Synthesising Information from Multiple Sources

Objectives

- understand what makes an effective synthesis
- master the process of synthesising information from multiple sources with GenAI
- evaluate synthesised information provided by GenAI tools critically

Materials/ Tools

- Handouts of the two synthesis examples (or this could be included in a shared document)
- Shard Word Document (or similar platforms or tools)
- ChatGPT/Poe
- SciSpace

Task 1 – Identifying Effective Synthesis

- Ask students to form pairs or groups of three
- Give them the handouts of the following two synthesis examples or the link to the shared document
- Ask them which one is a better example
- Ask them to identify the problems of the poor example and the merits of the better examples (answers/annotations can be found at the end of this document)

Example 1

Lenneberg (1967) theorised that language acquisition could occur only within a critical period of development between infancy and puberty. Johnson and Newport (1988) have researched the capability of young people to learn a second language. Their findings suggest that young learners acquire a second language more easily than older learners. Schepens, van Hout, and van der Slik (2022) have found that age and language dissimilarity play a role in adults' abilities to acquire a second language.

Example 2

Research on the barriers to second language acquisition has primarily focused on age-related difficulties. Building on Lenneberg's (1967) theory of a critical period of language acquisition, Johnson and Newport (1988) tested Lenneberg's idea in the context of second language acquisition. Their research seemed to confirm that young learners acquire a second language more easily than older learners. Recent research has considered other potential barriers to language acquisition. Schepens, van Hout, and van der Slik (2022) have revealed that the difficulties of learning a second language at an older age are compounded by dissimilarity between a learner's first language and the language they aim to acquire. Further research needs to be carried out to determine whether the difficulty faced by adult monoglot speakers is also faced by adults who acquired a second language during the "critical period."

Sources of the two examples: Ryan, R. (2024, July 4). *Synthesizing Sources | Examples & Synthesis Matrix.* Scribbr. https://www.scribbr.com/working-with-sources/synthesizing-sources/

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At the end of the activity

- Ask students to summarise the features of an effective synthesis

Features of an effective synthesis

An effective synthesis should
- ♦ have a clear theme that is identified to be shared by the sources read (e.g., aims, methods, conclusions);
- ♦ demonstrate the connection between sources (e.g., source A agrees with source B, source C built on source B's finding);
- ♦ highlight sources that have a different point of view/conclusion and relevance to other sources mentioned;
- ♦ identify research gaps or provide your insights of the meaning of the existing sources you have cited.

Task 2a – Process of Synthesising

- Ask students to use ChatGPT or Poe to help create a synthesis matrix using Example 2 in the previous task
- Let students play with different instructions
- Ask students to evaluate the tables/matrixes created by GenAI
- Ask students to share one least effective prompt and one most successful prompt together with the products to the class

The purpose of this task is to help students understand the synthesising process in which they need to be able to group information and discover common features and differences. The synthesis matrix is a good way to help achieve that.

Here is an example of a comparatively effective prompt which was tried with Poe:

Prompt: Create a table according to themes and sources of the paragraph below (add paragraph)

Result:

Here is a table organising the key points from the paragraph according to themes and sources:

Theme	Lenneberg (1967)	Johnson and Newport (1988)	Schepens, van Hout, and van der Slik (2022)	Future Research
Critical Period Hypothesis	- Proposed the theory of a critical period for language acquisition.	- Tested Lenneberg's theory in the context of second		-

Theme	Lenneberg (1967)	Johnson and Newport (1988)	Schepens, van Hout, and van der Slik (2022)	Future Research
		language acquisition.		
Age and Second Language Acquisition		- Found that young learners acquire a second language more easily than older learners.	- Revealed that the difficulties of learning a second language at an older age are compounded by dissimilarity between the learner's first language and the target language.	-
Future Research Directions	-	-	-	- There is a need to determine whether the difficulty faced by adult monoglot speakers is also faced by adults who acquired a second language during the "critical period."

This table organises the key points from the paragraph into three main themes: the critical period hypothesis, the role of age in second language acquisition, and future research directions on this topic. The information is further categorised by the source (researcher or research group) that provided each finding.

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Task 2b – Process of Synthesising

This is another possible activity

- Ask students to form pairs or groups of three
- Ask students to use Poe
- Provide students with 2 papers articles in pdf of your choice (or you can use the 2 pdfs as source 1 and source 2)
- Ask the students to try different ways to ask Poe to create a synthesis matrix for the two sources
- Monitor their process and give suggestions when appropriate
- Ask them
  - What do they think about the results?
  - How do they think GenAI can help them with the process?
  - Can they see the connections between the 2 sources?
- Remind them that they need to read the original text to verify the accuracy of the GenAI products.

Notes: Different ways to get Poe to create a synthesis matrix were attempted

Not working: simply upload 2 pdfs and ask Poe to create a table according to themes and sources. Poe only creates a table for one of the pdfs.

What works: upload the two pdfs separately and ask Poe to build a table for each pdf separately. Then, ask Poe again to compare the two documents in a table. Here is the result for reference.

