The Effect of Pre-segmented Instruction on Reading Fluency: A Study on Chinese-English Intermediate Learners

Xinyi Zhou* and Kaijie Mo

Abstract—Intra–sentence segmentation has been proven a useful way for first language (L1) learners to increase reading fluency, including comprehension and reading rate. However, although it is widely used in China to deal with long sentences, it is still worth investigating whether it can be an effective strategy for Chinese-English intermediate learners. In addition, different methods used for segmenting also deserve to be studied. In this study, two English-speaking graduates and four Chinese-English learners are presented with nine long sentences within three different conditions (non-adjustable, segmenting different phrases with a backslash, and putting different phrases into different lines) and under each sentence there is a statement of correct or incorrect judgment. According to the results, the pre-segmented strategy increases the comprehension for Chinese-English intermediate learners and putting different phrases into different lines is most useful.

Index Terms—Pre-segmented instruction, intra-sentence segmentation, reading comprehension, Chinese-English intermediate learners

I. INTRODUCTION

The difficulty for students to comprehend the written text is a classic concern for teachers across all grade levels [1]–[3]. Nowadays, current studies generally suggest that this ability develops progressively with natural exposure increasing [4]. However, learners in the English as Foreign Language (EFL) countries find it difficult to ensure that this exposure achieves results that translate into automatic text recognition, especially when they need to achieve good results on exams in a short period of time. In China, to deal with some examination like IELTs, TOFEL, and the Unified National Graduate Entrance Examination, teachers use a strategy called intra–sentence strategy to train students' sense of language. However, this approach has not been demonstrated experimentally.

According to previous research, in the process of reading, two skills to segment the text are required: Intra-sentence segmentation and inter-sentence segmentation [5]. Segmentation here can be defined as different meaningful phrases in the sentence. Although it is similar to 'chunk' to some extent, the relationship of segmentation is decided by grammar, not a lexical selection [5]. The difference between inter-sentence segmentation and intra-sentence segmentation is that inter-sentence segmentation is identified boundary between sentences with different topics [6] while intra-sentence refers to segmenting phrases within the sentence level.

Intra–sentence segmentation has been proved to be an effective way for students to deal with long–sentence [7]–[9].

Here, two subskills, known as word recognition and fluent reading, are considered important to increase reading comprehension [3]. Fluent reading is usually related to automaticity, which emphasizes the importance of reading rate and comprehension [10–12]. From this perspective, the mental representation of the text should be taken seriously since it is highly relative to reading rate and comprehension [13]. In the process of reading comprehension, readers gradually build the construction of a coherent mental representation of the presented information [14]. To help students establish this connection, some language teachers explore different approaches, one of which is segmenting the sentence. Subsequently, the ability to segment the sentence is proven necessary for increasing comprehension [8, 9, 15, 16].

However, while the use of intra–sentence segmentation to improve reading fluency has been proven helpful for first language (L1) kids [3, 9], it seems to attract scant attention in second language (L2) and foreign language (FL) settings [17] since learners are expected to grow naturally as reading practice increase. In addition, the method to segment sentences is also worth studying. The study done by O'Shea and Sindelar in 1983 uses five spaces to separate different phrases [8], while in the study done by Kren and O'Shea *et al.* [3], the number of blank spaces has increased to seven. This kind of difference can be defined to change the possibility for learners to perceive, which is related to salience, defined as "how noticeable or explicit a linguistic structure is in the input" [18]. Since using the backslash (\) and putting the different segmentations into different lines are the two most common ways in Chinese students, these two methods will be investigated in this study.

Compared with sentences with simple construction, long sentences with complicated structure and complex subordinate clause relationships require a higher capability to segment [19]. One of the biggest challenges for L2 learners in long-sentence comprehension, or translation, is in different sentence structures between their native language (NL) and the target language (TL) [5]. When discussed this challenge in Chinese context, the focus of the discussion becomes the structure of subordinate clauses that do not exist in Chinese. Some Chinese students usually consider subordinate clauses as one of the toughest issues in reading comprehension, since the identification of multiple subjects, multiple predicates, and their relationship to each other often makes students fall into a spiral of misunderstanding.

