

The influence of translation on reading amount, proficiency, and speed in extensive reading

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Abstract

This study attempted to examine the influence of a decrease in translation on the number of words read, reading comprehension, and reading rate in an extensive reading (ER) program. The participants were 70 first-year university students who experienced ER both in and outside the classroom for 15 weeks. The results of regression analyses confirmed that a decrease in translation and grammar analyses statistically significantly affected all three. A further investigation found that a decrease in translation overall as well as in grammar analyses made a difference in the means of the number of words read and the post-test scores. Moreover, a decrease in translation at the word level was statistically significant on reading comprehension, and so was a decrease in translation at the sentence level on the amount of reading. The results were discussed referring to automaticity together with the prior educational experience and mentality of typical Japanese students.

Keywords: extensive reading, translation, the number of words read, reading comprehension, reading rate

Reading instruction is a crucial component of English education. This is especially true in countries where English is not spoken as an official or first language. Japan is no exception. Elementary schools offer English lessons through songs and games now. However, their purpose is to encourage young pupils to become familiar with the world's common language. Learning English in a real sense still starts at junior high schools in Japan.

Literature Review

Deep-rooted Habit of Translation

Japanese students take a number of English classes for 6 years at junior and senior high schools. The names of those classes vary, but they are mostly centered around reading with the majority of teachers being native speakers of Japanese. In a typical English lesson, students are instructed to look at a sentence of a passage or dialogue, and to check the meaning of unknown vocabulary

in that sentence with their English Japanese dictionary. They are then directed to figure out the grammar and structure of the sentence and understand the content in Japanese. In addition, they are usually advised to make a vocabulary list or to buy a supplementary vocabulary book, or they are provided with such a list prepared by the teacher. All of these customarily place English words on one side and the meaning in Japanese on the other. Students memorize the Japanese part just by looking at the list.

As it is widely known, the grammar-translation method has been adopted in these English classes. According to Kanatani, Takayama, Usukura, and Ota (2011), it is the only method that is endorsed by senior high school English teachers. One of the laws concerning education called Teacher's License Law requires English teachers-to-be to take only one course to learn how to teach English effectively in teacher training programs. In other words, novice teachers who have just obtained an official teacher's license may know the theory but not practice. Under the current circumstances, inexperienced teachers are most likely to repeat the approach that is familiar to them from the time they were students (Kanatani et al., 2011). Similarly, the traditional method is prevalently employed in junior high schools. One piece of evidence is presented in textbooks screened by the Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2013). A textbook in the most popular series, *New Horizon*, only contains approximately 2,000 words (Hasegawa, Chujo, & Nishigaki, 2008). This limited amount is suggestive that a lot of time is spent on detailed analyses of grammar and word-by-word translation. As Chia and Chia (2000) stated, instruction can be more efficient when a shared language between the teacher and students is used in EFL settings. In this manner, reading by means of translation has been the norm in the Japanese English education system.

Change in Education Policy and ER

The grammar-translation method has remained in English classes in Japan, while grammar-oriented English education has started being shifted. The content and amount of learning are controlled by the Course of Study approved and enacted by MEXT. A major change was initiated when the revision of the Course of Study was announced in 1989 and went into effect in 1991. These guidelines strongly encouraged English to be taught in a communicative way. This caused approved textbooks to be altered accordingly and dramatically (Sakurai, 2007, 2008). Public junior and senior high schools are obliged to use a recommended textbook. Many private schools, although not bound by law, also tend to choose textbooks from among the approved ones. Analyzing present and past popular English textbooks at junior and senior high schools, Sakurai (2007, 2008) found that the amount of grammar to be learned decreased, whereas the number of seemingly oral / aural exercises increased. Even if more dialogues and conversational phrases are included in newer textbooks, it is plausible that some part of each lesson is still traditionally instructed. The conventional approach needs to be retained for the sake of term and entrance exams. Therefore, the stance each school administration and teacher takes influences the ratio of communicative activities and grammatical exercises in the classroom. As a result, the amount and content of learning are not as unified as they used to be (Sakurai, 2007, 2008).

One way to fill the gap among students whose previous experience of English learning differs greatly is extensive reading (ER). Students select and enjoy reading a lot of easy English books in an ER program under the guidance of the instructor (Day & Bamford, 1998). The learner-

oriented nature of ER enables the learning of students who have different educational backgrounds to be effective, reasonable and meaningful. Its popularity is growing at elementary, junior and senior high schools in addition to universities throughout Japan (Takase, 2010). Increase in sales of ER books and more space allocated for graded readers (GRs) in bookstores also indicate the spread of ER nationwide (Helgesen, 2008). Besides individual schools and teachers, the national and local governing organizations have started acknowledging the efficacy of ER. Education Reform Plan Corresponding to Globalization (MEXT, 2013), for instance, proposed that ER should be conducted in the classrooms of elementary, junior and senior high schools together with listening, discussion and presentation exercises.

