Castledown

OPEN ACCESS

Language Education & Assessment
ISSN 2209-3591
https://www.castledown.com/journals/lea/

Language Education & Assessment, 8(1), 102808 (2025)
https://doi.org/10.29140/lea.v8n1.102808

The Role of Transformation in Summary Writing of Chinese EFL Learners

JIULIANG LI

Beijing Institute of Fashion Technology

Abstract

This study examines the role of transformation in summary writing. Think-aloud protocols of seven learners of English as a foreign language (EFL) from a Chinese university were collected and analyzed. The protocols were coded into various strategies of which transformation constituted an important part serving three primary purposes: developing framework, selecting, and reformulating. Features of transformation operations and patterns of the use of these strategies were explored across participants, who were observed to conduct extensive operations of information transfer from the source text to their writing using various transformation strategies. Overall, the participants with higher language proficiency used more transformation strategies and were awarded higher summary scores than their less proficient peers. This study provides some potentially helpful insights into transformation in summary writing as well as other related academic writing tasks, holding implications for defining the construct and designing the task of summary writing as well as for classroom teaching.

Keywords: Transformation, summary writing, cognitive process, strategy use, EFL learners

Introduction

Summary writing is a core competency for students pursuing university studies (Kim & McCarthy, 2020). A common practice in classrooms is to ask students to write summaries of what they have read. Summarizing skills are also needed in more complex assignments that involve the incorporation of source material into original discourse (Keck, 2006; Kim & McCarthy, 2020; Li, Wijeyewardene, & Stackhouse, 2024; Lin, 2025). In these assignments, students are encouraged to use source texts more substantively as a means to develop a larger theme or argument (Hirvela & Du, 2013) and to go beyond

Copyright: *© 2025 xxxxxxxxx. This is an open access article distributed under the terms of the Creative Commons Attribution Non-Commercial 4.0 International License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*
Data Availability Statement: *All relevant data are within this paper.*

the given knowledge by creating links between their prior knowledge and the new information (Hood, 2008). In this process, summarization skills help students demonstrate knowledge transformation and construction. Previous research has highlighted the importance of summarization in various writing tasks in the academic domain, such as research papers and lab reports (Rosenfeld et al., 2001), demonstrating the importance of informed instruction and assessment of summary skills for facilitating L2 academic literacy development (Li et al., 2024; Sawaki et al., 2024). Resembling real-world language use makes summarization an authentic task for assessing communicative ability. Summarization has been incorporated into some international language tests (e.g., TOEFL iBT) and has continuously received research attention (e.g., Asención, 2004; Plakans, Liao, & Wang, 2019; Sawaki et al., 2024; Yu, 2009). However, the construct of summary writing as a read-to-write integrated task appears complex (Ivanova, 2020) because the task involves different language skills of different modalities, such as reading and writing. The issue has attracted an increasing amount of attention in the language testing literature over the last two decades (Chan & May, 2023) and more studies are still needed to clarify the construct the task intends to assess. To this end, the present study examines the test-taking process of EFL learners in summary writing with a particular focus on the role of *transformation*, an ability that is considered important for successful summary writing.

Literature Review: Transformation in Summary Writing

One of the validity qualities of a test is to ensure if test takers complete the test task in a way that relates to the construct or processes in the target language use situation (e.g., Bachman & Palmer, 1996; Weir, 2005), and a number of studies have investigated the test-taker processes and strategies while completing integrated writing tasks to establish the validity of their tests (e.g., Asención, 2004; Cohen & Upton, 2007). Although the process of summarization has been addressed previously (e.g., Johnson, 1983; Sarig, 1993), the cognitive skills essential to successful summary writing as an integrated L2 task has not received much attention. Qin (2023) suggested that further research is needed to establish which of the skills, if any, has the most positive effect on accurate textual conflation. Better understanding of these skills may be achieved by first examining one of the most comprehensive and extensively quoted definitions of summary.

> A summary is a condensed version, in your own words, of the writing of someone else, a condensation that reproduces the thought, emphasis, and tone of the original. It abstracts all the significant facts of the original - overall thesis, main points, important supporting details – but, unlike a paraphrase, it omits and/or condenses amplifications such as descriptive details (McAnulty, 1981, p. 50).

This definition appears to stress two strategies. 1. Develop a condensed form of original, as revealed in the line “a condensation…abstracts all the significant facts of the original”; 2. Create verbal representation, as indicated by “in your own words”. These two-way processes of meaning construction can be achieved through some major strategies that have been described in models developed by scholars (e.g., Brown & Day, 1983; Johnson, 1983; Kintsch & Van Dijk, 1978). Based on their review of these descriptions, Hidi and Anderson (1986) summarized three common strategies across the different models. The first strategy is selection, in which information is consciously evaluated. The second is condensation, in which higher level and more general concepts or superordinates are substituted for lower level and more detailed ideas. The third common aspect of these models is the terse and correct recapitulation of important ideas by integrating and combining the original text propositions.

Later studies adopted the term – *transformation* to describe the strategies central to read-to-write tasks, including summary writing. This description is prompted by the constructivist view (Spivey, 1990, 1997) which proposes that "writers perform transformations associated with the operations of organizing, selecting, and connecting as they appropriate source material for uses in different communicative contexts" (Spivey, 1990, p. 256). However, Spivey (1990) noted that the operations of organizing and connecting were not extensively demonstrated in the summary writing process. Hence the question arises: What major transformation operations are involved in summary writing? The question entails a reexamination of transformation to capture the strategies in addition to organizing, selecting, and connecting.

The L2 writing research literature contains studies that observed transformation as a potential construct of different integrated tasks sometimes from different perspectives using different terms, a major one being *discourse synthesis*. Plakans (2009a) believed that research by Spivey (1990, 1997) has shaped the notion of discourse synthesis in reading for writing tasks by exploring 'transformations'. Some participants in her study used discourse synthesis in formulating responses to the read-to-write tasks, and the patterns of such use across writers were different. Similarly, Yang and Plakans (2012) observed that discourse synthesis had a direct and positive impact on test performance. They concluded that L2 integrated writing strategy use is a multifaceted construct with three factors, and one of them is discourse synthesis. Zhu et al. (2021) made findings in support of the decisive role of discourse synthesis abilities in both L1 and L2 integrated writing assessments, as well as of the transferability of discourse synthesis skills from L1 to L2. In Chan's (2011) study most L2 ESL test takers engaged in discourse synthesis processes such as organizing textual ideas in and selecting relevant ideas from the source text to finish a summary task.

Asención's (2004, 2008) analysis also confirmed the potential of discourse synthesis as an underlying construct in response essays (which asked test takers to think about the ideas and arguments in a text and give their own thoughts and opinions on the subject) and summary tasks; however, the former elicited more strategies than did the latter. This led to a conclusion that summary writing and response essays are "different dimensions of the read-to-write ability" (Asención, 2008, p.140). This finding resonates with Spivey's observation mentioned above of the differences in the cognitive operations of *transformation* in summary writing and other read-to-write tasks and thus also points to the need for more research efforts in this regard.

The importance of transformation in both the reading and writing processes of meaning construction has also been recognized by some researchers who applied this notion to evaluate summary writing performance. Sarig (1993), for example, included transformation in an evaluation model to analyze the summaries written by an EFL student. The transformation criteria were presented as "the extent to which the summarizer used an appropriate macro-level rhetorical-conceptual framework to reformulate source-text propositional content and thus produce a tighter, more coherent, reader-based version of the source text" (p. 165). The participant was observed to transform original material "rhetorically, and sometimes conceptually, by deleting, adding, collapsing, retaining, and reconceptualizing" (p. 166). Thus, two types of transformation operations were distinguished: one relating to the source-text end of the summary writing continuum – reduction, and the other relating to the target-text end of the continuum – reconceptualization (see also Li, 2016). These operations are akin to the shared processes of reading and writing through which researchers examine the connection between the two domains (e.g., Fitzgerald & Shanahan, 2000; Plakans et al., 2019). Some researchers observed transformation mainly as target-text operation in the process of summary writing (e.g., Johnson, 1983; Kirkland & Saunders, 1991). The differential understanding and use of the term among researchers also imply the necessity to further investigate into the construct of transformation.