This situation is exacerbated in China by the knowledge gap and the lack of transparency of information. In China, the explanation and division of subject–verb–object relationships are often taught in week–long bridging classes during the transition from junior to senior secondary school. Unfortunately, this knowledge is rarely further reinforced and applied in future learning. When students find that they do not

need to understand this relationship nor does it prevent them from coping with high school and university English courses, it seems to be a given that the knowledge will be forgotten gradually. However, students who want to be a postgraduate will suffer at this point since, in the Unified National Graduate Entrance Examination, they are required to translate five long-sentence, which is quite difficult to understand with so complex subordinate clauses, into Chinese in a short time. As we mentioned before, before translating, the complicated structure here is too difficult for students to understand [19].

Some candidates are taught to use intra-sentence segmentation to deal with this kind of sentence. However, only a small number of studies have mentioned the use of this method in China, yet these papers are hardly considered as research since they only describe the various strategies that students can use when faced with long sentences in the examination but do not give the efficiency and scope of application of each method. There is also no study or datum to prove that this approach is effective for Chinese students. More research is needed.

The purpose of this paper is to find whether using the pre–segmented instruction can be useful for Chinese–English intermediate learners in long-sentence comprehension and whether changing the specific methods of intra–sentence segmentation influences the reading rate and comprehension of long sentences for those learners.

II. METHOD

A. Participants

Submit your manuscript electronically for review. Thirteen native English-speaking graduates (4=male, 9=female; age: Mean=22.92, Standard Deviation=0.71) and twenty Chinese-English intermediate learners, all of whom were undergraduate, participated in the study (10=male, 10=female; age: Mean=21.71, Standard Deviation=0.83). Considering the experiment is aiming to help Chinese learners in long-sentence comprehension for their IELTS, TOFEL, and Unified National Graduate Entrance Examination, one of the selection criteria for Chinese-English participants is that participants are not exposed in the English–speaking context. Thus, in view of the possible disruption caused by their training experience, participants are asked to have passed CET-4 (College English Test Band 4, a kind of general English test for Chinese undergraduates) to prove their language capability but have not been involved in IELTS, TOEFL, and the Unified National Graduate Entrance Examination.

Besides, since the study is focused on sentence processing, the difficulty of word recognition should be kept within a rationale scope. To exclude the possibility that the difficulty is caused by the lack of recognizing the meaning of the word, a small test including almost all the words present in the later experiment (33 words in total) is conducted (see Appendix 1). This test is administered as an online test. On their mobile phone screen or computer screen, when the participant clicks on the 'Start' button, a word and five options for the meaning of the word would appear (1 correct, 3 distractors, and 1 'I don't know'; almost all the distractors have an antonym and a word with morphological similarity). Once the participant

have completed a selection, they needed to click on 'next' to move on to the next word. At the end of the test participants were asked to write a pseudonym identical to that of the subsequent experiment (they could also use their real name if they wished) to help with the correlation analysis. Some of the test questions are shown in Fig. 1. The overall time taken to complete the test will be automatically recorded by the software and subsequently sent to the researcher's computer.

*10. monopolize
- a. dominate
- b. escape
- c. democracy
- d. compression
- e. I don't know.

Fig. 1. The screenshot of the word test in mobile phone screen and computer screen.

B. Materials

Nine long sentences from the TOEFL computer–based test are selected and the length of all sentences is from 37–41 words (see Appendix 2). To test whether participants have comprehended each sentence, there is a true–false statement following each sentence with three choices ('yes', 'no', and 'I do not know'). There are three selection criteria for the sentences: 1) Sentences can be understood without any context (including both cultural background and the text); 2) all words are included in the vocabulary list for the CET-4; 3) there is at least 1 subordinate clause structure in each sentence. Nine sentences are divided into 3 conditions, with 3 in each condition: 1) non–adjusted, where sentences occurred in is originated form; 2) pause, where the backslash (\) is used to segment different phrases; 3) lines, where the different segmentations are put into different lines. Only a correct answer can be scored.

