

## Time Limits: Effects on Recall\*

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### Abstract

This study investigates the effects of differing time limits and the level of language proficiency on the written recalls of 66 Japanese EFL undergraduates. Results showed that different time limits affected total recall, but not main ideas recalled. Regardless of proficiency level, the 20-minute group (Group 2) recalled a greater number of idea units than the 8-minute group (Group 1). However, no significant difference was found between Groups 1 and 2 regarding the recall of main ideas, although a longer time period of reading was given for Group 2. Furthermore, irrespective of differences in time limits, the high-proficiency students recalled the overall text and main ideas of paragraphs better than the low-proficiency students.

However, the lack of interaction between time limit and proficiency level in terms of total recall, and the recall of main ideas as well as paragraph recall indicated that differing time limits did not affect the differences between the high- and low-proficiency students in the following: 1) the total number of idea units recalled; 2) the recall of main ideas; and 3) paragraph recall. Moreover, the time limit x paragraph interaction was not significant, indicating that differences in paragraph recall were not affected by different time limits.

### KEY WORDS

recall protocols

EFL reading

time limits

language proficiency

### 1. Introduction

Hirano (2000) has pointed out that many variables affect comprehension measured by recall: background knowledge (e.g., Carrell, 1983), awareness of text structure (e.g., Carrell, 1992), the language of recall (native versus target) (e.g., Lee, 1986), pre-reading instructions given (e.g., Lee, 1986), story schema (i.e., the order of text presentation) (e.g., Mandler 1978; Carrell, 1984b), the level of language proficiency (e.g., Lee and Ballman, 1987; Takahashi, 1994; Hirano 2000), and the recall criteria (e.g., Hirano, 1998; Hirano 2000).

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Table 1 Means and SDs of the CELT scores

Proficiency level	n	Group 1(8 minutes)		Group 2(20 minutes)	
		M	SD	M	SD
High	14	178.86	12.51	178.79	12.25
Low	19	129.32	9.53	129.32	10.42
All	33	150.33	27.22	150.30	27.33

Note: Maximum possible score = 300

Table 2 Results of two-way ANOVA

Group	Proficiency Level	Group x Proficiency Level
F	F	F
0.00	303.01**	0.00

\*\*p < .01

To date, no research has investigated whether or not different time limits affect an EFL/ESL reader's ability to comprehend and recall the text. The present study attempts to determine the effects of differing time limits and language proficiency on recall protocols of Japanese university students' EFL reading comprehension. The purpose of this study is to investigate:

- 1) whether differing time limits have significant effects on: a) the total number of idea units of the text recalled; b) the recall of main ideas; and c) the quantity of paragraph idea units recalled;
- 2) whether different time limits affect the differences in recall between the two proficiency levels.

## 2. Method

### 2.1. Subjects

Sixty-six Japanese undergraduates served as subjects in the study. They were freshmen who were non-English majors. They were made up of two groups of 33 students each, an 8-minute group (i.e. Group 1) and a 20-minute group (i.e. Group 2). The subjects from the two groups were assigned to either of two proficiency levels: high or low on the basis of their scores on the CELT (i.e. Comprehensive English Language Test for Speakers of English as a Second Language). The CELT consists of vocabulary, structure, and listening tests, each of which has a maximum possible score of 100. The CELT scores ranged from 113 to 199 with a mean of 150.32 (SD=27.06). As indicated in Table 1, Group 1 (or the 8-minute group) had a mean of 150.3 (SD=27.2) and Group 2 (or the 20-minute group) 150.3 (SD=27.33). In each group, students at the high-proficiency level, who consisted of

14 students, had a mean score of 179, with scores of 154 and above. The low-proficiency level students ( $N=19$ ) had a mean score of 129, scoring between 113 and 151 on the CELT. A two-way analysis of variance (ANOVA) was conducted and found no significant main effect for group [ $F(1, 62)=0.00$ , ns] or significant interaction between group and proficiency level [ $F(1, 62)=0.00$ , ns] (see Table 2). That is, there was no significant difference between Group 1 and Group 2 in their average scores on the CELT. Proficiency level had a significant main effect [ $F(1, 62)=303.01$ ,  $p < .01$ ], indicating that ignoring groups, the high-proficiency level students scored significantly ( $p < .05$ ) higher than the low-proficiency level students.

## 2.2. Materials

The passage for the reading comprehension test was taken from *Reading Power* (Mikulecky and Jeffries, 1986: 100). The expository text contained 243 words with four paragraphs (see Appendix A).

