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Original Paper

A Study on Cognitive Processes in Literary Translation of *The Winter Scene in Jiangnan* from the Perspective of Think-Aloud Protocol

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Abstract

This study adopted the Think-Aloud Protocol (TAP) to collect corpus data on the translation processes of The Winter Scene in Jiangnan by three groups of translators with varying experience levels (an English teacher, a translation master's student, and an undergraduate student). Through the quantitative analysis of cognitive strategy differences using a three-dimensional coding system, the results show: 1) the frequency and accuracy of free translation for culture-loaded words increase significantly with translation experience; 2) there is a strong negative correlation between grammatical error rates and the frequency of meta-cognitive thinking; 3) the dynamism of image transformation strategies exhibits a positive correlation with translation experience. The study indicates that the Think-Aloud Protocol can reveal cognitive differences of translators, and translation experience promotes the systematization of translation strategies.

Keywords

Think-Aloud Protocol, Quantitative Analysis, Cognitive Thinking

1. Introduction

As a tool in cognitive translation studies, TAP derives from the psychological tradition Protocol Analysis, the methodological foundation was systematically established by Ericsson and Simon (1984) in Protocol Analysis: Verbal Reports as Data. Through capturing concurrent verbalization of the translator, TAP transforms implicit cognitive processes into analyzable textual data, which is especially suitable for decoding complex cognitive operations in literary translation, such as the transmission of cultural images and grammatical decision-making (Jääskeläinen, 1996; Gopferich, 2008). In translation studies, TAP was used to compare strategic differences between expert and novice translators at first, Jääskeläinen (1996)

found that highly experienced translators tend to adopt cultural compensation when handling metaphors, while lowly experienced translators rely more on literal translation, revealing how experience modulates cognitive automation. Guided by the PACTE Competence Model (2003), which categorizes translation competence into sub-abilities, this study takes "experience" as a composite of years of practice, formal training, and text-specific expertise, and differentiate three developmental stages: Novice (≤1 year), Intermediate (1-3 years), and Advanced (≥3 years).

This study adopts *The Winter Scene in Jiangnan* as the research material, six non-professional translators with different experience levels are divided as three groups for the three developmental stages, then, it could construct a low-medium-high experience gradient.

Through three-dimensional coding of TAP (Cultural Decoding, Grammar Monitoring, and Imagery Transformation), this study would explore the following questions:

1. Does the years of experience have a positive correlation with the frequency and accuracy rate of free translation for culture-loaded words?
2. Does the years of experience have a negative correlation between experience and grammatical error rates?
3. How do experience differences impact strategies of image transformation?

This study first contextualizes the research background, then reviews domestic and foreign literature to lay the foundation for this study, and finally details the methodology, data analysis, and findings.

This study extends TAP research beyond Eurocentric contexts by focusing on Chinese literary translation, by seeing what non-professional translators at different experience levels are good at or struggle with could give translators some helpful thoughts on handling similar texts, making cross-cultural communication a bit smoother.

2. Literature Review

2.1 Introduction to Think-Aloud Protocols

The concept of Think-Aloud was firstly shown in the study of mental processes in 1945 by a German psychologist, Duncker, who aimed to make thinking audible to study the process and methods during problem-solving. After that, the concept of Think-Aloud was defined by Ericsson & Simon (1984), who classified verbal reports. Based on the relationship between the time of verbal reporting and the time of completion of a specific task, they classified verbal reports into concurrent and retrospective reports. Concurrent reports refer to reporting his or her own mental cognitive process while the reporter is completing a specific task. Retrospective reports refer to the reporter recalling and retracing the cognitive and mental processes of reporter after completing the specific task. Moreover, verbal report was divided into three different levels. The first level of the verbal report consisted of the subject' s internal linguistic information, which the subject could express by sound coding; The content of the second level of the verbal report is the subject's nonverbal information, which the subject has to encode verbally and then acoustically so that this information can be expressed smoothly. The third level consisted of the subject'

s explanation of specific information, such as the reason for his or her choice of a method. They made a solid foundation for the development of Think-Aloud Protocols.

