

A Study on the Role of the Chunking Reading Processing Strategy in Enhancing College Students' Proficiency of ESL Reading

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English reading proficiency is essential for university students in a globalized academic environment, yet many L2 learners encounter challenges, such as limited vocabulary, complex syntax, and unclear text organization, leading to cognitive overload. Grounded in the Cognitive Load Theory (CLT), this study examines the role of the Chunking Reading Processing Strategy—which integrates fragmented linguistic information into meaningful units at lexical, syntactic, and discourse levels—in alleviating cognitive load and improving reading comprehension. Through a mixed-methods approach, the research investigates how learners at different proficiency levels perceive and apply the chunking strategy, and how such application relates to cognitive load management. The results indicate that higher-proficiency learners employ chunking more frequently and report greater benefits, whereas lower-proficiency learners depend more on instructional support. The study confirms the theoretical and pedagogical value of chunk-based reading instruction and suggests that differentiated, cognitively informed teaching of the chunking strategy can enhance both reading efficiency and strategic awareness among L2 learners.

Keywords: ESL reading, the chunking reading processing strategy, cognitive load, reading ability

Introduction

In the context of globalization and the internationalization of higher education, proficiency in English as a L2 (ESL) reading has become essential for university students to access disciplinary knowledge and expand academic perspectives. However, L2 readers often struggle with limited vocabulary, complex syntax, and poorly organized texts, which can lead to cognitive overload and impede reading comprehension.

The Cognitive Load Theory (CLT) provides a relevant framework for understanding these challenges. CLT posits that working memory is limited and that learning efficiency depends on the effective management of cognitive resources. During L2 reading, learners must process linguistic information at multiple levels simultaneously—each demanding mental effort. When text complexity exceeds working memory capacity, comprehension may fail.

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The chunking reading strategy offers a promising way to mitigate such overload. Chunking involves grouping fragmented linguistic input into meaningful units—such as lexical phrases, syntactic patterns, and discourse segments—thereby reducing extraneous cognitive load. By recognizing and processing these chunks, learners can allocate working memory more efficiently and focus on higher-level comprehension.

Although chunking aligns well with CLT principles, few empirical studies have systematically examined its role in L2 reading, particularly among university students at different proficiency levels. Most existing research treats chunking in isolation, lacking a cognitive perspective or comparative analysis across learner profiles.

To address this gap, this study employs a mixed-methods approach—combining questionnaires and semi-structured interviews—to investigate how L2 learners of varying proficiency levels perceive, use, and benefit from chunking strategies. By examining the relationship between chunking application and cognitive load management, this research aims to offer theoretical and pedagogical insights for implementing cognitively informed reading instruction.

Literature Review

L2 reading imposes high cognitive load due to linguistic complexity, challenging learners' working memory. CLT (Sweller, 1988) explains this by distinguishing intrinsic, extraneous, and germane load, emphasizing that instructional design should manage these loads to optimize learning. Chunking, a key strategy to mitigate cognitive load, involves grouping information into meaningful units. In L2 reading, this operates at lexical, syntactic, and discourse levels, helping learners process information more efficiently by reducing the number of discrete elements in working memory.

Empirical studies affirm its effectiveness. Ni and Ji (2023) found explicit chunking cues improved reading efficiency and comprehension by reducing cognitive load. Similarly, Ni (2017) demonstrated that chunking strategy training enhanced working memory capacity and reading performance. Internationally, Haj et al. (2018) showed chunking benefits even for individuals with severe memory impairments, underscoring its broad applicability.

However, gaps remain regarding how learners of different proficiency levels subjectively perceive and apply chunking in authentic contexts. This study addresses this by examining strategy use across proficiency levels, integrating CLT with mixed-methods inquiry.

Research Methods

This study adopts a mixed-methods design integrating a structured scale survey and semi-structured interviews to examine the effectiveness of the Chunking Reading Processing Strategy in ESL reading and its relationship with cognitive load.