The related literature reviewed in this section provides a general understanding of transformation, and points to a need for more research into its role in summary writing as an integrated L2 task. The present research builds on the existing theories of read-to-write and summary writing to develop further understanding of the transformation strategies in EFL context. These strategies may reveal the differences in writers' cognitive activities in read-to-write tasks in general and in summary writing in particular; hence, they may have significance for defining the constructs for these tasks and should be considered when studying the test-taking process and test validity. Studies illuminating writers' processes in these tasks in relation to the potential construct of academic writing would provide test developers with more information with which to design summarizing tasks and give test users greater confidence in interpreting the scores derived from such tasks (AERA, 2014). The study intends to seek answers to the following question: What role does transformation play in EFL summary writing? We approach the question from two aspects. First, originated from conceptualizing read-to-write in general, the role of transformation is less clear in summary writing, and the body of summary research seems to show different understanding of transformation strategies, for example, how they are related to reading and writing. So, the first aspect of the research question probes what major types of transformation strategies are involved in summary writing. As many researchers consider transformation as important to summary writing (e.g., Plakans, 2009a; Sarig, 1993; Yu, 2008), it is desirable to determine how it helps shape the summary writing outcomes. Thus, the second aspect of the question examines to what extent transformation strategies are important for summary writing. To answer these questions, defining transformation would be a point of departure. To this end, transformation was predefined as the strategies that summarizers use to create a compact conceptual representation of the source text by selecting and condensing and convert this representation into written form by recapitulating. This operational definition of transformation was developed based on the definition of a summary (McAnulty, 1981) and research findings presented in this section (Hidi & Anderson, 1986; Kirkland & Saunders, 1991; Plakans, 2009a; Sarig, 1993; Spivey, 1990, 1997).

Method

Participants

A sample of seven EFL learners was drawn from a class in their first year at a Chinese university. They had an average age of 19 and had been learning English for over six years. These participants could be considered as a convenient sample as the researcher was their teacher of college English, which proceeded twice a week with each time being 100 minutes long. Summary writing was part of the course. To familiarize the participants with the proper procedures, the researcher gave them additional training in the regular class hours using the guidelines provided by Friend (2000) so that they could respond to the task in an appropriate way. The participants' English proficiency was approximately CEFR (Common European Framework of Reference) B1 based on their NMET scores (Chinese National Matriculation English Test), the total of which was 150 (Liu, 2018). However, Lynch may be considered as A2 as her NMET score was well below the pass-fail line of 90 if the rule of thumb 60% was applied. Table 1 presents the characteristics of the participants. For ease of presentation, the table also provides information about their think-aloud process and the scores awarded to their summary scripts, which will be described in the following sections.

Summarization Task

An expository text was chosen as the source material for the summarization task. The rationale for selecting this text type is that people are more familiar with, or used to, this type of discourse in daily life, and it is common in studies of summary writing in education, linguistics, and psychology (Yu, 2009). The text was taken from an English textbook for Chinese college students developed by a

Table 1 *Characteristics of verbal reports providers*

Name[a]	Gender	TA duration[b]	TA length[c]		Summary score	Transform occurrence[e]	NMET score
			Chinese	English			
Wynne	Female	48 m	6202	2400	14	4.1%	135
Leo	Male	79 m	5986	1648	7	3.0%	128
Sarah	Female	39 m	2189	1001	10.5	3.5%	127
Lisa	Female	106 m	10031	2131	14.5	10.4%	120
Linda	Female	47 m	2389	964	13.5	2.9%	103
Jacob	Male	47 m	2178	1290	7.5	3.1%	97
Lynch	Female	122 m	4053	4162	7	6.1%	70

Note:
[a]Pseudonyms are used to preserve the confidentiality of individual participants.
[b]The "TA duration" column shows the time duration, as measured in minutes, of participants' think-aloud processes.
[c]The "TA length" column shows the number of Chinese characters and English words used in participants verbal reports.
[d]The "Number IU" column shows how many main idea units are included in participants' summaries.
[e]The "Transform occurrence" column shows the percentage of occurrence of transformation strategies of a participant over the total occurrence of all strategies of all participants.

prestigious publishing company. Thus, the text was considered suitable with respect to topic familiarity, information density, and complexity for the participants, who reported having not read the text before. The text, with 909 words and Flesch-Kincaid Grade Level of 12, examines how exercise affects iron levels in the human body. Based on Friend (2002), the summary task instructed the students to write an English summary of approximately 130 words without copying the source, to make sure that the first sentence is the thesis and ensure that each of the other sentences gives the main idea of one of the subsections of the passage. The task was given in a pen-and-paper form. No time limit was set in order for the participants to feel at ease and provide as much information as possible during the think-aloud process.

Scoring Rubric

The participants' summaries were evaluated by using a scoring rubric that included two parts: a model summary accompanied by a table of main idea units and an analytical scale (Appendix A). Predicated on theories of text comprehension (Kintsch & van Dijk, 1978; Van Dijk & Kintsch, 1983) and existent summary research (Rivard, 2001; Sawaki, 2003; Yu, 2008), the scale was designed to include four components: Main Idea Coverage (MIC), Integration (INT), Language Use (LU) and Source Use (SU). Each of the four components can be rated on a 0–5 points scale. Ratings of each component were summed to yield a final score.

The first rubric component MIC looked at the amount of main ideas presented in a summary, which was a key aspect of an effective summary. INT assessed how concisely the text information was conveyed. The LU component evaluated grammar, syntactic diversity, and vocabulary. Finally, the SU component focused on the precise and verbatim use of source text.

To make the scoring more operational with sufficient accuracy, a model summary was presented as a point of reference.

Think-aloud Protocols

Think-aloud protocols were used to obtain information regarding participants' test- taking process. In this study, all participants received instruction and training on giving verbal reports and then responded to the summary task while speaking aloud. We used the directions based on Ericsson and Simon (1982) to guide them through this process (Appendix B). Before a participant started doing the task, s/he was left alone in a room while the researcher waited outside to respond to any needs and calls. To remind the participants of continuously verbalizing their thoughts a large note of "KEEP TALKING" was placed in front of them during the test-taking process. To maintain a smooth and natural flow of the thinking process the participants were permitted to use the language (i.e., Chinese and English) in which they felt comfortable. In fact, they used their mother tongue (i.e., Chinese) for the majority of the time while providing think-aloud protocols. Where English was used, the participants mostly were repeating the English text or verbalizing the English sentence being written. Think-aloud data were collected over a four-day period with a digital audio recorder upon the participants' permission, and the duration of participants' verbal protocols ranged from 47 minutes to 122 minutes (see Table 1).

Interview

Immediately after the summary writing task was completed, interviews were conducted in a one-to-one condition with a view to supplementing and triangulating data. The interviews were conducted in Chinese to avoid misunderstanding and facilitate communication and were audio-recorded upon permission of the participants. The interviews served to elicit the participants' views mainly on: (1) the way how they approached the task; (2) the strategies they used in order to complete the task; and (3) what difficulties they encountered during the task and how they overcame them.

