

Tools

1. **LMNotebook** (from Google): Useful research tool to create multimedia to aid your own learning
2. **Skills files** (from Anthropic): create, save and share abilities
3. **cowork**
4. **Temperature**: increase the chance of unexpected responses
5. **seed**: produce the same output every time
6. **system prompt**: a power-prompt that the model gives more importance to
7. **vibe-coding** simulations and tools

Lesson 06 · Reading Packet

Audience · Purpose · Style · Flow

Writing and Revising with AI (SoSe26)

Swales & Feak

Unit 1: An Approach to Academic Writing

pp. 1-12

Framework overview (Figure 1), Audience, Purpose, Style

Unit One

An Approach to Academic Writing

As graduate students, you face a variety of writing tasks throughout your chosen degree programs. Naturally, these tasks will vary from one degree program to another. They are, however, similar in two respects. First, the tasks become progressively more complex and demanding the farther you go in the program. Second, in general they need to be written “academically,” although certain assigned writing in some fields may require personal reflection (such as teaching reflections) and thus may be somewhat more informal. In Units Two through Six of this textbook, we focus on the writing tasks that may be required in the earlier stages of a graduate career. In the last two units, we look a little farther ahead.

This opening unit is different from the others since it does not focus on a particular type of text. Instead, we try to help you reflect upon a variety of aspects of academic writing, ranging from style to some sociological, cultural, and rhetorical issues. Overall, we are primarily concerned with your “positioning” as a writer—the means by which you create in writing a credible image as a competent member of your chosen discipline. We begin with a focus on your writing strategies.

TASK ONE

Discuss these possible writing strategies with a partner. Put a check mark (✓) next to those writing strategies that you use a lot. If you rarely or never use some of the strategies, discuss why you do not.

- 1. Translating, if you use English as an international language
 - 2. Spending a lot of time on gathering information or doing research and then quickly writing your paper from your notes, data sources, or outlines
 - 3. Referring to one or more “model” papers in your discipline, noticing in particular such matters as how the papers are organized, how phrases are used, and where and why examples or illustrations are provided
 - 4. Relying on a mentor (either native or non-native speaker) who “knows the ropes” and can anticipate how a particular written text might be received by a particular set of readers or reviewers, who may also be able to offer advice on which journal or conference a piece might be submitted to and why
 - 5. Relying on friends who are not in your field to help you with phraseology
 - 6. Developing a sense of the anticipated audience, particularly with regard to what needs to be said and what does not
 - 7. Recognizing the need for some stylistic variation and acquiring the linguistic resources to achieve this
 - 8. Finding useful phraseology from other, possibly published papers and using it to string your ideas together
 - 9. Constructing an appropriate author “persona,” so that you come across as a member of the disciplinary community
 - 10. Concentrating on making sure your sentence-level grammar is accurate because that is the most important aspect of getting your ideas across
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Understanding your writing strategies is important in becoming a confident writer. To help you explore your strategies further, we offer Task Two.

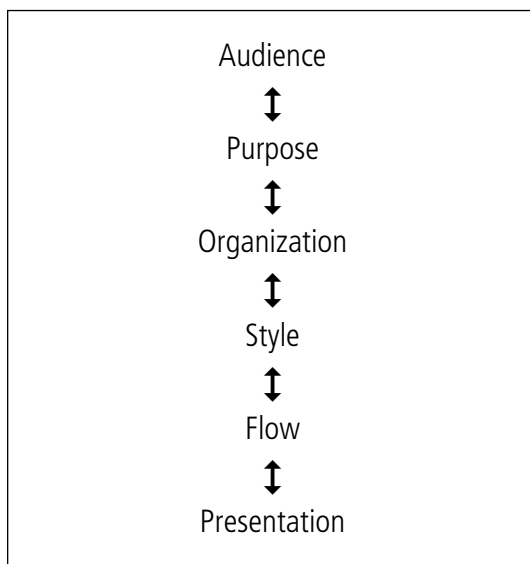
TASK TWO

Write a reflective paragraph in which you share your reactions to these questions.

1. What is your main writing strategy? Why do you use it? What one other strategy apart from those on the list do you use? Are your strategies dependent on the type of text you are composing?
2. Which of the strategies that you do not use would you most like to develop? And how might you go about developing it?
3. Do you think strategies listed in Task One apply equally well to all fields? How might they vary in importance for an author in Physics, History, Economics, Public Health, or Engineering? Which of them is most important in your own field?

As you may already realize, academic writing is a product of many considerations: audience, purpose, organization, style, flow, and presentation (see Figure 1).

FIGURE 1. Considerations in Academic Writing



Audience

Even before you write, you need to consider your audience. The audience for most graduate students will be an instructor, who is presumably quite knowledgeable about the assigned writing topic and will have expectations with which you need to be familiar. Other possible audiences include advisors, thesis committees, and those who will review research you may want to present at a conference or publish in a paper. Your understanding of your audience will affect the content of your writing.

TASK THREE

Read these excerpts from two longer texts that discuss obtaining drinking water from salt water. Answer these general questions with a partner. For whom were they written? What aspects of each text helped you decide the audience? In what kind of publication would you expect to find these texts? Sentence numbers have been added here (and in subsequent texts throughout the book) for ease of reference. Then answer the more specific questions that appear on page 5.

- A. ❶ People have been pulling freshwater out of the oceans for centuries using technologies that involve evaporation, which leaves the salts and other unwanted constituents behind. ❷ Salty source water is heated to speed evaporation, and the evaporated water is then trapped and distilled. ❸ This process works well but requires large quantities of heat energy, and costs have been far too high for nearly all but the wealthiest nations, such as Kuwait and Saudi Arabia. ❹ (One exception is the island of Curaçao in the Netherlands Antilles, which has provided continuous municipal supplies using desalination since 1928.) ❺ To make the process more affordable, modern distillation plants recycle heat from the evaporation step.

