

Writing the various sections of a paper

Adrian Wallwork

WHO IS THIS DOCUMENT FOR?

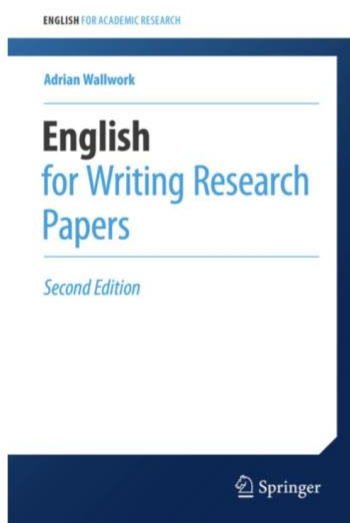
This document is primarily intended for students of my PhD English course on Scientific Communication. So some of what is written will only make sense if you have done the course.

However, most of what is contained herein should also be useful to anyone wishing to improving their writing skills – including native English speakers.

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2nd ed. 2016, XX, 377 p.

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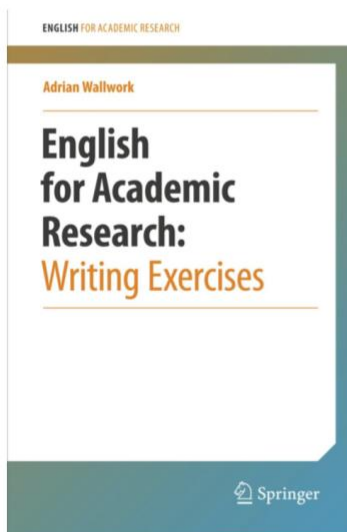
Adrian Wallwork

English for Writing Research Papers

Series: English for Academic Research

- At least two-thirds of published scientific papers are written by researchers whose first language is not English
- 20% of the comments referees make when reviewing papers for possible publication in international journals regard English language issues
- In some disciplines, acceptance rate by journals of papers originating from the US/UK is 30.4%, and is higher than all other countries

Publishing your research in an international journal is key to your success in academia. This guide is based on a study of over 1000 manuscripts and reviewers' reports revealing why papers written by non-native researchers are often rejected due to problems with English usage and poor structure and content. With easy-to-follow rules and tips, and examples taken from published and unpublished papers, you will learn how to: prepare and structure a manuscript increase readability and reduce the number of mistakes you make in English by writing concisely, with no redundancy and no ambiguity write a title and an abstract that will attract attention and be read decide what to include in the various parts of the paper (Introduction, Methodology, Discussion etc) highlight your claims and contribution avoid plagiarism discuss the limitations of your research choose the correct tenses and style satisfy the requirements of editors and reviewers This new edition contains over 40% new material, including two new chapters, stimulating factoids, and discussion points both for self-study and in-class use. EAP teachers will find this book to be a great source of tips for training students, and for preparing both instructive and entertaining lessons. Other books in the series cover: presentations at international conferences; academic correspondence; English grammar, usage and style; interacting on campus, plus exercise books and a teacher's guide to the whole series. Please visit <http://www.springer.com/series/13913> for a full list of titles in the series. Adrian Wallwork is the author of more than 30 ELT and EAP textbooks. He has trained several thousand PhD students and academics from 35 countries to write research papers, prepare presentations, and communicate with editors, referees and fellow researchers.



Adrian Wallwork

English for Academic Research: Writing Exercises

Series: English for Academic Research

- Contains examples from around 5000 real-life papers
- Covers crucial skills in academic life, such as writing to journal editors and applying to research posts
- Has a clear, easy-to-use layout

This book is based on a study of referees' reports and letters from journal editors on reasons why papers written by non-native researchers are rejected due to problems with English (long sentences, redundancy, poor structure etc). It draws on English-related errors from around 5000 papers written by non-native authors, around 3000 emails, 500 abstracts by PhD students, and over 1000 hours of teaching researchers how to write and present research papers. The exercises are organized into ten chapters on: punctuation and spelling word order writing short sentences and paragraphs link words - connecting phrases and sentences together being concise and removing redundancy ambiguity and political correctness paraphrasing and avoiding plagiarism defining, comparing, evaluating and highlighting anticipating possible objections, indicating level of certainty, discussion limitations, hedging, future workwriting each section of a paper Some exercises require no actual writing but simply choosing between various options, thus facilitating self-study, e-reading and rapid progress. In those exercises where extended writing is required, model answers are given. Exercise types are repeated for different contexts, for example the importance of being concise is tested for use in papers, referees' reports, and emails of various types. Such repetition of similar types of exercises is designed to facilitate revision. The exercises can also be integrated into English for Academic Purposes (EAP) and English for Special Purposes (ESP) courses at universities and research institutes. The book can be used in conjunction with the other exercise books in the series and is cross-referenced to: English for Research: Usage, Style, and Grammar English for Writing Research Papers

2013, XV, 190 p.