Data Analysis

Analysis was performed against data mainly from the participants' think-aloud protocols and summary scripts. The former helped develop insight into the transformation process, and the latter provide an indicator of the outcome of that process.

Think-aloud Protocols

Coding of Protocols. The resulting protocols were transcribed (Appendix C shows the symbols used in think-aloud protocol transcription), coded, and categorized into various strategies using NVivo7. The process involved both top-down approach (from the existing research and theories) and bottom-up approach (what the data shows) to data coding and analyzing, the benefits of which has been discussed in previous research (e.g., Gu, 2014). As the study intended to improve our understanding of transformation based on existent research, we planned to approach our research question by using a priori codes to analyze the data. However, a satisfactory priori coding scheme was not available due to the different understandings and applications of transformation in the research literature that tapped the strategies for completing summary writing. Therefore, the coding process began with a general structure of two broad categories to cover those operations used for the purpose of reading and those operations used for writing. The task of coding segments of verbal reports into strategies was informed by a review of the literature related to strategy use in reading (e.g., Cohen & Upton, 2007; Plakans, 2009b), writing (e.g., Baker & Boonkit, 2004), integrated reading/writing (e.g., Asención, 2004; Plakans, 2009a; Yang, 2009), and summarizing (e.g., Yang, 2014; Kirkland & Saunders, 1991).

As coding proceeded, the structure gradually grew in terms of number of strategies. Meanwhile, by examining the think-aloud protocols, a test-taking process of summary writing emerged with five

stages. The strategies were thus classified into these stages, which then served as the sub-categories of the coding scheme (Appendix D).

When coding was completed, reliability was checked by assigning the coding task to a second coder, a PhD candidate in applied linguistics at a Chinese university who had experience of transcript coding in research projects. Before coding, she completed a training session. The researcher explained the coding scheme, its categories and strategies to her and answered her questions regarding the task. The second coder then coded approximately 10% of each of the 7 protocols. The 10% was selected randomly. Some was selected from the beginning of a protocol, some the end, and some around the middle. Care was taken so that the selected 10%s cover the entire test-taking process. The agreement percentage for each protocol was respectably high (above 0.80).

Transformation strategies were derived from the coding scheme, and Appendix E showed some coded examples of transformation strategies. The definition presented at the end of the literature review section was used as criteria to distinguish transformational strategies from other strategies that focused more on reading the text (for example strategy 5), writing (strategy 57) and editing the summary scripts (strategy 50), and assessing task (strategy 2) and task fulfillment (strategy 68).

Reducing Strategies to Major Categories. The operation of individual strategies could not reflect the entire picture of how transformation worked to develop a summary. Thus, efforts were made to reduce the transformation strategies to main categories to develop an understanding of the internal structure of this activity. First, a general understanding of the major transformation strategies was developed by examining existing summarization theories and research findings presented in the 'literature review' section, particularly those proposed by Hidi and Anderson (1986), Sarig (1993), and Spivey (1990). This general understanding guided the entire reduction process. Then, all the transformation strategies were examined to determine common qualities among them which were then used as a criterion to combine strategies. For example, some strategies focused on the global structure of texts, such as strategies 1 and 2 (Appendix F), so they were grouped together. In addition, the strategies that the participants employed were carefully observed and contemplated in light of the purposes for which they were engaged to develop the text thesis and major supporting ideas as reflected in their verbal reports. These were the major considerations in the reduction process fraught with careful reasoning, analyzing, and thinking.

Summary Scripts

The summaries produced by the students were evaluated by two native Chinese raters who were postgraduate students from the same Chinese university, one majoring in language testing and the other in second language acquisition. They had participated in a number of official English essay rating events in China. A training session was administered to familiarize them with the test task, the source text, and the scoring rubric. In the rating session, when the difference between the raters' scores for a summary was larger than 4 points, it was resolved through discussion between the raters and the researcher. The average of the two raters' scores was the final score.

Results

This section presents research results in three parts. First described are the general features of the transformation strategies and then the internal structure of transformation. Finally, the patterns of the transformation process of individual participants are examined.

Features of Transformation in the Summarization Process

Eighteen strategies (26.5%) out of 68 employed by participants were coded as transformation strategies and presented in Table 2. Analyses of participants' think-aloud protocols revealed that many

transformation strategies occurred frequently after the participants finished reading the entire text and before they revised and edited their writings, especially in the stage of 'Work out text thesis and major ideas,' which involved 9 such strategies. Overall, the transformation strategies occurred 416 times (33.1%) as opposed to the total occurrence of all the strategies (1,256). The most frequently occurring strategy was 'Plan content from source,' which reflected the heavy reliance on source text in summary writing. The least-used strategies were 'Identify and learn key words in text' and 'Extrapolate based on understanding.' These two strategies were used by only one summarizer (Lisa). Diversity characterized the strategies used by the participants in completing the task as was revealed by the fact that there were only three strategies being used by all 7 students. Those three strategies were strategy 8 'Set organizational frame to meet own rhetorical needs', strategy 11 'Plan content from source', and strategy 16 'Integrate detail of what is read'.

Table 2 *Transformation strategies*

Transformation type	Strategy No.	Strategy description[a]	No. user[b]	Count
Developing Framework	1	Ascertain text thesis	5	9
	2	Identify and learn key words in text	1	2
	3	Recall idea	5	13
	4	Extrapolate based on understanding	1	2
	5	Recognize text structure	4	27
	6	Work out main idea of paragraph	5	29
	7	Skim for gist	5	19
	8	*Establish organizational frame to meet own rhetorical needs*	7	15
	9	*Compare own writing to source*	2	3
Subtotal count				119
Selecting	10	Assess importance of idea for use in writing	5	18
	11	*Plan content from source*	7	77
	12	*Scan text for information to use in writing*	5	22
	13	*Scan for specific words to use in writing*	3	6
	14	*Reread portions for use in writing*	6	42
	15	*Lift sentence from source*	5	12
Subtotal count				177
Reformulating				
	16	Integrate detail of what is read	7	38
	17	*Plan language*	4	48
	18	*Paraphrase selected portion*	6	34
Subtotal count				120
Total count				416

Note:
[a]Words in normal font are strategies for transforming the source text, and words in italics are strategies for creating own text.
[b]The No. user column shows how many summarizers used the strategy.

Structure of Transformation

The process of reducing transformation strategies to major categories resulted in three plans out of which one optimum candidate was selected that classified the 18 transformation strategies into three categories according to their purposes. They were Developing Framework, which involved 9 strategies, Selecting, which contained 6 strategies, and Reformulating, with 3 strategies. Of these, 9 strategies concerned reading to transform the source text, and 9 strategies was about writing to create one's own text (in italicized form in Table 2). Each category subsumed reading and writing activities. However, the Developing category involved much more reading than writing compared with the other categories.

Table 3 provides the count and percentage of each type of transformation strategy for the seven participants. It shows that the percentage of transformation strategies ranged from 21.6% to 43.8% in terms of their counts over the total counts of all strategies coded in the think-aloud protocols of individual participants, signifying the potential of this ability for successful summary writing.

Table 3 *Transformation strategies in participants' think-aloud protocols*

Summarizer	Wynne		Leo		Sarah		Lisa		Linda		Jacob		Lynch	
	C	%	C	%	C	%	C	%	C	%	C	%	C	%
Developing Framework	12	7.3	10	5.7	12	7.8	50	14.8	6	3.8	17	19.1	12	6.8
Selecting	22	13.3	16	9.1	20	13	53	15.7	21	13.3	15	16.9	30	17
Reformulating	17	10.3	12	6.8	12	7.8	27	8	10	6.3	7	7.9	35	19.9
Total of transformation strategies	51	30.9	38	21.6	44	28.6	130	38.5	37	23.4	39	43.8	77	43.8
Total of all strategies*	165	176	154	338	158	89	176							

*The total count of all strategies includes those for the purposes of, in addition to transformation, reading and writing, assessing task and task fulfilment.