⑥ A potentially cheaper technology called membrane desalination may expand the role of desalination worldwide, which today accounts for less than 0.2 percent of the water withdrawn from natural sources. ⑦ Membrane desalination relies on reverse osmosis—a process in which a thin, semipermeable membrane is placed between a volume of saltwater and a volume of freshwater. ⑧ The water on the salty side is highly pressurized to drive water molecules, but not salt and other impurities, to the pure side. ⑨ In essence, this process pushes freshwater out of saltwater. (Martindale, 2001)

B. ① Reverse osmosis (RO) membrane systems are often used for seawater and brackish water desalination. ② The systems are typically installed as a network of modules that must be designed to meet the technical, environmental, and economic requirements of the separation process. ③ The complete optimization of an RO network includes the optimal design of both the individual module structure and the network configuration. ④ For a given application, the choice and design of a particular module geometry depends on a number of factors, including ease and cost of module manufacture, energy efficiency, fouling tendency, required recovery, and capital cost of auxiliary equipment. ⑤ With suitable transport equations to predict the physical performance of the membrane module, it should be possible to obtain an optimal module structure for any given application. (Maskan et al., 2000)

1. How do the texts differ in terms of vocabulary?
 2. How do the texts differ in terms of detail?
 3. Where do the definitions of *reverse osmosis* appear? How do these definitions differ?
 4. Do the texts appear to be well written? Why do you think so?
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The differences in the two texts reflect some of the assumptions that the authors have made about the typical reader's familiarity with the subject. In the first text, the author assumes the reader is probably not familiar with reverse osmosis and thus provides a fair amount of background information along with a clear definition of the process.

TASK FOUR

Now write a short definition of a term in your field for two different audiences. One audience could consist of graduate students in a totally unrelated field, while the other could be students in your own graduate program. Exchange your definitions with a partner and discuss how they reflect differences in your chosen audiences.

Purpose and Strategy

Audience, purpose, and strategy are typically interconnected. If the audience knows less than the writer, the writer's purpose is often instructional (as in a textbook). If the audience knows more than the writer, the writer's purpose is usually to *display* familiarity, expertise, and intelligence. The latter is a common situation for the graduate student writer.

The interesting question that now arises is what strategy (or strategies) can a graduate student use to make a successful display. To explore this, let's consider the case of an international student who calls himself Sam in the United States. Sam is enrolled in a master's program in Public Health. He has nearly finished his first writing assignment, which focuses on the impact of video games on the cognitive development of children in the United States. This is a short five-page assignment rather than a major research paper. The deadline is approaching, and there is no more time for further data analysis. He wants to make a good impression with his concluding paragraph. He believes (rightly) that final impressions are important.

Sam (quite appropriately) begins his last paragraph by reminding his audience (i.e., his instructor) of what he has done in the paper.

He begins as follows:

Conclusion

The aim of this paper has been to examine the impact of video games on the cognitive development of pre-adolescent children in the United States. In particular I have examined the effects of video games on visual attention.

So far, so good. His first attempt at concluding his paper is as follows:

As I have explained, video games can indeed account for differences in cognitive abilities of pre-adolescents, specifically the ability to switch attention from one task to another.

He thinks, “This just repeats what I have already written; repeating makes it seem that I have nothing new or interesting here; my paper falls flat at the end.” Sam tries again. “This time,” he says to himself, “I will take my results, summarize them, and then try to connect them to some wider issue. That’s a better strategy.” Here is his second version.

As the tables show, pre-adolescent children who play video games score better on tests of visual attention than those who do not. This relationship was quite strong among children between 10 and 12 years of age, while for children aged 6 to 9 the association was not so pronounced. Children who were very good at playing video games, mostly those who are older, appear to be able to effectively switch attention. These findings support the conclusion of other studies that playing video games may not simply be a mindless activity; instead video games can enhance the cognitive skills of gamers.

Sam likes this version; however, he is also worried. He knows—but he has not said so anywhere in the paper yet—that there is a problem with the data he has been using. He knows that there are many types of video games and so the effects of one game on cognitive development may be quite different from those of another. For instance, shooting video games are not the same as sports video games. And even within the same game genre there is variation in terms of the skills that are needed to play. Luckily, he is not using his own research data for this assignment; he is using data that he has found in journal articles.

He now adds this to his concluding paragraph.

The conclusions presented here, however, should be interpreted cautiously. This is because the data presented here are based on analyses of two sports video games, which differ in terms of visual attentional demand from other types of video games, such as first-person shooting games that require an awareness of a full screen.

Sam is feeling somewhat unsure of his conclusion and is now asking himself the following questions: “Have I been too cautious in my conclusion when I use *appear to*, *may*, and *can*? Is it actually better to clearly state that there are problems with the data or to not mention this at all? Which strategy is better? Will I appear more or less capable by discussing the limitations of the data? And if I do discuss them, should I do so right at the end or at the beginning of my conclusions? In effect, how should I *position* myself as a junior graduate student?”

TASK FIVE

What advice would you give Sam? Consider the questions he raises about the strength of his points and the inclusion of limitations. Write this in a paragraph or two. Then edit or re-write his final paragraph to reflect your advice.

Organization

Readers have the expectation that information will be presented in a structured format that is appropriate for the particular type of text. Even short pieces of writing have regular, predictable patterns of organization. You can take advantage of these patterns, so that readers can still follow, even if you make some language errors.

