



ENGLISH FOR INTERNATIONAL BUSINESS RESEARCHERS

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UNIT 1

Articles

IN THIS UNIT YOU LEARN HOW TO:

- 1 Structure a research article
- 2 Write an academic profile

Grammar: Articles

Style guide: General guidelines



1 Pre-knowledge

This course focuses on the language skills required to write a research article. Research articles may be published in journals and conference proceedings.

2 Reflection

1 As a group, answer the questions.

- 1 Do you read research papers in the field of business studies? Why (or why not)?
- 2 Why are research skills important for business studies students?
- 3 Why are writing skills important for business studies students?

3 Discussion

2 As a group, answer the questions.

1 What are the differences and similarities between the following types of texts?

- blogs
- research articles
- review articles
- magazine articles
- proposals
- business reports

3 Have you written any of the above types of texts in English?

1.1 Structure a research article

1 Pre-knowledge

There are many possible structures of articles, depending on the type of article, the discipline, and the journal. Your chosen journal will provide guidelines and often a template.

4 Put the standard sections of a research article in the box into the most common order (1–11). Some of the sections have been done for you.

Conclusions | Authors | References | Title |
Acknowledgements | Abstract | Keywords

1	_____
2	_____
3	_____
4	_____
5	Introduction
6	Methods
7	Results
8	Discussion
9	_____
10	_____
11	_____

4 Writing tip

The IMRaD model is often used to teach the structure of research articles. The 'hourglass' shape is said to reflect the development of the content in the introduction from general background information to the particular focus of the article, and from discussion of the specific results to consideration of their wider implications.

5 Journal club

5 Working with a peer, select two top-cited research articles from your field. Answer the questions.

- 1 How are the papers structured?
- 2 Are they clearly written?
- 3 What are the most important/interesting aspects of the papers?

1.2 Write an academic biography

i Pre-knowledge

In addition to the sections of a research article mentioned in Section 1.1, some journals require that authors write an academic profile. Academic profiles usually appear very end of the article, after the references. Similar profiles can be used on professional networking sites and university websites, as well as in conference materials.

- 6 Read the academic biography below, which is written in the style of *IEEE Access* [1]. Decide if the statements below (1–6) are true or false. Underline the parts of the biography that support your answers.

RAFAŁ E. JACHOWICZ was born in Lodz, Poland in 1990. He received B.S. and M.S. degrees in Management and Production Engineering from Lodz University of Technology, Lodz, Poland, in 2015. He is currently pursuing a Ph.D. degree at Lodz University of Technology, Lodz, Poland.¹

From 2015 to 2020, he was a Research Assistant at the Higher School of Professional Business Studies. Since 2020, he has been an Innovation Strategy Consultant, coaching fledgling entrepreneurs. He is the author or co-author of five chapters in the monograph series "Business studies, Entrepreneurship, Humanities" and five research articles. His research interests include Business studies, Knowledge management, Marketing, Open innovation, and Innovation management.²

Mr. Jachowicz has been the recipient of numerous scholarships awarded for academic performance, including the Rector's scholarship at Lodz University of Technology and the Pro-quality Scholarship in 2006–2013, the Scholarship of the President of Lodz in 2011 and the Marshal of Lodzkie Voivodeship scholarship in 2012.³

- 1 Rafał Jachowicz studied for both his Master's and Bachelor's degrees at Lodz University of Technology.
- 2 He has completed his doctorate.
- 3 He provides specialist advice to businesses.
- 4 He has published in books and journals.
- 5 His main specialism is speech recognition.
- 6 He has received national and international awards and honors.

- 7 Match the statements (A–E) to the paragraphs in the academic biography. Write 1, 2, or 3 in the spaces provided.

- | | | |
|---|--|----------|
| A | Lists types of degree held or being studied, including the field, institution, city, state, country, and year in which the degree was earned | <u>1</u> |
| B | Lists any awards | — |
| C | Gives the author's place and date birth | — |
| D | Lists work experience | — |
| E | Lists previous publications | — |

★ Grammar Articles

There are three types of articles in English:

- Definite article (the): used for things we know about or which are unique.
- Indefinite article (a/an): used for things that are introduced for the first time or not specific. *An* is used before words that start with a vowel sound.
- Zero article (-): used for unspecified uncountable nouns, plural nouns, abstract nouns, and proper nouns.

- 8 Complete the academic biography with *a/an/the/(-)*.

STEPHANIE B. BAXTER received ¹_____ B.Eng. degree (Hons.) in ²_____ Business and Technology from ³_____ Lodz University of Technology, ⁴_____ Poland, in ⁵_____ 2016, where she is currently pursuing ⁶_____ Master's degree in ⁷_____ Management and Production Engineering.

Previously, she was ⁸_____ summer intern with ⁹_____ Acme Earplugs Ltd., where she was involved in ¹⁰_____ individual research project optimizing ¹¹_____ production process. Her research interests include ¹²_____ operations research, distribution, and ¹³_____ transportation systems.

- 9 Compare your answers with a partner. Try to explain your choices with reference to the points in the Grammar box.

i Reflection

- 10 What are the differences between the academic biography in Exercise 7 and the template given in Exercise 5? Explain the differences.

ii Discussion

- 11 Work in groups. Talk about what you would include in your academic biography.

iii Assessment

- 12 Write your own academic biography, based on the models in this section.

1.3 Use academic style

i Pre-knowledge

Business studies articles should be written in a formal academic style. This means avoiding many colloquialisms found in general speech. However, you should also avoid excessive formality, such as complex sentence structures and pompous words.

i Reflection

- 13 Why is it important to use a consistent formal writing style in your academic writing?

- 14 The text below contains some informal language, which is highlighted in bold. Re-write the text in a more formal style.

Nowadays artificial intelligence-based technologies are advancing rapidly. Artificial intelligence has already had a **big** impact on **a lot of** areas of science and engineering. **In my opinion**, the most dramatic advances have been in the field of radiology. Indeed, as **Dr Katie Chockley and Dr Ezekiel Emanuel observed in 2016**, many radiologists now see artificial intelligence as a threat, as it can detect some **things** better than experienced specialists. **But** artificial intelligence behaves differently from humans in two significant ways. Firstly, **if you set it a goal**, an algorithm **can't** adjust itself and only does what it has been programmed to explicitly. Secondly, algorithms can anticipate and detect changes, but **don't** understand their underlying causes. Nonetheless, artificial intelligence is **getting** smarter all the time, and many professionals now fear it will have a **bad** effect on **jobs** in their sector.

- 15 Compare your changes with a partner. Explain your changes with reference to the points in the Style guide box.

Discussion

- 16 Are you worried about the current uses and future capabilities of artificial intelligence? How could artificial intelligence impact your industry?

Style guide General guidelines

Here are a few general guidelines for formal academic writing: Journals often have their own requirements and conventions, as explained in a Guide for Authors.

- Avoid contractions.
e.g. don't use *don't*, you can't use *can't*
- We don't like *like* to introduce examples
use e.g. *such as, for instance, including*
- Forget *get*
use e.g. *obtain, source, procure*
- Avoid most phrasal verbs
e.g. *get better* → *improve*
- Avoid unnecessary words
e.g. *serves to explain* → *explains*
- Avoid idioms and clichés
e.g. *think outside the box* → *find new solutions*
- Avoid some simple words
e.g. *a big sample* → *a large sample*; *a bad effect* → *a negative effect*
- Don't use informal words
e.g. *boss* → *manager*; *chance* → *opportunity*
- Avoid starting sentences with *and* or *but*
- Avoid most personal language
e.g. *in my opinion, me, you*
- Avoid most dramatic and emotive language—e.g. *to save the planet* → *to protect the environment*; *the number of bacteria plummeted* → *the number of bacteria fell significantly*
- Refer to sources using a standard referencing system

UNIT 2

Titles and Abstracts

IN THIS UNIT YOU LEARN HOW TO:

- 1 Write titles
- 2 Write abstracts

Grammar: Compound nouns

Style guide: Punctuating titles



1 Pre-knowledge

The title and abstract are often the first parts of your article the audience will read. They are frequently available for free, even when the rest of the article is not. On the basis of the title and abstract, your audience will decide whether the rest of your paper is of interest. Titles and abstracts are often considered to be the most important parts of a paper—and the most difficult to write effectively.

