

# 总序

习近平总书记在十九大报告中指出：“创新是引领发展的第一动力，是建设现代化经济体系的战略支撑。”因此，要“加强国家创新体系建设，强化战略科技力量”。在人才培养上，“培养造就一大批具有国际水平的战略科技人才、科技领军人才、青年科技人才和高水平创新团队”。

学术英语改革服务于国家宏观的人才培养战略，正在成为最近几年高校英语教学改革热点之一。学术英语课程的设置、开发、构建、实施和推广已成为高校外语课程改革的重要选择。

作为“中国科学院大学研究生教材系列”之一的“果壳学术英语系列教程”着力于学术英语课程的体系化建设，明确学术英语课程之间的层次感，区分基础学术英语能力和更高层次学术英语能力的培养，细化不同类型的学术英语能力，并注重不同类型学术英语能力之间的相互促进。学术英语能力本身是一个十分复杂的体系：从语言使用的角度看，包括学术英语的听、说、读、写等能力；从语言情景的角度看，包括参与学术讨论的能力、撰写学术申请的能力等；从学术思维的角度看，包括批判性思维能力、提出并解决问题的能力、创新思考能力等。学术英语教学应该是系统的、持续的、战略性的工程，唯有系统性地开展学术英语教学，才能更为有效地培养学生的学术英语能力。

“果壳学术英语系列教程”着力于培养有情怀的科学家。学术英语教学不应仅仅止于各项语言技能的传授，还应在提高学术素养、激发学术兴趣、明晰科学伦理意识、注重人文关怀、引发哲学思辨等方面培养具有一定知识广度和思想深度的科技人才。知识广度有助于激发创新性思维，思想深度有助于产生创新性成果。语言教育在充分展示工具性特征的同时，还需兼具开拓崭新视域、融合多维思考、审视固有模式的作用，从而鼓励创造性地提出问题和创造性地解决问题。新时代的新使命呼唤高水平科技人才和科技领军人才，科技人才需要具有国际视野，通晓人类共同关心的普遍问题，展现出不拘于专业领域的知识广度和思想深度，从而具备带领中国科技引领未来世界的能力。

我们认为，学术英语教学应确立人才培养的长期目标，在最初阶段为学生播下学术英语的种子，在接下来的培养过程中持续灌溉，最终助力学生成长成根基扎实的大树，即为国家新时代的新使命做出自己贡献的创新型科技领军人才。

总主编 高原

# 前言

在建设世界科技强国的背景下，研究生英语教学迎来了新的机遇与挑战。这也赋予了研究生英语教学新的使命：培养学生的学术意识与素养，加强学生的思辨能力，提高学生用英语进行学术研究和学术交流的能力，从而提升我国科研人才的核心竞争力。《研究生学术英语读写教程》在这样一个时代背景下应运而生。

本教程为“果壳学术英语系列教程”中的一册，遵循“以读促写、读写并重”的教学理念，旨在培养学术英语阅读和学术英语写作能力，以期提高学生学术表达的规范性，强化学术素养和学术意识，为研究生阶段的专业学习和学术研究打好语言基础。作为研究生的学术英语读写教材，本教程具有独特的整体性、系统性、严谨性和创新性，适合硕士、博士研究生以及高年级的本科生进行较为系统的学术阅读技能和学术写作技能的学习。

本教程以学科为基础，共包括十个单元，每个单元主题围绕一个学科或专业内容，包括心理学、地学、物理、数学、计算机科学、生物、材料学、化学、管理学和医学十大与理工科研究生专业密切相关的学科内容。每单元课文选材和练习设计既体现了本单元的学科内容，又直接与本单元的学术阅读技能或学术写作技能相关。这两项技能的讲解与练习贯穿每个单元，并且在十个单元的整体编排上循序渐进、环环相扣、前后呼应。

本教程单元结构如下：

## 一、学术阅读板块 (Academic Reading)

- 1.1 导入问题 (Lead-in Questions)
- 1.2 精选文章 (Text A)
- 1.3 词汇表达 (New Words and Expressions)
- 1.4 文后练习 (Building Your Vocabulary & Understanding the Text)
- 1.5 学术阅读技能讲解与练习 (Academic Reading Skills)

## 二、学术写作板块 (Academic Writing)

- 2.1 学术论文 (Text B)
- 2.2 学术写作技能讲解与练习 (Academic Writing Skills)

在学术阅读板块，文前的导入问题 (Lead-in Questions) 有助于学生熟悉单元话题和背景知识。精选文章 (Text A) 为一篇通用学术文章，其中包含的理性思考、人文色彩和社会影响跨越时空，历久弥新，重在培养学生的语言理解能力、文本赏析能力、思

辨能力和作为未来科学家的人文情怀。文中的注释采用脚注的形式，简要介绍文章中提到的人物、概念、术语等。文后的练习部分包括两大类：一是词汇练习（Building Your Vocabulary），帮助学生积累并掌握常用的学术词汇；二是阅读理解练习（Understanding the Text），帮助学生巩固并检验对课文的理解。学术阅读技能（Academic Reading Skills）由讲解和练习两个部分构成：讲解部分语言简明扼要，重点突出；练习部分针对技能讲解设题，循序渐进。在学术阅读板块中，学术阅读技能与本单元Text A的课文呼应，在教学中可以鼓励学生运用所学的阅读技能更好地理解Text A。

在学术写作板块，学术论文（Text B）节选自近期发表的、影响力较大的学科期刊论文，在学术内容和学术语言上体现了本单元的学术写作技能。课文注释亦采用脚注的形式，简要介绍文章中提到的概念、术语等。学术写作技能（Academic Writing Skills）由讲解和练习两个部分构成：讲解部分梳理写作思路，剖析写作步骤，总结写作技巧，与前一板块中的学术阅读技能相衔接，遵循以读促写的教学理念；练习由易及难，紧扣学术写作技能的核心知识点，以便在讲解后可以有针对性地进行练习。

根据每单元的学术能力培养目标，本教程可分成四个模块。1-2单元为“探究问题”模块，重点培养学生在阅读文献的过程中按照学术规范的要求高效记笔记的能力；3-5单元为“提出问题”模块，旨在培养学生的批判性思维能力，提高判断信息、分析信息和综述信息的能力，从而使学生能够创造性地发现问题、提出问题。提出有意义的研究问题之后，接下来的研究任务是如何解决问题，即在科学研究中如何进行研究设计和数据收集。由6-7单元组成的第三模块便为“解决问题”模块，重点培养学生描述研究过程和研究结果的能力。8-10单元为最后一个模块——“呈现报告”，这三个单元从学术论文的文体风格出发培养学生恰当地使用学术语言撰写学术论文的能力。从“探究问题”到“提出问题”“解决问题”和“呈现报告”，四个模块贯穿起来，构建起本教程的整体框架。在循序渐进的学术技能推进下，十个不同学科内容的单元呈现出独到的整体性和系统性。这一构架本身既体现了“研究是一个过程”的理念，又展示出“项目研究教学法”的优势。

本教程希望培养学生学习的自主性、积极性和团队合作精神，建议教师在使用本教程的过程中结合“微课”“翻转课堂”“项目研究教学法”等多种教学模式，鼓励学生多思考，多交流，多合作。

本教程由中国科学院大学教材出版中心资助，提供学习和教学资源，为英语教学提供支持。

鉴于编者水平有限，教程中的不足之处在所难免，敬请广大读者批评指正。

编者

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# Unit 1

# Psychology

I doubt, therefore I think; I think, therefore I am.

— René Descartes



## 1 Academic Reading

**Text A:** Descartes Was Wrong: “A Person Is a Person Through Other Persons”

**Academic Reading Skills:** Predicting Theme and Identifying Patterns and Structures

## 2 Academic Writing

**Text B:** The Impacts and Opportunities of Face Recognition Variability Outside the Lab

**Academic Writing Skills:** Paraphrasing

## 1

# Academic Reading

## Lead-in Questions

1. What is your opinion of the quotation “I think, therefore I am”?
2. How do other people affect your self-perception?

## Text A

## Descartes Was Wrong: “A Person Is a Person Through Other Persons”

Abeba Birhane

- 1 According to Ubuntu<sup>1</sup> philosophy, which has its origins in ancient Africa, a newborn baby is not a person. People are born without “ena”, or selfhood, and instead must acquire it through interactions and experiences over time. So the “self”/“other” distinction that’s axiomatic in Western philosophy is much blurrier in Ubuntu thought. As the Kenyan-born philosopher John Mbiti put it in *African Religions and Philosophy* (1975): “I am because we are, and since we are, therefore I am.”
- 2 We know from everyday experience that a person is partly forged in the crucible of community. Relationships inform self-understanding. Who I am depends on many “others”: my family, my friends, my culture, my colleagues. The self I take grocery shopping, say, differs in her actions and behaviours from the self that talks to my PhD supervisor. Even my most private and personal reflections are entangled with the perspectives and voices of different people, be it those who agree with me, those who criticise, or those who praise me.
- 3 Yet the notion of a fluctuating and ambiguous self can be disconcerting. We can chalk up this discomfort, in large part, to René Descartes<sup>2</sup>. The 17th-century French

1 Ubuntu: 乌班图，起源于非洲南部的一种伦理概念。

2 René Descartes: 勒内·笛卡尔，法国哲学家、数学家和科学家。



philosopher believed that a human being was essentially self-contained and self-sufficient; an inherently rational, mind-bound subject, who ought to encounter the world outside her head with skepticism. While Descartes didn't single-handedly create the modern mind, he went a long way towards defining its contours.