Think-Aloud Protocols were first put forward by Hosenfeld (1976) as a "self-report procedure that will help teachers discover their students' learning strategies." When students complete tasks in class, Hosenfeld (1976) argued that the teacher's focus should be changed from results (the products) to learning strategies (the process) the students used to get to the results, and the Think-Aloud Protocols can help teachers to obtain this information.

2.2 Studies on Translation through TAP

To reveal the cognitive processes has always been a core issue on translation studies. TAP, as a tool for transmitting the implicit cognition into analyzable language data, provides an important pathway for decoding complex psychological activities in translation. This paper aims to review the translation cognition research framework based on TAP developed by scholars at home and abroad, comparing its theoretical foundations and application characteristics to provide methodological references for related fields.

The studies on translation at home mainly focus on empirical and pedagogical orientation, strengthening the practical use in translation strategy analysis and learning abilities of students. Guo Chunjie and Liu Fang (1997) finds that Chinese students rely too much on literal translation, TAP reveals this kind of cognitive inertia. Guo Chunjie (2007, 2015) systematically introduces the methodology of TAP, "By asking subjects to 'think aloud' when completing language tasks (e.g., translation, writing, listening), implicit cognitive processes are transformed into traceable verbal data, thereby revealing strategic choices, cognitive conflicts, and ability limitations in the thinking trajectory". Through empirical study, she discussed the influence of thinking mode of native language on English writing and translation, put forward an improved method combining record of words with TAP, which is more suitable for analysis of Chinese foreign language learners. Lu Min (2006) applied TAP in the training of listening strategies, finding that through real-time verbalization, learners can improve ability of meta-cognitive monitoring. Similarly, Zeng Zhixi (2020) indicated that non-English majors significantly enhance their effectiveness of selective attention in listening through TAP. Zheng Binghan and Tan Huimin (2007) compared units choice between Chinese and English translation through TAP, finding that experience of translator positively correlated with the frequency of sentence group processing, and translators with low experience were more inclined to translate word by word. Guo Chunjie (2020) proposed a cognitive-cultural dual-dimensional model, combining the strategy selection in TAP data with the unique aesthetic tendency of Chinese translators to faithfulness, expressiveness and elegance, finding that the frequency of image reconstruction strategy in literary translation was positively correlated with translators' classical literary literacy. In recent years, domestic researches actively study on the combination of TAP and neuroscience, constructing a dual verification system. Sun Sanjun (2023) demonstrates the composite research method of TAP and eye tracking, which records strategy choice of translators and visual attention distribution through Translog and Tobii devices, finding that the gaze point dwell time of low-

experience translators is 37% longer than that of experts when dealing with metaphors, which verifies the word-by-word translation tendency revealed by TAP.

The studies on translation at home mainly focus on theoretical construction and contrastive approach, which focuses on the exploration of TAP in translation capability model validation and cognitive automation mechanism. Ericsson and Simon (1984) laid the psychological foundation of TAP and proposed that the scientific nature of real-time speech reporting depends on the consciousness of the task processing stage. Krings (1986) analyzed the translation process of French learners through TAP, and revealed individual differences in problem-solving paths, which provided a basis for the classification of cognitive strategies. Based on the model of PACTE, Gopferich (2008) tracked the development of translators' translation ability sub-skills through TAP, finding that the frequency of meta-cognitive monitoring was negatively correlated with the grammatical error rate. Olk (2002) examined critical discourse awareness in political discourse translation and found that TAP can effectively capture translators' strategic choices of ideologically loaded words. In recent years, international research presents an inter-sectional trend of cognitive linguistics and neuroscience. Frontiers (2022) used TAP for gait assessment, which is not directly involved in translation, but its idea of multi-modal data fusion provides a methodological reference for translation cognition research, such as combining TAP with a pressure sensor to analyze the physiological stress response of translators.

Through the above research of domestic and foreign researches, it can be seen that domestic researches are application-driven, focusing on strategy training in foreign language teaching scenarios, most based on one-way translation between Chinese and English, focusing on language accuracy and teaching applicability. The overseas researches are theory-driven, emphasizing the combination of TAP and cognitive psychology theories, covering multilingual pairs, which focuses on cognitive mechanisms of translation ability and cross-cultural equivalence. Except that, influenced by the tradition of “faithfulness, expressiveness and elegance”, domestic studies pay more attention to literariness and cultural image transmission. Overseas researches focus on basic theoretical breakthroughs, using tools to promote methodological innovation, and emphasize technology-driven scientific discovery.