2 Reflection

- 1 As a group, answer the questions.
- Who are the potential readers of your title and abstract?
 - What does this mean for how your title and abstract should be written?

2.1 Write titles

- 2 Match the titles (1–5) to the types of titles (A–E) [4–8].

- 1 Higher corporate taxes affect everyone
- 2 Unraveling the MNE wage premium
- 3 Beyond “doing as the Romans do”: A review of research on countercultural business practices
- 4 A geographic relational perspective on the internationalization of emerging market firms
- 5 The effect of a worldwide tax system on tax management of foreign subsidiaries

- A A descriptive (or indicative) title that states the topic
B A title that uses a gerund (-ing word)
C A declarative title that states describes the conclusion
D A title that focuses on the theory or method
E A two-part title

3 Journal club

- 3 Search on the internet for a list of the top-cited research articles in your field. Answer the questions.

- 1 Which types of titles do they use?
- 2 What do you think the articles could be about?
- 3 Which articles sound the most interesting?

4 Style guide Punctuating titles

The titles of scientific articles should not be placed in inverted commas. Titles never end in a period (.). Two-part titles are separated by a colon (:). There are two ways to capitalize titles:

- 1) capitalize only the first letter of the first word as well as any proper nouns (sentence case),
- 2) capitalize all words except for articles and prepositions (Title Case).

Some titles are written in all caps. Always check the requirements of your chosen journal.

- 4 Re-write the titles in Exercise 2 in title case.

5 Style guide Compound nouns in titles

Authors often use compound nouns to make their titles more concise. A compound noun is a noun modified by an adjective, verb, or another noun. Compound nouns can be built up to form noun strings. However, such titles can be ambiguous and difficult to read. Compare:

- ✗ Municipal Solid Waste Classification Methodology
- ✓ Methodology For Classifying Municipal Solid Waste

As a general rule, try to limit noun strings to a maximum of three modifiers in a row.

- 5 Find examples of compound nouns in the titles from Exercise 2.
 - 6 Shorten the noun strings by replacing the prepositions and articles, using verb forms, etc.
- 1 Underground mine worker safety protection procedures
 - 2 Draft laboratory animal rights protection regulations
 - 3 Carpooling services recommendation system
 - 4 International banking system regulation recommendations
 - 5 Financial market fraud investigation

★ Grammar Compound nouns and adjectives

Compound nouns can be one word, like *database*, or two words, like *computer science*. If two or more words are used to modify a noun (or a compound noun) they may be joined with a hyphen, as in *billion-dollar particle collider*. This is known as a compound adjective.

Nouns that modify another noun are usually singular, even if they refer to something plural:

- Engines for cars: *Car engines*.

However, in some cases the noun modifier remains plural. For example:

- *Skills training*: more than one skill will be taught.
- *Data analyst*: the singular form *datum* is rare.
- *System(s) administrator*: the *s* is optional.

7 Re-write as compound nouns and compound adjectives.

- 1 A form you fill in to apply for a job.
- 2 A box where you can put suggestions.
- 3 A procedure for making a complaint.
- 4 A trip you make for the purpose of doing business.
- 5 Labor by children.
- 6 Discrimination based on age.
- 7 A market where stocks are bought and sold.
- 8 A plan that will take five years to complete.
- 9 A service for delivering pizzas.
- 10 A list of prices.

8 Shorten these titles by using compound nouns.

- 1 The internationalization of firms run by families: research from the past and an agenda for future research
- 2 The responses of businesses to regulations governing the pricing of carbon: Theory and evidence
- 3 Taking chances? The propensity of a CEO to take risks and the process of making decisions

2.2 Write abstracts

📌 Pre-knowledge

There are many types of abstract, which vary depending on the subject and the journal. However, typically they should include information about the following:

- general background about the topic
- the current state of knowledge
- the purpose of your study
- the methods you used / components of your approach
- the results / conclusions

- 9 Read the following abstract about research on leadership. Identify the sections based on the information in the Pre-knowledge box.

ABSTRACT: Leadership is one of the key factors associated with the success or failure of organizations. Leadership style is the manner in which people are directed and motivated by a leader to achieve organizational goals. Several major leadership styles have been identified in the literature. However, the success of any leadership style depends on the situation. In this study, we argue that emotional intelligence is the fundamental leadership trait associated with good leadership. We used interviews and questionnaires to determine the emotional intelligence and leadership styles of 50 business leaders. The results were correlated with selected performance indicators. Effectiveness was defined as the successful exercise of personal influence that results in the attainment of organizational goals. The results show that, regardless of their leadership style, leaders with higher emotional intelligence are more effective. These findings could help inform leader selection and leadership development programs.

- 10 Put the sections of the following abstract into the best order [1]. Compare your ideas as a class.

The scale, composed of 33 items, analyses seven dimensions of performance: appraisal, gender stereotypes, work-family balance, motivational barriers, unfair human resource practices, organizational culture barriers, and barriers to accessing influential networks.

The TOP WOMAN scale provides a practical tool to human resource managers to analyse the situation of gender discrimination and to implement best practices in organizations.

In spite of some recent advances, women still face more difficulties in accessing management positions.

The scale was tested in a pilot study on a large sample from the financial sector in Spain (n = 1304 workers).

However, perceptions of gender barriers may be different depending on the characteristics of specific organizations, jobs, teams, and employees.

In this study, we introduce the "TOP WOMAN" (Testing the Obstacles to Promotion of Women to Management) scale for measuring barriers to women's promotion.

Previous research has identified several types of barriers contributing to the maintenance of the glass ceiling, such as gender stereotypes, difficulties finding work-family balance, human resource policies, difficulties in accessing networks, organizational culture, and higher demands for women to demonstrate their value.

- 11 Work in pairs. Identify the tenses in the abstracts and discuss why each tense was used. Complete the table below.

Abstracts usually require only a small number of tenses. The most common tenses are listed below.

Tenses	Uses
Present simple	
Present perfect	
Past simple	
Future simple and modal verbs in future time (e.g. <i>could, might, may</i>)	

- 9 Put the useful phrases for abstracts into the correct order. Notice the function and tense of each phrase.

- 1 a the global new economy. in X has issue become key
- 2 been There have a of recent number studies on...
- 3 understanding of is currently a lack of... There
- 4 clear attention to X, Despite we lack understanding in-creasing of...
- 5 work This aims to...
- 6 addresses study the issue This of...
- 7 we Here, propose...
- 8 factor in... X is considered widely a key
- 9 propose We for... framework a theoretical
- 10 study We a case on... conduct
- 11 results that... show Our
- 12 conclude that... Based results, on our we
- 13 study could implications have for... This
- 14 results be of will interest The to...
- 15 approach Our opens way for... the

Writing tip

Novice writers are sometimes advised to re-use common phrases and structures from the scientific articles they read. Because these are typical phrases, this is not plagiarism. However, many papers—even those published in top journals—contain incorrect or inelegant formulations. If in doubt, consult a reliable phrasebank or contact a proofreading service.

Assessment

- 10 Choose one of these research questions, or write your own.
- How does gamification affect productivity on production lines?
 - Which is more effective for industrial training—traditional classroom instruction or using VR?
 - Does sleep improve creativity?
 - Can smells affect workplace atmosphere?
 - Do introverts or extroverts make better leaders?
 - What is the optimal size of group for decision-making?
 - Does mindfulness and meditation training reduce work stress?

Writing tip

Writing your abstract first can help you plan the other sections of your paper. However, many writers prefer to write the abstract last, to ensure they have included all the essential information. A good tip is to write a rough abstract first, then revise it once you have written the other sections of your paper.

- 11 Imagine you have completed research into the question you chose in Exercise 10. Write a title and abstract for a research article. Invent any necessary details.