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The other books in the series are available directly from Springer:

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If you want to do the course contact: adrian.wallwork@gmail.com

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1 TITLES

ONLY 1 in 500 people read the abstract after reading the title

Good titles have a verb and some prepositions.

They do NOT just have a sequence of nouns and adjectives

NO! An innovative Italian PhD student scientific English didactic methodology

YES! An innovative methodology for teaching scientific English to Italian PhD students

The Definite Article

I love books – no article, books in general

I love the book she gave me. – with article, specific books

PhD students are intelligent. (English brain: *OK this means all PhD students*)

The PhD students are intelligent. (English brain: *Wait a second. Which ones?*)

General rule: **the** + noun + **of** + noun

The importance of improving the design of internal systems

Don't delay your key words with abstract generic words

The design of an XYZ system for implementing ABC.

An investigation into the modeling of the XYZ process.

The development of an XYZ tool for predicting ABC.

A study of a novel ABC system.

An insight into XYZ.

Try to fill your title with as many key words as possible. You can put non key words in the second part of the title.

Scientific English for Italian PhD students: an interactive method for teaching online

2 ABSTRACTS

What is an abstract? Summary of whole paper

How important is the abstract? Only the title is more important. If readers can't understand the abstract they will not read the rest of your paper.

How many paragraphs? Depends on your journal. In any case use a **structured abstract** approach, i.e. a few sentences summarizing EACH part of the paper.

How many words? Depends on journal / conference.

When do you write it? Before and after.

Tenses and structure

Is it Time to Leave Him?

Sentences 1-2: what you found / key result

Three red flags *were identified* that indicate that the time to leave him has come. These red flags are: five burps per day, two episodes of mansplaining per day, and five games on the Playstation with friends per week.

simple past to say what you did in your research

Note: The guidelines for the present and past tense in this and the next slides, refer to their conventional use in an abstract but not necessarily in other sections of the paper.

Sentences 3-4: Introduce background by relating to S1-2

Many women *have* doubts about the right moment for leaving their partner. Often women *wait* in hope for a change in their partner's habits.

simple present to express scientific facts not found by you

S5-7: use background (S3-4) to justify what you did

One hundred couples *were* analyzed, recording their daily life for six months. Women *were* provided with a form to mark the moments of annoyance recorded during the day. Burps, mansplaining and games on the Playstation with friends *produced* the highest index of annoyance.

simple past to talk about your METHODS and your RESULTS

Penultimate sentence: provide more info on your results

The probability of eliminating these habits was found to be significantly low when the three red flags had been operative for more than three months.

simple past to say what the result was

Final sentences (9, 10): Implications

Thus, these numbers *provide* a good indication of when the time to leave him has come. With these red flags, women will no longer have to waste their time waiting for the right moment.

simple present to say what you believe your research means

Dynamic abstracts: What readers want in the order they want it

1. What you did + the key result, i.e. begin with info that the reader does NOT already know
2. Introduce background by connecting to what you said in (1).
3. Use the background information (max 30%) to justify what you did.
4. More info on your results.
5. Implications of your research.

Don't begin your abstract with redundant words or info that is already known by everyone (e.g. last example below:

In the last few years ... // The issue of xyz is becoming increasingly the subject of research ... // This paper presents ... // A new method for the design of ... // The aim of this research is to ... // Cancer is a worldwide problem ..

TENSE USAGE

Summary: Present simple vs Past simple in Abstracts

Present simple – whatever is already known + implications of your results

Smoking **causes** cancer ...

Our results **demonstrate** that ...

Past simple – what you did and found

We **enrolled** 3478 patients in our study. We **measured** their blood pressure. We **investigated** ... We **used** ultraviolet light in order to

In our study, smoking **caused** a 5% increase in cancer amongst 50-year-olds. We **found** that ...