Efficacy of ER and Translation

Various effects of ER have been observed and reported over the past decades. Krashen (2004) and Day and Bamford (1998) summarized a number of studies that strongly indicated that ER improved vocabulary, writing, grammar, spelling and test scores such as TOEFL, not to mention general English competency and overall reading skills. Some research even concluded that ER was superior to traditional, direct instruction (Krashen, 2004). Elley (1991) introduced some large-scale, long-term and well-designed studies in which elementary school pupils in the Pacific Islands acquired English rapidly through ER. One of the most impressive findings was revealed by Mason and Krashen (1997). ER positively affected Japanese university students who had failed and were repeating an English course, and it motivated them to learn and improve English.

It is speculated that Japanese students naturally translate English into Japanese even when they are reading ER books that are supposed to be easier than their textbooks. Basically, this is what they have been doing since the very beginning of their English education. Reading English may mean translating it into Japanese to many of them. However, translating is different from reading. House (2009) defines translation as “the process of replacing a text in one language by a text in another language (p. 4). It is also “slow, laborious work” (Cook, 2010, p. 88). Toyama (2012) noted that it would be difficult to understand a translated message or idea since the logic behind it would not be translated accurately from one language to another. In fact, the brain functions differently when we read and when we translate. Wolf (2008) confirmed that reading in English and reading in Japanese triggered different parts of the brain to be active. In a study conducted by Price, Green, and von Studnitz (1999), the results of positron emission tomography (PET) scans demonstrated that more areas of the brain were activated during translation. These findings of neuroscientific research imply that reading and translating are not identical. Furthermore, the process of reading and that of reading through translation differ. In the former, the meaning and sound of vocabulary are automatically and instantly understood, they are kept in the working memory as chunks, and then the meaning of a passage is understood with the help of background knowledge (Day & Bamford, 1998). The brain seems to work differently when translation intervenes in this reading process. According to the model presented by Nishizawa, Yoshioka, and Itoh (2010), after recognizing letters of English in a sentence, Japanese people who have been trained to read by translation instantly search for *kanji* (Chinese characters) that match English words they see. Then, they combine pieces of *kanji* and *kana* (Japanese syllabaries) mixtures to construct an equivalent sentence in Japanese. Hence, the meaning of an English sentence is comprehended in Japanese. More processing of the native language is involved than that of English in this model. This also leads to a conclusion that reading English through

translation is different from reading English per se. After all, translation is what O'Malley, Chamot, Stewner-Manzanares, Kupper, and Russo (1985) called an ineffective strategy used by language learners at beginning and intermediate levels.

Translation can be a hindrance in ER programs. Sakurai (2013) reported that a decrease in translation was attributed to an increase in the amount of reading in an ER program. She carried out two multiple regression analyses utilizing the data of the number of words students read and their replies to questionnaires. The participants of the research were 1208 first-year students who experienced ER for one year and 1137 students who did ER for one semester in the following year at a private university in Japan. The number of words these students read was the dependent variable and the replies to the questionnaires were independent variables. Stopping translating appeared as one of the two common factors that predicted the number of words they read in both of the analyses. The research result indicates an unfavorable impact of translation on the reading amount in an ER program.

Reading Speed and Fluency in ER

It is apparent that the reading amount, reading comprehension and reading rate are closely related. The amount of reading plays a crucial role in enhancing reading proficiency (Sakurai, 2011). In order to read a large number of texts, it is fundamental that students learn to read at a good rate and to comprehend the content sufficiently enough to enjoy the story. According to Nuttall (1982) and Rasinski (2000), slow reading rate results in poor comprehension. This is because the capacity of short-term memory is so limited that details must be decoded quickly enough to understand the message of a text (Brown & Hirst, 1983, as cited in Bell, 2001). In other words, fluency and automaticity are vital in reading. Various studies agreed on the definition of reading fluency as the capability to read a text rapidly, effortlessly, smoothly and automatically (Wolf & Katzir-Cohen, 2001). As Logan (1997) remarked, reading rate could be improved by practice, and progress in reading rate would be evidence of the acquisition of automaticity.