## 2.3. Procedure

All of the students were asked to read and comprehend the text. In prior to reading, they were informed that later they would be asked to write in Japanese as much as they could remember from the text, as accurately as they could, and in as much detail as possible. In order to investigate the effect of differing time limits, Group 1 was given 8 minutes to read the text, while Group 2 was given 20 minutes. After reading the text, both groups were asked to write the recall protocols in Japanese for 15 minutes, without looking back at the passage. Later analysis of the students' responses in a questionnaire showed that they had no prior knowledge about the content of the text.

## 2.4. Scoring and data analysis

Following Carrell (1985), the text was first parsed into 66 idea units by the researcher and one junior high school teacher (see Appendix B). A strict criterion was used to score recall protocols. One point was given for the idea unit only if the content of the idea unit recalled was semantically identical or synonymous to that in the original text.

The main ideas of paragraphs were determined based on Mikulecky and Jeffries (1986: 264) (Hirano 2000). Since the total main ideas consisted of ten idea units, the total possible score was 10 for main ideas. One point was awarded for each of the 10 main idea units. The four main ideas of paragraphs can be seen in Appendix C.

The researcher and a junior high school teacher independently scored 17 recall protocols (about 25% of a total of 66) against the a priori list of idea units to check for inter-rater reliability. The correlations between raters were above .9 in the strict criterion. All other protocols were scored by the researcher.

Table 3 Means and SDs of all idea units recalled

Proficiency		Group 1		Group 2	
Level	n	M	(SD)	M	(SD)
High	14	29.57	(7.09)	39.71	(8.28)
Low	19	23.68	(5.00)	30.84	(7.86)

Note: Maximum possible score=66

Table 4 Results of two-way ANOVA for total recall

Time Limit	Proficiency Level	Time Limit x Proficiency Level
F	F	F
22.59**	16.44**	0.67

\*\*p < .01

### 3. Results

#### 3.1. Total recall

The means and standard deviations of recall scores for each proficiency level in Groups 1 and 2 are shown in Table 3. A 2x2 (time limit x language proficiency) analysis of variance (ANOVA) was conducted on the data in the protocols. The results of the ANOVA (reported in Table 4) indicated that there were significant main effects for time limit and proficiency level with respect to the recall of the total number of idea units for the total text: for time limit,  $F(1, 62) = 22.59, p < .01$ ; for proficiency level,  $F(1, 62) = 16.44, p < .01$ . That is, irrespective of language proficiency level, Group 2 (i.e., the 20-minute group) recalled significantly more idea units for the total text than Group 1 (the 8-minute group). Furthermore, regardless of differing time limits, the high-proficiency students scored significantly higher in total recall than the low-proficiency students.

However, there was no significant interaction between time limit and proficiency level,  $F(1, 62) = 0.67, ns$ . This indicates that the differences in total recall between the high- and low-proficiency levels were not affected by different time limits.

#### 3.2. The recall of all main idea units

The means and standard deviations for the main idea units are reported in Table 5. As indicated in Table 6, the results of the two-way ANOVA showed that neither main effect for time limit group nor interaction between time limit and proficiency level were significant:  $F(1, 62) = 2.63$ , and  $F(1, 62) = 0.27$ , respectively. The 20-minute group (Group 2) did not perform significantly better in paragraph main ideas recalled than the 8-minute group (Group 1). Furthermore, differences in time limits did not affect the differences in main idea units recalled between the high- and low-proficiency students.

Table 5 Means and SDs for the recall of main idea units

Proficiency		Group 1		Group 2	
Level	n	M	(SD)	M	(SD)
High	14	5.21	(0.94)	5.93	(1.33)
Low	19	4.32	(1.22)	4.68	(1.56)

Note: Maximum possible score=10

Table 6 Results of two-way ANOVA for main idea units recalled

Time Limit	Proficiency Level	Time Limit x Proficiency Level
F	F	F
2.63	10.29**	0.27

\*\*p < .01

Table 7 Mean percentage of the recall of each paragraph

Time Limit	Paragraph	High	Low
		Mean (SD)	Mean (SD)
Group 1	Paragraph 1	67.86% (12.00)	69.93% (12.17)
	Paragraph 2	48.32% (16.06)	42.10% (17.21)
	Paragraph 3	39.01% (16.05)	30.36% (17.91)
	Paragraph 4	30.84% (12.88)	12.68% (12.12)
Group 2	Paragraph 1	85.71% (10.46)	79.32% (12.46)
	Paragraph 2	57.56% (16.37)	50.47% (16.00)
	Paragraph 3	64.29% (14.71)	40.08% (17.75)
	Paragraph 4	43.51% (18.95)	27.03% (17.35)

Only proficiency level had a significant main effect,  $F(1, 62) = 10.29$ ,  $p < .01$ , indicating that ignoring different time limits, the high-proficiency students recalled more main idea units than the low-proficiency students.