The questionnaire, distributed online to university-level ESL learners, collected data on participants' background, self-rated reading proficiency, cognitive load perception, and use of chunking strategies. It combined Likert-scale, multiple-choice, and open-ended items to obtain both quantitative and qualitative insights. After excluding invalid responses, 124 valid questionnaires were retained and divided into a high-proficiency group ($N = 74$) and a low-proficiency group ($N = 50$) for comparative analysis.

To supplement the survey findings, three follow-up interviews were conducted—two with high-proficiency and one with low-proficiency participants—to explore their cognitive load experiences, use of the chunking

strategy, and perceptions of effectiveness during real reading tasks. Each interview lasted about 30 minutes and was analyzed thematically.

This combined quantitative and qualitative approach provides both statistical patterns and in-depth insights, ensuring a comprehensive understanding of how chunking strategies support ESL learners' reading performance and cognitive load management.

Data Statistics and Analysis

Scale Survey

This study analyzed 124 valid questionnaire responses from Chinese university-level ESL learners, categorized into high-proficiency (Group A, $N = 74$) and low-proficiency (Group B, $N = 50$) groups based on language qualifications and self-assessed reading ability. Most participants demonstrated solid English foundations (95.2% passed CET-4; 78.2% passed CET-6), yet their reading competence varied considerably—33.9% reported fluent academic reading ability, while 11.3% relied heavily on translation tools. Awareness of cognitive load was high (83.9%), though lower-proficiency learners reported greater strain and lower efficiency, with 35.5% indicating significant negative impacts on comprehension.

The Chunking strategy adoption revealed proficiency-based differences: 85% of Group A frequently used segmentation techniques, while Group B showed inconsistent use. Learners displayed stronger preference for lexical (64.5%) and discourse-level (62.9%) chunking, followed by syntactic chunking (58.1%). A majority of the subjects (93.5%) believed chunking improved reading performance, with 43.5% noting clear increases in reading speed and 15.3% major improvement. The integration of CLT was highly valued—85.5% agreed it optimized strategy effectiveness, and 65.3% recognized better application outcomes.

Z-tests conducted on 12 key items yielded statistically significant positive results ($Z > 1.96, p < 0.05$). The highest endorsement was for willingness to adopt CLT-guided chunking strategy ($Z = 21.94$; 86.29% approval). Other strong results included understanding of cognitive load concepts ($Z = 19.33$; 83.87% agreement), frequent chunking use ($Z = 14.51$; 75.81%), improvement in overall reading performance ($Z = 14.23$; 75.81%), preference for chunk-organized materials ($Z = 15.08$; 77.42%), enhanced concentration ($Z = 10.65$; 66.94%), and faster reading ($Z = 8.68$; 58.87%) (see Table 1).

Table 1

Z-Test Results on Key Variables

Survey Items	Mean score	R ₁ vs. R ₂	Z-value	Significant or not?
I understand the basic concept of cognitive load.	4.12	0.8387 vs. 0.0403	19.33	Yes
Perceived level of cognitive load during reading.	3.34	0.3629 vs. 0.1129	3.94	Yes
I actively chunk information during reading to support comprehension.	3.81	0.7581 vs. 0.0806	14.51	Yes
My reading efficiency improves when materials include chunking prompts.	3.49	0.4516 vs. 0.0645	6.11	Yes
I believe chunking strategies guided by CLT are effective in reading.	3.98	0.8065 vs. 0.0242	16.43	Yes
I understand the basic principle of chunking strategies in reading.	4.05	0.7984 vs. 0.0565	16.60	Yes
Frequency of using chunking strategies during reading.	3.64	0.6290 vs. 0.1129	9.30	Yes
Chunking strategies help improve my English reading performance.	3.95	0.7581 vs. 0.0565	14.23	Yes
Chunking helps increase my reading speed.	3.66	0.5887 vs. 0.0645	8.68	Yes
Chunking helps me stay focused and maintain attention while reading.	3.77	0.6694 vs. 0.1048	10.65	Yes
I am more willing to read materials that are organized using chunking strategies.	3.95	0.7742 vs. 0.0565	15.08	Yes
I am willing to try chunking strategies based on CLT.	4.11	0.8629 vs. 0.0403	21.94	Yes