Guidelines for the separation of phrases are based on the short unit criteria established by Klare, Nichols, and Shuford in 1957 [20]:

(1) Subject and predicate of simple sentences are separated, and the object is also separated from the predicate.

(2) Phrases (chiefly prepositional) are set off.

(3) Noun modifiers, if short, are linked with a noun, and verb modifiers with the verb, but single subjects or objects stands alone.

(4) Clauses are set off and, if long, broken into appropriate thought units.

However, given the burden that too many segmentations may place on learners, the subject-predicate of simple sentences is sometimes not segmented.

C. Procedure

Before the experiment began, piloting has been conducted to test whether the segmentation here is in line with the native speakers' intuition. Two English L1 speakers are asked to rate the naturalness of the segmentation. All segmentation received a minimum of 3 on a 5-point Likert scale (5 = very natural). In addition, to make sure that the cutting points matches the teaching habits of Chinese teachers, this study consults with three teachers who have more than 6 years of teaching experience in the English training industry. They

confirm that the cutting nodes are consistent with what they normally teach. Although native speakers scored lower than expected, according to previous research, there is differences in pause patterns between speakers' mother tongue backgrounds [21]. We believe that the evaluation of three experienced English teachers can be used as a basis for the validity of the intra–sentence segmentation in this experiment.

Then in the experiment, participants were first asked to provide their consent. Then, they completed the word test used in this experiment (the result of this test is shown in Table I). After that, the practice of a simplified sentence with 20 words, followed by a true–false statement, was used to accustom participants. In the process of practice, participants were allowed to communicate with the researcher and ask questions about the experiment. There was no limit to the length of this process and participants can keep communicating with the researcher until they felt comfortable to start the experiment. In the later experiment. This study would not disturb participants as well as provide any help.

TABLE I: MEAN OF PARTICIPANTS' SCORES BY LANGUAGE GROUP IN THE WORD TEST

	Accuracy	Time (s)
English-speaking	98.15% (2.30)	293.54 (86.23)
Chinese-English	79.50% (0.13)	488.70(192.65)

The experiment is programmed and controlled using PsychoPy 3 software. PsychoPy is an open-source software package that can be easily used in experimental psychology research. By setting the properties of the loop trail, the materials used in this study can be reordered randomly each time, which means different participants can receive different orders of nine sentences to reduce the experimental inaccuracy caused by different reading orders. In addition, PsychoPy provides precise timekeeping and the output of the length of reflection will be automatically converted into numbers in Excel. Three groups of data were collected for later analysis: 1) The condition of the sentence; 2) participants' selection of each true-false statement (it can be transferred into correctness manually); 3) the response time.

The first part of the experiment is the introduction part to remind participants what they should do and which button they can use in the experiment. Then, after they felt they were well-prepared for the test, participants should click 'spacebar' on their keyboard to start the test. Thirdly, nine sentences appeared randomly one by one, and participants would click 1) '1' if they thought the statement matched the sentence above; 2) '5' if they thought the statement did not match the sentence above; 3) 'I do not know' if they considered they could not understand the sentence. Between every two sentences, there was a white screen of 500ms.

Finally, the experiment had an interview lasting no more than 10 minutes to investigate which sentences were more difficult for the participants and to ask them to give their opinion to improve the possible future experiment.

Most data were input into both EXCEL and SPSS for further analysis.

III. RESULTS

The mean percent of correct answers by conditions (1 non–adjustable, 2 pause, and 3 lines) and Response time are reported in Table II. Performance by the English-Speaking and Chinese-English learners will be discussed separately and compared.

TABLE II: DESCRIPTIVE STATISTICS FOR CORRECT ANSWERS AND RTS BY LANGUAGE GROUP IN THE THREE INTRA-SENTENCE SEGMENTATION CONDITIONS

	1		2		3	
	Correct	RTs (s)	Correct	RTs (s)	Correct	RTs (s)
English–speaking	94.87% (12.52)	45.49 (18.89)	82.05% (29.24)	40.40 (20.40)	100% (.00)	33.10 (12.87)
Chinese–English	70.00% (28.41)	66.56 (36.77)	52.57% (35.57)	56.78 (27.55)	82.48% (20.10)	52.22 (22.06)

As Table II illustrates, native English-speakers responded more correctly and quickly than learners in all three conditions. The response time in condition 2 showed an evident difference compared with other conditions. For native English-speakers, the use of the backslash shortened the length of reflection yet reduced correctness compared with non–adjustable sentences, which it was the same for Chinese-English learners. Overall, it appears that each type of pre-segmented instruction resulted in a reduction in sentence processing time, with putting segmentation into different lines reducing it the most.