- 4 Descartes had set himself a very particular puzzle to solve. He wanted to find a stable point of view from which to look on the world without relying on God-decreed wisdoms; a place from which he could discern the permanent structures beneath the changeable phenomena of nature. But Descartes believed that there was a trade-off between certainty and a kind of social, worldly richness. The only thing you can be certain of is your own *cogito*<sup>3</sup> – the fact that you are thinking. Other people and other things are inherently fickle and erratic. So they must have nothing to do with the basic constitution of the knowing self, which is a necessarily detached, coherent and contemplative whole.
- 5 Few respected philosophers and psychologists would be identified as strict Cartesian dualists<sup>4</sup>, in the sense of believing that mind and matter are completely separate. But the Cartesian *cogito* is still everywhere you look. The experimental design of memory testing, for example, tends to proceed from the assumption that it's possible to draw a sharp distinction between the self and the world. If memory simply lives inside the skull, then it's perfectly acceptable to remove a person from her everyday environment and relationships, and to test her recall using flashcards or screens in the artificial confines of a lab. A person is considered a standalone entity, irrespective of her surroundings, inscribed in the brain as a series of cognitive processes. Memory must be simply something you *have*, not something you *do* within a certain context.
- 6 Social psychology purports to examine the relationship between cognition and society. But even then, the investigation often presumes that a collective of Cartesian subjects are the real focus of the enquiry, not selves that co-evolve with others over time. In the 1960s, the American psychologists John Darley and Bibb Latané became interested in the murder of Kitty Genovese, a young white woman who had been stabbed and assaulted on her way home one night in New York. Multiple people had witnessed the crime but none stepped in to prevent it. Darley and Latané designed a series of experiments in which they simulated a crisis, such as an epileptic<sup>5</sup> fit, or

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3 *cogito*: 笛卡尔的哲学思想 “我思故我在”

4 dualists: 二元论者

5 epileptic: 癫痫的

## 4 Unit 1

smoke billowing in from the next room, to observe what people did. They were the first to identify the so-called “bystander effect”, in which people seem to respond more slowly to someone in distress if others are around.

- 7 Darley and Latané suggested that this might come from a “diffusion of responsibility”, in which the obligation to react is diluted across a bigger group of people. But as the American psychologist Frances Cherry argued in *The Stubborn Particulars of Social Psychology: Essays on the Research Process* (1995), this numerical approach wipes away vital contextual information that might help to understand people’s real motives. Genovese’s murder had to be seen against a backdrop in which violence against women was not taken seriously, Cherry said, and in which people were reluctant to step into what might have been a domestic dispute. Moreover, the murder of a poor black woman would have attracted far less subsequent media interest. But Darley and Latané’s focus makes structural factors much harder to see.
- 8 Is there a way of reconciling these two accounts of the self – the relational, world-embracing version, and the autonomous, inward one? The 20th-century Russian philosopher Mikhail Bakhtin believed that the answer lay in dialogue. We need others in order to evaluate our own existence and construct a coherent self-image. Think of that luminous moment when a poet captures something you’d felt but had never articulated; or when you’d struggled to summarise your thoughts, but they crystallised in conversation with a friend. Bakhtin believed that it was only through an encounter with another person that you could come to appreciate your own unique perspective and see yourself as a whole entity. By “looking through the screen of the other’s soul”, he wrote, “I vivify my exterior.” Selfhood and knowledge are evolving and dynamic; the self is never finished – it is an open book.
- 9 So reality is not simply *out there*, waiting to be uncovered. “Truth is not born nor is it to be found inside the head of an individual person, it is born *between people* collectively searching for truth, in the process of their dialogic interaction,” Bakhtin wrote in *Problems of Dostoevsky’s Poetics* (1929). Nothing simply is itself, outside the matrix of relationships in which it appears. Instead, *being* is an act or event that must happen in the space between the self and the world.
- 10 Accepting that others are vital to our self-perception is a corrective to the limitations of the Cartesian view. Consider two different models of child psychology. Jean Piaget’s theory of cognitive development conceives of individual growth in a Cartesian fashion, as the reorganisation of mental processes. The

developing child is depicted as a lone learner – an inventive scientist, struggling independently to make sense of the world. By contrast, “dialogical” theories, brought to life in experiments such as Lisa Freund’s “doll house study” from 1990, emphasise interactions between the child and the adult who can provide “scaffolding” for how she understands the world.

- 11 A grimmer example might be solitary confinement in prisons. The punishment was originally designed to encourage introspection: to turn the prisoner’s thoughts inward, to prompt her to reflect on her crimes, and to eventually help her return to society as a morally cleansed citizen. A perfect policy for the reform of Cartesian individuals. But, in fact, studies of such prisoners suggest that their sense of self dissolves if they are punished this way for long enough. Prisoners tend to suffer profound physical and psychological difficulties, such as confusion, anxiety, insomnia, feelings of inadequacy, and a distorted sense of time. Deprived of contact and interaction – the external perspective needed to consummate and sustain a coherent self-image – a person risks disappearing into non-existence.
- 12 The emerging fields of embodied and enactive cognition<sup>6</sup> have started to take dialogic models of the self more seriously. But for the most part, scientific psychology is only too willing to adopt individualistic Cartesian assumptions that cut away the webbing that ties the self to others. There is a Zulu<sup>7</sup> phrase, “*Umntu ngumuntu ngabantu*”, which means “A person is a person through other persons”. This is a richer and better account, I think, than “I think, therefore I am”.

## New Words and Expressions

**axiomatic** /ˌæksɪəˈmæɪtɪk/ *adj.* something that is axiomatic does not need to be proved because you can easily see that it is true 不需证明的，不言自明的

**blurry** /ˈblɜːri/ *adj.* indistinct or hazy in outline 模糊的

**forge** /fɔːdʒ/ *vt.* to develop something new, especially a strong relationship with other people, groups, or countries 形成，缔造

**crucible** /ˈkruːsɪbəl/ *n.* a container in which substances are heated to very high temperatures 坩埚，熔炉

6 enactive cognition (or enactivism): 生成认知

7 Zulu: 南非祖鲁族人 (的)

## 6 Unit 1

**inform** /ɪn'fɔ:m/ *vt.* to influence someone's attitude or opinion 影响 (某人的态度或观点)

**entangle** /ɪn'tæŋɡəl/ *vt.* to involve someone in an argument, a relationship, or a situation that is difficult to escape from 使卷入, 使陷入

**disconcerting** /,dɪskən'sɜ:tɪŋ/ *adj.* making you feel slightly confused, embarrassed, or worried 令人困惑的, 令人尴尬的, 令人不安的

**contour** /'kɒntʊə/ *n.* the shape of the outer edges of something such as an area of land or someone's body 轮廓; 外形

**discern** /dɪ'sɜ:n/ *vt.* to notice or understand something by thinking about it carefully (仔细想之后) 觉察出, 弄清楚, 辨明

**fickle** /'fɪkəl/ *adj.* someone who is fickle is always changing their mind about people or things that they like, so that you cannot depend on them 三心二意的, 靠不住的, 变化无常的  
something such as weather that is fickle often changes suddenly (天气等) 变幻莫测的

**erratic** /ɪ'rætɪk/ *adj.* something that is erratic does not follow any pattern or plan but happens in a way that is not regular 不规则的, 不确定的, 不稳定的

**contemplative** /kən'templətɪv, 'kɒntemplətɪv/ *adj.* spending a lot of time thinking seriously and quietly 沉思的, 冥想的, 默想的

**confines** /'kɒnfəɪnz/ *n.* limits or borders 范围, 界限

**inscribe** /ɪn'skraɪb/ *vt.* to carefully cut, print, or write words on something, especially on the surface of a stone or coin (尤指在石头或硬币表面) 雕刻, 印制, 题写

**purport** /pɜ:'pɔ:t/ *vt.* to claim to be or do something, even if this is not true 声称

**bystander** /'baɪ,stændə/ *n.* someone who watches what is happening without taking part 旁观者, 局外人, 看热闹的人

**dilute** /daɪ'lju:t/ *vt.* to make a quality, belief etc. weaker or less effective 降低(质量); 削弱(信念)

**reconcile** /'rekənsaɪl/ *vt.* if you reconcile two ideas, situations, or facts, you find a way in which they can both be true or acceptable 使和谐一致; 调和; 协调

**luminous** /'lu:mɪnəs/ *adj.* shining in the dark 发光的; 夜明的

**crystallise** /'krɪstəlaɪz/ *v.* if an idea, plan etc. crystallises or is crystallised, it becomes very clear in your mind (使想法、计划等) 变得明朗而具体

**vivify** /'vɪvə'faɪ/ *vt.* to give new life or energy to something 使生动, 使活跃

**solitary** /'sɒlɪ'təri/ *adj.* doing something without anyone else with you 单独的, 无伴的

**introspection** /,ɪntrə'spekʃən/ *n.* the process of thinking deeply about your own thoughts, feelings, or behaviour 内省, 反省

**insomnia** /ɪn'sɒmniə/ *n.* if you suffer from insomnia, you are not able to sleep 失眠

**consummate** /'kɒnsəmeɪt/ *vt.* to make something complete, especially an agreement 实现, 完成

**embody** /ɪm'bɒdi/ *vt.* to be a very good example of an idea or quality 代表, 体现 (思想或品质)

## Building Your Vocabulary

### Task 1

Complete the following sentences using the expressions in the box below. Change the form where necessary.

solitary	scaffold	inscribe	contour
purport	wipe away	axiomatic	contextual

1. Nowadays, there are hundreds of insurance policies that \_\_\_\_\_ to provide cyber insurance coverage.
2. Even modest price competition can easily \_\_\_\_\_ a third or more of operating income if grocers use lower prices to win customers.
3. Oracle Mobile Cloud aims to provide a more \_\_\_\_\_ user experience, which enables chatbots to switch seamlessly between unstructured conversation and personalised, structured data exchange.
4. In a beautiful mid-19th century painting by Rosa Bonheur, it's possible to see asymmetrical "mountains" in the \_\_\_\_\_ of her sheep's hindquarters.
5. He looked pleased: a(n) \_\_\_\_\_ man, by the look of him, one who cherished his privacy.
6. Each step you take provides \_\_\_\_\_ which will enable you to build the essay a little further.
7. It is \_\_\_\_\_ that all the sites that are infected should be treated if there is to be any hope of cure.
8. The memoirs of these survivors are rarely \_\_\_\_\_ in the chroniclers' sentimental journeys.

## Understanding the Text

### Task 2

Choose the statement that best summarises the theme of Text A.

- A The "self"/ "other" distinction has a long-term influence in academia.
- B Self-perception develops through impacts from others.
- C Descartes was wrong, due to the "self"/ "other" distinction on selfhood.

