ENGLISH FOR ACADEMIC RESEARCH

Adrian Wallwork

AI-Assisted Writing and Presenting in English

Springer

English for Academic Research

Series Editor
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This series aims to help non-native, English-speaking researchers communicate in English. The books in this series are designed like manuals or user guides to help readers find relevant information quickly, and assimilate it rapidly and effectively. The author has divided each book into short subsections of short paragraphs with many bullet points.

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Introduction

Why this book? How can AI writing tools benefit me?

This volume focuses on how to use AI, specifically large language models (LLMs), to write in English. The book covers how to use LLMs with research papers, emails to fellow academics, cover letters, rebuttal letters, texts for lay audiences, and scripts for presentations. It shows you when you can and cannot trust LLMs to carry out specific tasks. The book does NOT recommend using LLMs to write an entire paper (see 9.10).

A key issue with LLMs is that currently they have no menu, and this is why users may not be able to understand their full potential. This thus requires users to be creative and to instinctively know what prompts to ask a chabot- this book will teach you how.

> Note: Tools such as ChatGPT are technically called *large language models*. However, for the purposes of this book I use the terms *LLMs*, *bot* and *chatbot* to mean the same thing.

THE PROS OF LARGE LANGUAGE MODELS

As a researcher, you can save yourself a lot of effort if you use a chatbot to help you write in English. This books suggests two ways of doing this:

1. Write in your language, edit what you have written to make it English-ready, submit it to machine translation, and check the output.
2. Write directly in English using a chatbot to suggest content, and also to correct what you have written. This involves learning what prompts to use.

My tests with PhD students have shown that these two methods generally produce a more accurate text than writing directly in English without the aid of LLMs.

So the English will be accurate. But this does not necessarily mean that your text i) matches the criteria for good readability; ii) satisfies readers expectations from a content point of view; or iii) is written well, i.e. of a good quality.

THE CONS OF LARGE LANGUAGE MODELS

Large language models **cannot** do everything. For instance, if you are writing a research paper, there are currently **NO** tools that can 100% differentiate between essential and non-essential corrections to your English, tell you that you need to highlight your key findings more clearly, or that you have often used synonyms for key words. Without a lot of prompting, a chatbot cannot tell you that what you have written is tedious and full of vague terms and concepts, that you have plagiarized yourself or others, that you have written far too much, that you have failed to mention any limitations in your research, and that the reviewers are likely to criticize your work. Other types of tools, such as Grammarly and Writefull, while generally doing a good job at correcting English, are currently unable to do much of the work that a human editor can do. They also have some basic issue with the use of tenses, countable and uncountable nouns, spotting ambiguity, distinguishing between key and non-key words, dividing up long sentences and paragraphs.

Consequently the book also tells you when a better option would be to contact a professional translation / editing service.

This book is part of the *English for Research* series of guides for academics of all disciplines who work in an international field. To be able to benefit fully from this book, it helps if you have an upper intermediate level (B2) of English. Within the book there are many links to the other books in the series to enable you to study particular topics more in depth.

Which tools/models are analyzed?

Most of the examples in this book were generated by ChatGPT and Google Translate. But the guidelines and examples given apply to other chatbots and machine translation tools. People have their personal preferences as to which tools do the best job. When giving prompts, I strongly suggest that you consistently use a mix of chatbots, as they often provide different answers in different formats. You have a wide choice that includes Gemini, Copilot, Poe, Claude, and Perplexity. Tools such as Grammarly, Reverso, and QuillBot, can be effective but have a much more limited use, and are thus only touched on in passing in this book. At the time of writing this book, Grok and AJE's tool Curie were not available, but the latter is definitely worth checking out if you need to edit an entire paper.

Practically everything I say about Google Translate is also true of DeepL, which I have found to be an excellent machine translator.

What are the advantages of the pro models?

At the current state of the art, for the purposes of improving and correcting your English, I personally think the free versions are sufficient.

Structure of the book

Chapters 1–9 of this book are primarily intended for **non-native researchers**, but will also be useful for native speakers. Chapter 1 is a key chapter as it outlines exactly what a bot can and cannot do at the time of writing this book (summer 2023). Obviously, AI is still very much in its early days, and AI may soon be able to carry out some of the tasks that I mention as not being currently possible.

Chapter 9 is also for **professional language editors/translators**, who can indirectly learn how their professional work adds value for their clients.

Chapters 10 is for **EAP teachers**, who will learn how to

- use AI to its full potential as a translator and editor
- differentiate their service as an editor or translator from an AI tool
- use chatbots and automatic translation in a course for teaching academic English to non-natives

The main skills to learn for both native and non-natives are how to

- write a good prompt
- pre-edit a text for translation
- check/correct/improve the output of a chatbot or a machine translation

The book does not cover any ethical issues associated with AI, nor does it cover AI applications and general software that are not directly related to writing skills.

