Session 2 Reviewing and Critically Evaluating the Literature

Learning Outcomes:

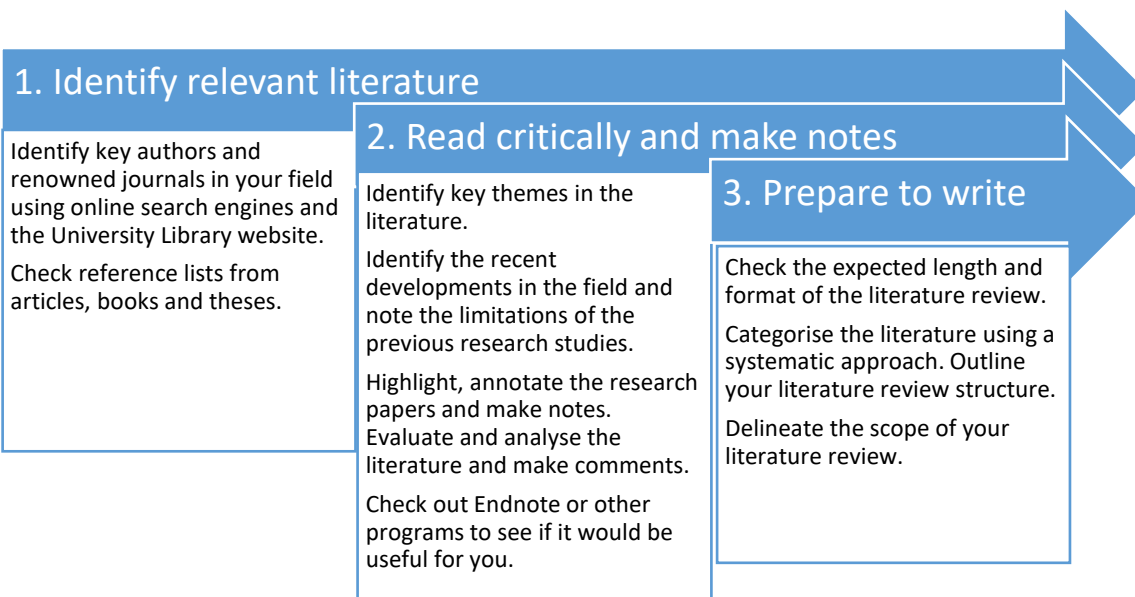By the end of this session, students should be able to:

- organize, summarize and critique the literature
- cite, reference, synthesize and paraphrase ideas from the literature; and
- use appropriate rhetorical devices and linguistic features to express their stance in the literature review
- explain key concepts and research findings in the literature

Warm-up Task

Find a partner. Share your experience about identifying and reviewing relevant literature:

1. How do you usually find suitable and relevant research articles? Online search? Recommended by your supervisor?

2. In your research field, when do you need to review previous research? In which types of writing do you need to have a literature review?

3. Why do researchers need to review previous research?

Steps in Preparing to Write a Literature Review

1. Identify relevant literature

Identify key authors and renowned journals in your field using online search engines and the University Library website.

Check reference lists from articles, books and theses.

2. Read critically and make notes

Identify key themes in the literature.

Identify the recent developments in the field and note the limitations of the previous research studies.

Highlight, annotate the research papers and make notes. Evaluate and analyse the literature and make comments.

Check out Endnote or other programs to see if it would be useful for you.

3. Prepare to write

Check the expected length and format of the literature review.

Categorise the literature using a systematic approach. Outline your literature review structure.

Delineate the scope of your literature review.

Task 1

General Purposes of Reviewing the Literature

Postgraduate researchers often have to demonstrate that their research is **original** and **worthwhile**. They should also prove that they are **knowledgeable about the theories and the recent developments in their field**. It is through your review of the literature that you can achieve the above.