Although our goal in this text is not to work on letter writing, we would like to begin our discussion of organization by looking at two letters that may, in fact, resemble letters or email you have received at some point in your academic career. Each letter has a clear, predictable pattern of organization. The first is a good-news letter.

<p>Dear Ms. Wong:</p> <p>Thank you for your interest in our university.</p> <p>On behalf of the Dean of the Graduate School, I congratulate you on being accepted to the program in Aerospace Engineering to begin study at the master level. This letter is your official authorization to register for Fall 20XX. As a reflection of the importance the Graduate School places on the ability of its students to communicate effectively, the Graduate School requires all new students whose native language is not English to have their English evaluated. Specific details for this procedure are given in the enclosed information packet.</p> <p>We look forward to welcoming you to Midwestern University and wish you success in your academic career.</p> <p>Sincerely,</p>	<p><i>Parts</i></p> <p>Greeting</p> <p>Acknowledgment</p> <p>Good news</p> <p>Administrative matters</p> <p>Welcoming close that points to the future</p>
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TASK SIX

Read the bad-news letter, and label the four parts: greeting, preparation for bad news, bad news, and close. Where does the most important news appear (first? second)? How does this compare to the good-news letter? How do the different purposes of the two letters influence the kind and placement of information?

<p>Dear Mr. Lee:</p> <p>Thank you for your interest in the graduate program in Industrial and Operations Engineering. We have now finished our rigorous review process for Fall 20XX applications. We received an unusually high number of applications for the Fall term and we unfortunately had to limit the number we could accept. While your background is impressive, I regret to inform you that your application to the program has not been accepted. Given your excellent qualifications, I trust you will be able to pursue your academic interests elsewhere and wish you luck in your further endeavors.</p> <p>Sincerely,</p>	<p><i>Parts</i></p>
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You are already likely aware that academic writers employ a variety of organizational patterns. You are already familiar with external organization features, such as chapters, sections, and paragraphs. As you work your way through this book, you will become familiar with the various approaches to internal organization as well. One very common strategy that is founda-

tional to academic writing is to organize information in terms of problems and solutions (Hoey, 1983). This pattern usually has four parts. Can you identify them in this next task?

TASK SEVEN

Draw boxes around and label the four parts of this problem-solution text (situation, problem, solution, and evaluation). After marking the text, answer the questions on page 12.

① As standards of living rise and the world's population grows, the demands for freshwater have been increasing. ② Along with this increase is growing pressure to protect this precious resource. ③ Efforts to protect the water supply have traditionally focused on regulating industrial and municipal waste that is discharged into rivers and lakes. ④ However, in recent years researchers have identified a new threat to world freshwater supplies. ⑤ Studies have identified in freshwater around the world a number of medicinal drugs, ranging from painkillers such as acetaminophen, to antibiotics, to cholesterol absorption inhibitors. ⑥ These drugs easily enter the water supply when they are eliminated through digestion or improperly disposed of by directly flushing them down a toilet. ⑦ Although the amount of these drugs in freshwater supplies is small (a few parts per billion or trillion), their impact on the freshwater supply and on human health has yet to be established. ⑧ Given this uncertainty, efforts are underway to address this problem. ⑨ One simple, inexpensive approach involves educating consumers about proper medication disposal methods. ⑩ This effort involves educating consumers to be made aware that medicines should not be poured into a sink or flushed, but should be discarded through local drug collection programs. ⑪ For example, many pharmacies collect unused or unwanted medicines and some communities have special medicine collection sites. ⑫ With increased education, consumers can dispose of medication properly and help protect freshwater resources.

1. How serious does the author perceive the problem to be? How did you determine this? To what extent is this a global problem?
2. What does the author think of the solution? What do you think of the solution?
3. What is one major problem in your field of study? Why is it important?

TASK EIGHT

Here is another passage with the same structure. Read it and answer the questions on page 13.

- ① Ghana is located on West Africa's Gulf of Guinea just north of the Equator. ② Unlike many poor West African countries, this country of 24 million has a growing economy that is expanding over 10% annually. ③ This growth has largely been attributed to the 2007 discovery of a major oil field off the coast and to Ghana's position as a leading gold producer. ④ Ghana has also emerged as an important center for e-waste recycling and disposal, an industry that contributes more than US\$200 million into the economy. ⑤ E-waste consists of electronic devices typically from Europe and North America that have been discarded, but still have some value. ⑥ E-waste has been said to provide opportunities for employment, poverty alleviation, recycling business developments, and may even bridge the digital divide by contributing to the country's growing demand for information technology. ⑦ However, this industry also poses environmental and health risks that cannot be ignored.
- ⑧ The largest e-waste recycling and disposal center is located in the capital city of Accra and is adjacent to the Agbogbloshie Food Market. ⑨ At this site recyclers disassemble electronics to retrieve valuable metals (for example, gold) or burn items covered with plastic (for example, computer wires) to recover metals such as copper and aluminum. ⑩ These processes expose workers and others living near the e-waste site to toxic materials including plastics, lead, aluminum, and silica that are known to cause cancers and central nervous system damage among other health problems.

Swales & Feak

Unit 1: Flow ? Old-to-New Information

pp. 28?48

The core mechanism for flow; tasks and exercises

TASK FIFTEEN

Now that you have become more familiar with some of the possible stylistic features of academic writing, write a one-page problem-solution text about a problem in a country that you are familiar with. Try to choose a problem unique to that country. Refer, if you like, to the text in Task Eight. Your audience is a group of professors and students interested in your selected country. Consider the style points on pages 16–25 as you write.