Contents

Chapter 1
Being realistic about what AI can and cannot do

1.1 Introduction

Large language models (LLMs), which with reference to models such as ChatGPT I also refer to as *chatbots* or *bots*, often seem to be smarter than they are: they can generate essays and emails, they can simulate a job interview, they can give accurate answers to most questions.

In fact, users often tend to interact with chatbots as if they were humans, even referring to the bot as *him* or *her*. The danger is that you will get frustrated when things go wrong and attribute the blame exclusively to the chatbot, rather than to the fact that the prompt you used may not have been ideal. In any case, like humans, they do make mistakes.

Moreover, they cannot do some of the basic things that a human can do, e.g. distinguish between an 'essential' and 'non-essential' correction in terms of English language use, or avoid changing key words even when asked several times not to do so. Apparently very specific prompts to reduce a text "by exactly 50 words" are beyond its powers: it will reduce the text instead by a totally random number of words or reduce it to a total of 50 words. So a chatbot may seem intelligent if you ask it to define an 'essential' correction or a 'key word' - it comes up with very articulate bulleted definitions. But in reality it relies on finding matching patterns in its database and in repeating knowledge in much the same way as a parrot.

However, this book would not have been written if I didn't think that LLMs could seriously help you to improve the accuracy of your English.

A. Wallwork, *AI-Assisted Writing and Presenting in English*, English for Academic Research, https://doi.org/10.1007/978-3-031-48147-5_1

This book primarily focuses on the various ways a bot **CAN** help you in all areas of writing in English – Chapters 2–8. Within those chapters, it also mentions those areas where a bot fails to do or simply **CANNOT** do what you would like it to do.

Section 1.2 of this chapter summarizes what a chatbot is able to do without too much difficulty. Then the focus moves to areas of good writing that **LLMs are currently unable to help** you with. Essentially, automatic translation and chatbots are excellent at producing accurate English. But if the text they are working on is not well written in terms of style, structure, and content (rather than in terms of the use of English), LLMs cannot miraculously transform it. So this chapter focuses on those areas that you need to work on yourself, rather than relying on artificial intelligence.

1.2 What a chatbot CAN generally do reliably

Chatbots can considerably improve your writing skills and also help with preparing presentations.

If prompted correctly (Chapter 2), ChatGPT can generally be depended on to carry out all of the following fundamental tasks, while applications such as Grammarly and Writefull are limited above all to points 1–7.

1. Correct grammar mistakes.
2. Identify where punctuation needs adding.
3. Paraphrase and summarize.
4. Make suggestions on improving the content and style of your text.
5. Make phrases more concise.
6. Transform passive to active sentences.
7. Make recommendations for the title of your paper.
8. Transform a structured abstract into an unstructured one and vice versa.
9. Help write all the various sections of a paper.
10. Generate a script for a presentation.
11. Generate suggestions for what to put on slides on the basis of your script.
12. Generate emails.
13. Make suggestions/comments regarding emails that you have written.
14. Make suggestions on how to appeal to a lay audience.
15. Role play specific academic scenarios (e.g. socializing at a conference, going to a job interview).

1.3 What a chatbot MAY or MAY NOT do

Bots are not consistent. You can give them a prompt one day and the bot will do as requested. The next day with the same prompt, it may be less obedient! You need to be aware that it is often difficult to:

1. Control the type and number of modifications that a bot will make.
2. Stop the bot from making possibly illogical connections between sentences by introducing link words such as *meanwhile*, *in contrast*.
3. Stick to the same prompt, even when you instruct it to do so.
4. Stop it from generating very generic statements, particularly when prompted to write emails without specifying the maximum number of words.
5. Get it to reduce the length by a specific number of words.
6. Prompt it to consistently break up long paragraphs into shorter ones.
7. Get it to vary the length of sentences. Bots tend to only produce sentences of 20–30 words.
8. Discourage it from always starting a text with an introduction and ending it with a conclusion that basically repeats the introductory sentence.

1.4 What a chatbot CANNOT do in terms of writing research papers

There are some areas of writing and editing a paper that only a human professional can be relied upon to do. These areas include the following vital points where chatbots regularly fail to be of assistance.

1. Provide a complete list of all the changes it has made to your text and why it has made such changes, even if specifically prompted to do so.
2. Differentiate between ‘essential’ and ‘non-essential’ – a bot has no idea what an essential correction consists of, even if you try to train it.
3. Highlight your key findings for you in a way that will make them stand out for the reader.