The research on translation cognition of Audio Thinking Method (TAP) at home and abroad presents a methodological complementary pattern: China focuses on strategy visualization in teaching scenarios, and foreign countries focus on theoretical modeling of cognitive ability. This study indicatively combines the PACTE model with TAP, and empirically analyzes the cognitive differences of Chinese load word processing, grammar monitoring efficiency and dynamic image transformation of the translation of *Winter Scene in Jiangnan* through empirical gradient grouping and three-dimensional coding system, which not only verifies the applicability of the PACTE model in non-Western contexts, but also provides an empirical basis for the experience-strategy systematization association of Chinese literary translation.

3. Methods

3.1 Research Design

3.1.1 Participants

1.Group A (2 English major seniors, 0.8 years): In the skill-acquisition phase, they rely on exploratory literal translation with trial-and-error lexical mapping.

An English major senior in Huanggang Normal University, during the college period, Subject A1 has passed TEM-8, and has acquired translation practice more than 3 thousand words. Since the third year of the university, Subject A1 has been learning translation for 0.8 years though she didn't pass Level 3 of CATTI.

An English major senior in Hubei University of Technology, Subject A2 has also passed TEM-8, and has acquired translation practice more than 3.5 thousand words. Subject A2 has been learning translation for 0.5 years as she majored in business English at first, translation is not systematically taught.

Developmental Stage: Translation skill acquisition phase

Strategic Profile: Exhibits exploratory literal translation strategies, characterized by trial-and-error linguistic mapping and hesitancy to employ abstract semantic reconstruction. Decision-making is primarily driven by surface-level lexical correspondence.

2.Group B (2 masters in translation, 1.5 years): In the theory-practice integration phase, demonstrating transitional strategies between academic norms and pragmatic needs.

A postgraduate major in MTI in Hubei University of Technology, Subject B1 has passed TEM-8 and Level 3 of CATTI during the college, and has acquired translation practice more than 15 thousand words. Subject B1 has been learning translation about 1.5 years.

A postgraduate major in MTI in Hubei University of Technology, Subject B2 has passed TEM-8 and Level 3 of CATTI, and has acquired translation practice more than 18 thousand words. Subject B2 has been learning translation about 2 years.

Developmental Stage: Theory-practice integration phase

Strategic Profile: Demonstrates transitional characteristics between academic theories and pragmatic application. Strategies reflect conscious mediation between formal translation norms and text-specific requirements, with emerging meta-cognitive monitoring of stylistic consistency.

3.Group C (2 secondary English teachers, 3 years): In the practical adaptation phase, prioritizing communicative efficacy via language teaching experience, with limited literary translation specialization.

An English teacher, Subject C1 has passed TEM-8 and certificate of English (high school), who has done translation practice about literary more than 8 thousand words, who has been learning translation for 3 years.

An English teacher, Subject C2 has got Level 2 of CATTI, who has done translation practice about literary more than 10 thousand words, who has been learning translation for 5 years.

Developmental Stage: Domain-specific adaptation phase

Strategic Profile: Displays a functional equivalence orientation, leveraging extensive language teaching

experience to prioritize target-text communicative efficacy. Literary translation expertise remains nascent, leading to over-reliance on referential meaning transfer and underdeveloped aesthetic equivalence strategies.

Therefore, Experience(X) is taken as the core independent variable, then three subjects are categorized as follows:

Low experience group: Subject A1 and A2; Medium experience group: Subject B1 and B2; High experience group: Subject C1 and C2.

3.1.2 Research Material

The material is from *The Winter Scene in Jiangnan*, here is the selected fragment.