Discuss the following questions in small groups:

1. What is the meaning of "originality" of research?

2. How can you show that your research is worthwhile in your thesis/journal article?

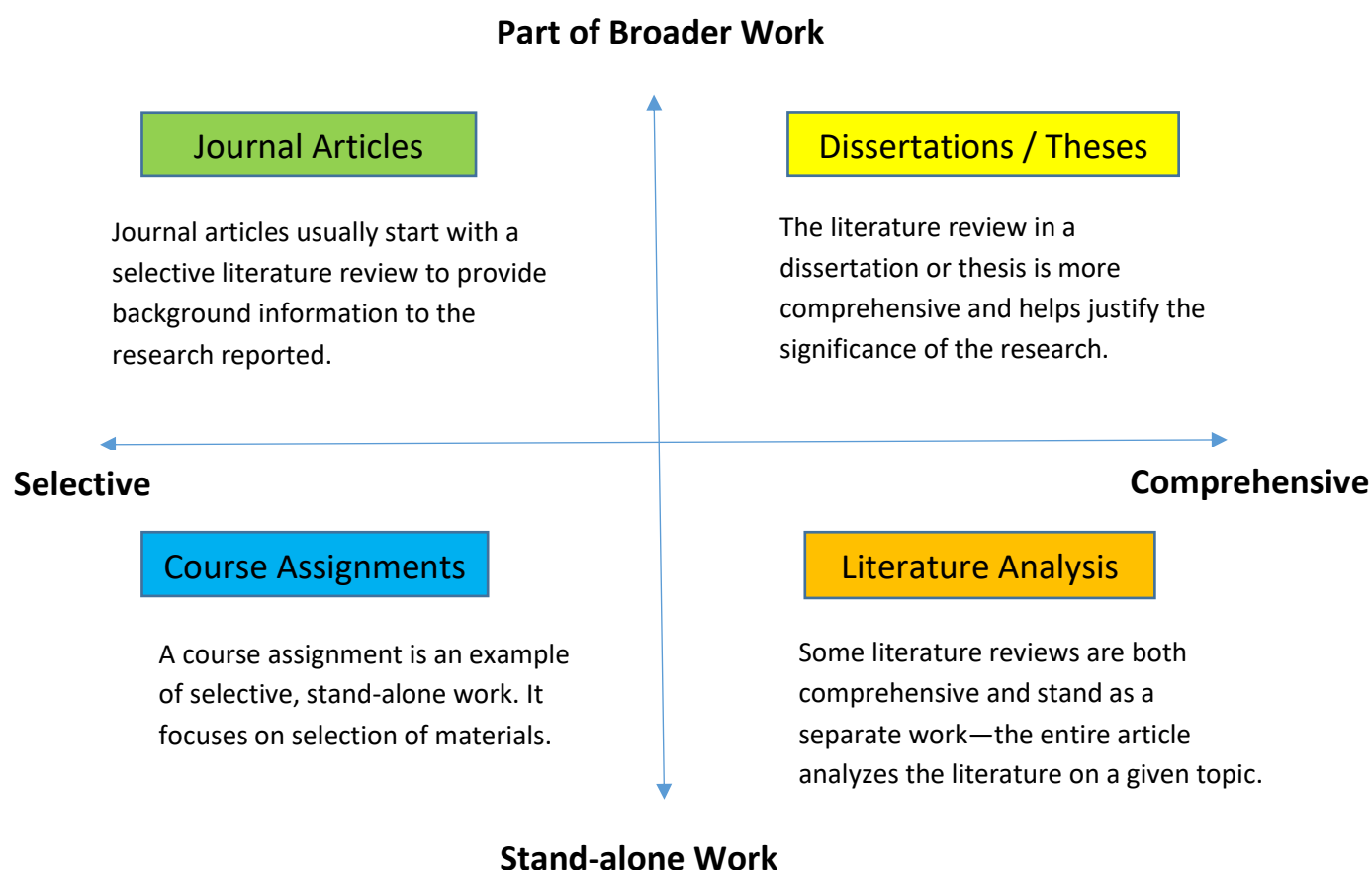**What is a Good Review of the Literature?**

LR is "…**an interpretation** of a selection of published and/or unpublished documents available from various sources on a specific topic that optimally involved summarization, analysis, evaluation, and synthesis of the documents." (Onwuegbuzie et al., 2012:2)

LR is "…a written document that presents **a logically argued case** founded on a comprehensive understanding of the current state of knowledge about a topic of study. This case establishes a convincing thesis to answer the study's question." (Machi & McEvoy, 2010:4)

The LR is "more than a summary. It includes **a critique** that assesses or weighs up the value of theories, ideas, claims, research designs, methods or conclusions." (Bitchener, 2010:61)

Functions and Moves of a Literature Review

Literature reviews can differ in structure, length, breadth and depth of content included. They can range from the selective (a narrow area of research) to the comprehensive (a larger amount or range of works). They can also exist as part of a larger work (i.e. in a journal article or thesis) or stand on their own.

Part of Broader Work

Journal Articles

Journal articles usually start with a selective literature review to provide background information to the research reported.