4. Clarify cases where you have not been explicit with regard to what you have found and others have found.
5. Highlight cases where you have used a synonym for a key word.
6. Advise you when you have written too much.
7. Identify a potentially ambiguous phrase.
8. Automatically warn you when you have used biased or inappropriate language, or non-gender-neutral pronouns.
9. Warn you that you have plagiarized yourself or others.
10. Anticipate possible opposition by your referees and readers by suggesting that you 'hedge' a very strong affirmation or you discuss the limitations of your research.

1.5 What are the main pros and cons of machine translation?

If you speak a major European language, machine translation (MT) of academic texts into English is generally as good as a human translator – there are really no cons. However, MT can only achieve the levels of a human translator if you work on the original text in your own language. This work is called pre-editing (Chapter 3). If you speak Chinese, Turkish, Arabic, Hindi, i.e. major languages but not European, then MT is not as accurate and may produce sentences in English that appear to have no sense. However, if you pre-edit your text in the ways suggested in Chapter 3, then MT will enable you to produce a good first draft, and the time you save by using MT you can spend on thorough post-editing (Chapter 4).

MT only translates, it cannot help you with any of the points mentioned in 1.4.

1.6 The difficulties non-native speakers have within academia

An article published in The Conversation (theconversation.com) and entitled *Non-native English speaking scientists work much harder just to keep up* reported some of the results from a survey by the translatE project. Compared to native English-speaking researchers, the survey (which predated ChatGPT) found that non-native researchers

1. take 91% more time to read a paper in the literature
2. need 51% more time to write a paper
3. have their papers rejected 2.6 times more frequently, and are asked for revisions 12.5 times more frequently
4. take 94% longer to prepare for a presentation at an international conference
5. are 50% less likely to decide to give an oral presentation, and 30% less likely to attend a conference

The article highlighted that the costs involved for a non-native academic to have their paper professionally edited or to attend a conference are often too much for them to bear – so they miss out, and as a consequence the scientific community misses out on the research that these academics are doing. In fact, the results of the translatE project demonstrate that much of the information that is published in non-English journals would be fundamental to 'solving global challenges such as the biodiversity crisis'.

Today, however, AI can completely or partially resolve the five issues listed above.

READING

The length of time to read someone's else's paper (91% more for non-natives according to the survey), can now easily be resolved by AI. If you have a paper to read in English, and your native language is say, Spanish, then just get Google Translate (DeepL etc.) to translate it for you. It takes a couple of minutes. Of course this implies two things: (i) the article is in a digital format; (ii) Google covers your language and is not one that is only spoken by a minority of people (i.e. with an insufficient database for Google to draw from).

WRITING

Second statistic: 51% longer to write. There are two ways in which AI can solve this problem. First, you could write in your own language, pre-edit it as suggested in Chapter 3, and translate it automatically into English. This seems to me to be a very simple option, and because of the pre-editing stage you would probably end up taking 10% more time to write than a native speaker. Of course you would need to check that the automatic translator had not made mistakes (just as you would have to check for mistakes if you had written it directly in English).

Alternatively, you could write it in English and then submit it to ChatGPT for correction – see Chapters 2 and 4. This second option will certainly take longer to produce a final paper than if a native speaker was writing it, but less than 51% longer.

REJECTIONS AND REVISIONS

The article in The Conversation doesn't specify whether or not the rejections and requests for revisions were based exclusively on language factors or not. In any case it is undoubtedly true that non-natives have their papers rejected more frequently, and there is a lot of literature that supports it.

In my 30 years as a scientific editor I have seen many papers that have been rejected due to 'poor English'. Poor English covers a massive terrain including: typos, grammar errors, syntax etc, and in such cases the reviewer is likely to give some examples to prove their case. But 'poor English' is often used as a polite way of saying: "you haven't really said very much, and what you have said doesn't really make a huge amount of sense". I would contend that a paper that gets rejected for poor English might have been rejected even if the author had written it in their native language and had submitted it to a journal with the same readability and scientific requirements as the English journal that rejected it. I am not saying that this is always the case, but it does happen. It also happens to native speakers, but in this case the comment is likely to be 'poor structure' or 'general lack of coherence'.

AI alone is not a sufficient aid to ensure that your paper will be accepted and will overcome the rigidity of some referees, but it can certainly help.

PRESENTATIONS AND CONFERENCES

A key reason why many non-natives do not attend conferences is cost AI can do little about this, but the scientific community can, by subsidizing such researchers.