Abstracts are usually written as a single paragraph of 300 words or less.

Additional activity

- 12 Work in groups of three (Students A, B, and C). Take turns to read a question from your card. Try to answer the questions read by your partners.

Student A

What do you call...

- 1 someone who founds multiple companies, one after another? (*serial entrepreneur*)
- 1 the combination of knowledge and skill that makes someone good at business? (*business acumen/business savvy*)
- 2 the amount of money you can make by selling something for more than you paid for it? (*profit margin*)
- 3 the day-to-day costs of running a business? (*operating costs / running costs*)
- 4 the process of finding and acquiring skilled candidates for employment within a company? (*talent acquisition*)
- 5 the style of leadership that involves selflessly working with followers to achieve shared goals that improve collective, rather than individual, welfare? (*service leadership*)
- 6 an organizational structure that groups people by function and by product team simultaneously? (*matrix structure*)
- 7 the degree to which people in a society are comfortable with unpredictable situations.? (*uncertainty avoidance*)
- 8 a business with under 500 employees that is independently managed, is owned by an individual or a small group of investors, is based locally, and is not a dominant company in its industry? (*small business*)
- 9 the manner in which people express their inner feelings subconsciously through physical actions such as sitting up straight versus being relaxed or looking people straight in the eye versus looking away from people.? (*body language*)

Student B

What do you call...

- 1 a person who has just started a new business. (*fledgling entrepreneur / business founder*)
- 2 the managers at a level just below senior executives? (*middle management*)
- 3 the process of identifying and developing new leaders and high-potential employees to replace current employees at a future time. (*succession planning*)
- 4 The department that deals with recruiting and training employees, as well as administering benefits (*human resources department*)
- 5 the penalty, financial or otherwise, that a consumer bears when giving up the use of a product currently being used to select a competing product or service. (*switching cost*)
- 6 the sequence of activities that turn inputs (parts or supplies) into outputs (goods or services)? (*value chain*)
- 7 a general description of how a firm will try to accomplish its mission? (*mission statement*)
- 8 people in an organization who view themselves as having discretion to act? (*change agent*)
- 9 a horizontal organizational structure in which individuals across the whole system are empowered to make decisions? (*flat organization*)
- 10 markets in countries that present tremendous potential for multinationals? (*emerging markets*)

Student C

What do you call...

- 1 the invisible barrier based on prejudicial beliefs that prevents women from moving beyond certain levels within a company? (*glass ceiling*)
- 2 a dysfunction in decision-making that is due to group pressures and group members' desire for conformity and consensus? (*groupthink*)
- 3 a temporary document that authorizes individuals from other countries to permanently or temporarily live and work in another country? (*work visa*)
- 4 funding obtained from investment firms that specialize in financing small, high-growth companies and receive an ownership stake and a voice in management in return for their money? (*venture capital*)
- 5 plans for dealing with alternative scenarios? (*contingency plans*)
- 6 long-term alliances that involve the creation of a new entity to develop and supply a new product/service? (*joint ventures*)
- 7 the combination of actions a company uses when selling a product or service (*marketing mix*)
- 8 attitude that sees hard work as a moral good? (*work ethic*)
- 9 the tendency for individual group members to reduce their effort on a group task? (*social loafing*)
- 10 an evaluation tool that collects feedback from managers, peers, direct reports, and customers? (*360 degree feedback*)

UNIT 3

Introduction

IN THIS UNIT YOU LEARN HOW TO:

- 1 Structure an introduction
- 2 Review the literature
- 3 Highlight the contribution

Grammar: Reference words

Style guide: References



1 Pre-knowledge

The content of a typical introduction is similar to that of an abstract. It should:

- provide background information;
- describe the specific research problem;
- state the purpose of the study, mention the methods, and highlight the outcomes.

However, the introduction should not simply repeat the abstract. Differences with an abstract may include:

- the introduction provides more detailed and wider background information;
- the introduction summarizes the results of related research, including citations;
- the introduction outlines the structure of the rest of the article (e.g. the content of the various sections).

By the end of the introduction, the reader should understand the purpose, topic, and scope and of the article.

3.1 Structure an introduction

- 1 You are going to read an introduction (adapted and abridged) from an article on the topic of organizational citizenship behavior (OCB) [2]. Before you read, answer the questions.
 - 1 What do you understand by OCB? Give examples.
 - 2 Which of these factors do you think most contribute to encourage OCB?
 - Individual traits, personal values, individual skills.
 - Group size, group cohesion, group norms.
 - Organizational structure, organizational culture,
- 2 Now scan the introduction. Decide if the statements (1–5) are true or false.
 - 1 The introduction moves from general background information to the specific focus of the article.
 - 2 Relevant literature is summarized and cited, but not discussed in depth.
 - 3 The authors explain their objectives and motivations.
 - 4 The authors give in-depth details of their methods.
 - 5 The introduction ends with a summary of the content of each section of the article.

- 3 Complete gaps 1–5 in the text using sentences A–F. There is one sentence you will not need.

- A Voice and helping behaviors are two types of OCB (Van Dyne & LePine, 1998).
- B Therefore, **they** are less likely to engage in discretionary behaviors that require additional cognitive demands.
- C **This** relative neglect is problematic, because the contribution of organizational factors may be contingent on the larger context, making one-size-fits-all recommendations inappropriate for international businesses.
- D Here, we examine the joint influence of organizational formalization and national uncertainty on OCB, to deepen our understanding of when and how culture matters for international business (Kirkman, Lowe, & Gibson, 2017; Beugelsdijk et al., 2017).
- E One standard assumption in management is that increasing formalization, in the sense of rules and procedures, reduces employee freedom by prescribing and enforcing procedures and regulations about appropriate actions (Adler, 2012; Hirst, van Knippenberg, Chen, & Sacramento, 2011; Juillerat, 2010; Organ et al., 2006; Organ & Greene, 1981).
- F **It** may therefore flourish only in certain contexts.

- 4 Look at Figure 1. Explain the main results of the study.

Discussion

- 5 Work in groups. Discuss the questions.

- 1 How would you rate yourself in terms of OCB? How would you rate your colleagues/classmates?
- 2 What do you think managers/teachers can do to increase levels of OCB?

★ Grammar Reference words

Reference words usually replace nouns, but can also refer back to whole clauses, sentences, and parts of text. Reference words are used to increase cohesion. However, they can introduce ambiguity. Always ensure that the antecedent of any reference words is clear. If in doubt, repeat the noun or provide a synonym.

- 6 Look at the words in bold in the text and in the missing sentences. What do they refer to?

INTRODUCTION

Organizational citizenship behavior (OCB) is central for the survival of modern businesses (Organ, Podsakoff, & MacKenzie, 2006). [1] Helping is defined as proactive interpersonal behavior directed towards others that strengthens existing relationships (Van Dyne, Cummings, & Parks, 1995; Tröster & van Knippenberg, 2012). Voice behavior involves speaking up with suggestions for change, challenging work routines that hinder effectiveness, and acting on one's own initiative to make changes to one's own task routines. OCB is essential for organizations to thrive, but can be risky for individuals (especially voice, due to its potentially challenging nature). [2]

Compared to the wealth of research on individual-level predictors of OCB, such as motivation and personality, there has been less exploration of organizational and national-level predictors of OCB (Carpenter, Berry, & Houston, 2014; Eatough, Chang, Miloslavic, & Johnson, 2011). [3] Understanding the interaction of contextual variables at the organizational level and in a cultural context at the national level is important for businesses seeking to encourage OCB (Smith, Peterson, & Thomas, 2008; Tröster & van Knippenberg, 2012; Tsui et al., 2007).

[4] Our starting hypothesis was that in contexts of perceived national uncertainty (such as war or political instability), employees use their cognitive resources to cope with the perceived uncertainty and regain a sense of control. [5] In **these** environments, perceived organizational formalization can compensate by providing structure and clarity, reducing the needs to expend cognitive resources on coping with uncertainty at the organizational level. In contrast, in contexts of low national uncertainty organizational formalization is not necessary for providing structure and may increase constraints on discretionary behavior.