### 3.3. Comparisons of the recall of idea units across paragraphs

Table 7 presents the mean percentages and standard deviations of the recall for each paragraph. A  $2 \times 2 \times 4$  (time limit x proficiency level x paragraph) ANOVA was conducted in order to determine the effects of time limit and proficiency level on the recall for each paragraph. The results of the ANOVA (Table 8) found a significant main effect for time limit,  $F(1, 62) = 24.59$ ,  $p < .01$ , indicating that Group 2 performed better in each paragraph than Group 1. Furthermore, the proficiency level x paragraph interaction was significant,  $F(3, 186) = 5.06$ ,  $p < .01$ . That is, there were significant differences in mean percentages of the recall across paragraphs between the two proficiency levels.

There was no significant interaction between time limit and proficiency level,  $F(3,$

Table 8 Results of three-way ANOVA for mean percentage of the recall of each paragraph

Time Limit (A)	Proficiency Level (B)	Paragraph (C)	AXB	BXC	AXC	AXBXC
F	F	F	F	F	F	F
24.59**	15.60**	142.17**	1.16	5.06**	1.16	1.39

\*\*p &lt; .01

Table 9 Mean percentage for the proficiency x paragraph interaction

Proficiency	Paragraph			
	1	2	3	4
High	76.79%	52.94%	51.65%	37.17%
Low	74.62%	46.29%	35.22%	19.86%

186) = 1.16, ns, and between time limit and paragraph,  $F(3, 186) = 1.16$ , ns. Nor was there any triple interaction (time limit x proficiency level x paragraph),  $F(3, 186) = 1.39$ , ns.

The interaction between proficiency level and paragraph revealed that for paragraphs 3 and 4, the high-proficiency students recalled a significantly greater percentage of idea units than the low-proficiency students (for the mean percentages, see Table 9). In paragraphs 1 and 2, however, the differences in mean percentages of idea units between the two groups were not significant. The post hoc analyses using the Least Significant Difference (LSD) procedure revealed that the pattern of differences in the mean percentages of idea units recalled among the four paragraphs was different in the two groups. The low-proficiency students' protocols had a significantly higher percentage of idea units in paragraph 1 than in any other paragraph: paragraph 1 > paragraph 2 > paragraph 3 > paragraph 4 ( $p < .05$ ). On the other hand, the high-proficiency students showed no significant difference in the quantity recalled between paragraph 2 and paragraph 3, though paragraph 1 was recalled best and paragraph 4 was the least well recalled: paragraph 1 > paragraph 2 = paragraph 3 > paragraph 4 ( $p < .05$ ).

#### 4. Discussion

The results of the study indicate that irrespective of proficiency levels, differing time limits had a significant factor affecting the total number of idea units recalled. The 20-minute group recalled a larger number of idea units of the overall text than the 8-minute group.

However, the ability to comprehend and recall main ideas of paragraphs was not affected by increasing the length of time for reading the passage. In other words, a longer length of reading time produced no significant difference between the 8- and 20-minute

groups in the recall of main idea units. One of the possible explanations for the lack of significant differences under different time limits is the linguistic demands of EFL reading. Further continued research is needed using a variety of time limits for reading and recalling the text.

Of interest to the study are the results that different time limits did not have a significant influence on the differences between the high- and low- proficiency levels in the total quantity of the passage recalled, main ideas recalled, and the recall of paragraphs. Although the students were given a longer length of reading time, the differences between the two levels of proficiency did not vary due to different time limits. Thus, it is suggested that we should not worry much about which time limit to use in a testing situation when discriminating between different levels of language proficiency.

Proficiency level proved to have a significant effect on the differences in the recall of paragraphs as well as all idea units and all main ideas recalled. This finding is consistent with that of Hirano (2000). Interestingly, the results of the present study reveal that it was the level of proficiency, not time limit that played an important role in the recall of idea units of paragraphs. That is, the proficiency level x paragraph interaction was significant, while no significant interactions were found between time limit and proficiency level and between time limit and paragraph. The existence of the significant interaction between proficiency level and paragraph indicates that students' level of language proficiency affected paragraph recall. The high-proficiency students recalled more idea units in two of the four paragraphs (not in the first and second paragraphs) than the low-proficiency students. Furthermore, for the low-proficiency students, there were significant differences between all four adjacent paragraphs recalled: paragraph 1 > paragraph 2 > paragraph 3 > paragraph 4, while for the high-proficiency students, significant differences were not found for all paragraphs: paragraph 1 > paragraph 2 = paragraph 3 > paragraph 4.

