An Analysis of the Correlation between Processing Difference and Reading Comprehension Performance

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Abstract

Reading comprehension has long been an important task in EFL in China's higher learning institutions. This article aims to discuss how processing differences among individual L2 learners are related to their performance in reading comprehension. We detect a strong correlation between the processing strategies and comprehension achievements in two ways: 1) gist-based processing has a more significant impact on the subjects' performances in general; 2) detail-oriented processing acts as a hinder in high-level compression tasks. We hope these findings are conducive to the teaching of reading comprehension in China's colleges and universities.

Keywords

Reading comprehension, processing difference, correlation, teaching methods.

1. Introduction

Reading comprehension has been widely studied as an important component of foreign language teaching in China, with myriads of ways and perspectives adopted and findings discussed in an attempt to improve the teaching quality and learning efficiency (Unruh & Mckellar 2017). As for empirical studies, similarly, much effort has been made in identifying what means of teaching and learning is more effective and why. Such studies, however, failed to some degree to address the very process of reading and comprehending the given texts on the part of readers. In other words, we have not been fully informed of what is exactly happening in reading and how it is related to comprehension achievements so far. Therefore, the primary target of this research is to investigate the degree to which tasks involving processing difference in EFL reading result in differences in performance of comprehension. This research is proposed to deal with two predictions as the following:

A. A better comprehension is likely to be observed when the subjects are required to select the main ideas of a given reading text and organize them into a summary.

B. Subjects' comprehension on the given text is likely to be poorer when, on the contrary, they are required to list the existing details in the text.

Note: The underlined parts above are termed as Method A (MA) and Method B (MB) respectively in this paper.

2. Method

2.1 Subjects

Some 50 students from two (I & II) different classes (25 for each), Grade 1, majoring in architecture management at Southwest Minzu University are chosen as the subjects for this research. None of the subjects have received specialized training on reading skills or whatever relevant. According to their

performance in the previous final exam, the whole subjects are re-divided into four groups (A,B,C,D), with A-subjects（11 students） performing better than those in the other three groups (B,C,D) in terms of their scores. Thus, group A is ranked as higher-leveled group while the others lower-leveled one (Students of Group A is marked with a “# “ in the following table.)

2.2 Reading materials

Lesson 16 (Reading1, Time to Plan Your Life, 1113 words) and Lesson 17 (Reading2, Women in Education, 1060 words) of the College English Reading Course 2 published by Shanghai Foreign Language Education Press, 2002 are used as the reading materials for the subjects in that the two texts are of the similar style (exposition) and the similar content (how modern women deal with new challenges posed by the new developments of society). Besides, all the subjects seem unfamiliar with this topic according to a pre-interview arranged by their teachers.

Multiple choice questions are taken as the testing means. Each of the texts is attached with 5 multiple choice questions respectively (seen in the text book). And all the questions are designed to follow the same principle of testing the subjects’ abilities in recognizing facts, interfering with the veiled propositions, recapturing the authors’ attitudes and making sense of the main ideas.

2.3 Procedures

We conducted this experiment on a 2-round basis. The whole research process took 90 minutes in total, 45 minutes (as one period) for one round. The procedures are briefly summarized as the following: In the first period, subjects of class I read R1, using MA, and subjects of Class II read R1, using MB. In the second period, subjects of Class I read R2, using MB, and subjects of Class II read R2, using MA. The overall experiment went smoothly and resulted in 48 valid answer sheets (One student ignored the direction for reading and one failed to answer all the questions within planned span).

3. Results

The overall consequence of this test is seen in the following Tables 1 and 2 (see in the Appendix).

The scores presented here indicate that, for all the students, the adoption of MA brought about a better result than that of MB in terms of the quality of comprehension. More specifically, a series of one-way ANOVAs for group differences, broken down for condition and text content, showed main effects for group differences in every case. Table 3 summarizes these findings.