We present the results of a three-level hierarchical linear modeling analysis of data from 7,537 employees in 267 organizations across 17 countries. **The research** provides broad support for our hypothesis: that perceived formalization is positively associated with both voice and helping behavior in nations with higher perceived uncertainty, whereas these relationships are weakened or negative in nations with higher perceived certainty.

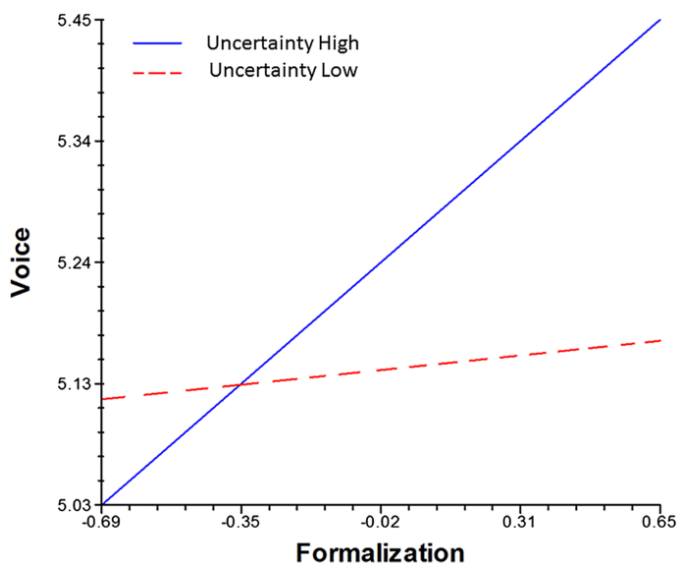


Figure 1. (The caption has been removed)

- 7 Complete these sentences with the best options.
- At the individual level, we controlled for age and managerial position, because _____ correlated with OCB in previous studies.
 - those variables
 - they
 - those
 - OCB is essential for organizations to thrive, but _____ can be risky for individuals.
 - it
 - this
 - OCB
 - The effect of organizational structure on OCB is more pronounced than _____ of national uncertainty.
 - the one
 - that
 -
 - OCB can have several important benefits for organizations. _____ include raising morale and increasing performance and productivity.
 - These
 - Those
 - They
 - Organizations in which there is high OCB tend to outperform _____ in which levels are low.
 - These
 - Those
 - They
 - Training or educating management about OCB will make _____ more aware of employee displays of OCB.
 - them
 - these
 - it
 - There are several factors that influence OCB in the workplace. _____ include job satisfaction, leadership, and organizational climate.
 - The latter
 - Those
 - These
 - The notion of *contextual performance* overlaps with OCB, although _____ emphasizes discretionary behavior whereas _____ does not.
 - the latter... the former
 - the first one... the last one
 - OCB... contextual performance
 - Smith et al. (2022) studied the relationship between team identification and the occurrence of OCB. _____ research focused on two elements: helping and loyalty.
 - their
 - theirs
 - their's
 - An employee who believes in organizational citizenship tries to do what is in the company's best interest at all times. _____ want to see the company succeed and will go beyond their normal job description to help make that happen.
 - She
 - He
 - They

3.2 Review the literature

i Pre-knowledge

A literature review is used to survey past research on the topic. Some articles require a separate literature review section. In other cases, the literature review material appears at appropriate points in the body of the text (especially in the Introduction and Discussion). Some articles consist entirely of an extended literature review. These are called review articles.

ii Reflection

- 8 How can you find papers for your literature review?
- 9 How can you decide which papers to include in your literature review?

iii Style guide References

Most references in this book are in the ordinal-number style, in which references are numbered to correspond to the full citation listed in the References. This is normally the order in which the cites first appear, although some journals require you to list your references alphabetically. Numbers are placed in square brackets [Ref] in both the text and the References. When citing multiple sources, these may be placed in the same brackets separated by commas [1, 2, 3] or a dash [1–3], or alternatively in their own brackets separated by commas or dashes—e.g. [1], [2], [3] or [1]–[3]. As always, check your journal's style guide and be consistent.

Another referencing style uses superscripted ordinal numbers. Sometimes, the references are then given as footnotes.

A third popular referencing style is the Harvard (author date) system, which uses author surnames and the year of publication in square or round brackets, like this: (Blogs 1990). According to some style guides, the surname and date may need to be separated by a comma. When citing multiple sources, these are placed in the same brackets, in alphabetical order, separated by semicolons, like this: (Blogs 1990; Smith and Jones 2010). The bibliography is then listed in alphabetical order according to the first author's surname. When references have two authors, the surnames of both authors are usually given, separated by "and" or "&". When references have more than two authors, only the first author's surname is usually given followed by "et al."—e.g. (Smith et al.). Note that "et al." is an abbreviation, so it requires a stop.

There are two main ways to use citations. In the author-prominent method, the author name is given as part of the sentence, followed by the cite. In the Harvard system, author names are not repeated in the brackets—e.g. 'Blogs (1990) showed that...' In the information-prominent method, author names are not mentioned as part of the sentence, and the cite is given at the end—e.g. [Ref].

iv Reflection

- 10 Which referencing systems are most common in your discipline?
- 11 How can you store and manage the bibliographic data of the articles you read?
- 12 Complete the paragraph below from a literature review [3] with the verbs in brackets in a suitable tense. More than one correct answer may be possible.

There _____ (**be**) a number of studies in the literature on the syntactic and semantic errors made by novice programmers [1]–[3]. Other studies _____ (**focus**) on how much time students spend correcting errors [4] and the frequency of particular errors [5]. Jadud [6] _____ (**investigate**) the mistakes and attempts at solutions made by students writing programs in Java. Kohn [7] _____ (**analyze**) over 4000 instances of error messages elicited by Python programs, and _____ (**identify**) the most common error categories. A more complex study of mistakes made by novice programmers in Python _____ (**be**) given in [8], including a quantitative analysis of the distribution, duration, and evolution of errors. However, there _____ (**be**) few studies concerning error and warning messages for programs written in C language.

v Writing tip

There is some flexibility with regard to tense choice in a literature review. Generally, you can use the present perfect to give an overview of a paper or a number of papers, the past simple to discuss individual papers in more detail, and the present simple to tell the reader where they should look for particular information. Unless you want to emphasize the historicity of a reference (e.g. in a literature survey), use the present tense.

- 13 Put the useful phrases for reviewing the literature in the correct order.
 - 1 numerous There have been studies have on X [Ref].
 - 2 [Ref]. studies Other focused X on have
 - 3 X extensive has the [Ref]. been of research subject
 - 4 given [Ref]. An review of literature is in extensive the
 - 5 of wide-ranging the X. is a literature There on subject
 - 6 on a study X, Smith [Ref]... In seminal
 - 7 by first [Ref]. systematic The on was study performed X

vi Assessment

- 14 Work in groups of three.
 - 1 Find at least three research articles connected to the research topic you chose in Unit 2. Note the main topic, methods, and findings in each paper.
 - 2 Write a short paragraph reviewing the literature for your research article.

3.3 Highlight the contribution

Pre-knowledge

Towards end of the introduction, often after reviewing the literature, it is usual to highlight the contribution of your article to the current state of knowledge.

15 Match the main types of contributions that a research paper can make (1–4) to the examples (A–D).

- 1 Theoretical
- 2 Methodological
- 3 Empirical
- 4 Practical

- A Possible applications
- B A more accurate or efficient way to solve a problem
- C Better understanding of concepts and their interrelationships
- D Data

16 Identify the main contributions mentioned in this excerpt from the same study as Exercise 12 [3].

In this paper, we classify and analyze C compiler diagnostic messages generated by novice programmers. The classifications refer to particular errors made by first-year students learning C. A method for generalizing compiler diagnostic messages is proposed, which was used to obtain 374 message patterns (Section 3.2). Almost 110,000 faulty programs were analyzed in terms of the most common compiler and linker errors (Section 3.3). Due to the substantial size of the sample, the conclusions can be considered reliable. Over 70 error categories were identified and analyzed (Section 3.4). The proposed categories significantly extend the research presented in [18] and [28]. The results could help to inform and improve classroom instruction. For instance, the most common errors may be presented and discussed during classes.

