Academic English: Writing a Research Article

(Bioscience) Engineering

Leen De Boom and Katrien Deroey
Opmaak: Le Pur et L’Impur

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Academic English: Writing a Research Article
(Bioscience) Engineering

This book belongs to a series of five books for doctoral students and researchers from different disciplines:

- Arts, Humanities and Law (Catherine Verguts, in collaboration with Marilyn Michels)
- Life Sciences and Medicine (Katrien L.B. Deroey, in collaboration with Dominique Neyts)
- Natural Sciences (Leen De Boom)
- Social and Behavioural Sciences (Catherine Verguts)
- (Bioscience) Engineering (Leen De Boom and Katrien L.B. Deroey)

A teacher’s manual is available upon request.

ISBN 978 90 382 2180 9
D/2013/4804/145
NUR 840

Uitgeverij Academia Press maakt deel uit van Lannoo Uitgeverij, de boeken- en multimediadivisie van Uitgeverij Lannoo nv.

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INTRODUCTION: YOU AS A WRITER

First, answer these questions individually. Then discuss in groups.

1. What type of texts have you written so far (e.g. research articles, letters and emails, scholarly assignments and progress reports)? What type of text will you be writing in the near future?

2. What is your attitude towards writing (negative – neutral – positive)? Do you know why? What exactly do you (dis)like about writing?

3. What have you been praised for or criticized for in the past as a writer?

4. What do you think are the main differences between writing in your mother tongue and in English?

5. What would you like to learn about writing research articles? In other words, what do you expect from this course?
Unit 1: ACADEMIC STYLE

Session aims

• Writing in a sufficiently formal register
• Adopting an impersonal style
• Writing clearly and concisely
• Structuring paragraphs and sentences
• Clarifying the relationship between points

• Language focus: Relative clauses
To achieve fluent academic discourse, your text needs the correct tone, conciseness and a good flow. These three criteria will be discussed in more detail in this unit.

1.1. Managing Tone

A. Formality

Exercise 1

Read the following passage which is taken from an Introduction. Underline the formal elements and complete the scheme below the text.

(1) Photostability testing of drug substances and products is conducted in order to determine if and to what degree they are likely to undergo photodegradation under the illumination conditions encountered during their manufacture, storage, and handling. (2) A number of important issues such as loss of efficacy and formation of toxic photoproducts are associated with drug photodegradation. (3) The results obtained from photostability testing are highly dependent upon such variables as choice of illumination source, sample placement, temperature, and humidity. (4) In order to standardize such testing, a monograph describing the guidelines for photostability testing of drug substances and products has been published by the International Committee on Harmonization (ICH).

<table>
<thead>
<tr>
<th>formal elements</th>
<th>examples</th>
</tr>
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<tbody>
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</table>
Formality is achieved by:

→ Formal vocabulary
  • Avoid colloquial vocabulary (words and expressions used in everyday spoken language) (exercise 2);
  • Limit the use of run-on expressions such as ‘and so forth’ and ‘etc.’.

→ Formal grammatical constructions
  • Do not contract words;
  • Be careful about using imperatives and direct questions;
  • Replace phrasal verbs by single-word verbs (exercise 3);
  • Place adverbs with the verb (exercise 4);
  • Write in a more impersonal style (exercise 5).

Reference section: Formality

Exercise 2

Replace the colloquial phrases in bold by more formal language.

1. Improved analytical approaches are necessary to meet more and more stringent regulatory requirements for the determination of impurities.

2. As far as we know, no data are available to confirm these findings.

3. The toxic responses differ a lot.

4. There is not very much research on the use of palm oil as course aggregate in the production of concrete.

5. We can see that no significant changes in the shape or the arrival time of the pulse are introduced by the presence of the foam.

6. The system provides a highly automated, turnkey, multi-dimensional approach that we can apply to a variety of complex mixtures with little user intervention.
7. This paper **is about** conditions for the approximation of functions in certain general spaces using radial-basis-function networks.

8. The system **is put into practice** in C using a relational database system.

**Exercise 3**

Choose a verb from the list to replace the less formal words in bold. You may need to make other changes so that the sentences are still grammatical.