Dissertations / Theses

The literature review in a dissertation or thesis is more comprehensive and helps justify the significance of the research.

Selective   **Comprehensive**

Course Assignments

A course assignment is an example of selective, stand-alone work. It focuses on selection of materials.

Literature Analysis

Some literature reviews are both comprehensive and stand as a separate work—the entire article analyzes the literature on a given topic.

Stand-alone Work

Task 2

Read the following examples of literature reviews taken from two journal articles in *Journal of Traditional Chinese Medicine* and *Journal of Marketing respectively*. Discuss the questions below in small groups*.

1. Can you identify the moves in the two literature reviews? Are the moves similar or different in the two literature reviews?

2. Compare the language use and citation style in the two literature reviews. Do you think they are similar or different?

Example 1 – A Literature Review excerpt taken from a journal article in *Journal of Traditional Chinese Medicine*

Alzheimer's disease (AD), the most prevalent cause of dementia, is characterized as a chronic, progressive neurodegenerative, severe and incurable disorder. AD is associated with memory loss and cognition impairment accompanied by abnormal behavior and changed personality. The pathological features associated with the cognitive dysfunction are neurofibrillary tangles (NFTs) and senile plaques (SP), combined with neuron loss mainly in the hippocampus and important cortical and subcortical brain regions.[1] It is estimated that nearly 40 million people mostly older than 60 years have dementia worldwide, and this figure is projected to reach over 115 million by 2050, and making it one of the most threat to elderly health and presenting one of the biggest healthcare issues.[2] Though the situation is severe, there is no effective therapy capable of alleviating symptoms or slowing down disease progression.[3]

Acupuncture, which is an important therapy method in Chinese medicine, has attracted growing attention for its complementary and alternative role in alleviating symptoms of some diseases safely and effectively. And recently it has been proved safe and effective in several diseases, including urinary leakage among women with stress urinary incontinence,[4] chronic severe functional constipation,[5] and migraine.[6] It has also indicated that acupuncture can ameliorate cognitive impairment and improve memory in AD patients.[7] Animal studies have found that the therapeutic effects of acupuncture may be achieved *via* multiple pathways, including clearing Aβ protein deposition,[8] inhibiting tau protein hyperphosphorylation,[9] prompting neural transimission,[10] reducing oxidative stress.[11] The acupoints selection and combination play a critical role in impacting the therapeutic effects of acupuncture. However, determining the most effective acupoints selection and combination for AD still remains to be elucidated. Insufficient or improper acupoints selection and combination may contribute to a limited clinical therapeutic effects and the application of acupuncture for AD.

In recent years, data mining method has been used to discover potential acupoints and Chinese herbs for improving the therapeutic effects of disease. Clinical trial has demonstrated that the dominant acupoints of Shaoyang Meredian, which was based on the data mining results, were effective in alleviating pain symptoms and reducing migraine recurrence for a long time.[6] Also, acupuncture on Zusanli (ST 36) of the Stomach Meridian was more effective than acupoints of the Gallbladder Meridian in alleviating functional dyspepsia.[12] These results may provide evidence that data mining method can be a promising and useful method to determine the rules of acupoints selection and combination for treating diseases.

In this data mining analysis, we aimed to discover acupoint combinations that were used to treat AD. Hopefully this can provide evidence-based information for AD treatment with acupuncture.

Source: Yu, C.C., Wang L., Kong, L.H., Shen, F., Ma, C.Y., Du, Y.J., & Zhou, H. (2018). Acupoint combinations used for treatment of Alzheimer's disease: A data mining analysis. *Journal of Traditional Chinese Medicine, 38*(6), 943-952.

Example 2 - A Literature Review excerpt taken from a journal article in *Journal of Marketing*

Impression Formation and Face Perception

Faces are known to bias decisions (Wheeler and Petty 2001). We form first impressions of others and make judgments about their social traits almost instantaneously on the basis of face perceptions (Samper, Yang, and Daniels 2018; Todorov et al. 2005; Willis and Todorov 2006). The neural mechanism underlying trait impressions of faces involves the amygdala, a subcortical brain region crucial in coding the value of stimuli (e.g., Engell, Haxby, and Todorov 2007). In functional magnetic resonance imaging (fMRI) studies, the amygdala has been observed to be more sensitive to unusual rather than to neutral stimuli, suggesting that our response to both attractive and unattractive faces may be stronger than to plain-looking ones (e.g., Said, Baron, and Todorov 2008).