Summary: Present Perfect in Abstracts

YES! ACTIVE FORM

With personal form (we) to announce in the first sentence what you have done.

We **have found** a cure for cancer.

We **have developed** a new method for treating cancer.

We **(have) investigated** six treatments for cancer.

= We will talk about our cure in the present paper.

NO! PASSIVE FORM

Do not use present perfect in the passive form in the first sentence of an abstract with reference to your own work.

A cure for cancer has been found ...

= by someone else, and we don't know when

3 THE INTRODUCTION

Abstract vs Introduction

Fragmentation of Rods by Cascading Cracks: Why Spaghetti Does Not Break in Half by [Basile Audoly](#) and [Sébastien Neukirch](#)

ABS When thin brittle rods such as dry spaghetti pasta are bent beyond their limit curvature, they often break into more than two pieces, typically three or four. **JUST ONE SENTENCE FOR**

BACKGROUND With the aim of understanding these multiple breakings, we study the dynamics of a bent rod that is suddenly released at one end.

INTRO The physical process of fragmentation is relevant to several areas of science and technology. Because different physical phenomena are at work during the fragmentation of a solid body, it has mainly been studied from a statistical viewpoint [1–5].

Find a paper in your journal of choice; preferably one written by a native speaker. Note:

- How Abstract and Intro are structured differently
- What elements from the Abstract the Introduction expands on
- How sentences from the Abstract are paraphrased in the Introduction
- What information is covered in the Abstract but not in the Introduction, and vice versa
- Relative word counts

Tenses

The physical process of fragmentation **is** relevant to several areas of science and technology. Because different physical phenomena **are** at work during the fragmentation of a solid body, it **has mainly been studied** from a statistical viewpoint [1–5]. Nevertheless a growing number of works **have included** physical considerations [6].

In this paper, we **explain** this multiple failure process and **point** out a general mechanism of cascading failure in rods.

Present tense

- What is **already known**
- To talk about what you do in **the rest of the paper**

Present perfect

- For **actions** that began in the past and continue into the present
- Used with: *to date, until now, yet, as yet, for the last x years/decades, since*

Note that the adverbs and phrases that indicate time are key to your decision to use the present perfect rather than the present

In the last few years Grammarly ~~is becoming~~ **has become** increasingly popular.

We believe that **this is the first time** that such a procedure ~~is~~ **has been** used for this purpose.

Since 2019 this method ~~is~~ **has been** adopted by the scientific community to investigate ...

What is the point of the Review of the Literature?

Look at a very similar paper in your chosen journal to see what they covered.

- Progress since seminal (i.e. the first) works?
- Most relevant recent works? Best order to mention?
- Pros and cons of these recent works?
- What gap do these limitations reveal?
- How do I fill this gap?

Reviewers' Advice

- Present the novelty of your approach and results in the context of what has already been done. Citing key papers without stating how specifically you build on them is insufficient.
- Describe (1) what others have done as far as relevant for the direction of your paper, and (2) how your contribution is original and distinguishes itself from previous work.

Reviewers' Criticisms

"The Introduction is about 40% of paper - too many general statements that are already widely known."

"No relationship between background and aim."

"Essentially a cut and paste from the Abstract."

Structure when reviewing the literature

Review of the literature is not a shopping list of past papers. Instead your aim is to state:

- what others have done or what you did in a previous paper
- the downside / limit of what they did
- your solution / improvement

Use this strategy:

Smith et al (2015) reported that $x = y$. **However**, they were unable to prove that $y = z + 1$. **We prove that ...**

In 2016 Jones et al carried out a test on Z, **but only** with a relatively small sample. **In this paper, we use** a much larger sample ...

In a **previous paper [23]** we found that ... **In this paper, we make a further** contribution by showing that ...

The Introduction of your paper is not just a historical summary.

It is a constant comparison between what OTHERS have done and what YOU did or are proposing to do.

Use the same us vs them technique in the Discussion when comparing your results with those of other authors.

Always be clear when you are talking about your own work – even your own past papers

It must always be clear to the reader when you are talking about your own work – even if this work was in a previous publication written by you.

CLEAR:

In a **previous paper [23]** we found that ...