Another thing that can be drawn from the table was the benefit of putting different segmentations into different lines (condition 3). As we can see, in condition 3, the response time of native English speakers did decline compared with the control group (condition 1). For Chinese-English learners, the correctness in condition 3 improved a lot and far exceeds the correct rate in the other two cases, while the time spent even decrease at the same time. Thus, in two groups, compared to segmenting by the backslash, which reduces correctness, putting segmentation into different lines surprisingly obviously increased correctness as well as shorten the response time.

To explore whether the types of segmentation have an influence on the RTs of Chinese-English intermediate learners, this study conduct a one-way analysis of variance, and the result indicates that there is a significant difference in RTs of learners amongst non–adjustable sentence (Mean=66.56, Standard Deviation=29.87), pause (Mean=56.78, Standard Deviation=27.55) and lines (Mean=52.22, Standard Deviation=22.06), $F(2,177)=3.72$, $p<0.05$. The effect size was small (eta squared = 0.04). S-N-K post hoc tests showed that sentences in condition 3 are quicker to understand than sentences in other conditions, $p<0.05$, whereas the latter two conditions do not differ from each other significantly.

Another one-way analysis of variance is also used to explore whether three conditions have an impact on the correctness of Chinese-English learners, but it is non–significant.

In addition, an analysis using Pearson's correlation coefficient supported the hypothesized relationship between different conditions and RTs, $r=0.20$, $p<0.001$. Although the extent of the statistical relationship of conditions and RTs is low, the correlation is significant.

Finally, given the possibility that analysis of the response times for each subject for each question in the sequence shows that there is no obvious effect on the response time by exposure to English materials.

IV. DISCUSSION

The present study provides evidence about the effect of intra-sentence segmentation on increasing reading rate for non-advanced learners, in line with previous studies [7–9], 17]. However, although learners' response time shorten in all control groups, their comprehension seems to relative to different method to segmentation.

Secondly, for the question that whether changing the salience of intra–sentence segmentation will influence the reading rate and comprehension of long sentences for Chinese–English intermediate learners, the answer is 'yes'. As shown in Table II, different methods used to segment sentences have a different effect on the response time. This may be related to human's cognitive ability, or it may be related to the number of words per line, as some reports have shown that the number of words per line affects a person's comprehension [22]. However, due to the paucity of better measure technology such as eye-tracking technology which could provide more details, it is not yet possible to conclude exactly what causes this difference. An interesting avenue for future research would be to use eye–tracking technology within the same experimental design.

There are some limitations in this study. Firstly, to imitate the teaching method used by most Chinese teachers who do exam training, sentences were presented without context. However, it is not only different with its presence in the IELTS, TOFEL, and Unified National Graduate Entrance Examination since in the examination those sentences are presented within context but also deprives students of the opportunity to learn by exposing them to the text. In the long run, if it is applied to teaching, this training may be detrimental to students' further English development. Secondly, the method used to measure the English proficiency of these Chinese-English learners needs further adjustment. Since most of the Chinese participants are juniors and seniors and they basically took CET-4 in their freshman year, it does not represent their English level at that time. Alternative measures of non-TOEFL and IELTS should be considered. Then, there was a gender imbalance among native English speakers in the experiment, with twice as many women as men. Gender differences in reading may influence the results of the experiment. Fourthly, in the interviews, the researcher found that despite similar sentence lengths and a similar number of difficult words in the sentences, participants broadly perceived some sentences to be more difficult than others. This may reflect a need for improvement in the researcher's choice of material. Finally, sentences and questions should probably be placed separately to avoid inaccurate measurement times caused by repeated reading. This approach to the handling of material has likewise led to speculation on the part of some participants. For example, according to one participant's account, when the questions were found to be simpler than the sentences, she chose to read the questions first to improve comprehension and correctness.

