How Does Extensive Reading Help Japanese EFL Learners Develop Grammatical Knowledge and Reading Fluency?

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Extensive reading (ER) plays a prominent role in EFL classrooms as it provides learners with English input in various contexts. This study has two aims: to investigate how the development of grammatical knowledge is related to the development of reading rates and to ascertain the reading behaviors of learners who developed grammatical knowledge and fluency and of those who did not. A total of 431 Japanese university students participated in the study: 247 in ER classes and 184 in the control group, where textbook-focused teaching was implemented. A latent profile analysis was conducted to find latent classes of related cases (individuals) from multivariate data. Three classes emerged, and they were named Classes 1 to 3. The results showed the grammar gain scores and reading rate gain scores were almost positive across all three classes. A detailed analysis of the reading behaviors of different class members showed similar reading patterns.

The last decade has seen a growth in interest in extensive reading (ER) worldwide. Grabe and Stoller (2002) define ER as an "approach to the teaching and learning of reading in which learners read large quantities of material that are within their linguistic competence" (p. 259). One of the important features of ER is that reading materials are within learner's linguistic competence. Another feature is that learners are exposed to a large amount of meaningful input for an extended period of time. A third important feature of ER is that learners are repeatedly exposed to linguistic forms, such as vocabulary or structures through ER, and they repeatedly process those forms. These features are particularly important for the English-as-a-foreign-language (EFL) context, where target language input is limited and the purpose of formal reading instruction is often to develop language skills rather than to develop reading abilities.

These features of ER, especially a large amount of exposure, including repetition of linguistic forms, resonate with a usage-based model of language. According to the model, "[T]he linguistic skills that a person possesses at any given moment in time – in the form of a 'structured inventory of symbolic units' – result from her accumulated experience with language across the totality of usage events in her life" (Tomasello, 2000, p.62). Usage event is the term for actual instances of language use, from which all linguistic units are abstracted through cognitive processes (Langacker, 2001). Linguistic skills are acquired through encountering the usage events of repeated uses of particular expressions and the

type variation in constituents of particular expressions.

ER provides EFL learners with not only linguistic input, but also opportunities to engage with reading processes repeatedly by themselves. Different processes are involved when a person reads for comprehension. Grabe (2010) categorizes them into lower-level and higher-level reading processes. The former includes word recognition, syntactic parsing (using grammatical information), and formation of semantic meaning units. The information activated at these lower-level processes temporarily forms "a network that becomes working memory" (Grabe, 2009, p. 33), which is then available for higher-level comprehension processes. A skilled reader combines "information from various sources while reading under fairly intense time constraints" (Grabe, 2010, p. 72). According to Grabe (2009), "Information used in the working memory fades when the immediate activity ends, but some network of integrated information will remain and be stored in long-term memory" (p. 33); this information is learned.

According to Grabe (2009, 2010), fluent reading is associated with reading comprehension, and reading fluency is a key component of reading comprehension abilities. ER is one of the teaching approaches that enhance learners' reading fluency (Grabe, 2009; Nation, 2009). On the other hand, Segalowitz (2010) argues that practice leads to a speeding up of performance, which may result from "qualitative changes in the functioning of the underlying processes through restructuring effects" (p. 85). We assume that ER has a facilitative effect, allowing EFL learners to develop their reading fluency and to have qualitative changes in their language, that is, their grammatical knowledge. This study focuses on reading fluency and grammatical knowledge.

Research has provided results that demonstrate the effectiveness of ER on learners' development of reading fluency (e.g., Beglar, Hunt, & Kite, 2011; Grabe, 2004; Huffman, 2014; Iwahori, 2008; Suk, 2016; Taguchi, Takayasu-Maass, & Gorsuch, 2004; McLean & Rouault, 2017; Suk, 2016). However, there is a paucity of research on the effects of ER on the development of learners' grammatical knowledge (Lee, 2002; Rodrigo, Krashen, & Gibbons, 2004; Sheu, 2003). Two studies reported the effects of ER on learners' grammatical knowledge in the Japanese EFL context. Maruhashi (2011) reported that EFL learners improved several aspects of grammatical knowledge, such as to infinitives, after three months of ER. In Takase (2008), EFL learners in a university remedial class perceived that their grammatical knowledge had improved after three months of ER. Furthermore, to date, little attention has been paid to the relation between grammar and fluency, except for some research suggesting that too much attention on form may jeopardize fluency (Thornbury, 2000).