17 Put the useful phrases for highlighting the contribution in the correct order.

- 1 this The of that... study lies in novelty fact the
- 2 as this contributions The major of paper follows: are
- 3 the previous To best of the there have been authors, no studies on... knowledge
- 4 solution applied here The could be to... presented
- 5 solution We an innovative the problem of... provide to
- 6 This opens research the of... possibility
- 7 applications, wide This technology including... has a of range industrial possible
- 8 improve... The could to help results
- 9 key The conclusion that... is
- 10 contribution of novelty is that... The our

Journal club

1 Working with a peer, select two top-cited research papers from your field. Answer the questions.

- 1 What research questions do the papers address?
- 2 Do the results of the papers support those found in previous research? Do they represent an incremental step forward? Are they paradigm-changing?

Assessment

2 Write a full introduction for your research article, like the one in Section 3.1.

UNIT 4

Methods

IN THIS UNIT YOU LEARN HOW TO:

- 1 Describe research designs
- 2 Describe theories

Grammar: Passives

Style guide: Subheadings



1 Pre-knowledge

Business studies articles often have a section titled “Methods”, “Methodology”, or “Method”, which describe the research design and techniques used to collect data. Even if a study is purely “theoretical” and does not include any empirical research, the assumption is that the theories and concepts can be tested—e.g. in the field or a laboratory setting.

4.1 Describe research designs

- 1 How much do you know about these basic research designs? Give examples if you can.

- Naturalistic observation
- Survey research
- Field studies
- Field experiments
- Laboratory experiments

- 2 Read the methodology section from a research article [4]. Which type of research design did the authors use?

- 3 Read the text and decide if the statements are true or false.

- 1 The researchers collected and analyzed both quantitative and qualitative data.
- 2 The survey was conducted on a random sample of employees.
- 3 The survey measured the strength of the respondents’ attitudes and opinions.
- 4 The survey did not allow free-form responses.
- 5 The focus group participants were selected by volunteer sampling.
- 6 The phrasing and order of the interview questions were not predefined.
- 7 The researchers used a qualitative research method to interpret the data from the interviews and focus groups.

Methodology

This research was conducted within a company in the European FinTech (financial technology) industry headquartered in London but with a remote workforce located across the UK and EU. A mixed methods approach was adopted, using an online survey, focus groups, and in-depth interviews with employees, board members, and senior executives. The aim was to build upon to previous research which focused mainly on quantitative methods and structured questionnaires.

Employee Survey

A questionnaire was administered to scope employee attitudes towards and engagement with ESG practices. The questionnaire was distributed to all 180 employees in the form of an online survey. In total, 81 employees responded to the questionnaire, representing 45% of the total employees of the company. The online questionnaire consisted of six closed questions (designed as statements that respondents had to rate on a Likert scale) and two open-ended questions (analyzed using thematic analysis). The eight survey items were as follows:

1. ESG (Environment, Social, Governance) practices are important for the FinTech Sector.
2. ESG values are important to me as an individual.
3. Prospective employees find companies with a strong ESG brand more attractive.
4. Individual employees can shape the ESG values and culture of a company.
5. ESG values should be at the forefront of company strategy.
6. I am aware of my company’s ESG contributions.
7. What do you think of your company’s current ESG practices?
8. How could your company improve its ESG practices?

Focus Groups and Interviews

Nine participants were invited to two online focus groups. Participants were selected through purposive sampling based on their interest in the topic and experience in the company. Semi-structured interviews were also conducted to gain more in-depth response without the limitations inherent to a questionnaire and focus group dynamic. In total, seven interviews were conducted with employees from the human resources department, as well as senior executives and board members. Both the interviews and the focus group were led following a structured discussion guide consisting of ten questions assessing employee attitudes and opinions regarding ESG and their company’s ESG practices. Thematic analysis was performed to identify patterns and themes in the collected data (Alhojailan, 2012; Braun & Clarke, 2006).

🔗 Style guide Subheadings

Many methods sections are divided using subheadings according to the topic. Methods are usually presented in the chronological order in which the experiments were conducted.

📌 Reflection

9 How can the following affect the responses you get in a survey?

- 1 Open-ended or closed-ended questions
- 2 Question wording (the choice of words and phrases in a question)
- 3 Agree/disagree format or providing a scale
- 4 Question order
- 5 Sample size and sample diversity

4 Use the words in the box to complete the sentences.

validity	pilot study	dependent variable
correlation	unrepresentative	predictors
reliability	indicator	cross-section
estimate	control variable	induction

- 1 A _____ is a factor that changes in response to other factors in a scientific experiment.
- 2 _____ refers to how accurately a method measures what it is intended to measure.
- 3 A _____ may be used to test and validate the methodology prior to full-scale research.
- 4 Curiosity and a growth mindset are good _____ of employee engagement.
- 5 _____ is a method of reasoning that moves from specific instances to a general conclusion.
- 6 In research, _____ means “repeatability”, in the sense that an approach always provides the same result.
- 7 Rough _____ of buying power can be derived from indirect measures such as bank deposits and retail sales.
- 8 The best _____ of performance are cognitive ability, work sample tests, personality tests, and structured interviews.
- 9 Principal component analysis (PCA) is a technique used to find underlying _____ in a set of variables.
- 10 We studied a _____ of companies in different sectors and European countries.
- 11 People who volunteer for polls may be different from other people in ways that make the poll _____.
- 12 A _____ is a factor that is not changed during an experiment.

🗨️ Discussion

10 Work in groups. Discuss the questions.

- 1 Can you think of any predictors of employee turnover?
- 2 Give an example of a dependent and independent variable in an experiment.
- 3 How can you control for age or gender in a research study?
- 4 What is the relationship between validity and reliability?

- 5 What are some common physiological and psychological indicators of stress in the workplace?
- 6 How can you ensure that your sample accurately represents the target population?
- 7 What is the difference between deduction and induction?

★ Grammar Passives

The passive is formed using the verb *to be* in the correct tense and the past participle of the main verb.

The passive is often used in the Methods section, to focus on what was done rather than who did it (which is probably obvious or less important).

- 5 Find examples of the passive voice in the reading text. Which tense is predominantly used? Why?
- 6 Change the sentences into the passive.
 - 1 We collected the data and compared the results.
 - 2 I interviewed 50 people in total.
 - 3 We divided the groups according to age.
 - 4 The majority of employees completed the survey.
 - 5 We conducted a focus group to validate the research findings.
 - 6 We had tested the interview questions in a pilot study.
 - 7 To assess the political, economic, sociocultural, and technological factors affecting the company, we used a PEST analysis.
 - 8 We chose this method because previous reports have shown it to produce good results.

4.2 Describe theories [5]

📌 Pre-knowledge

Many research articles in business and management studies are not based on “empirical” research. Instead, they are “theoretical”—discussing concepts, frameworks, etc. Briefly stated, a theory is a set of statements that serves to explain the manner in which certain concepts or variables are related.