In addition, the amygdala response to facial attractiveness triggers rapid automatic inferences about people's dispositions, which in turn affects subsequent information processing and decisions (Engell, Haxby, and Todorov 2007). Greater attention to an eye-catching face makes it more likely that people process additional information associated with the face, which may weaken but not change the nature of the relation between inferences from faces and decisions (Todorov et al. 2005; Vuilleumier 2000). Thus, advertisers find it effective to use either attractive or unattractive models to present certain products (Guihaire 2018).

Beauty and Ugliness Premiums

Studies in many fields have concluded that beauty has a premium and ugliness is penalized (Eagly et al. 1991; Langlois et al. 2000). According to evolutionary psychology (e.g., Magro 1999), an attractive face indicates good health and prospect for survival and reproduction. Beauty is also correlated with perceived intelligence and social skills (Eagly et al. 1991; Hamermesh 2011). Attractive solicitors can obtain twice as much in donations as their unattractive counterparts (Reingen and Kernan 1993), and a good-looking salesperson enhances customer evaluation of a

product simply by touching it (Argo, Dahl, and Morales 2008). Although attractiveness is valued in both men and women, men are more responsive to the physical attractiveness of women (Li and Kenrick 2006). Meanwhile, studies have found that attractiveness sometimes fails to work, for instance, when helping children in need or selling an embarrassing product (Fisher and Ma 2014; Wan and Wyer 2015).

Several recent studies show that unattractive faces are associated with certain positive outcomes. Gheorghiu, Callan, and Skylark (2017) find that students rate unattractive professors as better scientists than attractive professors. A study of Nobel laureates reinforces the pervasive stereotype that scientists sacrifice physical appeal for intellectual pursuits (Fidrmuc, Paphawasit, and Tunalı 2017). Kanazawa and Still (2018) indicate that very unattractive executives earn significantly more than their attractive counterparts, although the study does not consider perceptions of competence. These findings support the popular belief that unattractive people exert greater effort to compensate for their disadvantaged appearance; however, these studies fall short of offering plausible explanations for the ugliness premium.

Online Profile Pictures

Online forums and social media have aggravated people's concern with appearance and greatly affected social and consumption behaviors (Grabe, Ward, and Hyde 2008). The advantages of anonymity and lack of immediate social censoring may make such biases more prevalent online (Guan et al. 2015). Online transaction platforms (e.g., Uber, Airbnb) typically require sellers to upload real photos as their profile pictures and to display them in prominent positions. These profile pictures provide impression-bearing information that affects source credibility and behavioral outcomes (Forman, Ghose, and Wiesenfeld 2008; Luca 2017).

Studies of the attractiveness effect have mostly used a small number of pictures in experimental settings rather than assessing real-world situations, leaving the robustness and generalizability of their findings open to question (Langlois et al. 2000). It is not clear from the literature whether social stereotypes based on attractiveness extend to the C2C e-commerce context. Researchers usually adopt a linear model or compare only two levels of attractiveness (i.e., attractive vs. less attractive), neglecting any potential nonlinear effect. Thus, C2C e-commerce platforms involving ordinary people provide an excellent setting to explore the effect of beauty and ugliness premiums and their underlying mechanisms.

Source: Peng, L., Cui, G., Chung, Y.H., & Zheng, W.Y. (2020). The faces of success: Beauty and ugliness premiums in e-commerce platforms. *Journal of Marketing, 84*(4), 67-85.

Task 3

The **structure of a literature review (LR) varies across disciplines**, reflecting the conventions of each field. Some focus on chronological developments, while others emphasize themes or methods. Understanding these differences is key to writing an effective LR.

Now, analyze a literature review from your discipline. **Examine its structure and how it organizes and transitions between ideas**.

- Work in a group of 2-3. Choose an example LR or Introduction with LR and read it. Discuss how the review of previous research is organized in paragraphs.
- Highlight the topic of the paragraph or sentence(s) as well as words/phrases that show the logical development.
- Discuss whether you notice any logical development problems? Can you give any suggestions for improvement?