In a series of research studies conducted by the authors, we focused on the effects of ER on the development of EFL learners' grammatical ability, both at a sentence and discourse level, the development of fluency, and the relationship between the two. Furthermore, we examined the reading behaviors of learners who developed grammatical ability and fluency and of those who did not. Our research questions were as follows:

> 1. To what extent does a one-year ER program help Japanese EFL learners develop grammatical knowledge?

2. To what extent does a one-year ER program help Japanese EFL learners develop their reading rates?

3. How is the development of grammatical knowledge related to the development of reading rates?

4. What are the reading behaviors of learners who developed fluency and grammatical knowledge and of those who did not?

The first two questions have already been addressed in Yoshizawa, Takase, and Otsuki (2016, 2017). In summary, concerning the development of grammatical knowledge, there was a significant interaction between time and group (i.e., the ER group vs. the control group). The ER group increased their grammatical knowledge steadily; the control group increased their grammatical knowledge from the onset to the mid-point, but the development did not continue to the end of the program. Similarly, there was a significant interaction between time and group concerning reading rates. The ER group increased their reading rates steadily; however, a steady growth was not observed, nor was the growth rate smaller than that of the ER group. In this paper, the remaining research questions, that is, 3 and 4, are addressed.

Methods

Participants

A total of 431 first- and second-year university students participated in this one-year study: 247 in the ER classes and 184 in the control group. Their major areas included engineering, electronics, computer science, commerce, economics, law, and literature. Their English level was approximately CEFR A1 to B2.

The participants in the experimental group engaged in Sustained Silent Reading (SSR) for 40-45 minutes per session in 24 sessions over two semesters. Two thirds of the classes were conducted in computer rooms, and those participants could listen while reading. In addition to SSR, timed-reading practice was carried out using eight passages from Reading for Speed and Fluency 3 (Nation & Malarcher, 2007) throughout the year. Also, participants practiced reading aloud along with the recording of those passages. Depending on their results on the Edinburgh Project on Extensive Reading Placement/Progress Test, students were recommended to read a minimum of 100 very short books (50,000 words) or 50 short books (100,000 words) in the first 12 weeks. The material used in the ER course included both graded readers and leveled readers.

The participants in the control group used different textbooks. The second-year students used Reading Explorer 2 (National Geographic Learning, 2015), which includes passages based on articles in the National Geographic magazine. Reading skills, such as skimming and scanning were introduced over the course. The textbook used for the first-year students was an anthology of English-language short stories, which included unabridged works of English-language authors, such as Saki, Joyce, Mansfield, and Spark. The students were trained to read the original text and appreciate the literary effects of wording and the symbolism of items in the text through discussion. There were four examinations throughout the academic year, which assessed their understanding of the content of the passages in the textbook, as well as lexico-grammatical features. Quizzes on vocabulary understanding were also carried out several times in each semester.

Materials

Grammatical ability and fluency were assessed using the Japanese-English Bilingual Grammar Test and timed reading with comprehension questions. The grammar test was developed by the authors for the current study. It was designed to evaluate learners' grammar knowledge at the sentence level, following the format of the Edit Grammar Test (Koizumi, Sakai, Ido, Ota, Hayama, Sato, & Nemoto, 2011). The test consisted of 46 items that assess learners' knowledge of grammatical features, including noun phrases, verb phrases, subjunctives, SV agreement, tense agreement, and extraposition of complement.

Six passages from Nation and Malarcher (2007) were used to measure the participants' reading rates. Table 1 shows the number of words and readability (Flesch-Kincaid Grade Level) of each passage for the fluency checks. Each passage was followed by eight comprehension questions. The participants' reading rates and comprehension accuracy were recorded.

Table 1. The Characteristics of the Passages for Fluency Checks

Title	Words	Readability
Time 1 and Time 3		
Happy Birthday to You	409	9
Humans	420	6
Best sellers	349	7
Time 2		
Hippo	393	7
Alice	394	7
Popular Songs	425	7

Procedure

The participants took the Grammar Test and fluency check at the onset (Time 1) of the one-year reading courses, at the end of the spring semester (Time 2), and at the end of the fall semester (Time 3).