However, AI can help with the preparation of presentations, it can help you produce a perfect script in English, it can help you learn how to pronounce every word in your script, it can suggest a structure, it can generate content for your slides (text, tables, figures, images). Native speakers are also already using many of these features. To learn how to do this, see Chapter 6.

1.7 Using chatbots to identify what editors are looking for

Below are some of the typical things that editors are looking for in manuscripts to enable them to keep their readership levels high.

TYPE OF PAPER	Original research, or a systematic review, or a position paper etc (for more on the various types of papers consult Google Scholar or Wikipedia).
SUBJECT	Hot topic (contemporary issues), original and innovative.
AIM	Clarity of purpose, i.e. the research objectives are clear.
RESEARCH	Well conducted, methodology clear, ethical, reproducible, no bias, limitations highlighted.
RESULTS	In line with research objective; entirely new or confirmation of other results already published in the same journal; not too broad; can be generalized outside your very specific field.

The most obvious way to find out what kind of paper your journal wishes to receive, and the kind of style and format it should be written in, is to go directly to the site of the specific journal. Below is the link to such information for Nature.

https://www.nature.com/nature/for-authors/editorial-criteria-and-processes

However, you can also get ideas by consulting ChatGPT. Below is what ChatGPT generated with regard to what Nature is looking for. The **prompt** was:

> **I want to write a paper for Nature. What kind of papers will be the editor be looking for?**

I am reporting it here (i) to show you an example of how ChatGPT can help you as an academic, (ii) because what the bot writes is true of the requirements of most journals, so you can learn from it:

Originality and Innovation: Nature seeks papers that present novel and groundbreaking findings. Your research should push the boundaries of current knowledge, introduce new concepts, or challenge existing paradigms. The paper should clearly articulate the novelty of the work and how it advances the field.

Significance and Impact: The research presented in the paper should have a significant impact on its field or even beyond. It should address important questions, solve critical problems, or lead to new insights with broader implications.

Broad Appeal: Nature aims to publish papers that are of interest to a wide range of researchers across various disciplines. Your paper should be written in a way that makes it accessible to scientists from different backgrounds, not just specialists in your field.

Clear and Engaging Presentation: Your paper should be well-organized, with a clear and concise structure. Make sure your writing is engaging and easy to follow. Visual aids such as figures, graphs, and diagrams can help convey your findings effectively.

Robust and Rigorous Methodology: The methods you used to conduct your research should be robust and rigorous. Your experiments or analyses should be designed and executed meticulously to ensure the reliability and reproducibility of your results.

Data and Evidence: Your paper should present substantial and compelling evidence to support your conclusions. This evidence could include experimental data, statistical analyses, simulations, or any other relevant forms of empirical support.

Interdisciplinary Connections: Nature appreciates research that bridges different scientific disciplines. If your work has the potential to connect ideas from multiple fields, it might be especially appealing.

Clarity of Impact Statement: In your paper, make sure to clearly state the broader impact and significance of your findings. How will your research change the way scientists think or impact real-world applications?

Conciseness: Nature papers typically have strict word limits, so you need to convey your research and its importance succinctly. Every word should contribute to the paper's overall impact.

Previous Literature: Your paper should provide context by discussing relevant existing literature. Explain how your work builds upon or contrasts with previous research in the field.

The bot will produce a similar list of points for whatever journal name you submit. Even if ChatGPT is 'not aware of' chosen journal, it can still give you general insights on what editors might look for in papers submitted to a journal in your discipline. It also warns you to consult the journal's official guidelines.

1.8 AI cannot tell you how to highlight your key findings

One of my students once received the following comment by a referee as a justification for rejecting her paper: *Not acceptable. No new knowledge, science or discovery is presented.* This kind of comment may reach you even six months after you have sent your paper for review. For you, it represents a considerable waste of time and energy spent on a paper.

Before you start writing, be clear in your head about:

- The overall aim of your research.
- The most significant findings you've obtained and how you can establish their validity.
- How these discoveries deviate from, and contribute to, existing knowledge.

The significance of your findings may be evident to you due to months or even years of dedicated work. But the reader is coming to these findings for the first time – give the reader a clear message.

While deciding the content for each section of your paper, think about exactly where and how you could emphasize your unique contribution. Where: in what sections of your paper, and where within these sections. How: through clear unambiguous writing, within a short sentence and within a short paragraph etc.

The reader is going to be asking themself very similar questions to the points I mentioned above:

- What is the specific issue that this paper is trying to address or explore?
- How did the authors approach and tackle this problem?
- In what way does their approach stand apart from previous methodologies?
- What revelations did their investigation yield?
- How do their findings diverge from the existing literature, and what implications do they carry?