Communicating science toolkit: Understanding scientific and academic articles

Scientific and academic journals vs. non-academic writing

Journal articles usually report on a study or piece of research that has been carried out. They can be quite hard to read at first, as they often contain specific vocabulary related to the field and/or highly specialised vocabulary. Also the language is what we call 'academic', so firstly, we should be able to recognise the difference between formal and informal language uses.

Formal and informal in academic literature

- Written and spoken language can be both formal and informal. Academic writing shows characteristics of formal language, and its structure varies according to the genre i.e. whether it is an essay, thesis, report...
- Look at this spoken definition of the term 'wetlands' Read it and after look at the more formal written language version of the definition.

  Wetlands? Mmm… well I guess you'd say…they… they're… it's land or a…an area where the water simply..like…you could say er..meets the land. And, yes, there's loads of places like, erm.. these, I mean, mangroves, rivers, lakes, you know, all those kinds of places…also maybe paddy fields, deltas, floodplains, maybe.. coral reefs too! And of course all…every country has them, whether it's hot or cold there, from polar regions to the tropics, and oh..yes..any kind of land, like..where there's big high mountains and dry areas, you know?

  Wetlands occur **where water meets land**. They include mangroves, peatlands and marshes, rivers and lakes, deltas, floodplains and flooded forests, rice-fields, and even coral reefs. Wetlands exist in every country and in every climatic zone, from the polar regions to the tropics, and from high altitudes to dry regions.

  https://www.wetlands.org/wetlands/what-are-wetlands/

Key characteristics of academic/scientific literature

Now… look at the following sentences taken from a scientific article about tomatoes. You will be able to identify several characteristics (underlined below) that help to make these texts scientific, technical and/or academic:

- "Fresh tomatoes are produced year-round in the greenhouse under contrasting environmental conditions, triggering seasonal variations in their gustative and nutritional quality."
- "In the first experiment, pigments were extracted with acetone and petroleum ether; chlorophylls, ß-carotene, and lycopene contents were quantified by spectrophotometry with a Shimadzu UV-1605 spectrophotometer. In addition, a more precise and complete quantification including different carotene precursors was made in experiments 2 and 3 at harvest and after 6 ripening days under controlled conditions."

As can be seen, passive verb forms are used instead of active forms/there are no human subjects doing things, therefore it is more objective/presence of technical and scientific vocabulary/more extensive use of connectors/sometimes longer sentences, fewer verbs and more nouns

Extracts from Gautier et al., (2008) *How Does Tomato Quality (Sugar, Acid, and Nutritional Quality) Vary with Ripening Stage, Temperature, and Irradiance?* Journal of Agricultural and Food Chemistry, 56, 1241-1250.

Summary: Key characteristics of academic and non-academic discourse

Academic writing	Non-academic writing
Full forms There is The test did not show.. **Connectors** • The theory appears to provide an explanation for this phenomenon. *However*, this is ... • The experimental design was weak. *Moreover*, the methodology was ... **Nominal groups (verbs made into nouns)** *The application* (from verb to apply) *of the results needs to be considered..* (Using the verb the same sentence would be: We need to consider how we apply the results). **Passive voice** *In recent years, several articles have been published...* **Concise vocabulary** ... the focus is on... Researchers assumed that... **Point of view** • objective and impersonal e.g. This essay attempts to... • Use qualifying language, e.g. One possible reason may be...	**Short forms** There's The test didn't show... **Connectors** • I want to go to the cinema, *only* I have to work late. • Because of work, I can't go to London this weekend. *Anyway*, I don't have enough money **Use of pronouns** We need to carefully consider.. When you work with a patient who is very ill (better to say: nurses instead of you) **Active voice** In recent years, researchers have published... **Vague language** They wrote a couple of articles Drinking while driving is bad (dangerous, can kill others…etc.) **Informal vocabulary** .. talks about x.... They thought it would... **Point of view** • Subjective and personal, e.g. in my essay, I will attempt to... • Asking rhetorical questions, e.g. How can this be so?

Examples: Key characteristics of academic/scientific literature

The sentences that follow are formal or informal/scientific or colloquial. Look at the word or words and features that make them so (Formal or informal FORM.INFOR./scientific or colloquial SCIEN.COL.)

1. We didn't finish the Skype interview in the time slot we had, but it was really awesome! And dead easy! (INFOR/COL.: Contractions/colloquial expressions and adverbs)
2. The initial tests were completed and the results analysed by June 2002. (FORM/SCIEN: Passive/academic vocabulary)
3. I'd like to start by telling you about some previous studies we did. (INFOR: Contractions/use of pronoun 'I')
4. A couple of researchers have found out that... (INFOR: Vague language –' a couple' – not specific)
5. I suppose we'll make some more tests ASAP and get back to the drawing board sometime next year. (INFOR: Not specific/use of pronoun 'I', abbreviations which might not be known by reader)
6. I wonder why he put up with those terrible conditions for so long. (COL. Pronoun 'I', phrasal verb)
7. In last place, pour the chemicals into the test tube. (SCIEN. FORM.)
8. While it is still too early to draw firm conclusions from the data, preliminary analysis suggests that the following trends are present..(SCIEN. Language usec)

Making a glossary can be a good idea when getting involved in a citizen science project:
Terminology: the words or phrases used in a particular business, science or profession
https://www.macmillandictionary.com/thesaurus-category/british/specialist-languages-used-by-particular-groups-of-people

- Terminology related to wetlands:

https://medwet.org/aboutwetlands/wetland-terminology/

- Glossary of bird terms

https://academy.allaboutbirds.org/bird-academys-a-to-z-glossary-of-bird-terms/