Results and Discussion

In order to investigate how the development of grammatical knowledge is related to the development of reading rates (Research Question 3), a latent profile analysis was conducted. A latent profile analysis is a statistical method for finding hidden or latent classes of related cases (individuals) from multivariate continuous data (Kosugi & Shimizu, 2014). Cases within a class are similar to each other and they are different from those in other classes. Mplus software (Muthén & Muthén) was used for the analysis.

Three classes emerged from the latent profile analysis, and 63 participants (26%) were grouped in Class 1, 140 (57%) in Class 2, and 44 (18%) in Class 3. Class 1 (C1, hereafter) was the least developed class, and Class 3 (C3, hereafter) was the most developed class, while Class 2 (C2, hereafter) was at a level in-between. Table 2 shows the descriptive statistics of grammar, fluency, and comprehension of the three classes. The data from the grammar test was first analyzed using the Rasch dichotomous model, and it provided each participant's ability in logits. Grammars 1-3 reflected the person abilities based on the grammar test administered at the beginning, in the middle, and at the end of the year. Similarly, WPM refers to the number of words a participant was able to read per minute. Comprehension mean is the average number of correct answers at each data collection time. The maximum score is eight. For example, the comprehension mean of

Class 1 was 4.52 out of eight at Time 1, 4.95 at Time 2, and 4.64 at Time 3. The last three lines of Table 2 indicate the differences between Time 1 and Time 3. Grammar gain scores are the differences between Time 1 and Time 3 in logits (e.g., 0.86-0.66 = 0.20 for Class 1). Similarly, reading rate gain scores are the differences between WPM at Time 1 and WPM at Time 3. The comprehension gain scores refer to the differences in comprehension mean scores between Time 1 and Time 3.

The participants in C1 started with grammatical ability that was almost 1 to 1.3 logit lower than those in Class 2 or Class 3. This means that if C1 participants successfully answered a grammar item with a difficulty level the same as their ability level (i.e., .66), they had a success probability of .50. If they managed a grammar item with a difficulty level higher than their ability level, the success probability decreased. Similarly, if they solved an item with a difficulty level lower than their ability level, the success probability increased. If the C1 participants solved items with a difficulty level of 1.63, the same as the C2 ability mean, the C1 participants had a success probability of approximately .27. On the other hand, if the C2 participants solved grammar items with a difficulty level equivalent to the C1 ability mean (i.e., 0.66), they had a success probability of approximately .73.

The grammatical knowledge of the C1 participants increased as the year progressed, and the grammar gain score was the largest among the three classes. However, the differences in grammatical knowledge between C1 and the other two classes remained close to one logit, or more, throughout the year. Similarly, the average reading rate of C1 was lower than 100 WPM at Time 1. Their reading rate continued to increase, but it did not reach the 100 WPM level. Furthermore, their comprehension means were lower than the 70% criterion of

Table 2. Descriptive Statistics of Grammar, Fluency, and Comprehension

	Class 1	Class 2	Class 3
Grammar 1	0.66	1.63	1.95
Grammar 2	0.72	1.68	1.94
Grammar 3	0.86	1.82	1.79
Mean WPM 1	67.03	82.07	115.56
Mean WPM 2	72.38	82.22	119.39
Mean WPM 3	78.16	99.79	139.08
Comprehension mean 1	4.52	5.92	6.37
Comprehension mean 2	4.95	6.31	6.59
Comprehension mean 3	4.64	6.55	6.60
Grammar gain scores	0.20	0.19	-0.16
Reading rate gain scores	11.13	17.72	23.52
Comprehension gain scores	0.12	0.63	0.23

Note. WPM refers to words per minute.

adequate comprehension (Anderson, 2008, p.67) throughout the program.

Concerning the C2 participants, their grammatical knowledge increased as the year progressed, and the grammar gain score was almost the same as the C1 participants. The average reading rate of the C2 participants was lower than 100 WPM at the beginning and it continued to increase as the program progressed and reached the 100 WPM level by the end of the year. Furthermore, the C2 participants read while keeping the 70% criterion of adequate comprehension throughout the year.

On the other hand, the grammatical knowledge of C3 slightly decreased from Time 1 to Time 2 and from Time 2 to Time 3. This might be due to the item difficulties of the Bilingual Grammar Test and there might have been a ceiling effect. The C3 participants showed an average reading rate of higher than the 100 WPM level from Time 1 with accurate comprehension. Their

reading rate continued to increase throughout the year and the reading rate gain score was the largest among the three classes, 23.52 words.