Developing Framework

The category of Developing Framework described how participants attempted to extract the macro-structure of the source text (strategy 1 to 7) and converted this structure into a conceptual framework. This category contained the largest number of strategies, which highlighted the significance of demonstrating a global representation of the source text in summarization tasks.

The most frequently used strategies included strategy 6 'Work out main idea of paragraph,' strategy 5 'Recognize text structure', and strategy 7 'Skim for gist.' These strategies were related to the cognitive operation of generalization (Kintsch & van Dijk, 1978), which involved condensation of information, either a portion of the text, as in the case of strategy 7, or the entire reading, as in the case of strategy 5. Because the structure of a text may be regarded as its framework supported by the main ideas, these strategies were significant to the achievement of the task goal.

Selecting

In this category, participants developed the contents of their summaries through a screening process, in which they selected an idea, a sentence, an expression, or even a particular word from the source for use according to its importance and relevance. Various strategies were used more frequently in the Selecting category than in the other two categories, revealing a strong need to transfer information from the source text to the target text.

The most frequently used strategies were strategy 11 'Plan content from source' and strategy 14 'Reread portion for use in writing'. To some extent, these two strategies were closely related. The students first reread a text portion to assess its relevance for use in creating summary, and then selected the more important ideas to include in their summaries. This meant that the participants were making intentional efforts to select the most salient textual information to complete the summary task.

Another important operation was strategy 10 'Assess importance of idea for use in writing'. In various instances, the participants judged the importance of ideas based on the ideas' structural importance or centrality to the text. For example, Leo said: "Then, I shall write about the three stages of iron deficiency, but I don't have to present the details of each stage in my summary."

Reformulating

In the category of Reformulating, summarizers managed to find ways to convert the important ideas into written form. This category contained three strategies that were used frequently by the participants. Most often, the participants were looking for appropriate vocabulary and structures to state the main ideas of the text by using strategy 17 'Plan language'. The writers seemed to have similar use frequency for strategy 16 'Integrate detail of what is read'. They tried to use cover terms to restate the original ideas presented in the text. For example, Sarah said in her think-aloud protocol "women in general ignore, don't think about these. Pregnant women... En, also, many people don't pay attention" while trying to summarize the details of a paragraph in the text. With the knowledge that verbatim copying was not encouraged, the summarizers often had to paraphrase the selected sentences that conveyed the important ideas (strategy 18 'Paraphrase selected portion').

Pattern of Transformation Strategy Use across Participants

Appendix F and Figure 1 below present the detailed information about the application of various transformation operations in each category by participants, who were arranged according to their NMET scores shown in Table 1. If we draw a line between Lisa and Linda, the participants on the left of the line are the higher NMET scorers and those on the right the lower scorers. A seemingly unclear pattern emerges, as is shown in the figure below, that learners with higher NMET scores tended to use more transformation strategies and vice versa, both on the whole and across the three transformation categories, with the exception of Lynch, who might be regarded as an outlier with proficiency level CEFR A2, below the rest of the group who were on B1.

This pattern also appeared on the relationship between summary score and transformation strategy. It seemed that the more transformation strategies were used, the higher the summary score (Table 1). It should be pointed out that, however, although the more proficient learners seem to be also the more effective summarizers, their performance was still not up to expectation as they scored 7–14.5 points out of the total score of 20.

Examination of individual transformation operations revealed more variations across the participants. Such difference is more pronounced in the various strategies of Developing Framework, and the

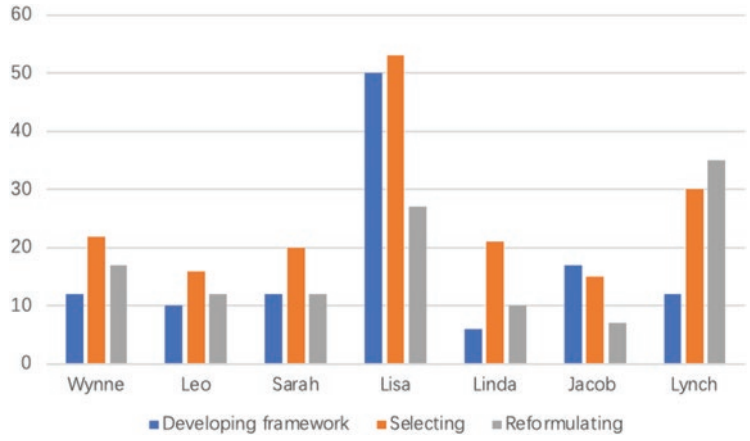


Figure 1 *Frequency of occurrence for transformation strategies.*

strategy 10 and 11 of Selecting, with conspicuous uneven distribution of frequencies between higher and lower NMET scorers. For example, the participants with higher NMET scores employed more frequently strategy 3 'Recall idea' and strategy 7 'Skim for gist' from the category of Developing Framework. As for strategy 3, the ideas participants recalled were generally what they considered the main ideas of the text and included in their summaries. Sarah, who scored 10.5, and Lisa, who scored 14.5, used most frequently the strategy of 'Recall idea' (five times each). In her think-aloud protocols, Sarah spoke of recalling and writing down in her draft paper the ideas that stayed in her head immediately after she finished reading the text. These ideas formed the framework and the major contents of her final summary script. However, this "impressionist" approach that relied heavily on memory proved to be ineffective with a score of only 10.5. Compared with Sarah, Lisa showed a more conscious attempt to figure out the main ideas of each part of the text using this strategy and spent longer time on this task. When she finished reading, Lisa immediately recalled the ideas of the entire text in an attempt to work out the text's thesis and then the main ideas of each subsection. This approach was elaborated by Lisa in her follow-up interview. It seems that both Sarah and Lisa tried to put what were most salient in their memory about the text into summaries but ended in different outcomes. The above observations suggest that, in order to work out the main ideas of the source text, some participants tried to direct attention to the macro-structure of the text and apply macro-level strategies to ascertain that structure.

In contrast, some strategies were used more frequently by the participants with lower NMET scores (strategy 6, 14, and 18). Lynch, though an "outlier", employed the transformation strategies most frequently among the lower NMET scorers and the second most frequently among all the participants. Lynch made extensive use of strategy 14 'Reread portion for use in writing' for selecting text chunks, and strategy 18 'Paraphrase selected portion' for revising. Both strategies reflect a focus on local and specific text portions. In addition, in the case of Lynch, strategy 14 was used in many instances as a result of an inadequate understanding of the ideas in the text based on the examination of her verbal report.

Discussion

This section is organized thematically into three parts. The first two parts address the two aspects of the research question: the major types and the importance of transformation strategies in summary writing; the third part discusses implications of the research in view of the significance of the findings.

Cognitive Operation of Transformation in Summary Writing

This section discusses the results in relation to the first aspect of the research question: What major transformation operations are involved in summary writing? The results of the study highlight the importance of transformation in creating a terse, conceptual representation of the source text when completing the task of summary writing. Over one fourth of the strategies were used for transformation whose counts took up 33.1% of the total counts of all the strategies. With respect to each individual participant, the percentage of transformation ranged from 2.9–10.4%. These figures are compared to those made by previous studies that focused on the test taking process of integrated reading-writing tasks (Asención, 2004, 2008; Plakans, 2009a). For example, Plakans (2009a) found that the participants with different proficiency levels employed discourse synthesis in read-to-write tasks to various degrees (5–38%). Chan (2011) observed that test takers spent on average 33.18% of the total time macroplanning, identifying key ideas, selecting and organizing ideas from the source text for their summary writing. The findings that many strategies were used in reading and writing (Appendix D) are commensurate with some previous studies. For example, Plakans et al. (2019) focused on the overlapping processes in reading and writing in integrated task and observed that participants spent a good deal of the time on the individual skills of reading and writing. On the one hand, it may be inferred from the relatively small number of transformation strategies used in these studies that transformation operations took a modest proportion of the entire test taking process; on the other, this seemed to be a natural outcome as a result of task characteristics, for example, response essay vs. summary writing (e.g., Asención, 2004).