"**江南河港交流**，且又地滨大海，湖沼特多，故空气里时含水分；到得冬天，不时也会下着微雨，而这微雨寒村里的**冬霖**景象，又是一种说不出的悠闲境界。你试想想，**秋收**过后，河流边三五家人家会聚在一道的一个小村子里，门对长桥，窗临**远阜**（△），这中间又多是树枝槎丫的**杂木树林**；在这一幅冬日农村的图上，再洒上一层细得同粉也似的**白雨**（△），加上一层淡得不成墨的背景（△），你说还够不够悠闲？（△）若再要点景致进去，则门前可以泊一只**乌篷小船**，**茅屋**里可以添几个喧哗的酒客，天垂暮了（△），还可以加一味红黄，在茅屋窗中画上一圈暗示着灯光的**月晕**（△）。人到了这一个境界，自然会得胸襟洒脱起来，终至于得失俱亡，死生不同了；我们总该还记得唐朝那位诗人做的 "暮雨潇潇江上村" 的一首**绝句**罢？诗人到此，连对**绿林豪客**都客气起来了（△），这不是江南冬景的迷人又是什么？（△）"

From the source text, it can be clearly seen that there are 12 cultural-loaded words in bold font, 8 rhetorical devices with（△）(similes, metaphors, personification, metonymy, antithesis), and 7 complex sentences.

Then, the study shows a framework draws on Jääskeläinen's (1996) analytical model of translation processes, in order to adapt with the characteristics of Chinese literary translation, systematically capture translators' multidimensional cognitive activities at the cultural, linguistic, and aesthetic levels.

Table 1. Coding Framework for Think-Aloud Protocol Corpus

First-Level Dimension	Second-Level Dimension	Coding Instructions
Cultural Decoding	Culture-loaded Words Handling	Translation strategies for terms with unique cultural connotations
	Allusion Handling	Approaches to translate classical poetry or literary references.
Grammatical Monitoring	Syntactic Restructuring	Transformation of Chinese paratactic sentences into English hypotactic structures.
	Subject-verb Agreement Checking	Verification of subject-verb concordance during translation.
	Prepositional Optimization	Selection of prepositions to convey spatial

		relationships accurately.
Imagery	Dynamic Verb Selection	Choice of verbs to evoke visual imagery.
Transformation	Color Term Conveyance	Retention or adaptation of color descriptors to maintain aesthetic equivalence.
	Temporal-Spatial Cohesion	Use of connectives to maintain chronological or spatial coherence.

For example, for Allusion Handling of Cultural Decoding, “暮雨潇潇江上村”, B says, “it’s a sentence of Tang poem, I need to retain stylistic characteristic, translating it to ‘quatrain’ and add annotation.”

3.2 Data Collecting

3.2.1 Standardized Training

Technical Training

A 2-hour simulation exercise was conducted before the research, using excerpts from *Spring* by Zhu Ziqing, requiring participants to verbalize their thinking while translating, such as: “For ‘红的像火’, a simile structure needs to be identified. Literal translation with 'Red is like fire' is possible, but ‘Red, as fiery as flames’ conveys more dynamism.” This practice aims to familiarize participants with the concurrent verbalization requirement and reduce cognitive strain during formal data collection.

Psychological Training

Participants should understand that the thinking process takes precedence over translation quality. Anxiety about verbal expression was mitigated through listening to example recordings, which modeled natural think-aloud behaviors and normalized self-observation.

3.2.2 Task Implementation

Participants completed the translation independently in a quiet classroom within a 60-minute time limit. Verbal protocols are audio-recorded simultaneously with translation. Upon task completion, both translation texts and audio recordings are collected, and recordings are transcribed verbatim into text about 31,000 words.

3.3 Data Analysis

3.3.1 The Correlation between Experience and the Frequency and Accuracy Rate of Free Translation for Culture-loaded Words

Cultural-loaded words (12):

江南、河港交流、冬霖、秋收、远阜、杂木树林、白雨、乌篷小船、茅屋、月晕、绝句、绿林豪客

Table 2. Precise Statistics on Processing Strategies for Culture-Loaded Words

Subject	Experience	Literal Translation	Free Translation	Annotation	Correct Counts	Accuracy (%)	Average Accuracy
A1	0.8	7	5	0	6	50.0	47.5
A2	0.5	8	4	0	5	45.0	
B1	1.5	3	8	1	10	83.3	79.2
B2	2.0	4	7	1	9	75.0	
C1	3.0	2	9	1	11	91.7	90.0
C2	5.0	2	9	1	10	88.3	

Conclusion:

1. Table 2 shows a positive correlation between experience and free translation frequency ($r=0.98$, $p<0.01$). The average frequency of free translation adopted by high-experience Group C reaches 75% of cases, compared to 37.5% in the low-experience Group A(5/12+4/12). This indicates that experience could help translators to shift from literal translation to cultural equivalence transformation.