AMBIGUOUS:

In a **previous paper [23]** it was found that

Summary

The Introduction of your paper is **not** just a historical summary.

It is a constant comparison between what **OTHERS** have done and what **YOU** did or are proposing to do.

4 METHODS AND RESULTS

METHODS

Past tense in the passive form to describe what you did

Samples **were taken** from ...

The following equipment **was used** ...

A survey on XYZ **was conducted** ...

The procedure **was adapted** from Smith et al. (2020) ...

All the items **were classified** as follows:

Present tense to give definitions, hypotheses or how an existing piece of equipment works

Firstly, we **define** X as an exogenous measure of the natural rate of longevity of people.

As in Chakraborty (2016), we **assume** that ... The rule **is** thus given by the following formula:

Our machine **uses** diesel ... It **has** a 1000 hp engine ...

RESULTS

This section is often the most boring in the paper as the author makes the typical mistake of using lots of tables and then reporting in the detail the content of the tables, WITHOUT any indication of which data is important, expected, counterintuitive etc.

Don't tell the reader ALL the results – just the most **relevant** and the most **unexpected**.

Put the rest in a **table**. If readers are interested in further details they can analyse the table.

Past Tense

To say what happened during your experiments

The value of x **WAS** higher than expected.

The increase in pressure **HAD** no effect on this value

Present Tense

To refer to figures, tables etc

To say what the implications are. Typically after *show, explain, highlight, believe, mean*

The results **are given** in Table 4

Figure 1 *highlights* that X **equals** Y.

We *believe* that this means that our method **outperforms** previous methods

5 DISCUSSION

In the DISCUSSION it is essential to:

- 1) be clear what you did and what other authors have done
- 2) highlight your unique contribution
- 3) discuss limitations of your findings
- 4) state what the applications and implications of your research are (this may be contained in the Conclusions)

5.1 Differentiating yourself from other authors

NO!! *It was found that ...*

When the reader begins reading the sentence above he/she cannot know who the person was that 'found' something. This use of the passive is very confusing.

Be clear what YOU have done and what OTHERS have done.

To distinguish between you and other authors

1. GOOD! In 2019, **we** confirmed that Italian dogs are more intelligent than British dogs [25].
2. GOOD! In 2018, **Carter** suggested that dogs are more intelligent than cats [36].
3. OK! In 2017, it was suggested that dogs are more intelligent than cats [**Carter, 36**].
4. NOT OK! In [36], it was suggested that dogs are more intelligent than cats.
5. DISASTER! In 2014, it was suggested that dogs are more intelligent than PhD students.

Generally the past tense is used after the name of the author, particularly if the date is part of the main sentence

1. In 2018, Carter **suggested** that dogs are more intelligent than cats [36].

However, sometimes you may also find the present.

2. Carter **suggests** that dogs are more intelligent than cats [Carter, 2018].

Below are three ways to make the same point, but only the third is clear

1) Bilingual children **were found BY WHO?** to show a greater adaptability to new situations and demonstrated a greater ease in communicating confidently with adults. As result of an extensive search for bilingual children in ten European countries, 149 children **were identified**.

Readers need to be able to understand the subject of the verb immediately (*were found* – by who?). Don't force them to wait till the end of the sentence.

Use the most appropriate tense: the **simple past** (*were found*) is frequently used to describe YOUR work not that of others. Use the present tense to talk about known facts discovered by other people.

2) Bilingual children **were found** to show a greater adaptability to new situations and demonstrated a greater ease in communicating confidently with adults [Simons, 1995]. As result of an extensive search for bilingual children in ten European countries, 149 children **were identified** (Table 1).

3) Bilingual children **show** a greater adaptability to new situations and demonstrated a greater ease in communicating confidently with adults [Simons, 1995]. **Simons investigated children from the US and Canada. On the other hand, the focus of our study was Europe and** as a result of an extensive search for bilingual children in ten European countries, 149 children **were identified** (Table 1).

In Example 2, the reader only understands who made the finding at the end of the sentence when he/she sees the reference.

In Example 3, the reader immediately understand because the present tense is used. The present tense indicates what is already known in the literature, so the reader automatically knows that this refers to someone else (i.e. not to the author of the paper that he/she is reading now)

Not making the distinction clear between what **YOU** did and what **OTHERS** have done causes more confusion for the reader than any grammatical or vocabulary mistake.