Under the MA condition, the mean comprehension score for the R1 text was X— =84.58 for the high-advanced learners, while the three groups of low-advanced learners had mean scores of 50.03,51.36,71.62. With regard to R2, the mean comprehension score was X—‘ =75.51, with that for the others being 77.51,53.38,52.12,54.66. (see in table 4, with the statistics of MB condition omitted) Scheffe post-hoc tests ($p<0.05$) revealed, as expected, that the high-advanced group outperformed the other two low-advanced groups. Table 4 presents the mean comprehension scores for all four groups. Thus, for all further analyses, the other three low-advanced groups were collapsed into a single low-advanced group.

Table 3 ANOVA summary statistics

		d. f.	SS	MSE	F	P
Summary (MA)						
R1		3.01	3684.041	1228.014	7.837	.001
				2,14		
R2		Q 3.05	3228.676	1076.225	5.081	.008
Examples (MB)						
	R1	3.05	2735.666	911.889	5.654	.005
	R2	3.01	2764.237	921.412	4.495	.014

Table 4 Mean comprehension scores for group, processing condition, and text content

Groups	Summary (MA)		Examples (MB)	
	R1	R2	R1	R2
High-advanced1	84.58	77.51	67.32	68.58
Low-advanced2	50.03	53.38	53.10	52.43
Low-advanced3	51.36	52.12	45.25	51.34
Low-advanced4	71.62	54.66	40.48	48.47

The main findings concerning processing differences is portrayed in Fig.1, where the overall mean comprehension scores are presented for the two processing conditions (MA&MB). A t-test performed on these scores revealed a significant difference between the two conditions: t (1,101)= -31.855, p<0.000. The mean scores of the students in the example and summary conditions were 54.17 and 62.43 respectively. On the whole, the students who did the summary task outperformed those who did the example task on the comprehension task.

To go further, Fig. 2 is to be concluded to summarize the results of all the other variants. It manifests the mean comprehension scores on the two contents (R1 and R2) under the two processing conditions (summary and examples) for the two proficiency groups (high-advanced and low-advanced). And the comparison comes in a clear-cut manner that in every single case, the summary condition shows better results than the example condition.

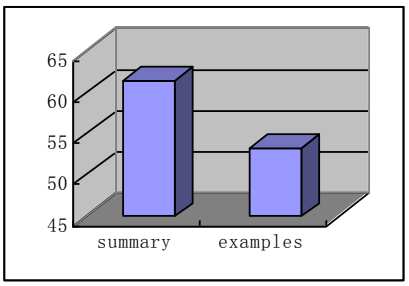

Fig.1 Overall mean scores in terms of processing condition.（left）

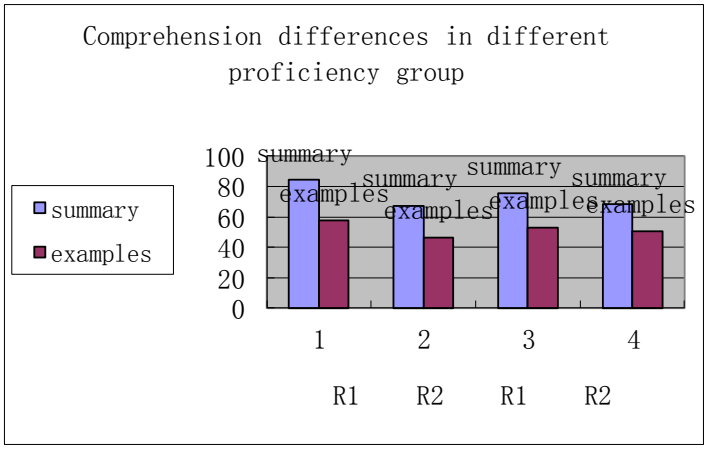

Fig.2 Comprehension differences in different proficiency groups (right)

4. Discussions

According to what the experiment revealed, we arrive at a tentative conclusion that the two conditions (MA/MB) do exert different influences on students' reading comprehension performances regardless what their English proficiency is like. Moreover, the MA condition is likely to result in better understanding as the experiment shows and our predictions indicate. To a certain degree, to summarize the gist of a text will help the readers to gain the core content by focusing on important information

rather than detailed examples so that the comprehension performance of the readers could be enhanced. Further, the advantage of summarizing in comprehension performance is more obvious in the high-advanced level than the low-advanced level. Hence, the writing of a summary of main points will help students of different proficiency groups to come up with a better understanding of the text. And, for the same reason, this method will help less sophisticated readers achieve better comprehension in different reading materials.