To conclude this extensive discussion on vocabulary and style, we now turn our attention to the use of the internet and online tools that may help you become more familiar with commonly used expressions or standard phraseology. Standard phraseology consists of expressions that are typical of academic writing across many disciplines. Many authors new to academic writing want to have some knowledge of these expressions as well as an understanding of what can be borrowed.

Using Google Scholar to Identify Potentially Useful Words and Phrases

1. Go to <http://scholar.google.com/>.
2. In the search box, place quotation marks around a phrase that you want to learn to use. For instance, you might want to find ways to use “In recent years there has been interest in” You might want to know what kind of modifiers can be used before *interest*. Place an asterisk * before *interest*. This search will yield the phrase along with words that come before *interest*. To narrow your search, you can add another topic. For instance, your area may be electric vehicles. Your search would then look something like this.

“In recent years, there has been * interest in” “electric vehicle”

A search in 2011 produced one screen that included this information.

FIGURE 2. Sample Google Scholar Results

<p><u>A novel design of a heat exchanger for a metal-hydrogen reactor</u> S Mellouli, F Askri, H Dhaou, A Jemni... - International Journal of ..., 2007 - Elsevier ... such as hydrogen which is especially attractive for electric vehicle use. Over the last decade, world wide interest in the use of hydrogen has led to much research interest on its storage and usage [1], [2] and [3]. In recent years, there has been increasing interest in using metal ... Cited by 33 - Related articles - All 3 versions</p> <p><u>A hybrid controller design for parallel hybrid electric vehicle</u> W Li, G Xu, Z Wang... - Integration Technology, 2007. ICIT' ..., 2007 - ieeexplore.ieee.org ... In recent years there has been considerable interest in using hybrid system theory to develop a systematic framework for the analysis and design of ... The hybrid electric vehicle systems contain interacting discrete and continuous dynamics, and exhibit simultaneously several ... Cited by 7 - Related articles - Availability at UMichigan - Availability at UMichigan - All 3 versions</p> <p><u>Design of interior PM machines for field-weakening applications</u> WL Soong, S Han... - Electrical Machines and ..., 2007 - ieeexplore.ieee.org ... In recent years there has been increasing interest in the use of concentrated winding stators for both interior [10] and surface PM rotors [8]. Surface PM machines using distributed winding ... The first application is for an electric vehicle traction motor. ... Cited by 5 - Related articles - Availability at UMichigan - All 4 versions</p> <p><u>Adaptive proportional–integral–derivative tuning sliding mode control for a shape memory alloy actuator</u> NT Tai... - Smart Materials and Structures, 2011 - iopscience.iop.org ... Robustness has gained more and more attention. In recent years, there has been extensive interest in self-tuning these three controller gains. For example, the PID self-tuning method based on the relay feedback technique was presented for a class of systems [32, 33]. ... Related articles - Availability at UMichigan - All 4 versions</p> <p><u>Design and test of a high-power high-efficiency loosely coupled planar wireless power transfer system</u> ZN Low, RA Chinga, R Tseng... - ..., IEEE Transactions on, 2009 - ieeexplore.ieee.org ... transfer. I. INTRODUCTION IN RECENT years, there has been increasing interest in research and development of wireless power technology [1] to eliminate the "last cable" after Wi-Fi becomes widely accepted. Wireless power ... Cited by 13 - Related articles - Availability at UMichigan - All 2 versions</p>
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As you can see in Figure 2, adjectives that can modify *interest* are *increasing*, *considerable*, and *extensive*. To determine how common these adjectives are, you can then search for the complete expressions (e.g., “in recent years there has been increasing interest in”).

Other ways to use the internet to search for specific language examples include WebCorp LSE (www.webcorp.org.uk/index.html), which searches all of the internet. You can also search online corpora with a specific focus such as MICUSP, the British National Corpus, the British Academic Written English (BAWE) corpus, or the Corpus of Contemporary American English (COCA). New corpora are being developed with great frequency, and you may want to periodically search the internet to see what is available. You can even create your own corpus of texts in your chosen field (or even

from your own writing) that you can then analyze using online tools such as Compleat Lexical Tutor or freeware such as AntConc, a concordance program for Windows, Macintosh OS X, and Linux. While we cannot offer instruction on the use of these resources here, you will find that you can learn to use them well enough on your own with minimal effort.

Flow

Another important consideration for successful communication is flow—moving from one statement in a text to the next. Naturally, establishing a clear connection of ideas is important to help your reader follow the text. We have already tried to demonstrate good flow of ideas in the water passage in Task Three.

TASK SIXTEEN

Read the passage and discuss the questions on page 31 with a partner.

- ❶ In many countries around the world, it is customary for consumers of hospitality and other services to provide gifts of money (called “tips”) to the workers who have served them. ❷ However, the specific service workers that are customarily tipped, and the amounts consumers give those workers, vary across nations.
- ❸ For example, in the United States consumers tip over 30 different service professions, while no service professions are tipped in Iceland (Star, 1988). ❹ In Mexico consumers tip restaurant servers 15% to 20% of the bill, but tip only 5% to 10% of the bill in Romania (Putzi, 2002). ❺ These variations in tipping norms are sources of uncertainty for international travelers and phenomena to be explained by hospitality and tourism researchers.
- ❻ International differences in tipping customs may be partially explained by differences in national values. ❼ According to Hofstede (1983), national values differ on four major dimensions—power distance, uncertainty avoidance, individualism, and masculinity. ❽ Power distance reflects a nation’s acceptance of power and status differences. ❾ This value should be positively related to national acceptance of tipping because tipping gives customers power over servers (Hemenway, 1984; Lynn, 2000a).