**Task 3** Read Paragraphs 3–4 and analyse the pattern the writer has used to explain Descartes' opinion on selfhood.

A large rectangular area with a light gray background and a scalloped bottom edge, containing ten horizontal dotted lines for writing.

# Academic Reading Skills

## Predicting Theme and Identifying Patterns and Structures

A piece of writing for general purposes is composed of a title (in some cases, a title and subtitles), an introduction, a body and a conclusion, and each of these should echo the theme. For research that involves reading a huge number of academic papers, researchers should optimise their reading strategy, thereby saving time and increasing efficiency. To this end, a quick scan of the paper's title (and the subtitles), the abstract, the introduction (particularly the final part of the introduction) and the conclusion, while skipping the body, would present a general idea of the paper. And to identify the theme or the main ideas of a paper sometimes would even shed light upon important details, such as research methodology, major problem(s) encountered and the conclusion reached. By this time, researchers should decide whether the paper benefits their research and whether it is necessary to go on reading the rest or not.

Authors choose from a variety of patterns and structures to organise the information for readers.

### Chronological sequence

Authors can proceed with their writing in the order of time. Look for time markers, such as “in 1989” and “last winter”, at the start of a sentence while perusing the text. Longer time markers, usually in the form of adverbial clauses, tend to be placed toward the end to avoid a top-heavy sentence structure. For instance, “The Chinese economy has soared since the introduction of the epoch-making policy of reform and opening-up in 1978”. With those time markers, readers can understand the chronological order of the article better. For example:

*Research spanning many decades has shown nutrients in the gastrointestinal tract can shape animals' flavour preferences. One of the earliest findings of this effect dates back to the 1960s, when Garvin Holman of the University of Washington reported hungry rats preferred consuming a liquid paired with food injected into the stomach rather than a solution coupled with a gastric infusion of water. More recently Ivan de Araujo, a neuroscientist at the Icahn School of Medicine at Mount Sinai, and his colleagues have shown calories can trump palatability: Their work has demonstrated mice prefer consuming bitter solutions paired with a sugar infusion injected in the gut rather than*

*a calorie-free sweet solution.*

## Cause & Effect

This is fairly self-explanatory. Do beware of the tendency of the English language that places effect before cause, which is traceable to Aristotelian deductive thought. This may explain why many English writers will state the conclusion, the topic sentence, or the effect first, and then provide the evidence, the rationale, the cause and other subordinate information. For example:

*One of the reasons that games like Fortnite are so addicting is that they play on the human emotional system, comprised of a long-standing set of psychological adaptations that has features going back millions of generations and across thousands of kinds of species of animals. Darwin himself was the first person to really make a strong case for the evolved function and motivational nature of the human emotional system.*

## Comparison & Contrast

Comparisons and contrasts are extensively employed in writing. Due to the fact that the English language is a hypotactic language, meaning that logical connections between sentences are usually exposed via transitional devices, such as “in addition”, “therefore”, “in contrast”, etc., comparisons and contrasts are usually easy to identify through commonly used transitional expressions. For example:

*Encoding refers to the temporary registration of sensations and thoughts into short-term memory, a kind of “buffer” or RAM that can hold information up to 30 seconds. For any event we experience, including this one, we’re not taking in every detail. From moment to moment, what our brain encodes is a function of what we’re paying attention to, and what has emotional significance to us. Those details are called central details. In contrast, what we’re not paying attention to, or has little or no significance to our brain at the time, are called peripheral details. Those are encoded poorly or not at all.*

## Classification

The writer, in order to facilitate reader understanding or arrive at a conclusion, usually needs to define which category a piece of random information belongs to, and whether it is quantitative or qualitative, prescriptive or descriptive, instructive or argumentative, etc. Pieces of information of the same nature or purpose should be combined into the same category. For example:



*Abundant evidence links personality with emotion via coping. Alternatively, personality can be viewed as an emergent property of responses to the experience of emotion. Dispositions to control, approach, escape, and avoid one's emotional experience underlie diverse traits, including positive and negative urgency, trait emotional approach and avoidance, alexithymia, and emotional expressiveness.*

## Problem & Solution

Critical essays sometimes will identify the problems of a theory and propose solutions to these problems. In other words, problems are almost always identified and explained before their potential solutions are proposed. Keep this cognitive sequence in mind when browsing through a text for this relationship. For example:

*A new study published in Computers in Human Behaviour shows how attitudes about communicating online – such as whether a person believes texting will lead to miscommunication, is easier than face-to-face communication or is an important part of maintaining relationships – can explain “text intensity”, or how dependent that person is on text messaging. According to Dr. Andrew Ledbetter, there are five attitudes people can hold about online communication. People vary on how much they hold each of these five attitudes. Those variations can come from the way a person grew up communicating with their family or that person's competence or skill at communicating with others.*

Readers experience a variety of text structures. They select specific comprehension strategies that fit a particular text based on knowledge of how the information is organised. Readers can anticipate what information will be revealed in a selection when they understand text structure. Understanding the pattern of a text helps readers organise ideas for synthesising and summarising. Here are some guiding questions to understand the pattern or structure of a text.

- ✓ Skim the article for titles, subtitles, headings, and key words. After scanning the text, how do you think the author organises the information?
- ✓ Which framework does this author use to organise the information? Chronological? Cause & Effect? Problem & Solution? Comparison & Contrast?
- ✓ Does the author use a combination of different patterns?
- ✓ How does the author organise the text to be “reader-friendly”?
- ✓ Which text features help you collect information from the article?

**Task 1** Predict the theme of Text A.

By scanning the title and the introduction of Text A, it can be inferred that the theme of the passage is that \_\_\_\_\_.

- A the Cartesian notion of “I think, therefore I am” is perfectly justified
- B neither the Cartesian nor the Ubuntu philosophy is reasonable
- C the Cartesian philosophy makes more sense than the Ubuntu one given that the former finds its roots in the superior Western culture
- D the Ubuntu philosophy differs from the Cartesian one in that the former doesn’t consider selfhood as inborn

**Task 2** Match the following paragraphs with their roles in Text A.

Paragraph	Role in Text A
Para. 1: ____	A The omnipresence of the Cartesian view in the actual world
Para. 2: ____	B One explanation of a social psychology experiment
Para. 3: ____	C Lead-in to the theme
Para. 4: ____	D Brief introduction of the Cartesian view
Para. 5: ____	E Examples stressing the benefits of harmonising the two views
Para. 6: ____	F An alternative explanation to the social psychology experiment
Para. 7: ____	G Reiteration of the author’s preference towards one of the two views
Para. 8: ____	H An intuitive, common-sense-based understanding of the Ubuntu view
Para. 9: ____	I Reconciliation of the two views
Para. 10: ____	J Application of the reconciliatory approach to understanding reality and truth
Para. 11: ____	K Examples showing the negative consequences of leaving the differences of the two views unattended to
Para. 12: ____	L Uneasiness on the understanding of selfhood is attributable to the Cartesian view

## Task 3

Read the following passage and discuss the patterns or structures the author has used to organise the information.

### Black Lies

Deception is so common that not only humans, but even animals engage in it. For instance, while apes often simply take food from weaker counterparts, they have also been shown to employ deception. When they can steal food by reaching through opaque instead of see-through tunnels, they often reach for the opaque tunnels so that their competitors cannot detect their actions. These cases of deception are exploitative, as the deceiving apes strategically mislead their counterparts for personal benefits (e.g. tasty food). But what determines whether or not people (and apes) engage in such black lies?

An obvious factor that influences whether people deceive is whether they think that they will get caught. For example, low chances of being detected increase deception of taxpayers. Such behaviour is rational, as being detected reduces the gain one can expect. Imagine the used car dealer who considers lying about a car's history of accidents to charge a higher price for the car (i.e. the gain). If the lie is easily detected (e.g. if the car has bumps and scratches), the likelihood to sell the car decreases. Consequently, the salesman will be honest.

A common assumption is that, rationally, deceiving for higher, rather than lower gains is more beneficial. Surprisingly however, this is not what psychological research finds. People seem to cheat equally often when both high and low gains are at play. Research suggests that cheating does not only depend on materialistic gains, but also on psychological costs that deception inflicts on the deceiver. On the one hand, deceiving for larger gains is more attractive than deceiving for smaller gains. On the other hand, deceiving for larger gains carries larger psychological costs. Psychological costs – the internal discomfort that people experience when doing something against their beliefs or values – depend on the magnitude of a lie. In one experiment, participants were paid according to the outcome they secretly rolled with a die. When asked about their outcome, they were more likely to commit “smaller” deceptions (i.e. reporting 5 instead of 4) than “bigger” ones (reporting 6 instead of 1). Thus, it seems that the psychological cost of telling a lie increases with the magnitude of the lie.

The psychological costs of a lie are closely linked to what one thinks about oneself. In general, people want to think that they are honest. Telling big lies and deceiving others is incompatible with this image. Telling somewhat smaller lies that are “almost true” is easier to reconcile with a positive image of oneself. Because generating a plausible justification for one's lie (e.g. “I almost rolled a 6 with my die”) is often a crucial part

of deception, limiting people's ability to come up with explanations for their lying increases honesty. Furthermore, measures that highlight that one wants to be a good person increase subsequent honesty. For example, signing on top of a self-report form (e.g. tax returns) increases the attention to the moral self. Consequently, people cheat less when completing the form. In other words, the human desire to view oneself as a moral person can be utilised to deter deception.

Taken together, people try to exploit others with black lies. Whether people engage in black lies depends on whether something can be gained through the deception, whether they will get caught, and whether psychological costs occur.

Yet, there is another important factor: the relationship with the deceived. Research shows that cheating socially distant others is more acceptable. However, people more frequently deceive close others. A possible explanation is that there is often more to gain from deceiving close others, and more to lose from revealing unpleasant truths. However, we suggest that this is not the only reason. Deception is not only driven by exploitative motives but can also result from affiliative motives. Therefore, we next discuss cases of deception that result from the motivation to forge a positive relationship with the deceived or to please the deceived.

#### Task 4

Read the following passage and choose the best answer to each exercise from the choices given below.