2. Table 2 shows a positive correlation between experience and accuracy($r = 0.97$, $p < 0.01$). Accuracy increases from 47.5% (A) to 90.0% (C).

3. Only the medium- and high-experience groups(B/C) mentioned annotations when processing "绿林豪客", reflecting how growing experience coincides with the awakening of cultural compensation awareness (Zhou Lingshun, 2014).

Table 3. Concrete Examples of Cultural-loaded Words

Cultural-loaded word	Cultural Difference	A1	B2	C1
乌篷小船	Western culture has no equivalent equipment	Black boat with sail	Black-awning boat	Traditional Chinese gondola
绿林豪客	This word comes from *Outlaws of the Marsh*, it has specific image.	The Avengers in Green forest	Outlaw from the greenwood	Outlaw heroes from the greenwood

Cognitive Thinking Process:

A1: "乌篷小船", I know it's a traditional Chinese boat,"乌" refers to black, "蓬" strengthens the function of covering, it may be "a black boat with sail"?

"豪客" means "豪情壮志的侠客"，maybe it's similar to The Avengers, the close expression I could think is 'hero' in the green forest.

B2: It's a boat of Jiangnan, I have learned from textbook before, the similarly equivalent translation is "black-awning boat".

The annotation should be added here to explain this image, however, the target readers may know little about Chinese culture of '侠盗', it contains both good and evil from different aspects. I would adopt free translation and add annotations to explain its historical origin.

C1: "乌蓬小船" conveys a image of Jiangnan, it's a particular boat from ancient China. It's hard to explain, but I remember a passage narrating a Venetian boat, whose shape is similar to it, I would choose cultural analogy to compensate the image.

I would add annotations to explain 'outlaws from the greenwood' and supplement 'heroes' to enrich the image.

Analysis:

For the translation of "乌蓬小船", A1 lacks the understanding of shape and structure of awnings made of bamboo, it's different from sails. B2 conveys the Chinese image accurately, but it's still an unfamiliar image towards western readers. C1 connects a cognitive bridge between '乌篷船' and 'gondola', it's cultural compensation. This indicates a positive correlation between experience and accuracy, showing the upgrade from misinterpretation to cultural analogy.

For the translation of "绿林豪客", A1 shows cultural misinterpretation of the image of '豪客' and 'superheroes'. B2 recognizes cultural specificity, however, limited by the available vocabulary, the commendatory meaning didn't display. C1 uses a composition 'outlaw heroes' to balance the rebellion and heroic quality.

The wrong analogy of low-experienced subject A1 reflects inefficient random retrieval cognition, while high-experienced subject C1 reflects schema-based rapid decision-making.

3.3.2 The Correlation between Experience and Grammar

Table 4. The Frequency of Grammatical Monitoring

Subject	Syntactic Restructuring	Subject-verb Agreement Checking	Prepositional Optimization	Total Numbers	Average Counts
A1(0.8)	3	4	5	12	13.5
A2(0.5)	4	5	5	15	
B1(1.5)	2	1	3	6	5.5
B2(2.0)	1	2	2	5	
C1(3.0)	1	1	0	2	2.5
C2(5.0)	2	1	0	3	

Conclusion: Think-Aloud Protocols compel translators to conduct real-time grammatical verification through "forced verbalization" (Swain, 1985). For the monitoring, mistakes would reduce, therefore, total numbers are few. Subject A1 (0.8) and A2 (0.5) show the highest proportion in preposition optimization (5 instances each), accounting for 41.7% and 33.3% of their total monitoring, revealing

their unfamiliarity with English spatial logic in selecting “front/by/along”. Subject B1 (1.5) and B2 (2.0) have fewer total numbers, with B1 focusing more on prepositional optimization and B2 on subject-verb agreement checking, indicating a transitional balance in grammatical awareness. Subject C1 (3.0) and C2 (5.0) have the lowest total numbers. Both show no preposition optimization, reflecting familiarity with spatial expression. C1 focuses on syntactic restructuring and subject-verb agreement; C2 slightly increases syntactic restructuring, possibly for literary style adjustment. With the growth of experience, the numbers of grammatical monitoring decrease, which indicates the cognitive rules “The more translation experience one accumulates, the more automated their grammatical processing becomes” (DeKeyser, 2001).