Critically Evaluating the Literature

When writing the literature review, you are expected to critically evaluate the sources. The criteria and the questions below help you form the foundation for critical inquiry as you read the sources:

Criteria	Possible Questions to Ask
Purpose of the article	▪ What is the purpose of the article?
Arguments	▪ Are the arguments clear? ▪ Are different viewpoints/perspectives on the issue given? ▪ Is there any bias (e.g. overgeneralizations, assumptions) in the arguments?
Use of evidence	▪ What kinds of evidence is provided to substantiate the argument(s) (e.g. personal examples, data, empirical evidence)? ▪ How well does the evidence support the argument(s)? ▪ What is missing or omitted?
Methodology or approach for empirical studies	▪ What approach was used for the research (e.g. quantitative or qualitative, case study?) ▪ Is this a cross-sectional study (i.e. subjects/people who differ on one key characteristic are studied at one specific point in time) or a longitudinal study (i.e. data are gathered for the same subjects/people repeatedly over a period of time/years)?
Sample	▪ Is the sample size large enough? ▪ Is the sample representative?
Results	▪ Are the results reliable? ▪ Can the results be generalized to the population?
Conclusion	▪ What conclusions are drawn? ▪ Are these conclusions suggestive, definitive or justified? ▪ Does the research make an original contribution to the field? Why or why not?

Task 4

Based on the above criteria, critically analyze a journal article you have recently read. If you were to cite this journal article in the literature review section in your thesis/manuscript, what **critical comments about this source** would you make? Make some notes in the space below. Share your ideas with a partner.

Writing a Systematic Literature Review or Meta-analysis Review Paper

Writing a meta-analysis or systematic literature review (SLR) paper requires a structured approach to ensure rigor, transparency, and reproducibility. Below are detailed guidelines for preparing such a paper:

1. **Clarity of Focus**: Start with a clear, specific, and researchable question or hypothesis for the review.
2. **Develop a Protocol**: Set clear objectives, inclusion/exclusion criteria, identify databases (e.g. PubMEd, Scopus) and keywords, determine search strategy and how data will be collected.
3. **Conduct a Comprehensive Literature Search**: Search multiple databases to ensure comprehensive coverage. Document the databases, keywords, and filters used.
4. **Filter Studies**: Use the inclusion/exclusion criteria to filter studies. Use software for efficient screening.
5. **Extract and Organize Data**: Develop a standardized data extraction form to collect relevant information consistently.
6. **Assess Study Quality**: Evaluate the quality and risk of bias in the included studies. Report the assessment explicitly and discuss its implications.
7. **Conduct Data Synthesis**:
   - **For Systematic Reviews**: Synthesize findings qualitatively by identifying patterns, themes, or gaps. Use thematic analysis or narrative synthesis.
   - **For Meta-Analyses**: Combine quantitative data using statistical methods. Calculate effect sizes.
   - Address heterogeneity in studies
8. **Interpret and Discuss Findings:** Highlight consistent patterns, significant results, and gaps. Discuss implications for practice, theory, and future research. Acknowledge limitations in your review process (e.g. publication bias, small sample sizes). Propose directions for future research or practical applications.
9. **Include Visuals:** Use tables, charts, and diagrams to summarize findings.
10. **Reference Properly:** Use reference management tools to cite sources correctly. Follow the required citation style.

Language Use in a Literature Review

Writing a literature review involves specific language features that help convey critical analysis, summarize existing research, and highlight gaps or contributions in the field. Here are some key features:

1. Reporting verbs (The choice of verbs reflects the writer's stance on the source)
2. Evaluative language (Used to assess the quality, relevance, or impact of research)
3. Hedging (Used to avoid overgeneralizations and present claims cautiously)
4. Comparative language (Used to compare and contrast findings or perspectives)
5. Signposting language (Used to help the reader follow the structure and flow of the review)
6. Synthesis language (Used to integrate multiple sources and show relationships between them)

Task 5

Use of Reporting Verbs in Research Writing

When referring to the research of others in academic writing, we need to use reporting verbs. Appropriate use of reporting verbs can help the reader understand the relevance of the sources in your writing and can help you strengthen your argument. Reporting verbs can also show your attitude/stance towards the sources. Students always repeatedly use "states", "points out" or "reports" when referring to the sources. In fact, there are many other reporting verbs:

Tentative reporting verbs	Neutral reporting verbs	Strong reporting verbs
Admit	Comment	Acknowledge
Consider	Compare	Advocate
Hypothesize	Define	Affirm
Imply	Describe	Argue
Postulate	Discuss	Assume
Propose	Demonstrate	Challenge
Question	Document	Concede
Recommend	Examine	Conclude
Speculate	Explain	Confirm
Suggest	Explore	Contend
	Identify	Deny
	Indicate	Doubt
	Interpret	Dispute
	Mention	Endorse
	Note	Emphasize
	Observe	Establish
	Point out	Highlight
	Report	Infer
	Regard	Maintain
	Reveal	Oppose
	Show	Object to
	Study	Presume
	State	Refute
	Take into consideration that	Reject
		Stress
		Support the view that
		Substantiate

Visit this website for more examples of reporting verbs: https://www.adelaide.edu.au/writingcentre/sites/default/files/docs/learningguide-verbsforreporting.pdf

Reporting verbs can be used to convey the attitudes of the writer of the summary/literature review. What do you think about the attitude of the writer of the two sentences below?