### Chimpanzees Play the Ultimatum Game

Darby Proctor et al

Humans often make decisions that seem irrational from an economic perspective. For instance, they may engage in behaviour that actually decreases their absolute wealth. One explanation for these decisions is that humans are not only concerned with their own rewards but also the rewards of others. Human reactions to reward distributions have been extensively studied by means of experimental economics tasks, in particular the ultimatum game<sup>8</sup> and the dictator game<sup>9</sup>. In the ultimatum game (UG), one individual (the proposer) is asked to split a quantity of money with another individual

8 ultimatum game: 最后通牒博弈，一种由两名参与者进行的非零和博弈。在这种博弈中，一名提议者向另一名响应者提出一种分配资源的方案，如果响应者同意这一方案，则按照这种方案进行资源分配；如果不同意，则两人都什么也得不到。

9 dictator game: 独裁者博弈，对最后通牒博弈进行修改，取消响应者对提议者所提要求的否决权，分配者就可以被叫作“独裁者”。

(the respondent). If the respondent accepts the offer, both players are rewarded using the proposed split. If the respondent rejects the offer, then neither player is rewarded. The dictator game (DG) is a variant of the UG in which the respondent has no chance to reject the offer and thus all of the proposer's offers are "accepted".

Proposers in both the UG and DG generally go against their own short-term interests in offering the partner more than the minimum possible amount of money. In UGs, people from Western cultures typically offer around 50% of the available money, even in anonymous one-shot games that lack any future interaction. In DGs, people still offer more of the money than a purely self-interested model would suggest, but offers are lower than in UGs. The reasons why humans typically offer more than self-interested models would predict are twofold. First, humans may be concerned with the welfare of others and thus behave more generously out of an altruistic motivation. Second, they may anticipate refusals of inequitable reward distributions during UGs and make larger offers to ensure that they are accepted, thus serving their own self-interest. Whereas either of these reasons is sufficient to drive human behaviour in these tasks, they may also work in concert.

However, cultural norms of fairness vary across study populations. For example, the Lamelara of Indonesia<sup>10</sup> typically offer more than a fair share (mean 58%), presumably because they are culturally dependent on large-scale cooperation (to hunt whales) and thus have mechanisms in place to share surplus resources. In contrast, the Hadza of Tanzania<sup>11</sup>, who are hunter-gatherers that share food with group members because of cultural expectations and the fear of ostracism<sup>12</sup>, make the lowest offers of any study population, and these offers are often rejected. This likely occurs because of the specific experimental setting of the UG, which may reduce the fear of being ostracised, allowing the Hadza participants to follow their self-interest. In all cases, a given culture's degree of cooperation, sharing, and punishment influences offers in economic games. What remains unclear is how other primates, including one of our closest living relatives, the chimpanzee (*Pan troglodytes*<sup>13</sup>), respond to these types of situations. Studying other primates may shed light on the evolutionary basis for the human tendency towards "fair" distributions.

10 the Lamelara of Indonesia: 印度尼西亚的拉买拉拉捕鲸人

11 the Hadza of Tanzania: 坦桑尼亚的哈德萨狩猎人

12 ostracism: 排挤, 孤立。陶片放逐法 (Ostracism) 是古希腊雅典等城邦实施的一项政治制度。雅典公民可以在陶片上写上那些不受欢迎以及极具社会威望、广受欢迎、最可能成为僭主的人的名字, 并通过投票表决将企图威胁雅典民主制度的政治人物予以政治放逐。

13 *Pan troglodytes*: 黑猩猩的学名

16 Unit 1

1. A scan of the title and the above introduction, taken from a psychological paper, indicates that the theme of the entire passage is most probably about \_\_\_\_\_.
  - A the economic incentives when humans make decisions
  - B the balancing of short-term and long-term interests by proposers in Ultimatum and Dictator Games
  - C the probe into the evolution of the human sense of fairness via the study of chimpanzees and other primates
  - D the debate on the inherent selfishness of the human species
  
2. How does the underlined sentence structure-wisely relate to the preceding paragraph?
  - A It introduces individual differences to generalisations.
  - B It leads to conclusions from supporting evidence.
  - C It presents a contradiction to a research finding.
  - D It serves as an illustration of a consensus.
  
3. Which one of the following hypothetical scenarios best matches the writing pattern of the second and the third paragraphs?
  - A Despite local activists' ardent and successful campaign urging the authority to loosen restrictions on Internet censorship, the overall political landscape of this particular region has not exactly displayed a marked improvement on a decade ago.
  - B The crime rates in all parts of the Town of Wisteria are below the national average. Such reassuring generality notwithstanding, the crime rate in the downtown area is relatively high due to a lack of nightly patrol, whereas the suburbia is almost immune to illegalities.
  - C John, a heavy smoker, has received an unexpectedly high overall score in his annual physical check-up. In particular, his lungs are rated positively by all the tests; so are his dental hygiene. This surprise may be attributable to his regular and conscientiously-executed physical exercise and frequent visits to the dentists.
  - D ABC Middle School is acknowledged as a highly diverse institution. However, circumstances vary between the junior and senior middle school divisions. The former is known for the students' highly diverse talents – artistic, academic, or otherwise; whereas the latter, probably faced with exam pressures, is far from diverse by any measure.

# Academic Writing

## The Impacts and Opportunities of Face Recognition Variability Outside the Lab

Brad Duchaine

- 1 Individual differences in psychological characteristics are taken into account in many situations in daily life. Lifeguards need to be strong swimmers, pilots must have good vision and courtrooms treat eyewitness testimony cautiously when witnesses were tired or under the influence of drugs. Similarly, individual differences in face recognition are relevant in a number of occupations and situations.
- 2 Police work is one occupation that obviously benefits from excellent face recognition ability. In the last few years, London's Scotland Yard<sup>14</sup> has assembled a group of 200 police officers who have especially strong face recognition and used them to great effect. For example, after the London riots of 2011, the police had thousands of hours of low-quality video from security cameras, and most officers were able to recognise very few of the suspects and face recognition software also fared poorly. In contrast, one police constable was able to identify 180 suspects in the videos because of his excellent face recognition ability. Scotland Yard also engages a group of super-recognisers to view live footage from security cameras during large festivals and gatherings like the Notting Hill Carnival in order to identify known offenders.
- 3 Inspired by the success in London, the police department in St. Petersburg, Florida contacted me in order to test the face recognition abilities of their 750 employees. Laura Germine at Harvard Medical School and I are developing a method that we will use to test all the officers and staff, and the department will then consider face recognition ability when assigning people to tasks. People with extraordinary face recognition may be used in a manner similar to the super-recognisers in London,

14 Scotland Yard: 苏格兰场（英国首都伦敦警务处总部及其代称）

whereas officers with especially poor face recognition can focus on tasks that do not demand strong face recognition. Face recognition ability may also become a factor that departments consider when hiring new officers.

- 4 Face recognition abilities are also highly relevant to security personnel who inspect identification photos. Face matching to IDs is difficult even for professionals with normal face recognition, with one recent study showing passport control officers accept fraudulent photos 14 percent of the time. This study also found that, despite years of experience inspecting passport photos, passport officers are no better than student participants at matching faces.
- 5 Each time I pass through airport security or customs, I wonder about the face recognition abilities of the person checking my ID. Is their face recognition good enough that they would be likely to notice a fraudulent photo that resembles the ID holder? Given the large number of Transportation Security Administration officers, it seems a near certainty that a significant number of them spend hours each day checking IDs even though their face recognition is so poor they should be assigned to other jobs.
- 6 Thousands of studies have investigated the accuracy of and influences on person recognition by eyewitnesses. It is well known that accuracy in eyewitness identification is poor, and retrospective analyses show that eyewitness identification errors are an important source of miscarriages of justice. However, the role that individual differences in face recognition ability play has only recently been examined. Not surprisingly, people who score better on face recognition tests are also better at eyewitness identification. Given the important role that eyewitness identification often plays in prosecutions, assessments of the face recognition ability of eyewitness should be carried out to allow police, judges and juries to better gauge the credibility of an eyewitness's identification of a suspect.
- 7 The military could also benefit from consideration of face recognition ability. Several prosopagnosics<sup>15</sup> have told me that their time in the military was extremely challenging because uniforms and short hair deprived them of cues they normally rely on. If prosopagnosics were identified when they enlist, accommodations could be made for them. In addition, although this review has focused on face identification, variability also exists for other aspects of face processing that are

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15 prosopagnosics: 面孔失认症患者，面孔失认症是一种神经心理性疾病，表现为对熟悉面孔的识别能力降低或丧失。



important for military personnel such as emotion recognition and other social judgements. Soldiers often need to engage with local populations in face-to-face interactions, often in the absence of a common language, and in such situations properly reading the face is critical.

- 8 In summary, psychological research has revealed that face recognition ability varies greatly. Face recognition ability impacts a number of occupations and consequential situations, and consideration of these differences holds promise as a means to help organisations dedicated to law enforcement and security function more efficiently.

# Academic Writing Skills

## Paraphrasing

There are three standard ways to incorporate academic sources into your paper: quoting, paraphrasing, and summarising. When you read through academic papers or articles, paraphrasing or summarising effectively in your notes for your current or future research can not only save your time in collecting different ideas but also help you avoid plagiarism in using them properly in your own article.

Paraphrasing refers to rewriting a given sentence or an excerpt using your own words. When you need to use other people's ideas or thoughts, you can paraphrase them to integrate them into your own writing as well as to give the original writer proper credit. In addition to using different words, you can use different grammar (e.g. different parts of speech). A proper paraphrase will demand the change of structure, particularly for longer statement(s). Otherwise, it might be considered as plagiarism of structure. Usually, the change of structure will be first considered before you use different words or different grammar.

The main purpose of paraphrasing has to do with being able to use someone else's ideas properly while you incorporate them into your own texts. Of course, it is required that any writer acknowledges the original source by using the proper citation format.

Read the following example to analyse the differences between appropriate and inappropriate paraphrase.

**Original sentence:** Human reactions to reward division are often studied by means of the ultimatum game, in which both partners need to agree on a distribution for both to receive rewards.