Based on the results for Research Question 3, it seems ER is most likely to help Japanese EFL learners to develop their reading rates when their grammatical knowledge at the onset of the ER program is at least at a level similar to that of Class 2.

In order to examine the reading behaviors of the participants in the ER group (Research Question 4), the reading records of the least improved C1 (N = 53) and the most improved C3 (N = 32) were examined. These participants kept full, or nearly full, records of their reading throughout the whole course, but the rest of the students either failed to record fully or lost their reading logs. Consequently, those participants were not included for further analyses. Table 3 shows the number of books and the word counts that the C1 and C3 participants read

Table 3. Reading Amount of C1 (N = 53) and C3 (N = 32) in the Spring and Fall Semesters

		Books		Word Count		Words per book	
		C1	*C3*	*C1*	*C3*	*C1*	*C3*
Spring	Mean	83.23	65.81	65,980.42	108,095.91	856.08	1,735.89
	SD	22.16	23.07	23,901.36	51,140.53	476.74	848.47
	Min	34	27	13,482	23,679	334	326
	Max	115	131	112,072	245,496	2,882	3,318
Fall	Mean	75.04	55.25	124,770.60	199,046.97	1,909.69	4,072.61
	SD	31.57	22.68	72,302.47	99,311.04	1,373.87	2,433.76
	Min	22	25	15,517	53,437	485	902
	Max	144	109	416,379	419,320	7,064	10,833
Total	Mean	158.26	121.06	190,751.02	307,142.88	1,286.98	2,683.24
	SD	41.57	36.09	89,601.17	134,604.14	814.52	1,313.89
	Min	69	52	28,999	86,175	420	777
	Max	233	232	528,451	646,328	5,116	5,823

in the spring and fall semesters and over the entire year. Also, the table contains the average number of words per book.

The participants from C1 read 83.23 books during the spring semester and 75.04 books during the fall semester, on average, whereas C3 read 65.81 and 55.25 books, respectively, fewer than the number of books read by C1. However, concerning the word count, participants from C3 read approximately 1.6 times more words than participants from

Table 4. The Book Series Read by the Participants at Each Level and their YLs

Book Levels	0	1	2	3	4	5	6
YL	*less than 1.0*	*1.0-1.9*	*2.0-2.9*	*3.0-3.9*	*4.0-4.9*	*5.0-5.9*	*6.0 or higher*
Leveled Readers and Young Readers							
All About Reading	0-1	2-3					
A to Z Mysteries				all			
I Can Read	0-1	2-3					
Longman Literacy Land	0-6	7-10	11-12				
Magic Tree House				all			
Mr. and Miss Series			all				
NY Times Best Sellers							all
Oxford Classic Tales	1-3						
Oxford Reading Tree	1-8	9					
Oxford Wolf Hill		1-3	4-5				
Ready to Read	1						
Scholastic Horrible Histories					all		
Scholastic Readers	1-2	3	4				
Skyrider			B-C				
Step into Reading	1-3	3-4					
Usborne Young Reading		1-2					
Who Was/Is Series				all			
Graded Readers							
Cambridge English Readers		0-1	2	3	4	5	6
Cengage Page Turners		1-3	4-7	8-9	10-12		
Foundations Reading Library	1-4	5-7					
MacMillan Readers	1	2	3	4-5	6		
Oxford Bookworms	0		1-2	3-4	5	6	
Oxford Domino			2				
Penguin Readers	0	1	2	3	4	5	6
Penguin Young Readers	1-2	3	4				

C1. The average words per book read by C1 were 856.08 in the spring semester and 1,909.69 in the fall semester, whereas those read by C3 were 1,735.89 and 4,072.61, respectively. This means that participants from C3 read books approximately twice as long in the spring semester, and 2.1 times longer in the fall semester than those read by C1. Concerning their word counts per book, both groups increased in a similar manner.

To examine the participants' reading behaviors in more detail, the books they read were classified based on the levels of books using the YL (Yomiyasusa Level) system. YL is a type of readability measure, which was established mainly for Japanese learners by Akio Furukawa and the SSS (Start with Simple Stories) Group in 2003, in cooperation with members of the Japan Extensive Reading Association (JERA). All the books are graded into 100 levels from 0.0 to 10.0 (see Furukawa, 2007, for more details). Table 4 shows the book series read by the participants at each level and their YLs.