In ER programs, learners read a great deal of easy books for pleasure. Because books with levels which are lower than readers' English proficiency levels are supposed to be utilized, reading speed is expected to be rather fast. There are, in fact, some researchers who reported that ER enabled learners to improve reading speed. For example, Beglar, Hunt, and Kite (2012) revealed that all of the three groups of Japanese university students who engaged in ER for an academic year statistically significantly improved their reading rate, while an intensive reading group did not. In a case study conducted by Nishino (2007), two Japanese junior high school students who continued ER for 2.5 years developed their reading speed from 72 to 137 wpm and from 58 to 111 wpm respectively. The gains were attributed to reading approximately 488,709 words and 528,138 words¹. Imamura (2012) reported that the average reading rate of a group of high school students who read the 45,447 mean words as homework over a period of 7 months increased to 100.55 from 77.60 wpm. The mean rate of the other less enthusiastic group who read 14,279 words on average changed from 86.74 to 96.90 wpm. These improved reading rates still appear to be rather slow compared to Carver's finding (1990, as cited in Fraser, 2007). In Carver's research, university students who were native speakers of English typically read at 260 to 300 wpm when they were casually reading and at 138 wpm when they had to memorize the

text. However, it should be highlighted that the participants of the studies by Beglar et al. (2012), Nishino (2007), and Imamura (2012) were Japanese students reading in a foreign language. Fraser (2007) conducted a study in which Chinese learners of English engaged in scanning, skimming, regular reading, reading to learn and reading and memorizing. They experienced these five tasks in L1 and L2. She found that reading speed in L2 was at least 50% slower than in the L1 across all of the five tasks. Also, reading speed in L2 can be affected by distance in the writing system between L2 and L1 (Fraser, 2007).

The Current Study

Students who have learned to read through translation are prone to spending a lot of time on every single word (Day & Bamford, 1998). If students persist in this habit while reading extensively, a slow rate of reading will impede reading fluency and limit the number of words to be read. In fact, it is suggested in the previously mentioned study by Sakurai (2013) that translation inhibits the number of words to be read from steadily growing in an ER program. It is then reasonable to hypothesize that translation could interfere with comprehension and decrease the reading rate since the reading amount, proficiency and rate appear to be crucially interrelated. The present study is intended to explore the influence of translation during ER further. Thus, the research questions are:

1. Does translating ER stories into Japanese affect reading comprehension and reading speed as well as the number of words read in an ER program?
2. If it does, what degree of translation influences them?

Method

Participants

Participants of this study were 70 first-year non-English majors at a private Japanese university. All freshmen were required to enroll in an English course. They were divided into 5 levels based on the results of the placement test developed by the university at the beginning of the first semester. The participants were placed in level 1, 3, 4, and 5. That is, their proficiency levels varied from beginner to intermediate. All of them were taking a Reading Skills course which met twice a week for one year, and 55 of them were also taking a twice-a-week Oral Communication course. ER was required as part of the final grades for both of the courses. They were expected to go to the library, check out ER books in their levels, and take quizzes on Moodle Reader after reading. The number of words in books was accumulated when the students passed quizzes. The amount of reading they needed to accomplish differed according to their levels. Depending on the number of words they accumulated, they had up to 5 points added to or deducted from their final grades of each semester. Table 1 summarizes the number of words per point, the minimum number of words to be read, and the number of words to be read to obtain 5 points. For example, Level 3 students had to read at least 25,000 words, and for every additional 5,000 words, they got 1 point added to their final grades.

Table 1. *The conversion of the number of words into points for the final grade (words)*

	1 point	±0	+5
Level 1	3,000	15,000	30,000
Level 3	5,000	25,000	50,000
Level 4	6,000	30,000	60,000
Level 5	6,500	35,000	70,000

In addition to ER outside the classroom, the participants experienced ER for 10 to 15 minutes in class. They were instructed to read smoothly and fluently without translating into Japanese and regressing. They were given Reading Record Sheets that were created by the instructor where they kept a record of the books they read in each lesson. They were oriented to write a comment that clearly showed that the book was read and understood along with the name of the book, the series name, the number of words it contained and an evaluation of the book. Most of them read ER books chosen and brought into the classroom by the instructor although they were allowed to read books from the library. Table 2 is the list of the series the students mainly read in and outside the classroom.

Table 2. *Books read by the participants*

Outside the classroom	In class
Oxford Bookworms, Cambridge English Readers, Penguin Readers, Macmillan Readers, Step Into Reading, Foundations Reading Library	Oxford Reading Tree, Henry & Mudge Series, I Can Read, Step Into Reading, All Aboard Reading, Ready-to-Read, Oxford Classic Tales, Fast Forward, Winnie the Witch Series, Cambridge Storybooks, Penguin Young Readers, Building Blocks Library, Primary Classic Readers

Instruments

As a measurement of reading proficiency, Edinburgh Project on Extensive Reading placement/progress test (EPER PPT) A was utilized. This research project to support ER programs was initiated in 1981 by the Institute for Applied Language Studies in the University of Edinburgh (Yamashita, 2008). The test is composed of 12 stories with 141 blanks to be filled in by writing an English word for each blank, and scored by an exact-word method. It is a semi-ratio cloze with about every 5th to 8th word deleted from the 2nd sentence on in each passage (Yamashita, 2008). As many practitioners seem to agree, various language abilities are demanded in order for missing words to be restored in cloze tests (Bachman, 1985). Among those, EPER PPT measures the knowledge of grammar and vocabulary as well as contextual understanding according to Takase (2012).