1. How do you think the author establishes the relationship between the ideas?
 2. Underline the grammatical subjects of Sentences 2–9. Can you find a link between each grammatical subject and the sentence that comes before it?
 3. How would you explain the relationship between Sentences 1 and 2?
 4. To what does *these variations* in Sentence 5 refer?
 5. Which words are repeated in the text? Are you surprised by the amount of repetition of words in the text? Did you even notice this when you first read the passage?
 6. What do you think Sentence 10 will discuss? Why?
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Old-to-New Information Flow

Although your first instinct in establishing a smooth flow of ideas is to use logical connectors such as *however* or *furthermore*, many writers generally try to follow a progression from old or given information, which is in the subject position or early at the left end of the sentence, to new information, which is placed at the right end of the sentence. Placing relevant “old” information in early position establishes a content connection backward and provides a forward content link that establishes the context. Notice how this old-to-new pattern is established in this text.

① Research has shown that caffeine does indeed reduce sleepiness and can lead to better/academic performance since students can spend more time studying. ② Despite its effectiveness in counteracting sleepiness, caffeine can have a negative impact on subsequent sleep, which for many students may already be compromised. ③ Specifically, caffeinated beverages consumed near bedtime at night can prolong sleep onset and reduce sleep efficiency and depth, thus affecting both sleep quality and duration. ④ Most of the research on how caffeine affects sleepiness/alertness has focused on coffee or no-doze pills. ⑤ However, a new kind of caffeinated drink has become increasingly popular, namely

functional energy drinks (FEDs). ⑥ FEDs are marketed as products that can improve both mental and physical performance. ⑦ In addition to containing caffeine, FEDs have other active ingredients such as taurine, glucose, and glucoronolactone. ⑧ Exactly how these ingredients together affect alertness remains unclear.

The old-to-new pattern of information is established by starting a text with some familiar information. In the following sentence, you can repeat some information from the previous sentence (exact repetition, in the form of a synonym or variation on the part of speech). In the energy drink example, you can see the repetition of caffeine in Sentences 1 and 2.

① Research has shown that caffeine does indeed reduce sleepiness and can lead to better academic performance since students can spend more time studying. ② Despite its effectiveness in counteracting sleepiness, caffeine can have a negative impact on subsequent sleep,

To tie two sentences together, you can repeat information from the beginning of the first sentence, as in the case of *caffeine* in Sentences 1 and 2. Alternatively, you can pick up information from the end of the first sentence (since, once read, this new information is now familiar). An example of this is Sentences 5 and 6.

⑤ However, a new kind of caffeinated drink has become increasingly popular, namely functional energy drinks (FEDs).
⑥ FEDs are marketed as products that can improve both mental and physical performance.

Note also how passive voice in Sentence 6 is essential here. The point about marketing might not be well connected using active voice. An old-to-new pattern can also be achieved by using *this/these* + a noun, which refers back to some or all of the preceding sentence. An example of this can be seen in this possible Sentence 9.

⑨ If this relationship could be explained, more effective FEDs could be developed.

If old-to-new cannot be easily maintained, writers will often opt to use a logical connector to make relationships clear, as in Sentences 4 and 5.

- ④ Most of the research on how caffeine affects sleepiness/alertness has focused on coffee or no-doze pills. ⑤ However, a new kind of caffeinated drink has become increasingly popular, namely functional energy drinks (FEDs).

Note that *a new kind of caffeinated drink* is new information that was not mentioned in Sentence 4. In order for the author to strongly establish the logical connection, the linking word, *however*, is added.

TASK SEVENTEEN

Work with a partner and answer these questions that focus on old-to-new flow of ideas.

1. The first sentence of a description of the biological clock follows. Given what you know about the old-to-new pattern of information, what are the two topics (or focal points) of the second sentence that the reader would likely expect?

The biological clock is a master clock that dictates the day-night cycle of activity known as circadian rhythm.

Topic 1: _____

Topic 2: _____

2. In fact, the writer produced Sentences 2 and 3. How clearly are Sentences 1, 2, and 3 connected to each other? Explain your opinion.

- ① The biological clock is a master clock that dictates the day-night cycle of activity known as circadian rhythm. ② The suprachiasmatic nucleus (SCN) was identified as the location of the clock in the brains of humans and animals. ③ Specialized clock genes are activated and deactivated mainly by a pair of proteins, one of which turns on a group of genes and the other of which turns off a key gene in a feedback loop that has a 24-hour rhythm (specifically a 24-hour and 18-minute rhythm).

3. What do you think of this revision? How does this differ from the first version?

① The biological clock is a master clock that dictates the day-night cycle of activity known as circadian rhythm. ② The clock was identified in a part of the brain called the suprachiasmatic nucleus (SCN). ③ Within individual SCN cells, specialized clock genes are activated and deactivated mainly by a pair of proteins, one of which turns on a group of genes and the other of which turns off a key gene in a feedback loop that has a 24-hour rhythm (more precisely, a 24-hour and 18-minute rhythm).

4. In Sentences 4 and 5, the author wrote this:

④ The biological clock functions regardless of the normal 24-hour cycle of light and darkness. ⑤ Light is involved in resetting and regulating the clock.

Is the relationship between the two sentences clear? Could the author do anything to clarify how the two points are related? What? What about combining the two sentences into one?

Can you offer a revision here?

5. Let's assume Sentences 4 and 5 are combined into one.

④ Although the biological clock functions regardless of the normal 24-hour cycle of light and darkness, light is still involved in resetting and regulating the clock.

How well connected is this Sentence 5?

⑤ Sunlight resets the internal biological clock each day to synchronize the rhythms of activity of the clock genes, promoting the production of certain substances, such as hormones, which are necessary for maintaining good health.

