

Using tenses in scientific writing

Tense considerations for science writing

When you write an experimental report, or draft a thesis chapter, you need to choose which tense, or tenses, to use.

This flyer provides advice intended to help you become more conscious of what the choice of verb tense involves, and to become better able to notice the tense choices that writers in your particular field have made.

From your chosen tense, your reader receives two kinds of information. One concerns **time**: it is about 'when' (past, present or future). The other relates to whether an event or process is **open** or **closed**.

The examples below illustrate the distinction between 'open' and 'closed' events:

*How long **were** you at Melbourne Uni?*

Simple past / closed event: the other person has already graduated.

*How long **have you been** at Melbourne Uni?*

Present perfect / open event: the other person is still engaged on his / her course.

What do tenses do?

Verb tenses present a **relationship** between

- the present moment (now), and,
- another moment or period in time (which may be long or short).

These moments or periods may be in the past, present or future.

Tenses manage time by placing them within particular relationships or 'time frameworks'.

As a generalisation: in various types of scientific writing, some time frameworks are more commonly used than others. Their frequency varies from one section of a paper or report to another, and they can also vary between one scientific discipline and another.

The next section gives some advice about the various tenses.

Abstract

This usually refers to your unpublished results and uses the **past tense**.

Introduction

Your introduction needs to include background information which is generally accepted as fact in a discipline. You also need to explain why the research you are reporting is important. It is usually presented in the **present tense**. Example:

*Genomics **provides** crucial information for rational drug design.*

You will need to refer to existing research relevant to your work, and you can indicate your opinion of the research you are writing about by careful tense selection.

For example, when you use the **present tense** you are indicating to the reader that you believe that the research findings are still true and relevant, even though the original research may have been conducted some time ago. Example:

*Many of the lakes and wetlands in the region **are located** in craters or valleys blocked by early Pliocene lava flows (Ollier & Joyce, 1964).*

Present perfect tense to report research

If you use **present perfect tense** in your introduction when you refer to previous research, you communicate 'recency' or 'currency'. Currency may be **positive** (asserting that previous studies have established a firm research foundation) or **negative** (asserting that not enough relevant or valid work has yet been done).

Positive and negative currency can even be asserted in the same sentence, as in the example below (which uses the **passive voice**): Example:

*A great deal of **research has been conducted** on the basic techniques of nuclear transfer, but few **experiments have been carried out** to discover the most appropriate age of the cytoplasm to support nuclear transfer most effectively.*

This suggests that you believe that more experiments are necessary. The existence of a 'research gap' is further emphasised by the phrase: 'but few experiments'.

Methods

Past tense to describe what was done

In your methods section it is customary to use a form of the **simple past tense** to describe what you did in your study. **Passive voice** is often used. Examples:

*Total phosphorous (TP) and total nitrogen (TN) **were measured** in the laboratory using standard procedures.*

*The standard protocol **was followed** for the preparation of the media from stock solutions.*

The two previous examples are in the past tense, but in the passive voice. Have a look at the following examples in the past passive and past active voice.

Past passive

*Three 2 litre samples **were taken** at a depth of between 0.1 and 0.5 m at the down-wind end of each wetland.*

Past active

*Each of the three groups **took** 2 litre samples at a depth of between 0.1 and 0.5m at the down-wind end of each wetland.*

From your reading, which voice do you think is most often used in your scientific discipline – active, or passive?

Present tense for diagrams and figures

If you use figures or diagrams to help explain what you did, refer to the figure or diagram using the **present tense**. Examples:

*Table 1 above **demonstrates** the success of cloning in various animal species.*

*Figure 2 below **shows** methylation in mouse 2-cell embryos.*

Results

Past tense for results obtained

In the results section, use the **past tense** to detail the results you obtained. Examples:

*Overall, more than 70% of the insects **collected** were non-phytophagous.*

*Results **indicated** that prolonged exposure to ultra-violet radiation **had** a positive correlation with the development of melanomas.*

*Following activation of NT oocytes with strontium, the cell cycle **resumed** in both groups.*

Present tense to refer to figures, tables and graphs

As in the previous sections, use the **present tense** when you refer to figures, tables and graphs.

Examples: Figure 1 **displays** the comparative variation in the morphology of donor chromatin in both age groups of oocytes.

Table 1 below **shows** the stream flows calculated for each stream using Equation 1.

Discussion

Present tense to explain significance of results

In your discussion section, you will explain the significance of the results. The **present tense** is normally used for this. Example:

*Removal of vegetation for agricultural purposes **appears** to negatively affect the water quality of streams.*

Past tense to summarise findings, with present tense to interpret results

Writers may use the **past tense** to summarise their findings, **in combination with** the **present tense** to explain or interpret what the results mean. Examples:

*As the maxima and minima **did not correspond** to high and low tides, it is possible that the patterns **observed may not be** the result of mixing of waters with different concentrations.*

*Leaf carbon and phenolic content **did not** differ across sites, **indicating** that the response of secondary plant chemicals such as phenolics to water **is** complex.*

In Example 1, the phrases 'it is possible that' and 'may not be' are used to indicate that other explanations are possible. This is an example of the use of limiting words to discuss findings in an academically **tentative** way.

Example 2 is **less tentative**. If you make a statement such as this, you are completely confident that your results and conclusion are correct.

Conclusion

A combination of tenses to highlight past research and future directions

In the final section of your thesis or report you summarise the main findings and the major implications of the study, point out any limitations, and offer suggestions for future research. To do these things you may use a **combination of tenses**. Example:

*Although the study **found** evidence of tillage and irrigation within the study area, from the data collected it **was not** possible to determine if the effects of agriculture upstream **cause** (or **caused**) higher levels of total nitrogen downstream. Further studies **are** therefore necessary to determine the effects of agriculture on the health of Stringybark Creek.*

Further Resources

Swales, J. M. & Feak, C. B. (2004). *Academic Writing for Graduate Students*. (2nd ed.). Ann Arbor: University of Michigan Press. (Pages 254-256).

Academic Skills