Thus, more research is required to explore more about this topic. If possible, it is also interesting to use eye–movement technology to track whether students' attention to the first and last points of phrases increases when taught using different intra–sentence segmentation strategies.

V. CONCLUSION

This study is the first to provide empirical evidence for the effect of intra-sentence segmentation instruction on reading comprehension. The results show that both two strategies of intra–sentence segmentation led to an advantage in improving reading rate over reading sentences in the originated form and putting segmentations into different lines increases the reading comprehension while using backslash to segment different phrases decreases the reading comprehension. These findings suggest that segmenting sentences in advance can effectively help English learners deal with the difficulties caused by some long and difficult sentences.

APPENDIX

Appendix 1:

Word Test (33)

demonstrate
  a. illustrate
  b. decorate
  c. appeal
  d. contraindicate
  e. I don't know.

valuable
  a. precious
  b. fragile
  c. hypocritical
  d. uninteresting
  e. I don't know.

insight
  a. stupid
  b. awareness
  c. environment
  d. sight
  e. I don't know.

existences
  a. absence
  b. thereness
  c. presence
  d. essence
  e. I don't know.

document
  a. record
  b. security
  c. authority
  d. discourse
  e. I don't know.

significance
  a. signal
  b. meaningless
  c. imperfection
  d. importance
  e. I don't know.

awareness
  a. recognition
  b. danger
  c. hunger
  d. disaster
  e. I don't know.

tremendous
  a. catastrophic
  b. great
  c. elegant
  d. contemplative
  e. I don't know.

circulation
  a. publication
  b. flooding

c. triangles
d. spreading
e. I don't know.

monopolize
a. dominate
b. escape
c. democracy
d. compression
e. I don't know.

landscape
a. skyscraper
b. Naturalism
c. scenery
d. building
e. I don't know.

establish
a. build
b. recognize
c. destroy
d. abolish
e. I don't know.

foster
a. lower
b. abolish
c. help
d. decrease
e. I don't know.

reign
a. govern
b. deregulate
c. establish
d. degradation
e. I don't know.

agricultural
a. craft
b. revolution
c. framework
d. farming
e. I don't know.

revolution
a. innovation
b. revenge
c. solution
d. dissolve
e. I don't know.

stimulate
a. advocate
b. provoke
c. similarity
d. bore
e. I don't know.

context
a. paragraph
b. conversation
c. degree
d. circumstances
e. I don't know.

alternative
a. substitute
b. feasible
c. convincing
d. incredible
e. I don't know.

proposal
a. activator
b. proposition
c. policy
d. guidance
e. I don't know

emergence
a. appearance
b. deactivation
c. freeze
d. fall
e. I don't know.

mainstream
a. streams
b. respective
c. capable
d. dominant
e. I don't know.

crafts
a. arts
b. movement
c. antique
d. machine
e. I don't know.

inspiration
a. contradiction
b. stimulus
c. intuition
d. production
e. I don't know.

execution
a. source
b. motion
c. implementation
d. stabilization
e. I don't know.

interaction
a. interplay
b. international
c. transparency
d. integrative
e. I don't know.

prompt
a. approval
b. spot
c. booster
d. inspire
e. I don't know.

prosperity
a. abundance
b. property
c. proposal
d. suggestion
e. I don't know.

economic
a. financial
b. industrial
c. agricultural
d. worldwide
e. I don't know.

households
a. international
b. external
c. housekeeping
d. domestic
e. I don't know.

predecessors
a. graduation
b. ancestor
c. generation
d. procedure
e. I don't know.

the Depression
a. a difficult dilemma that is often encountered in the workplace

b. divorce
c. the worst economic downturn in the history of the industrialized world
d. an emotional problem
e. I don't know.

mammals
a. males
b. a kind of worm–blooded animals
c. skyscraper
d. a kind of cold–blooded animals
e. I don't know.