📌 Reflection

- 7 Students of management often complain about “theoretical” or “abstract” approaches to their subject; they argue instead in favor of “relevant” and “applied” approaches. Do you think this a fair criticism?
- 8 How much do you know about these business research frameworks?
 - 1 The 3 Cs of marketing (Kenichi Ohmae)
 - 2 The 4 Ps (E. Jerome McCarthy)
 - 3 SWOT matrix (Albert Humphrey)
 - 4 Porter’s 5 forces (Michael Porter)
 - 5 PEST analysis (Francis Aguilar)
 - 6 BCG’s growth share matrix (Bruce Henderson)
 - 7 McKinsey 7S (Tom Peters and Robert Waterman)
 - 8 MECE (Barbara Minto)

- 9 What other management theories do you know about?
- 10 Give examples of research questions that each framework could be used to investigate. Suggest research designs and techniques for applying each framework to the research questions you identified.
- 11 Abraham Kaplan [6] discusses criteria for evaluating the utility or soundness of a theory. Match the concepts (1–5) to the criteria (A–E).
- 1 Internal consistency
 - 2 External consistency
 - 3 Scientific parsimony
 - 4 Generalizability
 - 5 Verification
- A A good theory presents propositions that can be tested. Without an ability to operationalize the variables and subject the theory to field or laboratory testing, we are unable to determine its accuracy or utility.
- B Are the propositions of a theory consistent with observations from real life?
- C Are the propositions central to the theory free from contradiction? Are they logical?
- D In order for a theory to have much utility, it must apply to a wide range of situations or organizations. A theory of employee motivation that applies only to one company hardly helps us understand motivational processes or apply such knowledge elsewhere.
- E Does the theory contain only those concepts that are necessary to account for findings or to explain relationships? Simplicity of presentation is preferable unless added complexity furthers understanding or clarifies additional research findings.

Journal club

- 12 Working with a peer, select two top-cited research articles from your field. Answer the questions.
- 1 Are the methods described in sufficient detail, both to judge the quality and validity of the data and to be replicated by others?
 - 2 Do the papers use the most appropriate approaches to address the research questions they ask? Are there any other methods that could have been used? Are there any ways in which the experimental design could be improved?
 - 3 If the paper is theoretical, how could the theory be tested in practice?
 - 4 If the paper is theoretical, how sound is the theory according to Kaplan's criteria?

Assessment

- 13 Write a short Methods section for your research article. Invent any necessary details.

UNIT 5

Results

IN THIS UNIT YOU LEARN HOW TO:

- 1 Express causes and results
- 2 Write captions for figures and tables
- 3 Describe figures and tables

Grammar: Adverbs

Style guide: Captions for figures and tables
Introducing figures and tables



Pre-knowledge

In some disciplines, there is a strict division between the Results and Discussion sections. In the results section, you should simply present your research findings. In the Discussion, you interpret the results in a wider context. Some journals have a combined section, titled Results and Discussion. In many articles, the results are reported and discussed along with the methods under different subheadings.

5.1 Express causes and results

- 1 Look at Table 1, which shows some common ways of expressing causes and results. Are there any words you do not understand or do not know how to use?

Writing tip

Use the past simple when referring to specific results and the present simple for general facts and conclusions.

- 2 Complete the sentences with one word from Table 1 in each gap. Use the past simple tense for verbs.
 - 1 The test groups modified their behavior in _____ to being observed.
 - 2 Giving two 5-minute breaks _____ in higher productivity.
 - 3 Six 5-minute breaks _____ to reduced output.
 - 4 The workers worked harder _____ they thought they were being monitored individually.
 - 5 Productivity increased _____ almost any change in the lighting.
 - 6 Improvements to levels of lighting _____ increases in productivity, but so did reversion to standard lighting and even below-standard lighting.
 - 7 _____ to fears that the company would lower their base rate, the workers reduced their productivity.
 - 8 Other _____ in the productivity rise were the ability to choose co-workers and improved teamwork.

Table 1. Common ways of expressing causes and results.

With verbs		
cause	enable	prevent
generate	allow for	block
induce	contribute to	stop
give rise to	influence	inhibit
initiate	attribute to	decrease
lead to	depend on	deteriorate
produce		diminish
trigger		lower
give		affect
result in		
result from		
account for		
increase		
raise		
With nouns	With conjunctions	
one reason for	due to	
as a result of	owing to	
as a consequence	because of	
in response to	therefore	
is a factor in		
is an effect of		
With sequence words	With conditionals	
following	if...	
then	when...	
upon		
after		

Discussion

- 3 The sentences in Exercise 2 refer to research conducted at the Hawthorne Western Electric plant by Elton Mayo. How much do you know about the "Hawthorne experiments"?
 - 4 Discuss what you know about the other famous experiments listed below. Can you explain the main results?
 - The invisible gorilla
 - The Milgram experiment
 - The piano staircase
 - The Pygmalion effect
 - The Ache conformity experiment

★ **Grammar Adverbs**

Adverbs can be used to add information, especially about the speed, place, manner, degree, or frequency of something. For example:

*Inflation rose **sharply** in the last quarter.*
***Slightly** different results were reported by Smith (2000).*
*The time was measured **precisely** to milliseconds.*

A small number of viewpoint adverbs are often used to highlight and qualify results. These adverbs are often placed at the beginning of the sentence, followed by a comma. For example:

Obviously, ...
Interestingly, ...
Surprisingly, ...
Unsurprisingly, ...
Unfortunately, ...
Importantly, ...
Clearly, ...

Do not over-use adverbs, or the tone of your writing may become sensational. Avoid adverbs such as *very, truly, really, actually, and extremely* in academic writing.

5 Complete the sentences with a suitable adverb in each gap.

- 1 What the invisible gorilla study shows is that, if we are paying attention _____ to one thing, we often fail to notice other things.
- 2 _____, the Pygmalion effect has important implications for managers.
- 3 The Milgram experiment found, _____, that a very high proportion of subjects would fully obey the instructions, albeit reluctantly.
- 4 The piano stairs experiment showed that making a task more fun can _____ change people's behavior.
- 5 The so-called Asch conformity experiments were _____ carried out in the 1950s and have been replicated many times since.

5.2 Write captions for figures and tables

① **Pre-knowledge**

Figures and tables are used to present data and highlight the main results. Captions are used to describe the content of figures and tables. Tables and figures should be understandable without reading the main text of your manuscript.

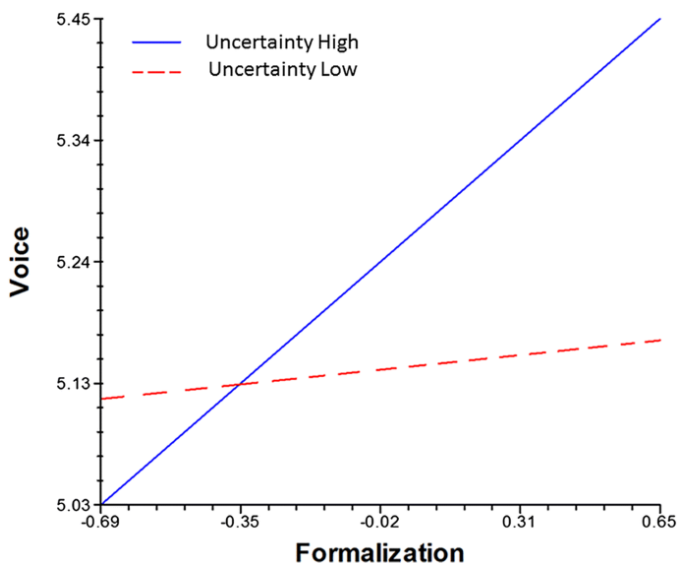
■ **Reflection**

- 6 Read the information in the Style guide. What do you think is the most important advice?
- 7 Write a caption for the graph you discussed in Unit 3. Read the introduction again if you need to [2].

🔗 **Style guide Captions for figures and tables**

A typical caption will describe the data contained in the figure/table, followed if necessary by an explanation of its main elements, such as abbreviations and notation used, parameter values etc., possibly in the space under a table. Each table or figure, including the caption, should be self-explanatory, i.e. comprehensible without needing to read the main text. Although there are no standard rules for writing captions to figures and tables, the following are some general guidelines.

- Captions are normally written below figures and above tables.
- Write “Table” or “Figure” (with a first capital letter or fully capitalized) followed by the number corresponding to the order in which the item appears. Word and LaTeX have good features for automatic numbering.
- Figure can be abbreviated as Fig., even at the start of the caption. You do not normally abbreviate Table (i.e. “Tab. 1” is rare).
- Most journals put a stop or a colon after the number of the figure or table, and begin the next sentence with a capital letter—e.g. *Figure 1. Schema of...*
- It is common to omit any article at the start of the first sentence, e.g. *A-Micrograph of an undamaged sample.*
- Other articles may sometimes be omitted, but this is not advisable except for highly proficient users of English.
- Make your captions as concise as possible.
- You are not always required by the journal to end the caption with a stop, but you must be consistent.
- Ensure that all elements of figures and tables (axes, arrows, lines, etc.) are explained, by the caption, labels, or legends.
- Include a credit for any images/data that are not your own at the end of the caption. Request permission from the copyright owner if necessary.
- Captions are often written in italics or in a slightly smaller font, to distinguish them from the main text.
- Always check the guidelines of your chosen journal for exceptions to these rules.