## 5. Summary and Conclusion

Using the strict criterion of scoring recalls, the present study has attempted to determine the effects of differing time limits on (1) the total quantity of a passage recalled, (2) the recall of main ideas within paragraphs and (3) the recall of idea units for each paragraph, at two levels of language proficiency. The major findings indicate that differing time limits proved to be a significant factor affecting the total quantity of the text recalled, but not total main ideas of paragraphs recalled. Furthermore, the differences between the high-and low-proficiency students were not affected by the differing length of reading time in terms of total recall, the total main ideas recalled, and paragraph recall. That is, regardless of different time limits, high-proficiency students recalled both the total text and main ideas significantly better than the low-proficiency students. Moreover, although the level of language proficiency affected the differences in the recall of idea units across paragraphs, differences in time limits did not have significant effects on the comparisons

of the quantity recalled among paragraphs.

Further quantitative studies as well as qualitative analyses of recalls need to be conducted on different texts under a variety of time limits in order to investigate the effects of time limits on recalls.

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### Appendix A (Passage)

American cities changed in many ways after World War II. Many people moved out of the city. They moved to the suburbs, the areas around a city. Most of the people who moved were rich. Poor people usually did not have enough money to move. They stayed in the cities.

During the 1950s and 60s there was another important change in American cities. Businesses began to leave the city, too. They left because the people in the city were poorer. Poor people do not have much money to buy things. So, many shops and restaurants moved out to the suburbs. People in the suburbs had more money to spend.

Cities began to have many serious problems. The rich people and the businesses did not pay city taxes anymore. The poor people could not pay much money in taxes. So cities had less money for schools and housing. Sometimes they could not pay their police officers or firefighters. And they could not take good care of their streets and parks.

But money was only part of the problem. Many people believed that American cities were dying. They had good reason to believe this. City streets were sadly empty. Many neighborhoods and parks were dirty and dangerous. In some places buildings were even falling down. And nobody seemed to care. This was the real problem. Most of the people and businesses with money were in the suburbs. They did not care what happened to the cities.

### Appendix B (Idea Unit Analysis)

(Paragraph 1) 1. American cities changed 2. in many ways 3. after World War II. 4. Many people moved 5. out of the city. 6. They moved 7. to the suburbs, 8. the areas around a city. 9. Most of the people...were rich. 10. who moved 11. Poor people usually did not have enough money 12. to move. 13. They stayed 14. in the cities.

(Paragraph 2) 15. During the 1950s 16. and 60s 17. there was another important change 18. in American cities. 19. Businesses began..., too. 20. to leave the city 21. They left 22. because the people...were poorer. 23. in the city 24. Poor people did not have much money 25. to buy things. 26. So, many shops 27. and restaurants moved 28. to the suburbs. 29. People...had more money 30. in the suburbs 31. to spend.

(Paragraph 3) 32. Cities began 33. to have many serious problems. 34. The rich people 35. and the businesses did not pay city taxes anymore. 36. The poor people could not pay much money 37. in taxes. 38. So cities had less money 39. for schools 40. and housing. 41. Sometimes they could not pay their police officers 42. or firefighters. 43. And they could not take good care of their streets 44. and parks.

(Paragraph 4) 45. But money was only part 46. of the problem. 47. Many people believed 48. that American cities were dying. 49. They had good reason 50. to believe this. 51. City streets were sadly empty. 52. Many neighborhoods...were dirty 53. and parks 54. and dangerous. 55. In some places 56. buildings were even falling down. 57. And nobody seemed 58. to care. 59. This was the real problem. 60. Most of the people. 61. and businesses...were 62. with money 63. in the suburbs. 64. They did not care. 65. what happened 66. to the cities.

(from Hirano 1998, 2000)

### Appendix C (Paragraph Main Ideas)

(1)(Paragraph 1) Many people moved / out of American cities / after World War II. (3 idea units)

(2)(Paragraph 2) American businesses (also) left the city / during the 1950s / and 60s. (3 idea units)

(3)(Paragraph 3) Cities began / to have money problems. (2 idea units)

(4)(Paragraph 4) Many people believed / that American cities were dying. (2 idea units)

(from Hirano 1998, 2000)