Appendix 2:

Practice
In this experiment you will be asked to read sentences in three forms:

1 What they do is to look at familiar conditions from a perspective that makes these conditions seem foolish, harmful or affected.

2 What they do / is / to look at familiar conditions / from a perspective / that makes these conditions seem foolish, harmful or affected.

3 What they do
is
to look at familiar conditions
from a perspective
that makes these conditions seem foolish, harmful or affected

After reading, please click "1", "5" or "0" to select your answer to the following statement according to your own comprehension:

The way they look at these ordinary things makes the things look stupid.
√Yes (click 1)
No (click5)
I do not know. (click 0)

Experiment
Condition 1 (non–adjustable)
1
The acute, growing public awareness of the social changes that had been taking place for some time was tied to tremendous growth in popular journalism in the late nineteenth century, including growth in quantity and circulation of both magazines and newspapers.

The increase in the number of magazines and newspapers has made the public more aware of social change.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

2
The agricultural revolution stimulated many in the countryside to seek a new life in the city and made it possible for fewer farmers to feed the large concentrations of people needed to provide a workforce for growing numbers of factories.

The agricultural revolution increased the burden on peasants and led to them having to work in factories.
Yes (click 1)   √No (click 5)   I do not know. (click 0)

3
With the turn–of–century Crafts movement and the discovery of nontraditional sources of inspiration, such as wooden African figures and masks, there arose a new urge for hands–on, personal execution of art and an interaction with the medium.

The hands–on execution of art and interaction with the medium is prompted by a number of craft movements and the discovery of non–traditional sources of inspiration.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

Condition 2 (pause)

1
The older painters, / most of whom were born before 1835, / practiced in a mode / often self–taught and monopolized by landscape subject matter / and were securely established in / and fostered / by the reigning American art organization, / the National Academy of Design.

These words describe the way in which the older painters grew up and where they became famous.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

2
Despite the gathering of more information / about ordinary women during the nineteenth century, / most of the writing about women / conformed to the "great women" theory of history, / just as much of mainstream American history / concentrated on "great men".

Great women are as important as great men in the history of the United States and the world.
Yes (click 1)   √No (click 5)   I do not know. (click 0)

3
Instead of / trying to keep down the body temperature / deep inside the body, / which would involve the expenditure of water and energy, / desert mammals / allow their temperatures to rise / to what would normally be fever height.

If their temperature is kept lower, the desert animal will consume more water.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

Condition 3 (lines)
1
These researchers have sought to demonstrate
that their work can be a valuable tool
not only of science but also of history,
providing fresh insights into the daily lives of ordinary people
whose existences might not otherwise be so well documented.

The work of researchers does have some significance, but it is unnecessary to document the lives of ordinary people.
Yes (click 1)   √No (click 5)   I do not know. (click 0)

2
In 15 or 30 seconds,
a speaker cannot establish
the historical context
that shaped the issue in question,
cannot detail the probable causes of the problem,
and cannot examine alternative proposals
to argue
that one is preferable to others.

To argue in detail the historical background of the problem, the reasons for its emergence and to compare the different options, the speaker needs more time.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

3
With the growing prosperity
brought on by the Second World War and the economic boom
that followed it,
young people married
and established households earlier
and began to raise larger families
than had their predecessors during the Depression.

The post–World War II economic boom brought young people out of the depression to raise their families.
√Yes (click 1)   No (click 5)   I do not know. (click 0)

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

REFERENCES

[1] J. S. Kim, M. A. Burkhauser, L. M. Mesite, C. A. Asher, J. E. Relyea, J. Fitzgerald, and J. Elmore, "Improving reading comprehension, science domain knowledge, and reading engagement through a first–grade content literacy intervention," *Journal of Educational Psychology*, vol. 113, no. 1, vol. 3, 2021.

[2] Language and Reading Research Consortium, H. Jiang, and J. Logan, "Improving reading comprehension in the primary grades: Mediated effects of a language-focused classroom intervention," *Journal of Speech, Language, and Hearing Research*, vol. 62, no. 8, pp. 2812–2828, 2019.