Table 5. The Types and Frequency of Grammatical Errors

Subject	Subject-verb Disagreement	Prepositional Redundancy	Tense Error	Sentence Blending	Error Rate (%)	Average Error Rate (%)
A1	3	2	0	1	33.3	36.1
A2	4	3	1	1	38.9	
B1	1	1	1	0	16.7	13.9
B2	1	0	1	0	11.1	
C1	0	1	0	0	5.6	5.6
C2	1	0	0	0	5.6	

Conclusion: There are 18 sentences in all. This table indicates a strong negative correlation between the total number of thinking instances and error rate (Pearson $r=-0.99$, $p < 0.001$). Additionally, the frequency of sentence restructuring showed a significant negative correlation with error rate ($r = -0.97$, $p < 0.01$). For the source text of “门前泊船”, Subject A1 translate it into “moor front the door”, which lacks the necessary preposition “of” or “by”, resulting in an ungrammatical structure. Subject B1 uses “moor by the door”, accurately conveying spatial proximity. From this, translators should transform isolated word knowledge into automated grammatical-culture units, reducing cognitive load and improving accuracy.

3.3.3 How do Experience Differences Impact Strategies of Image Transformation?

Table 6. Strategy of Image Transformation

Subject	Dynamic Verb Selection	Color Term Conveyance	Temporal-Spatial Cohesion	Total Numbers	Average Numbers
A1(0.8)	5	3	2	10	11
A2(0.5)	5	3	4	12	
B1(1.5)	9	6	4	19	20
B2(2.0)	10	6	5	21	

C1(3.0)	12	8	6	26	28.5
C2(5.0)	14	9	8	31	

Conclusion: For the frequency of dynamic verbs, there is a huge difference as the high-experienced group (C1, C2) with an average of 13 uses 2.6 times more than the low-experienced group (A1, A2) with an average of 5 ($F=12.5$, $p=0.02$). For the color term conveyance, as translation experience develops, the frequency increases significantly— the low-experienced group averages 3 uses, the intermediate group (B1, B2) averages 6 uses, and the high-experienced group averages 8.5 uses, showing an approximate 2.8-fold increase with growing experience ($F=10.8$, $p=0.03$). For the temporal-spatial cohesion, the high-experienced group with an average of 7 uses is about 3 times that of the low-experienced group with an average of 3 uses.

For the translation of "微雨寒村", Subject A2 uses fundamental verbs "the drizzle falls in the village" to describe the action, however, Subject C1 uses a verb "shrouds" to build a kind of hazy feeling, the translation text is "a drizzle shrouds the cold village". For the translation of "白雨", Subject B2 only conveys its physical property as 'white rain', western readers may misunderstand as albino rain. Subject C1 considers the image of Jiangnan, rain in here is fine and hazy, therefore, she adds qualifier, translating it as "fine, misty rain". For the temporal-spatial cohesion, "冬霖景象" is translated as "the scenery of winter rain" by Subject A1, this version only displays time. However, Subject C2 translates it as "winter drizzle scene in a cold village". The elements of time, incident and space are integrated to show a stereoscopic scene.

This chapter employs TAP to investigate the cognitive processes of six translators of three groups with varying experience levels in translating fragment of *Winter Scenery in Jiangnan*. Through standardized training and real-time verbal reporting, analyses across three dimensions—cultural decoding, grammatical monitoring, and imagery transformation—reveal: positive correlations between experience and free translation frequency ($r=0.98$), accuracy rate ($r=0.97$), and dynamic verb usage significant declines in total grammatical monitoring instances and error rates with increasing experience. The study confirms that TAP visually demonstrates translators' cognitive upgrading from "literal translation" to "schematic equivalent transformation," providing empirical evidence for analyzing literary translation strategy differences and directions for translation pedagogy optimization.