The internal structure of transformation became clearer after transformation strategies boiled down to three categories based on the purposes of strategy use: Developing Framework, Selecting, and Reformulating. This ordering reflected their importance in completing the summarization tasks and the cognitive complexities involved. It also revealed the procedure that summarizers followed while completing the task, in addition to its correspondence with the summary writing process proposed by scholars (e.g., Kirkland & Saunders, 1991).

Developing Framework took the first place with the largest number (9) of strategies which revealed sophisticated whole-text-level analysis, reorganization, and synthesis of ideas by the participants in trying to develop an accurate representation of the global properties of the text. According to researchers (e.g., Hidi & Anerson, 1986; Kintsch, 1998; Kirkland & Saunders, 1991) an essential element of comprehension in a summarizing context is constructing a more general conceptual framework from the analysis and synthesis of specific information. Analysis of the participants' verbal reports and interviews reflected the importance of idea saliency (Hidi & Anderson, 1986) in the process of developing framework for the source text. Idea saliency is considered constructive for completing the summarization task because according to Kintsch and van Dijk (1978), when the processing of a chunk of information is completed, only the propositions with important information for understanding the gist of the text are stored in long-term memory. Thus, in a sense, Developing Framework is close to their concept of *macro-structure*. In a similar vein, Kirkland and Saunders (1991) used the term super-ordination to describe the process of achieving the macrolevel conceptual framework of a text; Sarig (1993) early used transformation as a criteria in an evaluation model stressing the necessity of developing a macro-level rhetorical-conceptual framework of the source text; Chan (2011) found the ESL participants spent much time macro-planning before putting pen to paper on the summary task; and Chan and May (2023) identified through expert panel discussion the following two crucial features in a summary, which ranked the first 2 among the 14 features, that is similar to framework development: 1. Comprehensiveness of main ideas from source text, and 2. Identification of main points, key ideas, topics. The successful operation of Developing Framework paved the way for the follow-up activities, Selecting and Reformulating, whose main purpose was to provide verbal representation for the macro-structure of the text.

Selecting followed Developing Framework, for it occurred more frequently than the other categories (Table 2) and involved 6 strategies with which summarizers consciously evaluated text information in order to determine which segments should be deleted, and which were to be chosen for inclusion in the summaries. In the research literature, *selecting* is essential to all types of read-to-write integrated tasks, summary writing in particular (e.g., Cumming, Lai, & Cho, 2016), be it discussed in *transformation* (e.g., Spivey, 1990, 1997) or *discourse synthesis* (e.g., Chan, 2011; Yang & Plakans, 2012). The selection process entailed judgment, knowledge, effort, and decision-making (Li & Hoey, 2013) to differentiate the importance of ideas in the text and select appropriate ideas for use in the summary. Many researchers (e.g., Yu, 2008) have posited that one of the major skills involved in summary writing is related to the ability to identify structurally important text elements. In selecting, the participants were observed to occasionally resorted to the source for smaller units of information, sometimes a word or an expression, to fill in the gaps in their representation of ideas. Sometimes they just moved an entire sentence that represented the main idea of a text portion into the summary, which was considered by scholars the most frequently used test-wise strategy (e.g., Brown & Day, 1983), that is, verbatim or nearly verbatim repetition of propositions of a source text.

Finally came Reformulating, which aimed to accurately convert the important ideas into written form in the summarizers' own words. In this process the summarizers integrated individual sentences into smaller units and sometimes manipulated the information identified as important, such as removing unnecessary information and condensing original ideas. In a similar vein, Hidi and Anderson (1986) used the term *recapitulation* to denote this cognitive process, the result of which is an explicit, reader-based expression of the macrolevel conceptual framework of a source text (Kirkland & Saunders, 1991). Paraphrasing (strategy 18) is one significant strategy of reformulating and is found to have been extensively used by ESL learners in summary tasks (Keck, 2006, 2014; Li, 2025; Shi, 2004); it also constitutes an important indicator of summary quality which help differentiate summarizers with varying proficiency levels (Chan & May, 2023; Li et al., 2024; Lin, 2025). Reformulating is crucial as it directly leads to the end product of summary writing against which assessment and evaluation is made about the writers' summarization ability (Sawaki et al., 2024).

The taxonomy projected a structure different from that was proposed in the existent literature (e.g., Plakans, 2009a; Spivey, 1990) which mainly saw transformation as a triad of organizing, connecting, and selecting, the former two being proved not salient in summary writing though. It is reasonable to draw a distinction between transform for summary and for other read-to-write tasks so that the distinct strategies can be analyzed to provide insight into the nature of these different activities. The findings contribute to a more informed definition of transformation as opposed to those in the existent literature and the predefinition used in the present research under the section of Coding of Protocols. Based on these findings, transformation is redefined as a set of cognitive strategies that summarizers use to develop a mental framework for a compact conceptual representation of the source text and convert it into a summary by selecting and reformulating the important ideas from the source. This definition may be used in future research to further elucidate the role of transformation in summary writing.

Transformation and Summary Writing Performance

Variations in the use of transformation strategies were observed across participants to seek answers for the second aspect of the research question: To what extent are transformation operations important for summary writing? Although differences in the use of strategies among individuals are a natural and expected phenomenon, patterns identified among writers can be revealing (Plakans, 2009b). Compared with the less effective summarizers, the more effective writers generally demonstrated greater frequency on the use of some strategies, mostly for Developing Framework and Selecting. These findings appear to support the hypothesis that both strategy choice and number of strategies used

are important (Alexander et al., 1998; Phakiti, 2003). The differences may be attributed to proficiency level (Kirby, 1996; Perin et al., 2017). For example, Kirby (1996) proposed that a reasonable level of proficiency provided a necessary basis for the activation of higher-level thinking processes. The finding is consistent with other research in read-to-write activities, which observes that L2 proficiency may have affected writers' processes. For example, Plakans (2009a) found the percentages of discourse synthesis use of the more proficient learners ranged from 31% to 38% of their think-aloud segments, while the other two less proficient writers only spent 13% and 5% of their think-aloud protocols on discourse synthesis subprocesses. Thus, the participants' ability to transform text may be related to their general English proficiency.

While the strategies employed in completing the task informed our understanding about how transformation works, the products reflected the results of the process and shed light on the effects of transformation operation and, therefore, deserved consideration. Table 1 shows that students who scored higher on NMET overall employed more transformation and were awarded higher summary scores than those with lower NMET scores. This discovery is of significance as it suggests that there might be a positive relation between language proficiency, major transformation operations, and summarization performance. A case in point for the importance of transformation may be provided by Lynch, whose high percentage of transformation seemed to have helped compensate for the lower language proficiency in the summary task.

However, the analysis also shows that the frequencies of some strategies were similar across participants but resulted in different outcomes (e.g., strategy 3), and some strategies were even exercised more extensively by the less effective writers. These observations could be attributed less to frequency than to efficiency, that is, the degree with which the strategy was being used effectively. As has been proposed with regard to the impact of strategy use, what suits one learner may not work for another (e.g., Cohen, 2014). Previous studies have established that the same strategies may lead to different results for test takers of differing language proficiencies (e.g., Purpura, 1997, 1998).