Qualitative feedback has confirmed these trends: learners emphasized chunking's benefits for decoding sentence structures, maintaining attention, and managing cognitive effort. While some suggested improving flexibility (72.6%) and instructional design (66.9%), overall willingness to apply the strategy remained strong (86%), particularly among higher-proficiency learners (93%). Collectively, these findings validate the theoretical robustness and practical value of chunking reading processing strategy in mitigating cognitive load and enhancing reading efficiency across diverse ESL learner profiles.

Interviews

To complement the quantitative findings, this study conducted semi-structured interviews with three ESL learners representing different proficiency levels to examine their real experiences with chunking reading processing strategies. Two high-proficiency participants (C and L) demonstrated solid reading ability and systematic use of strategies, whereas the lower-proficiency participant (W) relied more on audiovisual input, translation tools, and frequent pauses when reading.

All the participants reported experiencing cognitive overload when reading in English. To manage this, higher-proficiency learners actively used chunking techniques, such as identifying topic sentences, recognizing paragraph structures, and grouping related ideas to facilitate comprehension. The lower-proficiency learner showed basic awareness of chunking principles but applied them inconsistently, often depending on external aids. Interestingly, even participants unfamiliar with the formal term "chunking" described intuitive practices aligned with the chunking theory, such as using contextual clues and locating key sentences.

Across proficiency levels, learners unanimously acknowledged chunking as helpful in reducing cognitive burden and improving comprehension. However, its effectiveness varied: advanced learners applied it more flexibly and holistically, while less proficient learners demonstrated fragmented understanding and limited application. These findings reinforce the survey results and highlight the interaction between cognitive load management, language proficiency, and strategic awareness.

Overall, the interviews confirm the practical value and general applicability of chunking reading processing strategies in ESL contexts. They also emphasize the importance of differentiated instruction that adapts chunk-based pedagogy to learners' proficiency levels, thereby supporting more effective cognitive resource management and improved reading outcomes.

Discussion

Grounded in CLT, this study confirms that the chunking strategy can reduce cognitive load and aid ESL reading comprehension. Lower-proficiency learners reported higher cognitive strain, aligning with CLT's emphasis on working memory limitations (Sweller, 1988), while higher-proficiency learners employed chunking more effectively to manage text complexity. The findings offer practical pedagogical insights. Over 85% of participants recognized chunking's benefits for fluency, particularly at lexical and discourse levels, supporting prior research on lexical bundles (Nation, 2001). However, learner needs varied by proficiency: higher-level learners sought flexible application, whereas lower-level learners required explicit instruction and visual scaffolding, echoing Carrell's (1984) view on tailoring strategy instruction to developmental readiness. Interviews revealed that many learners intuitively used chunk-like segmentation, suggesting instruction should focus on modeling and practice rather than terminology. Embedding chunking prompts into materials and digital tools can provide crucial scaffolding, reducing extraneous cognitive load. In summary, chunking serves as a vital

bridge from theory to practice, supporting differentiated instruction and fostering self-regulated, proficient L2 readers.

Conclusion

Based on questionnaire and interview data, this study confirms the effectiveness of the chunking strategy in enhancing ESL reading comprehension and reducing cognitive load. Learners, especially those with higher proficiency, have demonstrated stronger chunking awareness and reported benefits in reading speed, accuracy, and focus. A negative correlation was observed between cognitive load and reading efficiency, with lower-proficiency learners experiencing greater cognitive strain. The findings support the application of CLT in L2 reading instruction, suggesting that the chunking strategy helps optimize working memory resources. Pedagogically, explicit training in lexical, syntactic, and discourse-level chunking is recommended to improve reading outcomes. Limitations of the study include a sample skewed toward higher-proficiency learners and reliance on self-reported data. Future relevant studies should incorporate more diverse participants, objective measures like eye-tracking, and qualitative methods to further explore strategy use across proficiency levels and reading contexts.

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