5.2 Highlight your findings

Don't tell (mine is bigger than yours), show (towers of San Gimignano)

DON'T TELL

The large difference in mean size between X and Y is particularly *interesting*.

SHOW

X showed a massive increase, almost ten times that of Y. This is fundamental because it proves for the first time that

Don't use long paragraphs – print out your paper and see what it LOOKS like

This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. Here are my findings you will be lucky if you can see them here buried in the midst of this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. And now I will continue with this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. So here we go again with this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. Here are my findings you will be lucky if you can see them here buried in the midst of this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. And now I will continue with this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. So here we go again with this ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive. This is one ridiculously long paragraph containing all kinds of information about everything that you can possibly imagine and conceive.

Divide up long paragraphs into shorter ones. Note how your eye is naturally drawn to the second paragraph below. Use short paragraphs to give key info that you really want your readers to focus on

This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph.

Here are my findings, which you can now see quite clearly. Note how this paragraph is also quite short. In fact, it is shorter than the previous and following paragraphs.

This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph. This is now a much shorter paragraph.

5.3 Always discuss limitations of your findings

Always describe the limitations of your research + all possible objections. If you don't, the reviewers will find the limitations, ask you for explanations and this will delay publication.

Typical limitations

- Old data
- Not enough money
- Sample size too small
- Only studied x and not y
- Only *in vitro* tests done, no *in vivo*

- Same tests, different results each time
- Couldn't get authorization to do the tests

Don't present your limitations in a negative way.

Unfortunately, the sample size was small ...

Moreover, there were some discrepancies in the ...

[*Moreover* tends to be used to introduce another negative criticism when you have already mentioned one in the previous sentence. *In addition, furthermore, also* are neutral, *moreover* tends to be negative).

Note how the blue version below is much less negative and also adds many more details to justify the limitation.

Our method is not able to describe all the variables involved. The same tool was used for conducting a similar research with an American sample, and the results were reliable and representative.

Our method **may** not be optimal for describing **some** of the variables involved. **However** it is optimal for x, y and z. In addition, exactly the same tool was used for conducting similar research with American samples [Williams, 2013]. **Williams' results were reliable and representative and were in fact used by the US government.**

Three-part strategy for talking about limitations of your study

1) LIMITATION

We were unable to access the data on X because such data are not available in the public domain.

2) JUSTIFICATION

Other studies found the same problem (e.g. Lu 2012, King 2013) and decided to focus only on Y and Z.

3) SOLUTION

We are currently in the process of collecting data on X, and this will be the subject of a future paper.

Summary

1 Always mention your limitations

2 Present your limitations using positive language

3 Justify your limitations and provide a solution

Don't end your Discussion (or Conclusions) by talking about your limitations.

End with something very positive – this will be the reader's final impression.

6 CONCLUSIONS

Tenses

present perfect: to describe what you have done in the PAPER itself

We **have described** a new method for comparing languages. We **have shown** that it can be used in several situations.

The present perfect is typically used with verbs such as *describe, outline, present, propose, show, highlight*.

past simple: what you did in your RESEARCH.

We **used** an innovative method to achieve our objective. We **investigated** the use of several languages. We **used** XYZ software which **produced** some interesting results.

present simple: ABSTRACT of this paper

We **describe** a new method for comparing languages. We **show** that it can be used in several situations.

past simple: IN ANOTHER PAPER

[In a previous paper \[Pallino et al, 2019\]](#), we **described** a new method for comparing languages. We **showed** that it can be used in several situations.

present perfect: CONCLUSIONS of this paper

We **have described** a new method for comparing languages. We **have shown** that it can be used in several situations.

will

to refer to future research

Our future research **will address** the problem of

BETTER: In our future research **we plan** to address ...

will may sound arrogant

Do NOT use *will* to refer to the implications of your results.

The present findings **will help** other researchers to explore the mechanism of ...

= **should / may** help

Further studies **will be able** to demonstrate this with more accuracy.

= **should / may** be able to ..

Don't force readers to make a mental effort

DISCUSSION: do not just mention other authors' work that supports your own results and force the reader to make connections.

Instead, show how their work supports your results (or justify why it doesn't).

CONCLUSIONS: do not just make a summary and force the reader make their own conclusions.

Instead, tell them clearly why your work is so important and what the implications are.