6. What is the relationship between the information before *promoting* and the information after *promoting*? Should the author use a connector to make the relationship more clear?

7. In Sentence 6, the author wrote:

⑥ It was once thought that aging disrupts the biological clock.

Does this sentence flow smoothly from Sentence 5? If so, why? If not, why not?

8. Here are the final three sentences of the biological clock definition. Do you think they should be in their own paragraph? Why or why not?

⑥ It was once thought that aging disrupts the biological clock. ⑦ But, recent research (Czeisler et al., 2005) has shown that the body temperature and hormone fluctuations of the elderly are as regular as those of the young. ⑧ Doctors can consider this valuable information in the treatment of sleep disorders in the elderly.

9. What do you think about the connection between Sentences 7 and 8? Can you think of a better connection?

10. Now read these two texts on lasers in medicine. Which do you prefer? Why?

- A. ① Lasers have found widespread application in medicine. ② Lasers play an important role in the treatment of eye disease and the prevention of blindness. ③ The eye is ideally suited for laser surgery ④ Most of the eye tissue is transparent. ⑤ The frequency and focus of the laser beam can be adjusted according to the absorption of the tissue. ⑥ The beam “cuts” inside the eye with minimal damage to the surrounding tissue—even the tissue between the laser and the incision. ⑦ Lasers are effective in treating some causes of blindness. ⑧ Other treatments are not. ⑨ The interaction between laser light and eye tissue is not fully understood.
- B. ① Lasers have found widespread application in medicine. ② For example, they play an important role in the treatment of eye disease and the prevention of blindness. ③ The eye is ideally suited for laser surgery because most of the eye tissue is transparent. ④ Because of this transparency, the frequency and focus of the laser beam can be adjusted according to the absorption of the tissue so that the beam “cuts” inside the eye with minimal damage to the surrounding tissue—even the tissue between the laser and the incision. ⑤ Lasers are also more effective than other methods in treating some causes of blindness. ⑥ However, the interaction between laser light and eye tissue is not fully understood.
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Language Focus: Linking Words and Phrases

As demonstrated in Task Seventeen, repetition and linking words and phrases can help a writer maintain flow and establish clear relationships between ideas. Table 1 lists some of the more common linking words and phrases, arranged according to their function and grammatical use.

TABLE 1. Linking Words and Phrases

Function	Subordinators (introduce a dependent clause that must be joined to a complete sentence)	Sentence Connectors (introduce a complete sentence or independent clause)	Phrase Linkers (introduce a noun phrase)
Addition		<i>furthermore</i> <i>in addition</i> <i>moreover</i>	<i>in addition to</i>
Adversativity	<i>although</i> <i>even though</i> <i>despite the fact</i>	<i>however</i> <i>nevertheless</i>	<i>despite</i> <i>in spite of</i>
Cause and effect	<i>because</i> <i>since</i>	<i>therefore</i> <i>as a result</i> <i>consequently</i> <i>hence</i> <i>thus¹</i>	<i>because of</i> <i>due to</i> <i>as a result of</i>
Clarification		<i>in other words</i> <i>that is</i> <i>i.e.</i>	
Contrast	<i>while</i> <i>whereas</i>	<i>in contrast</i> <i>however</i> <i>on the other hand</i> <i>conversely</i>	<i>unlike</i>
Illustration		<i>for example</i> <i>for instance</i>	
Intensification		<i>on the contrary</i> <i>as a matter of fact</i> <i>in fact</i>	

¹ Note that *thus* may also be used in non-finite clauses of result, as in this example: *A fungus infected the fruit, thus causing a significant economic loss to the farmers.* See Unit Three for further discussion of this point.

Sentence connectors raise a small, but important, issue—namely, punctuation. Many general style guides and style guides for your specific area of study are available (online and in book form) that can provide detailed explanations of punctuation use. Therefore, we will limit our discussion to a few key points regarding semicolons (;), colons (:), dashes (—), and commas (,). (See Figure 3.)

1. Semicolons join two completely independent clauses or sentences and work much like a full stop.

Air traffic delays due to high traffic volume have increased considerably over the last decade; these delays have become a major public policy issue.

2. Semicolons can be used with sentence connectors. In the following example, note the use of the comma after the connector.

Increasing the size of airports is one solution to traffic congestion; however, this is a long-term solution whose benefits may not be seen for many years into the future.

3. Because semicolons are a “stronger” type of punctuation than commas (they mark a stronger break in the flow of ideas), they can be used to break sequences into parts.