<table>
<thead>
<tr>
<th>enhance</th>
<th>investigate</th>
<th>enable</th>
<th>constitute</th>
</tr>
</thead>
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<tr>
<td>facilitate</td>
<td>attribute</td>
<td>arise</td>
<td>elucidate</td>
</tr>
<tr>
<td>reduce</td>
<td>expedite</td>
<td>provide</td>
<td>describe</td>
</tr>
</tbody>
</table>

1. Molecular beacon probes combined with amplification by NASBA **make** homogeneous, real-time detection of RNA **possible**.
2. This interaction is **made better** by other sequence motifs.
3. Additionally, greater knowledge of acquired thermotolerance regulation should **make** the manipulation of crops **easier**.
4. We **looked into** the feasibility of applying this approach in our research.
5. The poor response of vegetation growth **was put down** to the high pH of the interstitial waters of this substrate.
6. The visual range **becomes smaller** in the presence of substantial aerosol particles.
7. However, they have failed to **come up with** a satisfactory explanation for this phenomenon.
8. Phase differences in pressure measurements which **come** from time delays between the structure and the sensor must be taken into account.
9. These elements **make up** the so-called Platinum Group Elements.
10. The new high efficiency Chromolith C18 column was found to have the excellent performance characteristics necessary to **speed up** the approach.
11. To **make** the ground state properties of Ni-Fe-Al **clear**, DFT calculations with our ab initio mixed-basis pseudopotential (MBPP) code were performed.
12. The first part of this article **gives** the present situation.
In academic writing, single adverbs tend to be placed with the verb (midposition). If there is no auxiliary, the adverb in midposition is placed before the main verb.

Wheelchair tie-down systems typically use four adjustable-length straps to secure the front and rear of the wheelchair to anchorages in the floor of the vehicle.

When the verb ‘be’ is on its own, the adverb comes after it.

These data are generally consistent with those of Moore et al. (21) and Parravicini et al. (25), who used a specific antibody to detect relatively high levels of HHV-8 vIL-6 in PEL and MCD, respectively.

The adverb is usually placed after the first auxiliary verb, except for the adverb of manner. Compare:

This model was originally developed by Ponten (1977). (after the first auxiliary)
The evaluation of structural integrity using Lamb waves has long been acknowledged as a very promising technique [2] and [3]. (after the first auxiliary)
It is shown that the low-frequency Lamb waves could be successfully used to interrogate composite structures after a repair has been undertaken. (after ALL auxiliaries)

Exercise 4

Find a single adverb to replace the words in bold and place it with the verb.

1. Measurements of Re and PGE abundances suggest that, as a rule, clinopyroxene has low Re and PGE concentrations.
2. After this, early fractions containing more polar compounds were analysed using a weaker isocratic eluent.

3. In essence, in the case of HPLC, separations are carried out in one dimension.

4. Environmental managers are faced with having to determine the extent of environmental contamination and identifying habitats at risk all the time.

5. Now and then, the water supply must be inspected to prevent blockages.

6. The different BSE parameters that are being used at the present time can lead to significant differences in calculated model ages.

7. In our previous study, we have shown that the coordinatively unsaturated silyl, aryl osmium(II) complexes, Os[Si(Oet)₃](Aryl)(CO)(PPh₃)₂ (Aryl = Ph, o-tolyl) are resistant to C-Si reductive elimination even at elevated temperatures.

8. These transducers have been used with success to excite and capture the A₀ and S₀ modes at low frequencies in other studies.

9. Bit by bit, minute cracks develop in the matrix.

10. By using an unequal error protection scheme, the slice group containing the most important macroblocks can be protected in a better way than the other slice group.

### B. Impersonal style

Academic style is typically depersonalised: most fields favour a style in which the personal author disappears behind arguments and analysis.

**Reference section: Impersonal style**
Exercise 5

Answer the following questions about using personal pronouns in research articles. The following examples can help you in your discussion.

1. Are first person pronouns ‘I’ and ‘we’ used in research articles in your field?

2. If they are, in which context and for what purpose are they used?

3. If they are not, how is their use avoided?

- Since most readers of this review can be expected to be familiar with earlier editions of the text, I will summarize the differences between the new edition and the second.
- As we will see in Chapters 5 through 8, nonionic contaminants are sorbed to natural substances usually either by a partition process (a solution phenomenon) or by an adsorption process (a surface phenomenon).
- We defined context as information used to characterise the situation of an entity.
- In summary, we have discovered that nucleic acid polymers form a hybrid material with carbon nanotubes.
- We especially acknowledge our editor, Harry Briggs, for his enthusiastic advocacy and stoic patience.

Reference section: Personal pronouns
1.2. Improving conciseness

The goal of concise writing is to use the most effective words. Concise writing does not always have the fewest words, but it always uses the strongest ones. Writers often fill sentences with weak or unnecessary words that can be deleted or replaced.

Compare the following examples:

✗ The test was displacement-controlled with a speed of 2 mm/min and the test was stopped at a maximum midspan deflection of 34.54 mm for a total span of 170 mm.
✔ The test was displacement-controlled with a speed of 2 mm/min and was stopped at a maximum midspan deflection of 34.54 mm for a total span of 170 mm.

✗ There are not any data available on the response of these drill cuttings to saline water.
✔ There are no data on the response of these drill cuttings to saline water.

✗ This will allow an assessment of fluctuations in lamp output during the course of the experiments.
✔ Fluctuations in lamp output can thus be assessed during the experiments.