**Inappropriate paraphrase:** People's responses to the division of rewards are usually researched through the ultimatum game, and in such a game both players should reach consensus on a distribution for both to be rewarded. (This paraphrase only changes a few details of wording, for example, converting "human" to "people", or "studied" to "researched", while keeping the grammatical structure largely intact. Such technique is far from sufficient to write up a proper paraphrase.)

**Appropriate paraphrase:** In an ultimatum game, if both players are to be rewarded, consensus is required of both of them on how the distribution should be conducted. It is through this game that research attempts to understand how human beings respond to reward distribution.

Paraphrasing consists of two processes mainly: One is close reading, and the other rewriting. Specifically, the following steps can help you paraphrase a text effectively.

- Step 1 Read the text you want to paraphrase until you fully understand its meaning, the relationship between different information, and the author's purpose or intention.
- Step 2 Reorganise the information in a new or different order.
- Step 3 Rewrite its points in your own words and expressions.
- Step 4 Check your paraphrasing against the original.
- Step 5 Include a citation.

### Task 1 Paraphrase the following sentences from Text B.

1. People with extraordinary face recognition may be used in a manner similar to the super-recognisers in London, whereas officers with especially poor face recognition can focus on tasks that do not demand strong face recognition. Face recognition ability may also become a factor that departments consider when hiring new officers. (Para. 3)

Your paraphrase: \_\_\_\_\_

\_\_\_\_\_

2. This study also found that, despite years of experience inspecting passport photos, passport officers are no better than student participants at matching faces. (Para. 4)

Your paraphrase: \_\_\_\_\_

\_\_\_\_\_

3. Soldiers often need to engage with local populations in face-to-face interactions, often in the absence of a common language, and in such situations properly reading the face is critical. (Para. 7)

Your paraphrase: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Task 2** Identify the better one of the two paraphrases of the underlined text, and justify your choice.

**Original text:**

However, cultural norms of fairness vary across study populations. For example, the Lamelara of Indonesia typically offer more than a fair share (mean 58%), presumably because they are culturally dependent on large-scale cooperation (to hunt whales) and thus have mechanisms in place to share surplus resources. In contrast, the Hadza of Tanzania, who are hunter-gatherers that share food with group members because of cultural expectations and the fear of ostracism, make the lowest offers of any study population, and these offers are often rejected. This likely occurs because of the specific experimental setting of the UG, which may reduce the fear of being ostracised, allowing the Hadza participants to follow their self-interest.

**Paraphrase 1:**

The Lamelara of Indonesia have put in place arrangements for distributing excess resources as their culture dictates cooperation among a wide community of people for activities like whale-hunting. As a result, offers made by the Lamelara tend to exceed 50%, at an average of 58%. This is one example showing how ideas of fairness differ from culture to culture.

**Paraphrase 2:**

Nevertheless, the idea of fairness differs from study population to study population. For instance, the Lamelara of Indonesia usually give more than half of the amount (average: 58%), possibly owing to the fact that they rely on massive cooperation to hunt whales. As a result, they have measures in place to distribute surplus resources.

**Explain your reason(s) for choosing Paraphrase 1 or Paraphrase 2:**

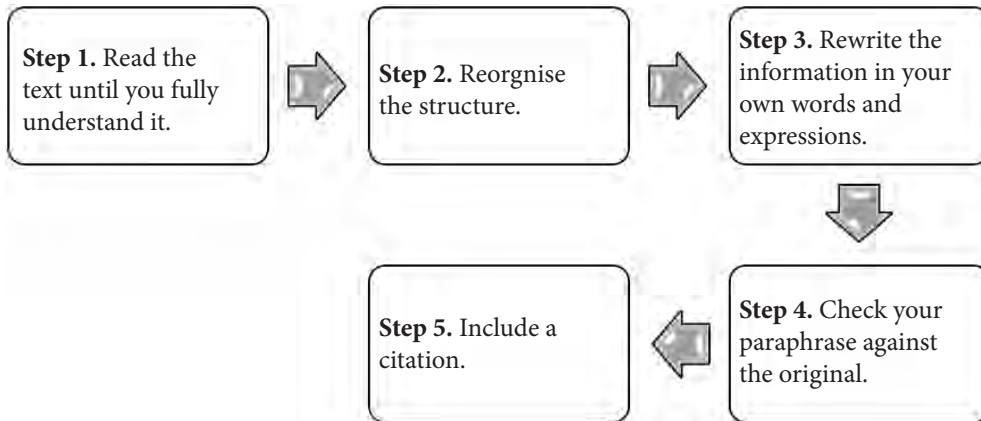
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Task 3** Follow the suggested steps to paraphrase the following text.

## Original text:

Intelligence quotient (IQ) is generally touted as a gift predicting exceptional outcomes in many domains including educational attainment and income level. However, there are conflicting studies in the literature which point to an association between gifted IQ, particularly high verbal ability, and various mental and immunological outcomes. (Karpinski et al, 2018)

## Writing steps:



Your paraphrase: \_\_\_\_\_

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**Task 4** Paraphrase the following paragraphs in your own words.

## Paragraph 1:

Visioning is important especially in the difficult times. There are times in every relationship when it is so easy to get swamped by the negative emotions of disappointment, frustration, anger, and fear. The complaints filling our mind can even cause an atmosphere of distress, which can even prompt us to consider leaving the relationship. Once we envision, we see possibilities and opportunities, we put an action plan together, we start working, and then our positivity can rise.

Your paraphrase: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Paragraph 2:

Reading a road map upside-down and generating synonyms for the word “brilliant” are two very different skills. But each is a measurable indicator of general intelligence, a construct that includes problem-solving abilities, spatial manipulation and language acquisition. Scientists generally agree that intelligence can be captured by psychometric tests. But the study of intelligence is dogged by questions of just how much IQ contributes to an individual’s success and well-being, how genes and environment interact to generate smarts and why the average IQ score rose throughout the world during the twentieth century.

Your paraphrase: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Paragraph 3:

Humans often make decisions that seem irrational from an economic perspective. For instance, they may engage in behaviour that actually decreases their absolute wealth. One explanation for these decisions is that humans are not only concerned with their own rewards but also the rewards of others. Human reactions to reward distributions have been extensively studied by means of experimental economics tasks, in particular the ultimatum game and the dictator game.

Your paraphrase: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Unit 2

## Geoscience

Our imagination is struck only by what is great; but the lover of natural philosophy should reflect equally on little things.

— Alexander von Humboldt



### 1 Academic Reading

**Text A:** Are We Ready for the Next Volcanic Catastrophe?

**Academic Reading Skills:** Making Inferences

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### 2 Academic Writing

**Text B:** Hot Mantle Rising

**Academic Writing Skills:** Summarising

## 1

# Academic Reading

## Lead-in Questions

1. Can you name some major natural disasters in history?
2. What can you suggest to minimise the damage of natural disasters (e.g. flooding)?

## Text A

### Are We Ready for the Next Volcanic Catastrophe?

Bill McGuire

- 1 In April 1815, the biggest known eruption of the historical period blew apart the Tambora volcano<sup>1</sup>, on the Indonesian island of Sumbawa, 12,000km from the UK. What happened next testifies to the enormous reach of the biggest volcanic blasts.
- 2 The Tambora volcano had shown no signs of life for 1,000 years; a single eruption in the previous five millennia provided the only indication that magma<sup>2</sup> was still churning far beneath. It was. On 5 April 1815, a titanic explosion hurled a cloud of ash to a height of more than 30km. Violent, but short-lived, the blast lasted just two hours, after which the volcano returned to a state of brooding menace. According to the lieutenant governor, Thomas Stamford (later Sir Stamford) Bingley Raffles, to whom volcanologists are indebted for his accounts of the eruption, the detonation was so loud that it was mistaken across Java for cannon fire, causing consternation among the British troops, which had ousted the Dutch and French forces just a few years earlier.
- 3 But the blast was small beer in comparison with what followed. After five days of relative calm, the climactic phase of the eruption began with a colossal explosion that

1 Tambora volcano: 印度尼西亚的坦博拉火山。1815年该火山爆发，为近代记载中最严重的火山爆发。

2 magma: 岩浆



launched a towering column of ash to the edge of space. For four or five days, utter blackness reigned across the island as the hurricane blasts of hot ash and scalding gas – known as pyroclastic<sup>3</sup> flows – scoured the flanks of the volcano of everything and everyone, and drifts of ash metres thick entombed what few signs of life remained. When the explosions ceased and the darkness finally lifted, the view revealed was a vision of Tolkien's Mordor<sup>4</sup>; a grey landscape within which nothing lived or moved. The top 500m of the volcano was gone, blasted into smithereens, and replaced by a 6km-wide maw from which steam spiralled skywards. Communities on the flanks of the volcano had vanished, along with the lives of around 12,000 men, women and children. These, perhaps, were the lucky ones, as a further 60,000 survivors of the eruption succumbed slowly and agonisingly to famine or disease.

- 4 But the consequences were not confined to this Indonesian backwater. The explosion was heard 2,600km away in Sumatra, while giant rafts of floating pumice<sup>5</sup> – some kilometres in length – clogged shipping routes for years. The 50 cubic kilometres or so of ash ejected over the course of the eruption returned to earth in the following days and weeks, leaving a thick covering as far away as Borneo, 500km to the north. In addition to the ash, an estimated 200 million tonnes of microscopic sulphur<sup>6</sup> particles pumped into the stratosphere<sup>7</sup>, spread outwards from Sumbawa to form a giant aerosol<sup>8</sup> veil that enclosed the planet and acted as a block to incoming sunlight.
- 5 The consequences for the developed societies of the northern hemisphere were dire. A dry, sulphurous fog draped itself across the landscape of eastern North America, causing temperatures to plunge and bringing unprecedented summer cold. In New York State, snow fell in June, while the bitter cold and killing frosts wiped out crops and halved the length of the growing season across much of the region. On the other side of the Atlantic, Europe saw summer temperatures down by 2°C compared to the average for the decade; the unseasonal cold accompanied by incessant rains and – into the following winter – by unusually powerful storms. Analysis of climate records reveals that 1816, the so-called “year without a summer”, was the second coldest in the northern hemisphere of the past six centuries.