Discussion

- 8 Show some graphs and tables you have used in your previous work. Discuss how the graphs and captions can be improved.

The conventions for drawing tables and figures are complicated, and lie beyond the scope of this coursebook. See the *Chicago Manual of Style* [21] for much useful advice.

5.3 Describe figures and tables

Pre-knowledge

All tables and figures should be referred to in the text. How much detail you give about each table and figure in the main text depends on the topic and the content of the table/figure.

- 9 Read the information in the Style guide. What do you think is the most important advice?

Style guide Introducing figures and tables

A typical cross-reference will introduce the figure or table by saying what it shows, describe the general features or trends, and highlight the most important data. Ensure that you do not simply repeat all the data that is given in the figure or table. You should also avoid repeating all the information given in the caption.

- When the words “table” or “figure” are followed by a number, the first letter is always capitalized (e.g. Table 1).
- Do not put a stop after the number of a figure or a table in the text (i.e. do not write “Figure 1. shows...”).
- Do not abbreviate the word “figure” if it is not followed by a number.
- Be consistent if you are abbreviating Figure to Fig. The plural abbreviated form can be Fig. or Figs.
- The abbreviation “Tab.” for “Table” is discouraged in many style guides.
- Do not start sentences with the abbreviated form Fig.
- You can refer to figures and tables within the sentence, or in brackets like this: “The results showed a positive correlation (Fig. 2)” or “(see Fig. 2)”.
- Do not write “As it is shown in Figure 1...” or “As Figure 1 shows...”. Do write “As shown in Figure 1...” or “Figure 1 shows...”
- In your first reference to a figure or table, always refer to by the number, e.g. “Table 1”, never to its position in the text (e.g. “see the table below”).
- In your discussion of a table or figure that has been introduced already by its number, you may subsequently use the definite article “the” to refer to “the table” or “the figure” that has been mentioned.
- Ensure that it is clear which figure or table you are referring to. Repeat the number if necessary.
- Always check the style guide of your chosen journal for exceptions to these rules.

Reflection

- 10 How can you decide which results to highlight in the main text?
- 11 Look at Fig. 2 [7]. Brainstorm vocabulary for describing the trends.

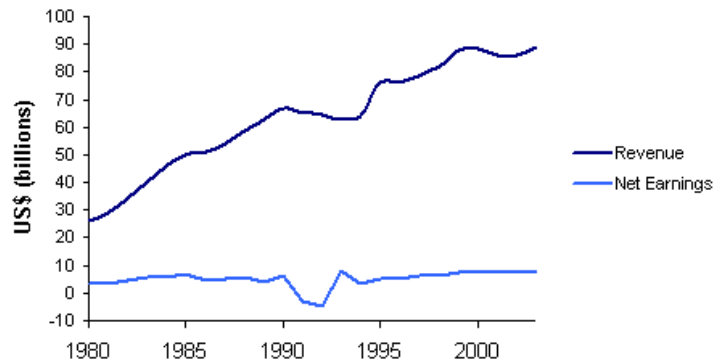


Fig. 2. IBM revenue and net earnings 1980–2003.

- 12 Complete the text with one word in each gap. There may be more than one correct answer.

Figure 2 ¹_____ the net earnings and revenue of IBM in the years 1980–2003. As can be ²_____, although overall revenues ³_____ in the period, net earnings remained relatively ⁴_____. This may have been due to the company’s large investments in research and development, capital expenditures, and acquisitions. In 1990, there was a rapid ⁵_____ in net earnings as revenues started to ⁶_____. According to the company, this was mainly an effect of the broader global slowdown, although some analysts blamed the costs of restructuring and the slow transition to the company’s new family of mainframe computers [Ref.]. Net earnings bounced ⁷_____ about two years later, and had recovered by 1995. After 1995, revenues continued to grow, with some ⁸_____ (especially due to the uncertainty surrounding Y2K).

Journal club

- 13 Working with a peer, select two top-cited research articles from your field. Discuss the questions.

- 1 For each experiment/method used, what did they find?
- 2 Do the results answer the research questions presented in the introduction?
- 3 Are all of the figures informative and necessary?

Assessment

- 14 Write the Results section for your research article. Invent any necessary details.

UNIT 6

Discussion and Conclusions

IN THIS UNIT YOU LEARN HOW TO:

- 1 Structure the Discussion section
- 2 Summarize and conclude

Grammar: Linking words and phrases

Style guide: Avoid unnecessary linking words



1 Pre-knowledge

If your paper has a separate Discussion section, this is where you compare and contrast your methods and results with those reported by other authors. You may also discuss the limitations of your study and areas requiring further research. In many articles, the Discussion section includes a brief conclusion paragraph. Other papers have a separate Conclusions section, which summarizes the purpose and content of the article. Some articles have a combined Discussion and Conclusions section.

2 Reflection

- 1 Work in groups. Answer the questions.
- Why is it important to relate your work to previous studies?
 - Why is it important to discuss the limitations of your research and avenues for future work?

3 Discussion

- 2 How do you think sleep affects academic performance?



- 3 Look at the picture above [8]. Discuss what you can do to improve the quality of your sleep.

6.1 Structure the Discussion section

- 4 Read the Discussion section from an article about the effect of sleep on academic performance [9]. Ignore the gaps. Do you find anything surprising? Is there anything you don't find surprising?

DISCUSSION

This study investigated the relation between sleep duration, sleep quality, and sleep consistency and academic performance. ¹ H Multiple linear regression revealed that these three sleep measures accounted for 24.4% of the variance in grade performance. Our results correlating overall sleep quality and duration with academic performance are in agreement with previous studies on the effects of sleep on cognitive performance [Ref]. **Likewise**, this study complements two linked studies which found that having more hours of sleep the week before final exams [Ref] and more consistent sleep for five days prior to a final assignment [Ref] enhanced students' performance. ² ____ It thereby provides new insights regarding the relation between sleep and academic performance.

Unlike a prior study [Ref], we did not find that longer sleep duration the night before an exam was associated with better test performance. ³ ____ Therefore, simply having a good night's sleep the night before a test may not be as helpful as being able to concentrate fully during class [Ref]. As reported in previous research [Ref], female students tended to experience better quality sleep and with more consistency than male students. ⁴ ____ This female advantage in terms of academic performance was eliminated once sleep patterns were statistically equated, suggesting that it may be especially important to encourage better sleep habits among male students (**although** developing such habits may be helpful for all students).

⁵ ____ First, sleep quality was determined using Fitbit, a wearable activity tracker. There is evidence that the use of cardiac, respiratory, and movement information from Fitbit devices can accurately estimate sleep stages [Ref]. **Nonetheless**, there is no published evidence that Fitbit's sleep quality scores represent a valid assessment of sleep quality. Second, the relation between sleep and academic performance may be moderated by factors that can affect sleep, such as stress, anxiety, motivation, personality traits, and gender roles. ⁶ ____ Third, our findings concern a particular student population at MIT enrolled on a particular course. Further studies are needed to assess the generalizability of these findings to other types of student populations and other kinds of classes.

⁷ ____ The tested parameters together accounted for a substantial amount (about a quarter) of the overall variance in academic performance.