The pattern discovered will be discussed in relation to the transformation operation by participants during the test-taking process to reveal more insight into the role of the relevant transformation strategies.

Difference in Developing Framework

Among the three major types of transformation operations, the difference across summarizers was larger with respect to Developing Framework. Strategies in this category were generally applied on the global level to develop a conceptual framework that represented the macro-structure of the source text. While pattern of strategy use by the more effective summary writers is revealing, it is interesting to note that Jacob and Lynch, the less effective writers, tried far more frequently than their peers to work out the main ideas of paragraphs (strategy 6) because this strategy is considered conducive to the goal of summarization tasks. The reason for this may be that the more effective writers tended to regard the paragraphs that focused on the same topic as a group and to work out the main idea of the paragraph cluster, not each individual paragraph. The less effective summarizers appeared less able to establish links across paragraphs, and these students attempted to ascertain the main ideas of all paragraphs (as in the case of Jacob who wrote the main idea of each paragraph in Chinese in his draft), regardless of the connections or affinity between paragraphs. In addition, participants' think-aloud protocols suggested that although the less effective composers made more attempts to work out the main ideas of paragraphs, they sometimes failed to develop an appropriate summary of paragraphs. For example, Lynch summarized the second and the third paragraphs in her think-aloud this way: "The second paragraph is about what that person said, and her research; the third paragraph is also about what she said." Difficulty encountered by

the less proficient summarizers might be attributed to the summarizability of the source text (Yu, 2009), which is mostly influenced by factors including macro-organization, frequency of unfamiliar words, topic familiarity, and length of source texts as perceived by the participants.

The analysis reveals that while transforming, some summarizers were better able to relate information across the entire text and operated at the global level of the text structure whereas others tended to address the text in a sequential fashion and focus more on individual paragraphs, sentences, and text details. These findings are consistent with those of previous researchers (e.g., Keck, 2006, 2014; Kirby, 1996; Sarig, 1993) who reported the more efficient summarizers appeared to be more able than the less efficient summarizers to go beyond the discrete, concrete, and specific representations of knowledge in the source text. The ability is also emphasized in summary writing training (Friend, 2002).

Difference in Selecting

Marked variation across the summarizers emerged in this category, in particular strategy 11 and 12, both involved identifying information for use in developing summaries. The frequencies for these two strategies of the writers with higher NMET scores were much greater than the less proficient summarizers (Appendix F). The importance of these strategies is stressed in what scholars (e.g., Kirkland & Saunders, 1991) discovered that some form of planning is involved in selecting information to be included in summaries and that the cognitive operation of planning has a central role in summarization. Strategy 10 merits attention as the ability to differentiate more important ideas from less important ones facilitates a full understanding of a passage (Friend, 2002), and researchers have reported that sensitivity to importance accounts for a sizable portion of the variance in summarization performance scores (Li & Hoey, 2013). Strategy 10 was applied by all the four higher NMET scorers but was only used by one lower NMET scorer (Jacb) twice. Despite its importance, strategy 10 was not used by Linda and Lynch, and was only employed once by Wynne and Sarah. It can be assumed that either some summarizers selected ideas randomly for their summaries or their judgment was guided more by personal interest than by structural importance and idea saliency, a characteristic similar to the immature L1 summarizers described by Hidi and Anderson (1986).

Difference in Reformulating

Less variation is observed in this category across participants. Four of the participants, including the 3 more proficient summarizers and Lynch the "outlier", used fairly frequently strategy 17 'Plan language,' which showed that summarizers contrived to construct their own sentences to reformulate the original ideas whereas the less efficient summarizers relied heavily on what was provided in the text. In addition, although paraphrasing is considered by many to be an important strategy in academic writing (e.g., Keck, 2014; Yang, 2014), not all participants in the present study apply this strategy appropriately. For example, Linda and Lynch used much more of strategy 18 'Paraphrase selected portion.' However, analysis of the participants' think-aloud data and summaries showed that while paraphrasing, they often focused on individual sentences and compared their revisions with the original sentences with a primary view of avoiding verbatim copying and/or departure from the original meaning. Nonetheless, this technique sometimes resulted in near verbatim copying and less substantial revisions. For example, one instance of Linda's revision read, "Iron deficiency is common among women", which was close to the original sentence, "Iron deficiency is very common among women in general". Such a pattern is consistent with previous studies in which ESL students were observed to have a greater tendency to copy sentences from the text verbatim or nearly verbatim and had more difficulty combining idea units from across sentences and paragraphs to make substantial revisions than did the higher-proficiency ESL students (e.g., Keck, 2014; Shi, 2004).

Implications

Construct of Summary Writing

Our findings provide some potentially helpful insights regarding transformation in the summarization process. Applying transformation appears to be an integrated reading-writing construct that incorporates reading skill with composing. In transformation, some strategies were used to process the source text whereas others were used to create writers' own text. To some extent, these transformation strategies are akin to the three essential cognitive operations summarized by Hidi and Anderson (1986), that is, selecting, condensing, and recapitulating. They are also similar to the operations that the L1 literature has proposed for the purpose of mining and writerly reading in read-to-write academic activities, but which may be transferable to the L2 context as well (Plakans, 2009b). Mining is the process of reading for the purpose of selecting information from a text with specific writing goals in mind. For example, borrowing words/phrases (e.g., strategy 13), recalling content from reading (e.g., strategy 3). Writerly reading is to read with the view to improving one's writing by example, such as examining lexical use or argumentation structure of the reading material. In summary writing, working out the source text's framework or macro-structure could be an example of writerly reading. Mining and writerly reading may be used for read-to-write tasks but "not in reading comprehension" (Plakans, 2009b, p. 254) and independent writing.

Thus, it may be reasonable to infer that transformation strategies are either not typically employed in reading comprehension and independent writing or that there may be differences in terms of the degree of deliberate use of some of these strategies in these tasks. Given the weak association between summarization and reading comprehension and independent writing observed in previous studies (e.g., Asención, 2008; Yu, 2008), the core ability involved in summary writing may shape a unique construct. Based on the findings of the present study, transformation may constitute an important construct of summary writing as well as other types of read-to-write integrated tasks such as the response essay, in which transformation may take a variant form. Analysis of its operation may improve our understanding of the construct of summary writing as well as read-to-write tasks in general. This is important because scholars have recognized that a construct of L2 reading-writing is lacking in the field and researchers are not yet fully clear about the processes connecting reading and writing in a second language (Hirvela, 2004; Plakans et al., 2019).

Summary Writing Task Design

Examining the important strategies involved in summary writing tasks helps us improve our knowledge of their construct and utilize these tasks more practically in language assessment practices. Thus, the findings of the present study also have implications for summary writing task design. It may offer a feasible approach to the confounding effects of reading and writing abilities on summary writing performance (e.g., Yu, 2007), which, among other considerations, render the use of summary writing and other integrated reading/writing tasks controversial at both a theoretical and a practical level (Yang & Plakans, 2012; Yu, 2008).

The three-category taxonomy of transformation strategies sheds some light on the features of this construct and thus deserves attention from test developers in defining the construct domain. Task specification can use the taxonomy to clarify that summary writing involves transformation as an important ability with which test takers are expected to develop the macro-structure of source text, select the major supporting ideas to flesh out this framework, and use their own words to present a concise and accurate representation of the major topics. This taxonomy can also be carefully incorporated into the design of scoring rubrics so that scorers are aware of the concept of transformation and can apply the rubric effectively.