Reference section: Improving conciseness

Exercise 6

A. Improve conciseness by replacing the words in bold.

1. This will bring more clarity in the relationships between the different elements.

2. Both thermoplastics have the ability to resist high temperatures.
3. These materials should be used in a more careful manner.

4. Because of the fact that motion pictures are playing an increasingly important role in our multimedia environments, the focus of this paper is put on video sequences as multimedia resources.

5. The ionization of the weaker compound could be significantly suppressed by the ionization of the stronger.

6. The detection limits equal or surpass the detection limits reported previously.

7. When comparing the dynamic curves, no clear differences can be noticed.

8. It is clear that the result of a successful merging process between new textile materials and wearable microelectronics has enabled these developments.

9. To identify hydrodynamical changes in time, long series of measurements with a high frequency are necessary.

10. In the following paragraph, a short overview of existing methods to calculate the impact of a macroblock will be provided as well as the shortcomings of them.

B. Make these sentences more concise. Work individually first and then compare your version with that of a fellow student.

1. Improving test efficiency can be obtained by decreasing the noise levels in the recording, increasing the response amplitudes, and testing multiple frequencies simultaneously.

2. For decades, caloric examination by the use of water has been an established procedure for clinically assessing vestibular function.
3. Besides the discussion about using water as preferred irrigation medium, there is also the discussion about the construction of the optimal test protocol.

4. Another climatic factor that may have an influence on the content of phenolic compounds in olive oil is altitude.

5. First, by means of a within-subject design the impact of these two ASSR stimuli on response amplitude, SNR and ASSR thresholds will be evaluated.

6. Because of respiration, oxygen tensions will drop and as a result, this limits the auto-oxidation of the reduced phenazine, which in turn can fulfil other physiological roles.

⚠️ Language focus: Participle clauses

Some sentences can be condensed by using participle clauses. These sometimes have the added advantage of depersonalising the text by allowing the omission of the subject.

Some examples:

A satisfactory solution has been put forward and this makes a further investigation of this phenomenon unnecessary.

→ A satisfactory solution has been put forward, making a further investigation of this phenomenon unnecessary.

The approach which we outline here relies on a standardized two-dimensional technique that could be employed on a variety of pharmaceutical related analytes.

→ The approach outlined here relies on a standardized two-dimensional technique that could be employed on a variety of pharmaceutical related analytes.
Taller detector arrays, \textit{which comprise} over 700 neutron detectors and 350 CsI (Tl) gamma-ray detectors, allow full height ULDs to be imaged with reduced projection effects.

\rightarrow Taller detector arrays, \textit{comprising} over 700 neutron detectors and 350 CsI (Tl) gamma-ray detectors, allow full height ULDs to be imaged with reduced projection effects.

The oil in the sump, \textit{when it is averaged} together with the metal in the same path, shows as a green patch.

\rightarrow The oil in the sump, \textit{when averaged} together with the metal in the same path, shows as a green patch.

\textbf{Exercise 7}

Increase conciseness through participle clauses.

1. The factor for 5ml SIR-spheres\textsuperscript{®} \textit{which is derived in this way} might result in a larger uncertainty because SIR-spheres\textsuperscript{®} might not be very homogeneous.

2. A fairly standardized methodology \textit{which encompasses} a total on-line fraction analysis was carried out with minimal user intervention.

3. This solar simulator was constructed to provide illumination \textit{that closely matches} terrestrial sunlight.

4. Another method \textit{that is being investigated} is fast-neutron resonance radiography.

5. \textit{Unless we state otherwise}, temperature treatments were achieved using an electronically controlled eight-position thermal plate system.

6. The scan speed is increased, \textit{and this allows} complete ULDs to be scanned in 1–2 min.
7. The results show that the method could constitute an efficient tool when we check the model validity.

8. The failure mode of K2CO3a was not HISCC as the wire was still intact when it was recovered from the concrete.

9. To fulfil the new structural performance needs in the automotive industry and, at the same time, to minimize the impact on structural mass, a new generation of Advanced High-Strength Steel grades has been developed.

Exercise 8

Comment on the (number of) participle clauses in the following sentences.

1. The energy $\Delta_{2p-2h}$ needed to excite two particles across the closed $Z=82$ proton shell gap corrected with the pairing and monopole energy was obtained following the procedure described in [2].

2. The ratio $R$ of the upstream to the downstream ion saturation current collected by the probe proves to be a function of the ratio of flow velocity in the parallel and perpendicular direction to the ion sound speed $C_s$, defined as the Mach numbers $M_{\parallel,\perp}$.

1.3. Enhancing flow

Your text, paragraphs and sentences should be structured and connected so that your account is easy to follow, clear and logical. This is mainly achieved by:

- Structuring paragraphs and sentences
- Clarifying the relationship between points