Campbell (2010) **presumes** that the findings will be representative of the whole population…

The authors **speculate** that people who scrap their old cars will immediately buy another new(er) car.

Notice also how the addition of an adverb can even more clearly reveal the stance of the writer. This is commonly used when making critical analysis of the sources.

The authors *incorrectly assume* that patients will always take the medicine that he been prescribed.

Practice: Replace *"say"* with each of the verbs listed and try to find out their implied meanings.

Dr. Mead *says* that COVID-19 could be airborne in addition to contact infection.

Words	Key	Implied meanings
1. Tells, states		a. You are not sure.
2. points out		b. He presents arguments for his views.
3. asserts, argues		c. He and you both think it is unquestionably true.
4. suggests		d. He is not sure.
5. claims, alleges		e. He knows something that you don't.
6. implies		f. He does not say it directly but you read between the lines.
7. explains		g. You have mentioned some other view of his.
8. reveals, discloses		h. He says it when discussing something else and you accept it as a fact.
9. indicates		i. The idea is probably true but he doesn't like it.
10. adds		j. More or less neutral.
11. mentions		k. It was a fact previously kept secret.
12. complains		l. He gives signs from which we can deduce he thinks this.

Extended Task: Find at least three well-written published research papers that are typical of papers in your field of study. Underline all the reporting verbs in the literature review section. Then, answer the following questions.

Answer the questions below:

1. What tense(s) is/are used for the reporting verbs? Why do you think the particular tense(s) is/are used?

10

2. Do you think the reporting verbs show the attitude of the writer of the summary/literature review? Can you give some examples?

This task was adapted from: Swales, J.M., & Feak, C.B. (2012). *Academic writing for graduate students (3rd edition).* The University of Michigan Press.

Task 6

Use of Evaluative Language in Literature Review Writing

A key role of your literature review is to show your critical analysis and evaluation of the literature. When reviewing the literature and taking notes, you can develop this critical evaluation by asking yourself questions such as:

- What are the **strengths** and **weaknesses/limitations** of the different bodies of literature/studies you are reviewing?

- What accounts for the **different or similar findings** in the previous studies? How can these be explained (e.g. theory or methodology adopted, the context of the studies, etc.)?

- Which **issues, gaps, ambiguities, unresolved problems**, etc. in the literature do you wish to particularly address in your own research? Why?

- What are the **implications** of your critical analysis and evaluation?

When writing up your literature review, you can use evaluative language to show your critical interpretation and evaluation.

Examples of Evaluative Language:

1. Attitude markers	
Evaluative adjectives	Important, useful, significant, effective, interesting
Evaluative nouns	Importance, interest, contribution, effectiveness, potential, attention
Evaluative adverbs	Appropriately, importantly, well
Evaluative verbs	Outperform, highlight, improve, enhance, achieve

Intensifying adverbs	Extremely, widely, particularly, very, greatly
Formulaic expressions (phrases)	Play an important role in…, contribute to…, shed new/further light on…

2.   Certainty markers
Clear, apparent, evident, clearly, unsurprisingly, evidently, certainly

3.   Stance modality markers
Can, could, might, should, may, seem, must, possibly

4.   Discourse-based markers

Negative expressions	Do not account for; did not grasp; does not involve
Adversatives	However, even though, nevertheless, while
Disjuncts	Unfortunately, hopefully, unsurprisingly

1.   Read the following short paragraph. Underline all the evaluative language:

Hematopoietic lineage choice and differentiation require dynamic changes in gene expression, under tight regulation by lineage-specific transcription factors (TFs), whose interplay can promote or antagonize distinct fates. Our understanding of the TFs that are involved in myelopoeisis and the precise stages at which they function remains rudimentary. Our prior scRNA-Seq studies, coupled with colony assays, identified a novel mixed-lineage intermediate (MultiLin) state in which collapsing hematopoietic stem cell/progenitor (HSCP) gene expression is coupled with opening of early myeloid enhancers by PU.1 and Cebpa. We demonstrated that exit from the MulitLin state can occur via a metastable intermediate exhibiting simultaneous low-level expression of the antagonistic TFs Irf8 and Gfi1, and identified complex cross regulation between these factors and other TFs (Ets1, Per3, Klf4, Zeb2 and Irf5)7; however, the complete gene regulatory network (GRN) remains unknown.