5 Choose the best sentence (A–H) for each gap in the text. There is one sentence you will not need.

- A Establishing a causal relation between sleep and academic performance would require experimental manipulations in randomized controlled trials, **but** these are challenging to conduct in a real educational setting, when students care about their grades.
- B **In conclusion**, this study provides evidence for a strong correlation between sleep and academic performance, based on quantifiable and objective measures of sleep quality, duration, and consistency in the ecological context of a live classroom.
- C Females **also** received higher overall test scores compared with males.
- D **However**, the present study extends our understanding of the relationship between sleep and academic performance significantly, by using multiple objective measures of sleep over an entire semester, with academic assessments completed along the way.
- E **Instead**, both sleep duration and sleep quality over the full month and in the week before a midterm assessment were more strongly associated with test performance.
- F Several limitations of the present study should be noted.
- G **In fact**, the cognitive performance of an individual who has been awake for 17 h is equivalent to that exhibited by one who has a blood alcohol concentration of 0.05% [Ref].
- H **Overall**, there was a substantial association between sleep and academic performance.

6 Decide if the statements are true or false. Highlight the words and phrases in the text that helped you decide.

- 1 The results of the study are consistent with data reported in some other studies.
- 2 The study adds to existing knowledge about the topic.
- 3 The results contradict some previous studies.
- 4 The results could have practical implications or applications.
- 5 Not all the possible variables were taken into account.
- 6 The results are universally valid.
- 7 More research is underway to confirm and expand the results.

★ **Grammar** Linking words and phrases

Linking words and phrases can be used to compare, contrast, and add ideas, as well as draw conclusions. Table 1 lists some common linking words and phrases used in scientific writing.

7 Which words or phrases from Table 1 could be used to replace the words in bold in the text? Would there be any change in meaning or emphasis?

8 Complete the text below with the best options.

Online education is one of the fastest growing segments of Higher Education. **Despite / Nonetheless**, many teachers and employers remain skeptical about its quality and whether it provides value for money [Ref]. **Whereas / While** there is ample evidence that online learning has some benefits, the present study supports the consensus that face-to-face teaching is more effective. Previous studies have suggested that students learn faster online [Ref], **however / although** this was not supported by our results. **We also found that / What is more** the top students performed similarly in online and in-person courses. **Although / However**, weaker students did much worse online. Most previous studies report that the majority of students have positive attitudes towards e-learning [Ref], **whereas / while** in our survey group opinions were mixed. **Overall, / Finally**, this study raises questions about the effectiveness and popularity of online education.

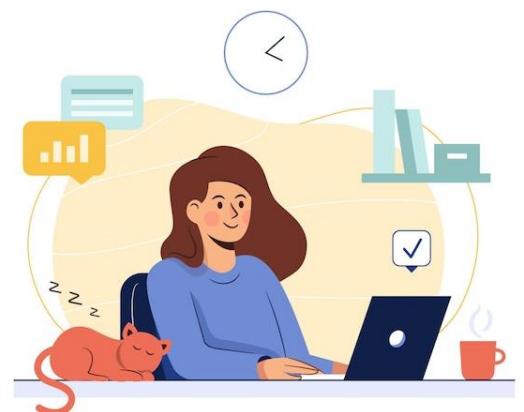
Table 1. Linking words and phrases.

Comparison or similarity	
similarly	
analogously	
for instance	
for example	
in the same way	
Contrast	
in contrast (to)	
contrary to	
nevertheless	
despite	
in spite of	
yet	
whereas	
while	
Addition	
furthermore	
in addition to	
additionally	
moreover	
also	
and	
as well as	
what is more	
in fact	
Conclusion	
finally	
to conclude	
in conclusion	
in summary	
in short	
in brief	
in general	
on the whole	

■ **Discussion**

9 Look at the picture below [10]. Discuss the questions.

- 1 What are your experiences of e-learning? What do you think are its advantages and disadvantages?
- 2 Do you have any experience of working from home (home office, remote work)? What do you think are its advantages and disadvantages?



Style guide Avoid unnecessary linking words

Linking words are not always necessary, if your ideas flow logically. Unnecessary linking words should be avoided.

- 10 Decide if the linking words in bold are necessary and cross out the unnecessary linking words [11].

The psychologist Jean Piaget noted that in order for learning to occur, the content must be meaningful to the student. **Moreover**, Piaget's constructivist theory of learning highlighted the importance of engaged learning where meaningful discussions were held between peers [Ref]. The sociologist Lev Vygotsky **likewise** emphasized the importance of social interaction in learning [Ref]. **In fact**, in traditional formal education this interaction occurs largely between the student and the teacher, but as students and teachers become distanced from each other in the virtual classroom, creative strategies for instruction are needed. **For example**, incorporating team projects can help alleviate feelings of isolation [Ref]. **What is more**, a "student lounge" can be created as an informal space for socialization not related to coursework [Ref]. **In addition**, use of video and audio components can enhance connection and communication with peers, as this supports learners to expand on their responses and engage in discussions [Ref]. **Nonetheless**, online instructors should be cognizant of where participants are physically located; when members of the course span two or more time zones, the timing of the course can become problematic [Ref].

6.2 Summarize and conclude

1 Pre-knowledge

If you have a separate Conclusions section, it is generally shorter than the Discussion. You should not normally add any new information, or discuss either your results or the research of others in detail. The Conclusions section should typically summarize the aims, methods, and main results of the article. It may also acknowledge the limitations of the study, and point to areas requiring further research. As such, it re-states much of the information given earlier in the paper. However, you should not simply copy/paste sentences and parts from previous sections.

- 11 Put this alternative conclusion to the article on sleep and academic performance (A–E) into the best order. Note there is no separate Conclusions section in the original article [9].
- 12 Match the parts of the summary (A–E) to the sections of the article in which the information is most likely to have first appeared—the Introduction, Methods, Results, or Discussion.

A

Wearable activity trackers were used to take multiple sleep measurements from students on an introductory college chemistry course. In total, 88 of the 100 participants completed the study. The duration, consistency, and quality of the students' sleep were correlated with their performance in quizzes and midterm examinations.

B

No relation was observed between sleep measures taken on the night before a test and the overall score. Differences in the academic performance of male and female students were noted, but these were eliminated once sleep patterns were statistically equated.

C

These findings provide quantitative, objective evidence that sleep quality, duration, and consistency each have a strong impact on academic performance in college. More work is needed to confirm the generalizability of the results and to explore possible moderating factors, such as stress, anxiety, motivation, personality traits, and gender roles.

D

In general, there was a strong correlation between longer, better quality, and more consistent sleep and better grades. Sleep measures accounted for nearly 25% of the variance in academic performance. Importantly, better grades were associated with the duration, quality, and consistency of sleep during the full month and in the week before a test.

E

This study set out to assess the relationship between sleep and academic performance.

Discussion

- 13 Discuss the questions.

- 1 How do you think sleeping habits affect workplace performance?
- 2 What can managers do to encourage their employees to get more sleep?
- 3 Does your workplace offer any resources or facilities to encourage employees to get a good night's rest?

Writing tip

Conclusions are what you infer from your research. A *conclusion* is the end, for example of a presentation. The most common heading for the concluding section of a research paper is *Conclusions*.

14 Put the useful phrases for the Conclusions section into the correct order.

- 1 set This out study to...
- 2 this In work, investigated... we
- 3 was The of this aim research to...
- 4 research are The of this that... findings key
- 5 suggest Our that... results
- 6 the present limitations of study the include fact The that...
- 7 necessary research is to... More
- 8 concentrate work will on... Future
- 9 already the Research by is to... underway authors
- 10 fields the research possible has applications This in of...

Journal club

15 Working with a peer, find a selection of research articles related to your research topic for this course. Discuss the questions.

- 1 What are the main methods used?
- 2 How are they different from the methods you are writing about for your paper?
- 3 How are the methods used in the research studies different from each other? Are the method used more or less appropriate / comprehensive than those used in other studies, including your own?
- 4 What are the main results of the papers? Are they different or do they support your results?
- 5 Do the papers present differing theories or opinions regarding the topic? Does your research support or contradict those theories or opinions?

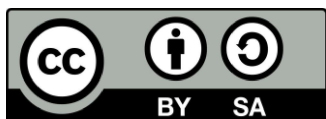
Assessment

16 Write a short Discussion and Conclusions section for your research article. Invent any necessary details.

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