[3] J. Kren, L. J. O'Shea, and W. Reid, "Training students to recognize intra-sentence phrases to enhance reading comprehension," *Education and Treatment of Children*, vol. 12, no. 3, pp. 232–242, 1989.

[4] S. M. Al Zoubi, "The impact of exposure to English language on language acquisition," *Journal of Applied Linguistics and Language Research*, vol. 5, no. 4, pp. 151–162, 2018.

[5] S. D. Kim, B. T. Zhang, and Y. T. Kim, "Learning—Based intra-sentence segmentation for efficient translation of long sentences," *Machine Translation*, vol. 16, no. 3, 151–174, 2001.

[6] D. Beeferman, A. Berger, and J. Lafferty, "Statistical models for text segmentation," *Machine Learning*, vol. 34, no. 1, pp. 177–210, 1999.

[7] J. R. Bormuth and J. Manning, "Children's comprehension of between and within-sentence syntactic structures," *Journal of Educational Psychology*, vol. 61, no. 5, pp. 349–357, 1970.

[8] L. J. O'Shea and P. T. Sindelar, "The effects of segmenting written discourse on the reading comprehension of low and high-performance readers," *Reading Research Quarterly*, vol. 18, no. 4, pp. 458–465, 1983.

[9] K. Stoddard, G. Valcante, P. Sindelar, and B. Algozzine, "Increasing reading rate and comprehension: The effects of repeated readings, sentence segmentation, and intonation training," *Reading Research and Instruction*, vol. 32, no. 4, pp. 53–65, 1993.

[10] S. Hood, N. Solomon, and A. Burns, "Focus on reading," National Centre for English Language Teaching and Research, Macquarie University, Sydney, New South Wales, Australia, 2109.

[11] P. Metzner, T. von der Malsburg, S. Vasishth, and F. Rösler, "The importance of reading naturally: Evidence from combined recordings of eye movements and electric brain potentials," *Cognitive Science*, vol. 41, pp. 1232–1263, 2017.

[12] M. Wolf, M. Barzillai, and J. Dunne, "The importance of deep reading. Challenging the whole child: Reflections on best practices in learning, teaching, and leadership," vol. 130, p. 21, 2009.

[13] C. Perfetti and J. Stafura, "Word knowledge in a theory of reading comprehension," *Scientific Studies of Reading*, vol. 18, no. 1, pp. 22–37, 2014.

[14] P. van den Broek and P. Kendeou, "Development of reading comprehension," *Theories of Reading Development*, pp. 283–306, 2017.

[15] W. Cromer, "The difference model: A new explanation for some reading difficulties," *Journal of Educational Psychology*, vol. 61, pp. 472–483, 1970.

[16] F. Smith, *Understanding Reading: A Psycholinguistic Analysis of Reading and Learning to Read*, New York: Holt, Rinehart, and Winston, 1978.

[17] E. Taguchi, G. J. Gorsuch, and E. Sasamoto, "Developing second and foreign language reading fluency and its effect on comprehension: A missing link," *Reading Matrix: An International Online Journal*, vol. 6, no. 2, 2006.

[18] S. Loewen and H. Reinders, *Key Concepts in Second Language*, 2011.

[19] L. Wang, "Translation strategies of long and difficult sentences in English linguistics academic works under big data environment," in *Proc. 2020 International Conference on Computers, Information Processing and Advanced Education, CIPAE 2020*, 2020, pp. 102–104.

[20] G. R. Klare, W. H. Nichols, and E. H. Shuford, "The relationship of typographic arrangement to the learning of technical training material," *Journal of Applied Psychology*, vol. 41, no. 1, pp. 41–45, 1957.

[21] Ö. Eren, M. Kılıç, and E. Bada, "L1 and L2 read speech habits: Pause patterns from a crosslinguistic perspective," *The Reading Matrix: An International Online Journal*, vol. 20, no. 1, 2020.

[22] L. S. Braam and A. Berger, "Effectiveness of four methods of increasing reading rate, comprehension, and flexibility," *Journal of Reading*, vol. 11, no. 5, pp. 346–352, 1968.