Basu, J., Olsson, A., Ferchen, K. Elizaveta, K., Chetal, K., Nicolas, E., Czyzewicz, P., Levchenko, D. Ge, L. Hua, X. Grimes, H., Salomonis, N., & Kappes, D. (2023). ThPOK is a critical multifaceted regulator of myeloid lineage development. *Nat Immunol,* 24, 1295–1307. https://doi.org/10.1038/s41590-023-01549-3

2. Read the literature review section of a journal article in your field. Identify instances of evaluative language and analyze their rhetorical purposes. Share your findings with the class.

Task 7

Choose a systematic literature review or meta-analysis paper from a reputable journal in your field.
1. Examine how the paper is organized.
2. Analyze the language features (e.g. reporting verbs, evaluative language, hedging, comparative language, signposting).
3. Reflect on how the structure and language of the paper contribute to its clarity and effectiveness.

Making Academic Attribution

Why do you need to cite sources in academic writing?

- To demonstrate you are familiar with the work in your field
- Incorporate other people's work to justify your arguments and make your work more credible
- Attribute the research space to the studies conducted by other researchers in order to show the originality of your research
- Avoid plagiarism

What is plagiarism?

- Plagiarism means making use of other peoples' words or ideas without acknowledgement, copying word for word or only making slight changes when rewriting the ideas using your own words.
- Plagiarism applies to all kinds of information and all types of sources including books, magazines, newspapers, lecturer's notes, TV programmes, online videos, websites, students' work.

Task 8

Citation and Referencing skills (In-text citations, paraphrasing and synthesizing skills)

You can use the **author-prominent approach** or **information-prominent approach** in in-text citations. Compare the two approaches below:

Author-prominent approach:

Wang (2019) suggests that reading literature is a sophisticated action, which involves interacting with the text and reflecting on readers' own experiences.

Wang[1] in 2019 suggests that reading literature is a sophisticated action, which involves interacting with the text and reflecting on readers' own experiences.

Note: The first example above uses the name-year system while the second example uses a number reference system.

Information-prominent approach:

Reading literature is a sophisticated action, which involves interacting with the text and reflecting on readers' own experiences (Wang, 2019).

Reading literature is a sophisticated action, which involves interacting with the text and reflecting on readers' own experiences[1].

1. Which in-text citation approach is more common in your field? Do you know why?

Sometimes direct quotations are used when the original wording is particularly useful or paraphrasing the ideas may change the meaning of the original text. The direct quotation should be indicated by double quotation marks, and the page number should be provided. For example:

The survey of corporate senior marketing managers produced findings suggesting that "clients should be responsible for the strategic direction and planning, which are the foundation of integrated communications programs" (Low, 2000, p.36).

The survey of corporate senior marketing managers produced findings suggesting that "clients should be responsible for the strategic direction and planning, which are the foundation of integrated communications programs"[1, p36]

2. Can you find any direct quotations in the sample journal articles/theses in your field? How are direct quotation cited in the text?

Paraphrasing is a more common in-text citation method than direct quotations. It means communicating the source's ideas using your own words. There are several advantages: It shows that you have understood the ideas in the sources; you are able to select and skillfully integrate key definitions, theories, models, ideas of research findings into your own paper, using your own words.

If you want to use the information in the source but write in your own words, you could begin by identifying the important information in the sentences and the relationships between points. You then might think about the language to establish relationships:

- What are the important points?
- What are the important relationships between the points? (e.g. cause and effect, problem and solution, pros and cons, comparison and contrast)
- What linking phrases and expressions that can connect the points? (e.g. because, therefore, as a result, due to, caused by, can be attributed to)

Next, you might consider possible synonyms for the source vocabulary and changing the part of speech (e.g. nouns to verbs) and sentence structure.

3. Read the following example of paraphrase. Identify the paraphrasing strategies adopted by the writer.

Original paragraph:

The use of a helmet is the key to reducing bicycling fatalities, which are due to head injuries 75% of the time. By cushioning the head upon impact, a helmet can reduce accidental injury by as much as 85%, saving the lives of hundreds of victims annually, half of whom are school children ("Bike Helmets: Unused Lifesavers", 1990).