These implications are of great importance as they suggest the commonly applied strategies of reading may do not work as effectively as many researchers and teachers have argued. As is familiar to many foreign language teachers, reading comprehension should start from facts and details in texts because it is an easy task and naturally easier tasks should precede those difficult ones (Ellis 2008).This idea is right by nature, but, problematically, it gives rise to three points which are popular as well: 1) the identification and collection of facts/ details should be the major task of reading comprehension; 2) proficiency in dealing with facts/details can automatically result in grasp of the main idea of a text; and 3) analytical reading skills are not what should be taught by teachers but what should emerge spontaneously with more practice by the students. Alarmingly, such prevalent assumptions cannot hold true according our experiment. For one thing, even though students are sufficiently good at dealing with facts/details, they are not necessarily doing a satisfying job in comprehension. This is more evident if we consider the relations between facts and the gist. Namely, the gist of a text is not a mechanical sum of all the facts in a row; instead, facts follow a particular logical pattern that contributes to the cohesion and coherence of of the text so that the gist can possibly be generalized from it (Halliday 1973). Such a process is concerned with the cognitive operations of the readers including categorization, conceptualization, fictive scanning and so forth , a complex cognitive and intellectual endeavor that happens when different visual triggers are presented (Talmy 2000; Langacker 2008). For another thing, reading skills should be of a wide range and of a clear-cut hierarchy, which means spotting facts/details is merely a part of the whole picture. What needs addressing, therefore, is that skills are not naturally grasped by students even if they do large amounts of exercise. The point is that there should be specific concerns for teachers in terms of getting more involved in fostering students' high-level reading skills.

5. Conclusion

This paper marks a tentative endeavour in accentuating the study of reading process, processing strategies in particular, of foreign language learners. We are convinced that this is an enormously significant area to explore since reading itself is not a mechanical but human process. It is readers' cognitive mechanisms and operations that play a role in directing them to use particular knowledge and skills, adopt certain strategies and make their own decisions in reading comprehension. This accepted, we are provided vast possibilities to achieve deeper understandings of what is happening in reading comprehension and of what should be taken into consideration in future reading-related teaching. The experiment in this paper, with its limitations in terms of the sample scale and analysis methods, is just a trial in this direction.

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References

[1]Unruh.S, Mckellar.N.A. Reading Comprehension. Assessment and Intervention for English Language Learners. Springer International Publishing, 2017.

[2]Carrell.P.L. Second Language Reading: Reading Ability or Language Proficiency? Applied Linguistics, 1991, 12(2):159-179.
[3]Halliday.M.A.K. Explorations in the Functions of Language. Explorations in the functions of language. Edward Arnold, 1973:652-655.
[4]Ellis.N.C. Sequencing in SLA: Phonological Memory, Chunking, and Points of Order. Studies in Second Language Acquisition, 2008, 18(1):91-126.
[5]R. Langacker, Cognitive grammar. Oxford: Oxford University Press, 2008.
[6]L.Talmy, Toward a Cognitive Semantics (Vol I): Concept Structuring Systems. Cambridge and London: The MIT Press, 2000.

Appendix

Table 1: Scores of Class I

	R1	R2
No.	score1/MA	score2/MB
1	8	6
2	8	5
3	9	6
#4	10	7
#5	9	7
6	9	6
7	7	4
8	8	5
9	8	6
#10	10	7
11	9	4
12	9	5
13	7	4
14	8	5
15	8	6
16	9	5
17	8	4
#18	9	8
19	7	5
20	7	7
#21	10	8
22	8	5
23	7	5
24	8	5
25	9	6

No. score1/MB score2/MA

Table 2: Scores of Class II

#1	6	9
2	5	7
3	6	10
4	6	8
5	4	8
6	5	9
7	3	7
8	5	9
9	4	8
10	6	9
#11	7	10
#12	8	10
13	4	8
14	5	9
#15	6	9
#16	7	9
17	5	8
18	4	8
19	5	9
20	5	7
21	6	9
22	6	8
#23	7	10

(original score*10 in the following computation)