In the design of an analytic rubric, transformation can be measured on a separate scale, or it can be broken down into several subscales consistent with the taxonomy suggested here with appropriate wording. For example, the subscale Developing Framework can be used to measure to what extent a summary demonstrates a terse conceptual representation of the source text, Selecting subscale be used to assess whether a summary faithfully reflects all the important statements from the source text, and Reformulating to evaluate to what extent a summary expresses the important statements concisely and correctly in the summarizer's own words. In addition, the score report form can be designed in a manner that informs the test takers of what they achieve and underachieve in terms of the important operations involved in a summary writing task (Sawaki et al., 2024). Such information may benefit test users by instilling greater transparency and confidence in students' ability assessment to accurately interpret the scores derived from such tasks. These considerations are helpful to improve task validity and reliability (AERA et al., 2014).

Pedagogical Implication

The present research holds some pedagogical implication for teaching summary writing in EFL classroom, in China in particular. As the model is developed out of data provided by Chinese EFL learners, students from the same background may have better understanding of it than models based on data collected elsewhere. Teacher can show the triad structure of transformation model to the learners in the class and let them discuss in a small group the significance of each category and its strategies. Sample summaries of different qualities can be shown to illustrate how the purposes of the categories and strategies are achieved.

As the first and foremost step in transformation, how to work out the framework of an English text can be modelled to the class with the appropriate use of related strategies, for example strategy 2, Identify and learn key words in text. Methods of identifying text structure can be communicated to the learners followed by group discussion. To achieve this, teachers can convey the knowledge to learners about patterns of text development, for example, comparison and contrast, cause and effect, etc.

As for Selecting, instruction should emphasize the ability to differentiate important ideas from less important ones. Awareness should be raised that judgement ought to be made based on the ideas' structural importance and idea saliency rather than summarizers' personal interest (Hidi & Anderson, 1986). Some pitfalls should be pointed out, for example strategy 15, Lift sentence from source, as it is associated with plagiarism which may engender serious consequences.

In teaching of reformulating, instructors may train learners how to write a statement that covers details of one or more paragraphs. Exercises can be designed about integration or generalization based on related literature (e.g., Friend, 2002). As an essential strategy for summarization, paraphrasing should be emphasized. Examples of different types of paraphrasing (Keck, 2006, 2014; Li, 2025) written by peers can be given to learners to illustrate how to accomplish appropriate paraphrasing.

To facilitate teaching and learning, feedback, as an important practice in formative assessment and assessment for learning (Li & Wu, 2018), has proven effective in improving EFL learners' summary writing and therefore, is an encouraged practice in classroom teaching (Xie & Yuan, 2020). It can be delivered, with an analytic scale discussed in the above section, through traditional form, for example self or peer assessment (Li, 2023; Yang, 2016), or using online platform (Sawaki et al., 2024) supported by generative artificial intelligence (Ding & Zou, 2024) that provides instant fine-grained feedback.

Conclusion

This study attempts to fill the gap identified in the related literature by examining the cognitive operations of transformation. With regard to the research questions raised, results revealed that (a) in order

to develop a terse representation of the source text and convert it into written form the participants frequently performed various transformation strategies which boiled down to three major categories with different purposes, and (b) there seemed to be a positive association between transformation and summary writing performance.

Limitations

The role of transformation in summarization may arguably be more promising in view of the constraints that the present study suffers. First, participants were only novice L2 summarizers, as evidenced by their summary scores, thus, some expected types of transformation strategies may not have occurred extensively, such as generalization (i.e., grouping ideas together, dropping details, and retaining general principles [Friend, 2000]), and superordination (i.e., constructing general categories to include specific details [Kirkland & Saunders, 1991]). Second, this study was exploratory, using a small sample of seven participants to provide verbal reports, which restricted the findings to this sample and limited the generalizability of the results. Studies with more participants are expected to provide substantiation of the findings. Third, the use of concurrent think-aloud protocols has innate shortcomings. Not all strategies can be fully and accurately captured with this technique, and it is subjected to individual differences amongst participants in what/how much/how well they can verbalize (e.g., Bowles, 2010). Therefore, it is possible that some of the observed variations in the type and frequency of strategies used across the participants may result more from the above individual differences than what actually happened in the task process. What's more, this research method may impact on the test-taking performance of the participants, for example, their thinking process and the quality of their summary writing products. Therefore, findings obtained from using this method should be interpreted with caution. In view of the above limitations, more research is needed to assess the role of transformation as well as its relation to reading and writing in integrated tasks and how transformation strategies affect the process and product of summary writing, both individually and collectively.

References

Alexander, P. A., Graham, S., & Harris, K. R. (1998). A perspective on strategy research: Progress and prospects. *Educational Psychology Review, 10*(2), 129–154.

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. American Educational Research Association.

Asención, Y. (2004). *Validation of reading-to-write assessment tasks performed by second language learners*. Unpublished PhD thesis, Northern Arizona University.

Asención, Y. (2008). Investigating the reading-to-write construct. *Journal of English for Academic Purposes, 7*(3), 140–150.

Baker, W., & Boonkit, K. (2004). Learning strategies in reading and writing: EAP contexts. *RELC Journal, 35*(3), 299–328.

Bowles, M.A. (2010). *The Think-Aloud Controversy in Second Language Research*. Routledge.

Brown, A. L., & Day, J. D. (1983). Macrorules for summarizing texts: The development of expertise. *Journal of Verbal Learning and Verbal Behavior*, *22*(1), 1–14.

Chan, S., & May, L. (2023). Towards more valid scoring criteria for integrated reading writing and listening-writing summary tasks. *Language Testing, 40*(2), 410–439.

Cohen, A. D. (2014). *Strategies in learning and using a second language*. Routledge/Pearson Education.

Cohen, A. D., & Upton, T. A. (2007). 'I want to go back to the text': Response strategies on the reading subtest of the new TOEFL®1. *Language Testing, 24*(2), 209–250.

Cumming, A., Lai, C., & Cho, H. (2016). Students' writing from sources for academic purposes: A synthesis of recent research. *Journal of English for Academic Purposes, 23*, 47–58.

Ding, L., & Zou, D. (2024). Automated writing evaluation systems: A systematic review of Grammarly, Pigai, and Criterion with a perspective on future directions in the age of generative artificial intelligence. *Education and Information Technologies* (pp. 1–53).

Ericsson, K.A., & Simon, H.A. (1982). *Protocol Analysis: Verbal Reports as Data* (Rev.ed.). MIT Press.

Fitzgerald, J., & Shanahan, T. (2000). Reading and writing relations and their development. *Educational Psychologist, 35*, 39–50. https://doi.org/10.1207/S15326985EP3501_5.

Friend, R. (2000). Teaching summarization as a content area reading strategy. *Journal of Adolescent & Adult Literacy, 44*(4), 320–329.

Friend, R. (2002). Summing it up – teaching summary writing to enhance science learning. *The Science Teacher, 69*(4), 40–43.

Gu, Y. (2014). To code or not to code: Dilemmas in analysing think-aloud protocols in learning strategies research. *System, 43*, 74–81.

Hidi, S., & Anderson, V. (1986). Producing written summaries: task demands, cognitive operations, and implications for instruction. *Review of Educational Research*, *56*(4), 473–493.

Hirvela, A. (2004). *Connecting reading and writing in second language writing instruction*. The University of Michigan Press.

Hirvela, A., & Du, Q. (2013). "Why am I paraphrasing?" Undergraduate ESL writers' engagement with source-based academic writing and reading. *Journal of English for Academic Purpose, 12*, 87–98.

Hood, S. (2008). Summary writing in academic contexts: Implicating meaning in process of change. *Linguistics and Education, 19*, 351–365.