Table 5 shows the average number of books and words in seven levels that the C1 and C3 members read each semester.

As Table 5 illustrates, C1 read 75.81 books (40,824 words) from the easiest level and 13.95 books (23,482 words) from the Level 1 books, on average, during the spring semester. In the fall semester, many participants raised their reading level to Levels 1 (54,919 words), 2, 3, 4 and 6, while some still continued reading books from level 0 (28,058 words). Likewise, C3 read 27.85 books from Level 0 (27,578 words) and 36.20 books (83,195 words) from Level 1, which were easy enough for them in the spring semester. They also raised their levels and advanced to Levels 2 (76,191 words), 3 (57,982 words), 4 (15,525 words) and 6 (2,500 words), while some students remained at Levels 0 and 1 in the fall semester.

In conclusion, the results show that the reading behaviors of C1 and C3 were very similar. In the spring semester, the participants in both classes read a large amount at levels that felt comfortable to them, and they raised their reading levels in the fall semester. The main difference between the two classes was the total amount of reading. C1 read 190,751 words and C3 read 307,143 words on average (Table 3). Since C3 scored higher in grammar, reading speed, and comprehension tests at the pre-tests, they

Table 5. The Average Reading Amount of C1 and C3 Participants in Each Level of Books

| | Number of Books | | | | Word Count | | | |
| | Spring Semester | | Fall Semester | | Spring Semester | | Fall Semester | |
Level	C1	C3	C1	C3	C1	C3	C1	C3
0	75.8	27.85	36.95	6.60	40,824	22,578	28,058	7,474
1	13.95	36.20	25.70	19.60	23,482	83,195	54,919	63,168
2	0.92	9.00	4.86	13.75	3,193	29,299	19,778	76,191
3	0.03	0.10	1.03	6.15	297	1,272	8,909	57,982
4	0.00	0.00	0.05	0.95	0	0	775	15,525
5	0.00	0.00	0.00	0.00	0	0	0	0
6	0.00	0.00	0.03	0.05	0	0	1,707	2,500

were able to read books at higher levels than those of C1 from the beginning, which resulted in larger word counts. This suggests that if the reading behaviors are the same, the amount of reading is a key factor for improvement in reading fluency and comprehension.

Moreover, the results for Research Questions 3 and 4 show that the grammar gain scores and reading gain scores are positive across all three classes. The only exception is the grammar gain score of C3. We can say that the present study provides further empirical evidence that extensive reading helps Japanese EFL learners to develop their grammatical ability and reading fluency, and that the amount of reading is a crucial factor that leads to improvements in learners. The findings of the current study are congruent with the results of Nakanishi (2015). He conducted a meta-analysis of the effects of ER on reading rates. His results indicate that ER has a large effect on reading rates. On the other hand, as mentioned above in relation to the results for Research Question 3, ER is most likely to help Japanese EFL learners to develop their reading rates when their grammatical knowledge at the onset of the ER program is at least at a level similar to that of Class 2. Class 1 learners may need additional care from teachers. Concerning grammatical knowledge, previous research studies reported that ER has a facilitative effect in developing learners' general grammatical knowledge. The result of the current study showed similar findings. However, our finding is different from Maruhashi's (2011), which shows only the low-level group indicated a significant difference between the pre-test and the post-test scores. In the current study, both Classes 1 and 2, 82% of the ER participants, developed their grammatical knowledge incrementally.

The present study is not without limitations. First, the ER group spent approximately 10 minutes on speed reading practice and reading-aloud practice in eight out of 24 classes over the year, and these in-class tasks might have influenced how the participants in the ER group engaged with reading by themselves. Second, the participants performed mostly SSR in class, although they could listen to the CD of a reader, if available. Therefore, the findings of the current study are generalizable only to the SSR context, but not to those where extensive reading is practiced differently. Similarly, the L1 of the participants uses both a syllabic writing system and a morphemic writing system, and their target language has an alphabetic writing system. Generalizability is limited to learners or learning contexts similar to those of the current study.

The present study lasted only for one year. If it had lasted longer, we might have seen further development in grammatical knowledge and fluency, especially among the C1 participants. Further study will shed more light on the relationship between ER and the development of learners' grammatical ability and fluency.

Acknowledgements

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