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3 pyroclastic: 火山碎屑的

4 Tolkien's Mordor: 英国作家托尔金《指环王》三部曲中的“魔都”

5 pumice: 浮岩, 浮石(一种火山岩)。

6 sulphur: 硫

7 stratosphere: [气]平流层

8 aerosol: [化]气溶胶; 喷雾剂; 悬浮微粒。

- 6 The alleged cultural implications of this “volcano weather” for Europe are somewhat whimsical. The brilliant, gas-charged sunsets have been declared by some to have provided the inspiration for some of J. M. W. Turner’s<sup>9</sup> more flamboyant skies. In a similar vein, the damp and gloom of the 1816 summer has been charged with setting the scene for both Lord Byron’s<sup>10</sup> grim vision *Darkness*, and Mary Shelley’s<sup>11</sup> gothic novel *Frankenstein*. For the less well-to-do of Europe, however, the Tambora eruption brought nothing less than hunger, disease and death. Widespread harvest failure resulted in the most serious famine for more than a hundred years, doubling the price of grain and spawning bread riots and widespread civil unrest. Such was the degree of breakdown of food supply that economic historian John Post has called the episode “the last, great subsistence crisis in the Western world”. Malnourished and weakened, the starving succumbed rapidly to disease, with typhus<sup>12</sup> in particular rife. Many tens of thousands are thought to have died across the continent, including more than 40,000 in Ireland alone.
- 7 How would we fare if faced with a Tambora-sized eruption today? Is it even something we could feasibly prepare for? Received wisdom has it that globalisation would make it easier to cope. Should the European harvest fail, so the thinking goes, we can always buy our food from elsewhere. The very interconnectedness of world markets may, however, make things worse – the collapse of food production across Europe, parts of North America and perhaps elsewhere, could result in global shortages which in turn would drive a dramatic rise in the cost of food commodities. At the same time, the intense worldwide competition for food supplies, scarce as a consequence of the harvest failures, could drastically reduce the range of products available in the UK, interfere with supply and distribution, and bring about a collapse of the supermarkets’ ultra-sensitive, time-critical, stock-control systems, leaving their shelves increasingly depleted. While the less well-off could be priced out of purchasing even staple foodstuffs, panic buying by those who can afford it could quickly empty the stores.
- 8 On top of this, harvest disruption in response to volcano weather might extend far beyond Europe, and might – in ensuing decades – be exacerbated by the consequence of

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9 J. M. W. (Joseph Mallord William) Turner: 约瑟夫·马洛德·威廉·透纳，英国画家，西方艺术史上最为杰出的风景画家之一。

10 Byron: 拜伦，英国 19 世纪初期浪漫主义诗人。

11 Mary Shelley: 玛丽·雪莱，英国小说家，被誉为“科幻小说之母”。

12 typhus: 斑疹伤寒

rampant climate change. In spite of our modern farming methods and distribution systems, the ramifications could be far more severe than we expect. It is also worth considering that while the Tambora blast was approximately 1,000 times bigger than the 2010 Icelandic eruption, it was a minor hiccup in comparison with the greatest volcanic explosions of history. The Toba eruption<sup>13</sup> that excavated the world's largest volcanic crater in Sumatra, around 74,000 years ago, for example, injected hundreds of times more sulphur gases into the stratosphere than Tambora. The severe "volcanic winter" that followed probably lasted for several years and saw a third or more of the earth covered with snow and ice and the wholesale dieback of vegetation.

- 9 So, if a Tambora-scale scenario would be bad news, far worse could be lying in wait. While we can't stop the next Tambora, nor handle its potential impacts on the climate and the harvest, we can ensure that contingency plans are in place to keep everyone adequately fed until the sulphur veil dissipates and temperatures return to normal. In the UK at present, contingency food supplies probably amount to little more than a few weeks' worth. Some serious policy changes are needed if a future volcanic blast is not to bring about another subsistence crisis.
- 10 Hazarding a guess about when and where the next Tambora will explode is far from an exact science. Eruptions on such a scale seem to happen, on average, a few times every millennium and one estimate holds that there is a 1 in 10 chance of a comparable event in the next 50 years. The earth does not, however, operate to a timetable so such an eruption is equally likely to occur in any single year. There is even a chance that climate change may have a hand to play. Looking back at previous episodes of dramatic climate warming provides us with plenty of robust evidence for a vigorous volcanic response, most notably as our world heated up rapidly at the end of the last Ice Age. The reaction is most pronounced at ice-covered volcanoes, where melting reduces the weight acting on the volcanoes beneath, facilitating eruptions and even promoting the production of more magma. Coastal volcanoes may also be brought to eruption as the increased load of water, due to climbing sea levels, bends the crust<sup>14</sup> around the margins of the oceans, squeezing magma upwards like toothpaste out of a tube.
- 11 No volcano erupts without warning signs, caused by rising magma triggering

13 The Toba eruption: 多巴火山爆发。多巴火山位于印尼苏门答腊岛北部，曾于约 74,000 年前有过一次超级爆发。

14 crust: (地球的) 地壳

earthquake swarms and inflating the ground surface. The problem is that out of our world's 1,300 or more active and potentially active volcanoes, we monitor only a few hundred. The Tambora eruption reinforces the unofficial volcanological axiom: The longer the wait, the bigger the bang. That rule of thumb is borne out by the fact that fully half of the biggest eruptions since 1800 originated at volcanoes that had previously been dormant throughout history. What we should be keeping a special watch on then, in order to prepare ourselves for the next arrival of Vulcan's<sup>15</sup> shock troops, are those seemingly innocuous volcanoes that have kept their heads down for centuries or even millennia. While there are too many candidates to keep a serious eye on, the numbers can be narrowed down by focusing on those that have been recently "restless"; perhaps best regarded as the volcanologists' term for "bubbling under". Beyond that, though, it's anyone's guess.

## New Words and Expressions

**eruption** /ɪˈrʌpʃən/ *n.* an occasion when a volcano suddenly throws out burning rocks, smoke, etc. 喷发, 爆发

**testify** /ˈtestɪfaɪ/ *v.* to show clearly that something is the case 证明, 证实

**churn** /tʃɜ:n/ *v.* if water, mud etc. churns, or if something churns it, it moves about violently (水、烂泥等) 剧烈翻腾

**hurl** /hɜ:l/ *vt.* to throw something violently and with a lot of force 猛投, 用力掷

**brooding** /ˈbru:diŋ/ *adj.* mysterious and threatening 神秘莫测的; 阴森逼人的

**indebted** /mˈdetɪd/ *adj.* very grateful to someone for the help they have given you (对某人十分) 感激的

**detonation** /ˌdetəˈneɪʃən/ *n.* an explosion; the action of making something explode 爆炸, 爆发

**consternation** /ˌkɒnstəˈneɪʃən/ *n.* a feeling of worry, shock, or fear 惊愕; 惊惶失措

**oust** /aʊst/ *vt.* to force someone out of a position of power, especially so that you can take their place (尤指为取而代之) 强迫(某人)放弃职权, 把……撵走

**climactic** /klaɪˈmæktɪk/ *adj.* forming a very exciting or important part of an event or story, especially near the end of it 高潮的, 形成高潮的

**colossal** /kəˈlɒsəl/ *adj.* used to emphasise that something is extremely large 巨大的, 庞大的

**scour** /skaʊə/ *vt.* to clean something by rubbing its surface hard with rough material 冲刷, 冲洗

**smithereens** /ˌsmɪðəˈri:nz/ *n. pl.* very small pieces 碎片

**spiral** /ˈspɑɪərəl/ *vi.* to move in a continuous curve that gets nearer to or further from its central point as it goes round 螺旋式上升 [下降]

15 Vulcan: 伏尔甘, 罗马神话中的火与工匠之神。

**confined** /kən'faɪnd/ *adj.* existing in or affecting only a particular place or group (指空间)有限的, 受限制的

**clog** /klɒg/ *vt.* to block something or become blocked 阻塞, 塞住

**enclose** /ɪn'kləʊz/ *vt.* to surround something, especially with a fence or wall, in order to make it separate (尤指用篱笆或围墙)将……围起来

**plunge** /plʌndʒ/ *vi.* if a price, rate etc. plunges, it suddenly decreases by a large amount (价格、比率等)暴跌, 骤降

**unprecedented** /ʌn'presɪdentsɪd/ *adj.* never having happened before, or never having happened so much 空前的, 前所未有的

**incessant** /ɪn'sesənt/ *adj.* continuing without stopping 持续不断的, 没完没了的

**implication** /ɪm'plɪkəʃən/ *n.* a suggestion that is not made directly but that people are expected to understand or accept 含意, 暗示

**whimsical** /'wɪmzɪkəl/ *adj.* unusual or strange and often amusing 古怪的; 异想天开的

**flamboyant** /flæm'boɪənt/ *adj.* brightly coloured and easily noticed 色彩艳丽的

**episode** /'epɪsəʊd/ *n.* an event or a short period of time during which something happens 一段经历; 一段时期

**feasible** /'fi:zəbəl/ *adj.* a plan, idea, or method that is feasible is possible and is likely to work (计划、想法或方法)可行的, 可实行的, 行得通的

**intense** /ɪn'tens/ *adj.* having a very strong effect or felt very strongly 剧烈的, 强烈的

**staple** /'steɪpəl/ *adj.* forming the greatest or most important part of something 主要的; 最重要的

**exacerbate** /ɪg'zæsəbeɪt/ *vt.* to make a bad situation worse 使恶化; 使加重

**rampant** /'ræmpənt/ *adj.* if something bad, such as crime or disease, is rampant, there is a lot of it and it is very difficult to control (犯罪、疾病等)猖獗的, 肆虐的, 失控的

**ramification** /,ræmɪfə'keɪʃən/ *n.* an additional result of something you do, which may not have been clear when you first decided to do it 衍生后果, 派生影响