Ivanova, I. (2020) Making sense of research: University students' difficulties in writing academic summaries. *Studies in Linguistics, Culture and ELT, 8,* 16–34.

Johnson, N. S. (1983). What do you do if you can't tell the whole story? The development of summarization skills. In K. E. Nelson (Ed.), *Children's language* (vol. 4, pp. 315–383).

Keck, C. (2006). The use of paraphrase in summary writing: A comparison of L1 and L2 writers. *Journal of Second Language Writing, 15,* 261–278.

Keck, C. (2014). Copying, paraphrasing, and academic writing development: A re-examination of L1 and L2 summarization practices. *Journal of Second Language Writing, 25,* 4–22.

Kim, M. K., & McCarthy, K.S. (2020). Improving summary writing through formative feedback in a technology enhanced learning environment. *Journal of Computer Assist Learning*, 1–21. https://doi.org/10.1111/jcal.12516

Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge University Press.

Kintsch, W., & van Dijk, T.A. (1978). Toward a model of text comprehension and production. *Psychological Review, 85*(5), 363–394.

Kirby, J. R. (1996). Studying in a second language: The experience of Asian students in Canada. In D. Watkins & J. B. Biggs (eds.), *The Chinese learner: cultural, psychological and contextual influences*. Australian Council for Educational Research.

Kirkland, M. R., & Saunders, M. A. P. (1991). Maximizing student performance in summary writing: Managing cognitive load. *TESOL Quarterly, 25*(1), 105–121.

Li, H., Wijeyewardene, I., W., & Stackhouse, S. (2024). Scaffolding Summary Writing through the 'Reading to Learn' Pedagogy. *RELC Journal*, 1–13. https://doi.org/10.1177/00336882231226281

Li, J. (2016). Modeling the process of summary writing of Chinese learners of English as a foreign language. *Irish Educational Studies, 35*(1), 73–100, https://doi.org/10.1080/03323315.2016.1146154

Li, J. (2023). Unveiling learning regulations through reflective notes. *Language Education & Assessment, 6*(1), 38–65. https://doi.org/10.29140/lea.v6n1.1235

Li, J. (2025). Examining EFL learners' source text use in summary writing. *Language Teaching Research, 29*(1), 150–173. https://doi.org/10.1177/13621688211055887

Li, N., & Wu, J. (2018). Exploring assessment for learning practices in the EMI classroom in the context of Taiwanese higher education. *Language Education & Assessment*, (1), 28–44.

Li, Y., & Hoey, M. (2013). Strategies of writing summaries for hard news texts: A text analysis approach. *Discourse Studies, 0*(0), 1–17. https://doi.org/10.1177/1461445613496356

Lin, M-C. (2025). Contextual antecedents and motivational mediators in EFL summary-writing and future CLIL course choices, *Cogent Education, 12*(1), 2510101, https://doi.org/10.1080/2331186X.2025.2510101

Liu, J. (2018). Aligning China's standards of English (CSE) with CEFR. Paper presented at the International Conference of the Asian Association for Language Assessment (5th).

McAnulty, S. J. (1981). Paraphrase, summary, précis: Advantages, definitions, models. *Teaching English in the Two-Year College, 8*, 47–51.

Perin, D., Lauterbach, M., Raufman, J., & Kalamkarian, H. S. (2017). Text-based writing of low-skilled postsecondary students: Relation to comprehension, self-efficacy and teacher judgments. *Reading and Writing, 30*(4), 887–915.

Phakiti, A. (2003). A closer look at the relationship of cognitive and metacognitive strategy use to EFL reading achievement test performance. *Language Testing, 20*(1), 26–56.

Plakans, L. (2009a). Discourse synthesis in integrated second language writing assessment. *Language Testing, 26*(4), 561–587.

Plakans, L. (2009b). The role of reading strategies in integrated L2 writing tasks. *Journal of English for Academic Purposes, 8*(4), 252–266.

Plakans, L., Liao, J-T., & Wang, F. (2019). "I should summarize this whole paragraph": Shared processes of reading and writing in iterative integrated assessment tasks. *Assessing Writing, 40*, 14–26. https://doi.org/10.1016/j.asw.2019.03.003

Purpura, J. E. (1997). An analysis of the relationships between test-takers' cognitive and metacognitive strategy use and second language test performance. *Language Learning, 47*(2), 289–325.

Purpura, J. E. (1998). Investigating the effects of strategy use and second language test performance with high- and low-ability test-takers: A structural equation modelling approach. *Language Testing, 15*(3), 333–379.

Qin, J., & Groombridge, T. (2023). Deconstructing summary writing: Further exploration of L2 reading and writing. *Sage Open, 13*(4), 1–10. https://doi.org/10.1177/21582440231200935

Rivard, L. P. (2001). Summary writing: A multi-grade study of French-immersion and francophone secondary students. *Language, Culture and Curriculum, 14*(2), 171–186.

Sarig, G. (1993). Composing a study summary: A reading-writing encounter. In J. G. Carson & I. Leki (Eds.), *Reading in the composition classroom: Second language perspectives*. Newbury House.

Sawaki, Y. (2003). *A comparison of summarization and free recall as reading comprehension tasks in web-based assessment of Japanese as a foreign language* (Unpublished PhD thesis). University of California, Los Angeles (UCLA).

Sawaki, Y., Ishii, Y., Yamada, H. & Tokunaga, T. (2024). Developing and validating an online module for formative assessment of summary writing with automated content feedback for EFL academic writing instruction. *Language Testing in Asia, 14*(50), 1–27. https://doi.org/10.1186/s40468-024-00325-w

Shi, L. (2004). Textual borrowing in second-language writing. *Written Communication, 21,* 171–200.

Spivey, N. (1990). Transforming texts. *Written Communication*, *7*(2), 256–287.

Spivey, N. (1997). *The constructivist metaphor: Reading, writing and the making of meaning*. Academic Press.

Van Dijk, T. A., & Kintsch, W. (1983). *Strategies of discourse comprehension*. Academic Press.

Xie, Q., & Yuan, J. (2020). English writing anxiety and preservice teacher's written corrective feedback. *Language Education & Assessment*, (2), 58–84.

Yang, H. (2009). *Exploring the complexity of second language writers' strategy use and performance on an integrated writing test through structural equation modeling and qualitative approaches*. Unpublished PhD thesis, University of Texas at Austin.

Yang, H. (2014). Toward a model of strategies and summary writing performance. *Language Assessment Quarterly, 11*(4), 403–431.

Yang, H., & Plakans, L. (2012). Second language writers' strategy use and performance on an integrated reading-listening-writing task. *TESOL Quarterly, 46*(1), p. 49–70.

Yang, Y.-F. (2016). Transforming and constructing academic knowledge through online peer feedback in summary writing. *Computer Assisted Language Learning*, *29*(4), 683–702, https://doi.org/10.1080/09588221.2015.1016440

Yu, G. (2007). Students' voices in the evaluation of their written summaries: Empowerment and democracy for test takers? *Language Testing, 24*(4), 539–572.

Yu, G. (2008). Reading to summarize in English and Chinese: A tale of two languages? *Language Testing, 25*(4), 521–551.

Yu, G. (2009). The shifting sands in the effects of source text summarizability on summary writing. *Assessing Writing, 14*(2), 116–137.

Zhu, X., Li, G. Y., Cheong, C. M., Yu, G., & Liao, X. (2021). Secondary school students' discourse synthesis performance on Chinese (L1) and English (L2) integrated writing assessments. *Reading and Writing, 34*, 49–78. https://doi.org/10.1007/s11145-020-10065-x