4. Conclusion

Overall, TAP clarifies that experience drives cognitive progression from literal correspondence to systematic strategy application, validating the role of practice in shaping translation competence. For the translation of cultural-loaded words, upon the difference of experience, subject translators show strategies transformation from literal translation to free translation with cultural decoding. This change could transmit cultural characteristics accurately and decrease the loss of imagery or misinterpretation. For the handling of grammar, as for grammatical monitoring, low-experienced translators are more prone

to making mistakes for subject-verb disagreement, high-experienced translators are more prone to omit details such as prepositional redundancy. For the translation of image transmission, limited by knowledge and experience, low-experienced subjects are hard to transmit the image equivalently, only showing literary meaning. However, high-experience subjects pay close attention to aesthetic equivalence, with the aim of achieving the artistic conception behind the context.

This study verifies the applicability of the PACTE model in non-western contexts, as experience-based stratification aligns with its sub-competence development framework. Except that, it uses empirical evidence, revealing that how cultural compensation strategies bridge literal fidelity and communicative efficacy in Chinese literary translation, which supplements the "truth-seeking vs. pragmatism" continuum.

For practical insights, novice training should emphasize cultural schema building and meta-cognitive monitoring of grammatical logic; intermediate translators need practice in balancing theoretical norms with pragmatic adaptation; advanced training could focus on aesthetic reconstruction, enhancing dynamic verb selection and temporal-spatial cohesion to convey literary imagery.

This study has several limitations. The sample size is small, with only six participants covering limited experience ranges, which may restrict the generalization of findings. Additionally, some implicit cognitive processes during translation were not fully verbalized, potentially leaving gaps in analyzing deeper decision-making mechanisms. Focusing solely on *The Winter Scene in Jiangnan* also limits insights into how cognitive patterns vary across diverse literary genres or cultural contexts. Future research could expand the sample to include professional translators, combine TAP with neuroscientific tools to capture multi-dimensional cognitive data, and explore cognitive processes in translating other literary forms to enrich the understanding of literary translation cognition.

References

Aripin, N., & Rahmat, N. H. (2019). Exploring metacognitive writing strategies in the writing process using think aloud protocol: A study across gender. *American Journal of Social Sciences and Humanities*, *4*(1), 178-187.

Bowles, R. P. (2010). Using think - aloud protocols to investigate second language writing processes: An update and reappraisal. *Journal of Second Language Writing*, *19*(2), 79-92.

Dimitrova, B. E. (2005). Expertise and Explicitation in the Translation Process. *Amsterdam/Philadelphia: John Benjamins*.

Ericsson, K. A., & Simon, H. A. (1984). *Protocol Analysis: Verbal Report as Data* (Revised Edition). Cambridge: MK: MIT Press.

Flavell, J. H. (1979). Metacognition and cognitive monitoring：A new area of cognitive developmental inquiry. *American Psychologist*, *34*(10), 906-911.

Gagne, E. D. (1985). *The cognitive psychology of school Learning*. Boston: Little, Brown and Company.

Krings, H. P. (1986). Translation Problems and Translation Strategies of Advanced German Learners of French(L2). *Norwood, NJ: Julianne House and Shoshana Blum-Kul-ka(eds)*, 263-276.

Munday, J. (2022). *Introducing Translation Studies: Theories and applications*. New York: Routledge.

O'Brien, E. (2022). Expert and novice translators' cognitive processes: A think - aloud study of metaphor translation. *Meta*, *67*(1), 145-168.

Olk, H. (2002). Critical discourse awareness in translation. *The Translator*, *8*(1), 101-115.

Oxford, R. L. (1990). *Language Strategies: What Every Teacher Should Know*. New York: New York: Newbury House Publishers.

Shreve, G. M., & Angelone, E. (2021). Think - aloud protocols in translation process research: A methodological update. Target. *International Journal of Translation Studies*, *33*(1), 3-22.

Van Someren, M., Barnard, Y. F., & Sandberg, J. (1994). The think aloud method: a practical approach to modelling cognitive. *London: Academic Press*, *11*, 29-41.

Wang, Y. (2022). Exploring the Cognitive Processes of Chinese - English Translation of Publicity Texts by Chinese EFL Learners: A Think - Aloud Protocol Study. *Frontiers in Psychology*, *2022*, 13.