**excavate** /'ekskəveɪt/ *vt.* to find by digging in the ground 发掘, 挖出

**scenario** /sə'ni:əriəʊ/ *n.* a situation that could possibly happen 可能发生的事, 可能出现的情况

**dissipate** /'dɪsɪpeɪt/ *v.* to gradually become less or weaker before disappearing completely, or to make something do this (使某事物)消散, 消失

**hazard** /'hæzəd/ *vt.* to say something that is only a suggestion or guess and that might not be correct 冒昧提出; 大胆猜测

**trigger** /'trɪgə/ *vt.* to make something happen very quickly, especially a series of events 引发, 激发

**dormant** /'dɔ:mənt/ *adj.* not active or not growing at the present time but able to be active later 蛰伏的, 休眠的

**innocuous** /ɪ'nɒkjʊəs/ *adj.* not offensive, dangerous, or harmful 无冒犯之意的; 不危险的; 无害的

## Building Your Vocabulary

**Task 1** Match the words in Column A with their appropriate explanations in Column B.

Column A	Column B
1 ____ testify	A connotation, meaning
2 ____ confine	B happening immediately after other events
3 ____ scenario	C demonstrate, prove
4 ____ feasible	D huge, enormous
5 ____ facilitate	E block, set a limit to
6 ____ reinforce	F incident, experience
7 ____ colossal	G make it stronger or more intense
8 ____ episode	H make it easier or more likely to happen
9 ____ ensuing	I a postulated sequence of possible events
10 ____ implication	J capable of being done

## Understanding the Text

**Task 2** Choose the statement that best summarises the theme of Text A.

- A Tambora volcano is the most destructive eruption known in history.
- B Dormant volcanoes like Tambora may bring lethal damage once they are active.
- C The Tambora volcano eruption provides a lesson we need to learn.

**Task 3** Paraphrase the following sentences.

1. Analysis of climate records reveals that 1816, the so-called “year without a summer”, was the second coldest in the northern hemisphere of the past six centuries. (Para. 5)

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2. For the less well-to-do of Europe, however, the Tambora eruption brought nothing less than hunger, disease and death. (Para. 6)

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3. No volcano erupts without warning signs, caused by rising magma triggering earthquake swarms and inflating the ground surface. (Para. 11)

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4. That rule of thumb is borne out by the fact that fully half of the biggest eruptions since 1800 originated at volcanoes that had previously been dormant throughout history. (Para. 11)

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# Academic Reading Skills

## Making Inferences

Making inferences is a language learning strategy. Learners can use available information to guess the meaning or usage of unknown or unfamiliar information, to predict outcomes, and to compensate for missing information in a language task. Context at both the sentence and discourse levels can be utilised by learners to make inferences. Several types of inferences are illustrated below.

### Type 1: Gap-filling inferences

Readers can make this type of inferences by referring to their life experience and prior knowledge. For example, when reading the first three paragraphs of Text A, by referring to our prior knowledge, we can infer that the consequences of the eruption of the Tambora Volcano were disastrous.

### Type 2: Text-connecting inferences

Readers make inferences by analysing the relationship between sentences. By referring to existing information, readers can understand the implicit cause-effect relationship in a sentence. For instance:

*By the 1960s, Holmes' idea began to gain more credibility as scientists increased their understanding of the ocean floor via mapping, discovered its mid-ocean ridges and learned more about its age. (Based on this part, we can infer that scientists' understanding of the ocean floor made Arthur Holmes' viewpoint accepted.)*

### Type 3: Coherence inferences

To fully understand a sentence, readers need to infer what pronouns in the sentence refer to. For instance:

*Communities on the flanks of the volcano had vanished, along with the lives of around 12,000 men, women and children. These, perhaps, were the lucky ones, as a further 60,000 survivors of the eruption succumbed slowly and agonisingly to famine or disease. (Based on the above sentences, we can infer that "these" refers to "around 12,000 men, women and children", rather than "60,000 survivors of the eruption".)*



## Type 4: On-line inferences

On-line inferences are drawn by finding out the statements that are supported by details or examples. For instance:

*According to the lieutenant governor, Thomas Stamford (later Sir Stamford) Bingley Raffles, to whom volcanologists are indebted for his accounts of the eruption, the detonation was so loud that it was mistaken across Java for cannon fire, causing consternation among the British troops, which had ousted the Dutch and French forces just a few years earlier. (We can infer that the author includes this piece of information to show the 1815 eruption at Tambora was intimidating.)*

**Task 1** Choose the best answer to the following questions based on the information in Text A.

1. What can be inferred from the effects of the Tambora volcano eruption?
  - A The effects were far-reaching and long-term.
  - B The effects were soon under control by scientists' efforts.
  - C The effects were confined to Indonesian backwater.
  - D Developed countries were more influenced by the eruption.
  
2. What can be inferred from Paragraph 7?
  - A With advanced technologies, we can cope with a Tambora-sized eruption.
  - B Globalisation can prepare us well for disastrous volcano eruptions.
  - C Wealthy people get more resources than poor people in disastrous situations.
  - D The harvest failures could reduce the products available in the UK.
  
3. What can be inferred from Paragraph 10?
  - A Scientists can predict when and where the next Tambora will explode.
  - B Records of climate warming may help scientists predict next eruption.
  - C Coastal volcanoes are more likely to erupt than other types of volcanoes.
  - D Volcano eruptions may promote the production of more magma.

4. What can be inferred from Paragraph 11?
- A Inactive volcanoes may bring catastrophic consequences once they erupt.
  - B Since 1800, more and more inactive volcanoes have shown warning signs of eruptions.
  - C Scientists should focus on those volcanoes that have been recently restless.
  - D The number of active volcanoes outweighs that of inactive volcanoes.

**Task 2** Choose the best answer based on the following reading materials.

### Reading material 1:

About 450,000 years ago Britain was connected to France by a long, rocky, chalk ridge, approximately 32km long, behind which was a great lake, likely dotted with icebergs, with ice stretching across what is now the North Sea. “*It* would have been a dramatic landscape,” said Sanjeev Gupta, professor of earth science at Imperial College London and co-author of the research. The English Channel itself would have been dry, except for small rivers, while the surrounding land would have been forbidding. “It would have been cold, grey, rocky, with very, very sparse vegetation, like Svalbard or Siberia,” he said. But, whether as a result of melting of the ice sheet or some other reason, it seems this dam-like ridge began to overflow.

What does “*It*” in Line 3 of this reading material refer to?

- A Britain.
- B The ridge.
- C The English Channel.
- D The North Sea.

### Reading material 2:

... sea levels are indeed rising at faster rates each year. “The rate of sea-level rise is increasing, and that increase is basically what we expected,” says Steven Nerem, a remote-sensing expert at the University of Colorado Boulder who is leading the reanalysis. He presented the as-yet-unpublished analysis on 13 July in New York City at a conference sponsored by the World Climate Research Programme and the International Oceanographic Commission, among others. Nerem’s team calculated that the rate of sea-level rise increased from around 1.8 millimetres per year in 1993 to roughly 3.9 millimetres per year today as a result of global warming. In addition to the satellite calibration error, his analysis also takes into account other factors that

have influenced sea-level rise in the last several decades, such as the eruption of Mount Pinatubo in the Philippines in 1991 and the recent El Niño weather pattern.

What can be inferred from the above reading material?

- A Sea levels are rising at faster rates annually.
- B Steven Nerem is specialised in remote-sensing.
- C Factors influencing sea-level rise are complicated.
- D The study finding is widely supported by many scholars.

### Reading material 3:

Researchers created a computer programme called SEAGLAS that combined several climate simulations to forecast US climate until 2100, assuming greenhouse gas emissions keep ramping up. Then, using data from previous studies on how temperature and rainfall affect several economic factors – including crop yields, crime rates and energy expenditures – SEAGLAS predicted how the economy of each of the 3,143 counties in the United States would fare. By the end of the century, some counties may see their gross domestic product decline by more than 20 percent, while others may actually experience more than a 10 percent increase in GDP. This could make for the biggest transfer of wealth in US history, says study co-author Solomon Hsiang, an economist at the University of California, Berkeley.

What can be inferred from the above reading material?

- A Greenhouse gas emissions will hit their highest emission levels in 2100.
- B Climatic information may help predict the economy of each county in the US.
- C Some counties will suffer the gross domestic product decline by the end of the century.
- D Few greenhouse gas emissions may increase the gross domestic product of the United States.

## 2

## Academic Writing

## Text B

## Hot Mantle Rising

Oliver Shorttle

- 1 The earth's history has been punctuated by vast magmatic episodes. These events are preserved in the geological record as large igneous provinces – areas of the earth's surface flooded by millions of cubic kilometres of lava that erupted in short periods of time. Thought to be triggered by upwelling plumes<sup>16</sup> of hot mantle<sup>17</sup>, the size and frequency of these volcanic episodes may have been greater in the past, fuelled by the hotter mantle of the earth's Archaean eon<sup>18</sup>. During this time, a distinctive type of igneous rock – komatiite<sup>19</sup> – formed from magmas with high eruption temperatures that cooled to grow long needle-like olivine crystals. The rarity of komatiite eruptions more recently in the earth's history is taken as evidence of the mantle's slow cooling. However, komatiitic lavas that formed 89 million years ago from the volcanic outpourings of the nascent Galápagos plume have been found in the Tortugal suite of the Caribbean large igneous province. Writing in *Nature Geoscience*, Trela et al demonstrate that these lavas formed from anomalously hot mantle with a temperature similar to that which produced the ancient Archaean komatiites, challenging our view of the earth's thermal structure and history.
- 2 Our present picture of the earth's thermal structure is anchored by observations from different depths within the planet. The chemistry and temperature of primitive erupted lavas can be used to reconstruct the temperature of the upper mantle, whereas seismic observations of temperature-dependent mineral phase changes can be used to infer temperatures at the base of the upper mantle. By taking into account the influence of pressure on temperature, these estimates can then be extrapolated to

16 plumes: 地幔柱，一股上升的圆柱状固态物质的热塑性流体。

17 mantle: 地幔，地质学专业术语，是指地壳下面、地核上面的地球中间层。

18 Archaean eon: 太古时代，该时代离我们久远，是地质发展史中最古老的时期。

19 komatiite: 科马提岩，一种在高温下形成的喷出岩。

infer temperatures at greater depths, down to the core-mantle boundary. Applying this normalisation to the temperature estimates made at various mantle depths, and accounting for phase changes, leads to a coherent picture in which ambient mantle potential temperature is approximately 1,300°C. Present-day variations about this typical upper-mantle temperature are of the order 200°C.

