerations

In all the ambits, while it might be tempting to submit your paper as soon as you have inserted the final full stop, do not be so quick to forget about it completely!

When you start planning your paper, look at how much time you have before the hand-in date. Leave yourself a few days between finishing your draft and submitting your paper to read through your work with fresh, critical eyes. This will give you time to take a step back from your work and spot any mistakes, add important information you may have overlooked or take out anything you now deem to be redundant.

This process is known as editing and is an essential part of publication. It might seem daunting at first, but it increases the academic quality of your work. It is much easier to criticise and make improvements to your writing than it is to create content from scratch. The bulk of the work is done, now this is your chance to polish it off.

Finally, print out your work. This helps you see your writing with fresh eyes, as if it were written by someone else. Take a different coloured pen and do not be afraid to cross things out or add comments to the page. Visualising the editing process before you make and save your changes will help guide you through the process.

b) Structure

When you first start the editing process, focus on the overarching structure of your paper. Make sure your discussion presents your ideas in a logical order, that it flows through your argument and leads the reader to a coherent conclusion. Do not be afraid to rearrange your paragraphs, perhaps sticking two shorter ones together and cutting out unnecessary introductions to create space for more valuable content. If you do this, however, read through the paper again to ensure your new order flows logically.

c) Content

It is common to finish a draft over the word limit, but that limit exists for a reason. Concise writing is an art form, and even if you have not managed it so far, editing your work tightens up your ideas and leaves you with a clean and polished paper. Here are a few tips for this final stage:

- Delve in a little deeper. Look at the sentences that make up your paragraphs. In Spanish and Catalan, the tendency is to write long sentences with lots of information. However, English-speaking readers are much more receptive to shorter sentences that break up the information into digestible chunks and facilitate their understanding of your argument. That being said, these are often used alongside longer, more complex sentences to make the paragraph more interesting to read and easier to understand. Look out for repetitions. Your reader will have good academic skills, so avoid explaining

your points more than once, or extending your argument with redundant examples, simply to stress how important you think it is.

- Check your ideas against your original plan. Have you included everything you believed would be useful during your research stage? A lot of preparation has gone into this paper. Make sure you have not left anything important out, but also only include the most relevant arguments in your discussion, those that will lead the reader to the clear conclusions you have drawn. Do all the points you make help answer the question or title of your paper? Everything you write should be relevant.

- Have another look at your introduction. It might not have been the first thing you wrote; but now you have had a chance to look at the whole text as a body of work, does your introduction do its job? Does it signpost your reader through your work? Make sure to revise it, especially if you moved things around as you edited!

d) Spelling

Check your spelling is consistent. Depending on your university, your style guide will recommend either British or American English, so make sure you are consistent throughout your paper.

Also check common spelling mistakes caused by confusion between *there*, *their* and *they're*, or *our* and *are*, or *it's* and *its*. These are common signs that you failed to proofread your work and can lead your reader to draw negative conclusions about your competence.

This may seem obvious. Always run a spelling and grammar check once you have finished writing. It may pull up some errors you missed in your own proofreading!

e) Punctuation

Review your use of commas. Even native English speakers have trouble using commas correctly, but they can make or break your writing. One trick is to put commas where you would naturally take a pause when speaking. Try reading your paper aloud, which might also help you spot other mistakes, such as repetitions. Finally, consider using a semicolon, as it can be an effective way of adding a final point to close an argument.

Purdue University has an excellent website on using commas.

See https://owl.purdue.edu/owl/general_writing/punctuation/commas/index.html.

f) Check and recheck your references

Reference your citations correctly. Take another look at the referencing style guide recommended for your degree. Check that all your citations include the relevant information and whether they are listed as footnotes or embedded within the text itself. Check that your bibliography is listed in alphabetical

order and include all the information that is relevant to the publication of each source. Again, the information you need to include will be detailed in the referencing style guide you are using.

g) Feedback

Asking for feedback is one of the most useful ways to help improve the academic quality of your paper. If your tutor offers to read a draft of your final project, accept! After all, they are the ones who will be marking the final version. Once you have spent so long engaged in the writing stage, it is often difficult to see your own mistakes or spot ways in which you can improve.

If you have already handed work in and had it marked, look at the feedback from your teachers. Are there any recurring comments? Have they given you any tips on how to structure your paper more effectively? Look at all their comments as constructive criticism and apply this to your current paper. Swap your work with a classmate to get a fresh perspective. Peer learning can be very effective, especially when someone looks at your work objectively!

Part 3.   Bibliography

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