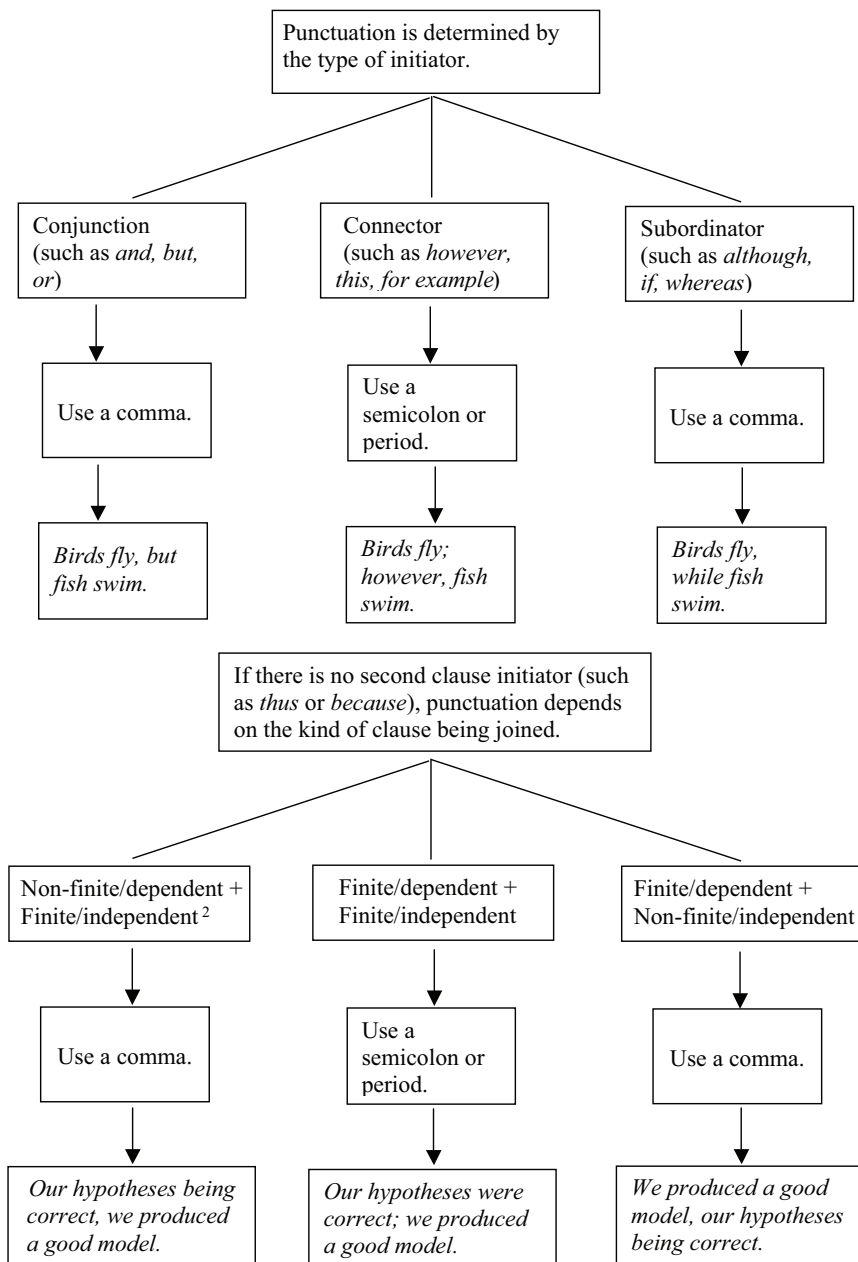
In recent years GNP growth rates have varied considerably for the countries in this study (China, 6%; U.S., 3%; Japan, 1%).

Several researchers have examined whether capital income should be taxed in the steady state (Moriyama, 2003; Correia, 1996; Chamley, 1986).

4. Semicolons can be used to separate rather long items in a list.

Some of the solutions to the air traffic delay problem include increasing the size of airports that routinely experience major flight delays; overhauling the air traffic control system so that more flights can be safely handled; and increasing landing fees (which are currently based on the weight of an aircraft) during peak periods.

FIGURE 3. Punctuation



²A finite verb is a main verb that is inflected to indicate tense and person.

Although commas could be used in the preceding example, the length of the elements suggests that semicolons would work better; note the use of the semicolon before *and* toward the end of the sentence. Similar considerations apply to sentences that use a colon to introduce a list.

There are four main causes of airport congestion: bad weather, excessive volume, runway closures, and equipment outages.

There are four main causes of airport congestion: bad weather, such as a snowstorm, may ground planes; too many planes may be scheduled to arrive or depart within a short period; runways may be closed; and equipment may be out of service.

Sometimes a dash is used to introduce a list as well, but how you should choose between a dash and a comma is a matter of debate. Often dashes are used by authors to intrude into a sentence and to provide some additional information. Commas are used in a variety of situations. It is best to check a style manual for the many uses. For our purposes here, however, we will say only that commas are used with many of the subordinators.

Although weather is a major cause of airport delays, excess traffic volume is also a major factor.

5. Importantly, style manuals also have guidelines for semicolon uses. Refer to these for more information on semicolon use in your field.

TASK EIGHTEEN

Edit this passage by adding semicolons or commas where necessary.

Although most major companies provide their employees with email accounts as well as internet access many of these companies are concerned about potential abuse and monitor their employees' use of these media. In fact, more than 75% of all major corporations report that they monitor their employees' use of email and internet access either by spot-checking or constant surveillance. Businesses have many reasons for monitoring email and internet use for example they may be concerned about protecting sensitive company information they may be worried about lawsuits arising from sexual harassment because of mass mailing of offensive jokes they may also want to identify employees who are surfing the internet rather than working. In other words they are concerned about cyberslacking.

TASK NINETEEN

Supply linking words or phrases to enhance the flow of one of these passages. Look carefully at the punctuation to help you make an appropriate choice. Once you have made your choices, consider why the linking words are important and why an old-to-new pattern of information flow alone might not be adequate.

- A. It has long been documented that individuals in an organization may voluntarily carry out tasks that are not part of their regular job duties. _____, individuals may go above and beyond the call of duty to help coworkers, prevent problems, or volunteer to stay late when not expected to do so. This behavior is intended to help others in the organization or the organization itself and is often referred to as organizational citizenship behavior (OCB).

_____ it is recognized that OCB is important for an organization to effectively function, there is debate among researchers as to how OCB can be encouraged and rewarded. This debate is further complicated when considering the role of OCB in multinational corporations pursuing global diversity. Most OCB research has focused on Western cultures; _____, whether these research findings can be extended to other cultures is not clear, _____ suggesting a need to investigate OCB as it exists in other cultures, particularly those described as “collectivist.”