- 3 Trela and colleagues use geochemical measurements of primitive lavas erupted above the early Galápagos plume – and now preserved in Costa Rica – to reconstruct mantle temperatures. They find that the lavas formed from a mantle source that was 200°C warmer than the hottest regions of the present-day mantle and 400°C above its ambient temperature. It is in the context of these present-day mantle temperatures that the observations from the Tortugal suite are remarkable. These lavas formed just 89 million years ago and are extremely young with respect to the major period of komatiite eruptions, 2.5 billion years ago during the Archaean. The existence of such hot eruptions implies that mantle domains with Archaean-like temperatures are still formed or preserved in the deep earth. Such long-term preservation of hot mantle domains resonates with a recent idea that lower mantle temperatures have long been close to the steady state, in contrast to the model of progressive mantle cooling that was previously assumed.
- 4 Trela et al characterise hot komatiitic lavas that erupted relatively recently, in geological terms, above the early Galápagos plume. The existence of such hot and relatively young lavas implies that regions of the earth's mantle with extreme temperatures are still present, and that this heat can be preserved in ascending mantle plumes and drive melting and volcanism at the present day.

# Academic Writing Skills

## Summarising

As academic readers, you need to learn how to summarise appropriately, as it helps you take notes when you process audio and written information. To avoid plagiarism, your own words should be used to write summaries. Before learning how to write qualified summaries, you need to figure out the differences between summarising and paraphrasing.

In a summary, it is necessary to include the gist or main idea of a text but exclude details and examples. As summarising aims to condense a text to its most important ideas, a summary should be shorter than the original text, about 1/3 of the original text in terms of length. Paraphrasing means using your own words to match the source text in meaning. Specifically, you need to change the words or phrases of a text but maintain the meaning of the original text. Paraphrasing should be about the same length as the original text.

### Skills for writing a summary

1. Read the original text carefully and
2. Take notes on the following:
  - A The source of the original text (author's first/last name, title, date of publication, volume number, place of publication, publisher, URL, etc.)
  - B The main idea of the original text (use your own words)
  - C Important supporting points (arrange the points in a logical manner)
3. The first sentence of the summary should include the in-text citation of the source as well as the main idea of the original passage. There are different requirements for summaries at different length. For a summary containing just one paragraph, use a separate sentence to discuss each supporting point. Give 1–2 explanations for each supporting point, and the explanations should be concise and concluded from the original text. For a multi-paragraph summary, each paragraph should discuss a supporting point. Give each supporting point, as the topic sentence, at the beginning of each paragraph.
4. To avoid plagiarism, use your own words when summarising.
5. Transitional words and expressions should be used to show how your summary is organised.
6. The sources of the original texts should be acknowledged in your summaries.

## Language conventions for writing a summary

Your own language should be used to summarise other researchers' ideas. To prevent plagiarism, you must cite the sources of the ideas you use properly.

Reporting verbs, such as “argue”, “state”, and “claim”, will be written in the simple present tense. Some examples are listed in the following box:

1. In this article, \_\_\_\_\_ (author's name) (year) argues that \_\_\_\_\_ (main idea). For example:  
*In his article, Davis (2017) describes how Britain separated from the European mainland.*
2. \_\_\_\_\_ (author's name) (year) argues that \_\_\_\_\_.  
(main idea). For example:  
*Ravillious (2017) argues that dams may produce negative consequences.*
3. According to \_\_\_\_\_ (author's name) (year), \_\_\_\_\_  
(main idea). For example:  
*According to Briney (2017), there are three driving forces for the movement of tectonic plates.*
4. (main idea) \_\_\_\_\_ (author's name, year). For example:  
*Hot and relatively young lavas suggest that regions of the earth's mantle with extreme temperatures still exist (Shorttle, 2017).*

### Task 1

Identify the sentence option which best expresses the essential information in each of the following sentences excerpted from Text B.

1. The chemistry and temperature of primitive erupted lavas can be used to reconstruct the temperature of the upper mantle, whereas seismic observations of temperature-dependent mineral phase changes can be used to infer temperatures at the base of the upper mantle. (Para. 2)
  - A The temperatures of the upper mantle and its base can be obtained through different methods.
  - B The chemistry and temperature of primitive lavas can be used to infer temperatures at the base of the upper mantle.
  - C Seismic observations of temperature-dependent mineral phase changes can be used to infer the temperature of the upper mantle.

2. Writing in *Nature Geoscience*, Trela et al demonstrate that these lavas formed from anomalously hot mantle with a temperature similar to that which produced the ancient Archaean komatiites, challenging our view of the earth's thermal structure and history. (Para. 1)
  - A Our view of the earth's thermal structure and history is challenged by the fact that komatiitic lavas and the ancient Archaean komatiites were formed by hot mantle with similar temperatures.
  - B According to our knowledge of the earth's history and structure, the temperature of komatiitic lavas is similar to that of the ancient Archaean komatiites.
  - C Trela et al challenged our view of the earth's thermal structure and history by demonstrating that komatiitic lavas and the ancient Archaean formed simultaneously.
  
3. Thought to be triggered by upwelling plumes of hot mantle, the size and frequency of these volcanic episodes may have been greater in the past, fuelled by the hotter mantle of the earth's Archaean eon. (Para. 1)
  - A In the past, the hotter mantle of the earth's Archaean eon may have made the size of volcanic episodes greater; now, the upwelling plumes of hot mantle are making it greater.
  - B The hotter mantle of the earth's Archaean eon and the upwelling plumes of hot mantle make the size and frequency of the volcanic episodes greater than in the past.
  - C In the past, the size and frequency of the volcanic episodes, which were supposedly a result of upwelling plumes of hot mantle, were possibly greater.

**Task 2**

Complete the following summarising statements by citing researchers properly.

1. Links between subduction and Yellowstone volcanism are also the gist of a third recent study \_\_\_\_\_ (Quan Zhou et al).
  
2. \_\_\_\_\_ (MacDonald et al), an even greater proportion (37%) of the Indo-Gangetic Basin groundwater system suffers from high levels of arsenic.
  
3. \_\_\_\_\_ (Ying Zhou) for depths above 700km imply that mantle



upwelling and downwelling indeed coexist.

4. Indeed, \_\_\_\_\_ (Nelson and Grand) recently report having traced the Yellowstone plume from the core-mantle boundary upwards.

**Task 3** Use one sentence only to summarise each of the following paragraphs.

1. Scientists have uncovered the largest volcanic region on earth – two kilometres below the surface of the vast ice sheet that covers west Antarctica. The project, by Edinburgh University researchers, has revealed almost 100 volcanoes – with the highest as tall as the Eiger, which stands at almost 4,000 metres in Switzerland. Geologists say this huge region is likely to dwarf that of east Africa’s volcanic ridge, currently rated the densest concentration of volcanoes in the world. (Robin McKie, 2017)

Your summary:

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2. The monster El Niño weather pattern of 2014–2016 caused tropical forests to burn up 3 billion tonnes of carbon, according to a new analysis. That is equivalent to nearly 20% of the emissions produced during the same period by burning fossil fuels and making cement. Measurements taken by NASA’s Orbiting Carbon Observatory-2 (OCO-2) satellite, which measures the level of carbon dioxide in the atmosphere, suggest that El Niño boosted emissions in three ways. A combination of high temperatures and drought increased the number and severity of wildfires in southeast Asia, while drought stunted plant growth in the Amazon rainforest, reducing the amount of carbon it absorbed. And in Africa, a combination of warming temperatures and near-normal rainfall increased the rate at which forests exhaled CO<sub>2</sub>. The overall jump in emissions from tropical forests was roughly three times the annual average carbon output from deforestation and land-use change globally between 2006 and 2015. (Gabriel Popkin, 2017)

Your summary:

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**Task 4** Read the following material and summarise the three primary driving forces for the movement of the earth's tectonic plates within 100 words.

Scientists today have a better understanding of the make-up of the tectonic plates, the driving forces of their movement, and the ways in which they interact with one another. A tectonic plate itself is defined as a rigid segment of the earth's lithosphere<sup>20</sup> that moves separately from those surrounding it.

There are three main driving forces for the movement of the earth's tectonic plates. They are mantle convection, gravity, and the earth's rotation. Mantle convection is the most widely studied method of tectonic plate movement and it is very similar to the theory developed by Holmes in 1929. There are large convection currents of molten material in the earth's upper mantle. As these currents transmit energy to the earth's asthenosphere<sup>21</sup> (the fluid portion of the earth's lower mantle below the lithosphere) new lithospheric material is pushed up toward the earth's crust.

Evidence of this is shown at mid-ocean ridges where younger land is pushed up through the ridge, causing the older land to move out and away from the ridge, thus moving the tectonic plates.

Gravity is a secondary driving force for the movement of the earth's tectonic plates. At mid-ocean ridges the elevation is higher than the surrounding ocean floor. As the convection currents within the earth cause new lithospheric material to rise and spread away from the ridge, gravity causes the older material to sink toward the ocean floor and aid in the movement of the plates. The earth's rotation is the final mechanism for the movement of the earth's plates but it is minor in comparison to mantle convection and gravity.

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20 lithosphere: 岩石圈

21 asthenosphere: 软流圈

As the earth's tectonic plates move they interact in a number of different ways and they form different types of plate boundaries. Divergent boundaries are where the plates move away from each other and new crust is created. Mid-ocean ridges are an example of divergent boundaries. Convergent boundaries are where the plates collide with one another causing the subduction of one plate beneath the other. Transform boundaries are the final type of plate boundaries and at these locations no new crust is created and none is destroyed. Instead the plates slide horizontally past one another. No matter the type of boundary though, the movement of the earth's tectonic plates is essential in the formation of the various landscape features we see across the globe today.

(Amanda Briney, 2018)

Your summary:

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