Paraphrase:

Of the hundreds of bicycling deaths each year, three-fourths are caused by head injuries. Half of those killed are school-age children. One study concluded that wearing a bike helmet can reduce the risk of head injury by 85 percent. In an accident, a bike helmet absorbs the shock and cushions the head ("Bike Helmets: Unused Lifesavers", 1990).

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4. Choose one research article you have read recently and paraphrase a short section/paragraph of it. You may focus on the methods, results or implications. What tense(s) will you use in your paraphrase? Why? After you finished, show your paraphrase to a classmate. Then, show the original text to him/her. Get feedback.

When writing a literature review, you are expected to synthesize information from a number of sources that may overlap, slightly differ, or contradict each other. When working with multiple sources, you often need to infer and make explicit the relationships among them. This is called **synthesizing skills**. To do so, you need to identify the similarities and/or differences between the sources. Then, organize the ideas to ensure that you can logically present the information. To summarize, use the following steps to synthesize information from multiple sources:

1. Organize your sources and identify the similarities and differences between the sources
2. Outline the structure of the synthesis
3. Write paragraphs with topic sentences
4. Revise, edit and proofread the synthesis

Step 1: Organize your sources

You may use the following summary table or synthesis matrix to help you identify the relationships between the sources:

A Summary Table

	Aims	Methods	Context and sample size	Key findings	Conclusion	Evaluation
Source 1						
Source 2						
Source 3						
Source 4						

Each row in the table lists one source, and each column identifies a specific part of the source. You can decide which headings to include based on what is most relevant to the literature you are reading. The summary table gives you a quick overview of the key points of each source. This allows you to group sources by relevant similarities, as well as noticing important differences or contradictions in their findings.

A Synthesis Matrix

	Source 1	Source 2	Source 3	Source 4
Theme 1				
Theme 2				
Theme 3				
Theme 4				

If you plan to organize your literature review using a thematic approach, a synthesis matrix may help. Each column in the table lists one source. Each row is labelled with a specific concept, topic or theme that recurs across all or most of the sources. Then, for each source, you summarize the main points or arguments related to the theme. This allows you to identify the common points that connect the sources, and also the differences between the sources.

Step 2: Outline the structure of the synthesis

The most commonly used approaches/frameworks for organizing ideas in a synthesis are: chronological, thematic, methodological and theoretical approaches. You need to decide which approach is more suitable for the literature you are dealing with.

Step 3: Write paragraphs with topic sentences

When writing a synthesis, each paragraph should discuss a few different sources, and you should be able to condense the overall point of the paragraph into one sentence which is called the topic sentence. The topic sentence signals what the whole paragraph is about; every sentence in the paragraph should be clearly related to it. For an effective synthesis, you can use topic sentences to link back to the previous paragraph or highlight a point of debate or critique. By using topic sentences, you can ensure that your paragraphs are coherent and clearly show the connections between the articles you are discussing.

Step 4: Revise, edit and proofread the synthesis

After writing the synthesis, you can use the following checklist to evaluate your synthesis:

√ Is there a clear and focused topic sentence outlining what the paragraph is about?
√ Is the paragraph organized around one single idea?
√ Has the synthesis discussed multiple sources?
√ Are the similarities and differences between the sources highlighted?
√ Is the synthesis written in your own words?
√ Is the synthesis directly relevant to your research question or topic?
√ Is there a logical transition between sentences and between paragraphs?
√ Are the sources cited correctly using the correct referencing style and conventions?

5. Choose three research articles you have read recently and identify the common points between them. Write a synthesis (no more than 80 words) of the information from the three sources. You may focus on the methods, results or implications. After you finished, show your synthesis to a classmate. Use the checklist above (in step 4) to evaluate the synthesis.

Session Two Independent Learning Tasks

Watch the guided videos below. Continue to use your personal corpora to do linguistic search.

BNC Web Corpus

Video 4: Search for One Word (*indicate*); Sort and Frequency Breakdown Functions (~8 minutes)

➨   https://youtu.be/esL5EVjkHVw

Video 5: Search for Phrases (*the* NOUN *that*) (~7 minutes)

➨   https://youtu.be/YeLGzHmJ7N0

AntConc

Video 5: Search for Collocations in AntConc (~6 minutes)

➨   https://youtu.be/BrKQx-87IbE