Criteria	"PSYCHOLOGICAL BARRIERS IN THE ACQUISITION OF SECOND LANGUAGE.pdf"	"PROBLEMS OF SECOND LANGUAGE LEARNING.pdf"
Topic	Factors affecting second language acquisition	Problems of second language learning
Focus	Primarily explores the psychological, cognitive, and affective factors that impact second language acquisition	Covers a broader range of factors, including age, social, psychological, teaching aids, and interference from the mother tongue
Approach	Adopts a more theoretical and research-oriented approach, reviewing various models and theories of second language acquisition	Takes a more practical approach, discussing the specific problems faced by Kannada speakers in learning English as a second language
Scope	Focuses on second language acquisition in general, without	Primarily focuses on the problems faced by Kannada speakers in learning English as a second language

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Criteria	"PSYCHOLOGICAL BARRIERS IN THE ACQUISITION OF SECOND LANGUAGE.pdf"	"PROBLEMS OF SECOND LANGUAGE LEARNING.pdf"
	specific references to any particular language pair	
Key Factors Discussed	- Age-related differences in language learning abilities- Cognitive factors, such as language aptitude and working memory- Affective factors, such as motivation and anxiety	- Age factor- Social factors- Psychological factors- Teaching aids- Monolingual instructor- Interference of the mother tongue
Conclusion	Emphasises the need to consider various individual and contextual factors in understanding and promoting successful second language acquisition	Highlights the need to address the specific challenges faced by second language learners, particularly those related to the influence of the mother tongue and the learning environment

If time allows, students can also be asked to focus on the key factors discussed and do a more detailed and specific synthesis matrix.

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Task 3 – Evaluating GenAI synthesis

- Put students in pairs or groups of three
- Teacher asks this question "What is the most significant barrier to second language acquisition?" in SciSpace.
- Ask students if they think that the "insight" generated is a good synthesis (see an example of the insights below)
- Teacher asks the same question in Poe (see an example answer from Poe below)
- Ask students to synthesise the information from the two sources, can they see shared features/differences?
- Ask students what more information or steps they need after seeing the two sources about the same question

Insight generated by SciSpace

The most significant barrier to second language acquisition is the presence of affective barriers, particularly psychological barriers, which create obstacles for non-native learners in mastering a second language. These barriers include anxiety, lack of confidence, adjustment issues to a new environment, and limited motivation, as highlighted in various research papers [1] [2]. Additionally, factors such as interference of the first language, socio-linguistic and socio-economic backgrounds, flawed pedagogy, lack of interaction, practice, and motivation among learners contribute to the complexity of second language acquisition [3]. Furthermore, the age at which individuals start learning a second language, the level of education they achieve, and the amount of exposure to the first language also play crucial roles in determining the success of second language acquisition [4]. Understanding and addressing these affective and external factors are essential in overcoming the significant barriers to second language acquisition.

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<u>Answer by Poe</u>

The most significant barrier to second language acquisition is often considered to be the influence of the learner's first language (L1). This phenomenon is known as "first language interference" or "language transfer."

The key ways in which the learner's first language can impede second language acquisition include:

1. Phonological interference:
   - Learners tend to apply the sound system, pronunciation patterns, and intonation of their L1 when speaking the second language (L2), leading to an accent or mispronunciation.
   - Sounds that do not exist in the L1 can be particularly challenging for learners to acquire correctly in the L2.
2. Grammatical interference:
   - The grammar rules, sentence structures, and word order of the L1 can significantly interfere with the learner's ability to correctly apply the grammar of the L2.
   - Learners may unconsciously translate directly from their L1 to the L2, leading to grammatical errors.
3. Lexical interference:
   - Learners may rely on direct translation of words from their L1 to the L2, leading to the use of incorrect vocabulary or idiomatic expressions.
   - Unfamiliar concepts or cultural references in the L2 can be challenging to acquire without the learner's L1 frame of reference.
4. Pragmatic and discourse-level interference:
   - The conventions and norms of communication, such as turn-taking, politeness strategies, and discourse structures, can differ significantly between the L1 and L2.
   - Learners may inadvertently apply their L1 pragmatic skills inappropriately in the L2 context.

The degree of first language interference can be influenced by factors such as the linguistic distance between the L1 and L2, the learner's proficiency level, age of acquisition, and exposure to the L2.

Overcoming the barrier of first language interference is a significant challenge in second language acquisition, and language learners often need to develop metalinguistic awareness and consciously work to restructure their linguistic knowledge to successfully acquire the target language.

Suggested Answers

Task 1

Example 2 is better.

Example 1

Lenneberg (1967) theorised that language acquisition could occur only within a critical period of development between infancy and puberty. Johnson and Newport (1988) have researched the capability of young people to learn a second language. Their findings suggest that young learners acquire a second language more easily than older learners. Schepens, van Hout, and van der Slik (2022) have found that age and language dissimilarity play a role in adults' abilities to acquire a second language.

> The focus of the paragraph is not clear.

> Did not really explain the connections between the sources. Mostly description.

> no analysis of sources, did not mention implications or research gaps, insights missing

> Demonstrated the connection between the two sources

> A clear topic

> A commonly shared theme of the sources

Example 2

Research on the barriers to second language acquisition has primarily focused on age-related difficulties. Building on Lenneberg's (1967) theory of a critical period of language acquisition, Johnson and Newport (1988) tested Lenneberg's idea in the context of second language acquisition. Their research seemed to confirm that young learners acquire a second language more easily than older learners. Recent research has considered other potential barriers to language acquisition. Schepens, van Hout, and van der Slik (2022) have revealed that the difficulties of learning a second language at an older age are compounded by dissimilarity between a learner's first language and the language they aim to acquire. Further research needs to be carried out to determine whether the difficulty faced by adult monoglot speakers is also faced by adults who acquired a second language during the "critical period."

> Shared stance

> Different opinions

> Group sources according to year of publication. Showed connection.

> Insights gained from the sources, identifying research gap.