- B. Shape Memory Alloys (SMA) are a group of metallic materials that can return to some previously defined shape or size when subjected to the appropriate temperature. When some SMA are cold they can be deformed at a low temperature; _____, when the material is heated above this temperature it undergoes a change in crystal structure, _____ causing it to return to its original shape. Some materials exhibit shape memory only when heated; others can undergo a shape change both when heated and when cooled. _____ many alloys are known to have the ability to “remember” their shape, only some may actually find widespread commercial use. Of particular interest are those that can recover substantial amounts of strain or that generate significant force upon changing shape. _____, one common nickel and titanium SMA, Nitinol, has this ability and is being used in surgical implants, clamps, miniature valves and switches, and other devices.
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***This* and Summary Phrases**

As indicated earlier, *this/these* + a noun can be used to establish a good old-to-new flow of information. Consider the following sentences.

Writing instructors know that students need to understand the differences between formal and informal language. *This understanding* can help students make strategic choices in their writing.

What does *this understanding* refer to? Consider the following sentences.

In recent years, the number of students applying to PhD programs has increased steadily, while the number of places available has remained fairly constant. *This situation* has resulted in intense competition for admission.

What does *this situation* refer to? What is the effect of using *this* instead of *that*?

The phrases in italics contain a summary noun or word that refers back to the idea in the previous sentence. They summarize what has already been said and pick up where the previous sentence has ended. You may have noticed in your academic reading that *this* is not always followed by a noun—that is, *this* is unsupported or unattended. Keep in mind, however, that if there is a possibility your reader will not understand what *this* is referring to, your best strategy is to follow *this* with a noun so that your meaning is clear.

TASK TWENTY

Choose a noun to complete the second sentence of each set of sentences. More than one answer may be possible.

1. According to a recent survey, 26% of all American adults, down from 38% 30 years ago, now smoke. This _____ can be partly attributed to the mounting evidence linking smoking and fatal diseases, such as cancer.
a. decline b. decrease c. drop d. improvement e. reduction

Can you think of any other nouns that could complete the sentence?

2. Early in September each year, the population of Ann Arbor, Michigan, suddenly increases by about 25,000 as students arrive for the new academic year. This _____ changes the character of the town in a number of ways.

a. increase b. influx c. invasion d. jump e. rise

Can you think of any other nouns that could complete the sentence?

3. Nowadays, laptop computers are lighter, more powerful, and easier to use than they were five years ago. These _____ have led to an increase in the sales of these machines.

a. advances b. changes c. developments d. improvements

Can you think of any other nouns that could complete the sentence?

As the task indicates, the noun that you choose to follow *this/these* can provide a strong interpretive signal that reveals your stance (see Unit Six). By revealing your stance you communicate not only what you know, but also what you think.

TASK TWENTY-ONE

Choose a summary word from the list to complete each sentence.
Can you think of other possible summary words in addition to those on the list?

difficulty	estimation	problem	situation
disruption	finding	process	view

1. The traditional economic and consumer behavior models assume a rational, thoughtful consumer who gathers information about a good and then carefully makes a purchase. This _____ has recently been challenged, particularly because of the growing number of consumer choices.
 2. Our pilot study has shown that wind turbines used to generate electricity can pose a threat to flying birds. This _____ suggests a need for further research on improving the safety of these mechanisms.
 3. In soccer, goalkeepers routinely wear gloves that may restrict heat loss from the hands and cause discomfort. In order to alleviate this _____, special materials, called phase control materials (PCMs), have been incorporated into gloves to reduce the amount of heat inside the glove, thus maintaining a comfortable temperature.
 4. Normal average human skin temperature is 37°C. At any lower environmental temperature, heat will be lost from the skin to the environment as the body attempts to heat up the air in direct contact with the body. This _____ is known as conduction.
 5. Until adjustment of the body clock has occurred, individuals suffering from “jet lag” feel tired during the new daytime, yet are unable to sleep properly during the new night. For athletes in particular this _____ of sleep can affect mood and powers of concentration and might result in poorer training performances and competition results (Reilly et al., 1997b).
 6. Until recently, the support needs of frail older people in Sweden have been met primarily by the state, with there being little expectation that the family would provide care. This _____ is now changing as increasing emphasis is being placed on the role of the family.
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TASK TWENTY-TWO

Now try to find your own summary words that can complete these sentences.

1. Irrigation in sub-Saharan Africa is in most cases performed using a rope and bucket to raise and distribute water from a shallow open well. While this _____ has the advantage of being inexpensive, its low capacity and labor-intensive nature is decidedly a disadvantage.
2. Motor vehicle deaths in the U.S. declined from nearly 60,000 in 1966 to just over 40,000 in 2011, even though Americans drive millions more miles now and millions more vehicles are on the road. The death rate, which was 7.6 deaths per 100 million miles in 1950, declined from 5.5 in 1966 to 1.6 in 2011. This _____ can be attributed to the manufacture of safer vehicles with features such as airbags and antilock brakes.
3. Haigney concludes from his study that driving performance decreases when drivers use their cell phones. This _____ is consistent with recent reviews of the literature on driving distractions.
4. Although it seems that the construction of new roads and widening of existing roads should reduce traffic congestion, recent research has shown that these activities actually lead to increases in traffic. This _____ is known as the “induced traffic” effect.
5. In 1900, average life expectancy at birth was 47 years for individuals born in developed countries. In 1950, life expectancy was nearly 68. For newborns today, life expectancy is about 77 years. This _____, however, does not mean that humans are undergoing some physiological change. Rather, it is a result of advances in medicine and technology.

Summary expressions may be expanded into longer phrases to add clarity or interpretation. However, you should weigh the benefits of expanding the summary phrase. A long and possibly complicated summary phrase may actually be less effective.