A 6-point Likert scale questionnaire was formulated in Japanese (see Appendix 1 for the translated version of the questionnaire). It consisted of 9 questions about translating and pausing. All of the questions started with “Compared to April when I started ER” and they contained the phrase “less often.” Questions #1 to #5 asked if the amount of translation decreased compared to

April in the sentence and word levels. The underlying assumption was that the students would have given up translating not all at once but gradually by degrees. More specifically, it was hypothesized that they would have stopped translating words they knew well first, words that appeared often second, and sentences in the Japanese word order last if they had ever attempted to abandon the ingrained habit. The replies were expected to show whether or not the degree of decrease was influential. The next question interrogated decrease in vocalization of stories, which was speculated to affect reading speed. In questions #7 and #8, the participants indicated whether they paused while reading extensively. The last question inquired if they thought about English grammar less often during ER at the end of the semester. These questions about stopping and paying attention to grammar were included as they appeared essential at the time of translating.

Reading Record Sheets that had been collected after every 10th book were examined and the number of words read in class was calculated when the comment for a book was approved to be sufficient to prove the book was read and understood. The number of words the students accumulated by taking quizzes for outside-the-classroom ER was added to the number of words read in class.

Procedure

EPER PPT was administered in April before the participants started the ER program as well as at the end of the spring semester. Due to time restriction, only 20 minutes was allocated for both of the pretest in April and posttest in July although the test was supposed to be 60 minutes long. At the same time, the number of words the participants read per minute (wpm) was calculated in April and July. The students read a book of their choice from among the ER books the instructor brought into the classroom. Different sets of books were utilized at the beginning and end of the semester. The latter set included longer and more difficult books. The participants were told to use their smart phones or watches with a second hand to record the minutes and seconds they needed to finish reading the book on their Reading Record Sheets in addition to recording other necessary information such as the number of words in the book. Also, the questionnaire was administered in class at the end of the semester. The total number of words read, the raw scores of pre- and post-tests, the reading rates in April and July and replies to the questionnaire were first input into Excel, and then transferred to SPSS (version 18.0).

Data Analyses

Research question #1 asked if translating ER books into Japanese affected reading comprehension and reading speed as well as the number of words read in an ER program. In order to answer this question, it seemed necessary to verify first that the participants were actually engaged in ER and ER had an effect on their ability to comprehend stories quickly. Therefore, paired *t*-tests were run in an attempt to find out if there was statistically significant progress in reading proficiency and reading speed after calculating the descriptive statistics. Then, principle component analysis with the 9 survey questions was performed. This was because the questionnaire had 5 questions that inquired about translation in different degrees to examine the other research question. It was considered appropriate to obtain one underlying variable rather than to use the replies to one of the 5 questions or to adopt five variables. Finally,

utilizing the factor scores of the factors extracted, regression analyses were carried out to investigate the influence of a decrease in translation on the number of words read, reading comprehension and reading rate.

Research question #2 addressed what degree of translation influenced the amount of reading, reading comprehension and reading speed in the case that the answer to the first research question was affirmative. In order to explore this, one-way analysis of variance (ANOVA) was calculated with the reading amount, reading comprehension, and reading speed as dependent variables and replies to the survey as independent variables. First, the participants were divided into two groups. Those who replied positively to a question by writing down the numbers 6, 5, and 4 constituted the first group, Group P (positive). The other group, Group N (negative), was comprised of those who indicated a negative response with the numbers 3, 2, and 1. It was expected that a difference in the means of the three dependent variables between the two groups would indicate that agreeing to what was stated in a question made a difference and contributed to a larger reading amount, better comprehension and a faster reading rate.

Results and Discussion

Descriptive Statistics

Table 3 exhibits the descriptive statistics of the total number of words the participants accumulated in and outside the classroom, the raw scores of pre- and post-EPER PPTs and reading speeds in April and July. The participants read 99,739.51 words on average for 15 weeks. Impressively, the most enthusiastic student accumulated 228,262 words. A simple calculation indicates that the student read about 20,000 words a week.

The mean scores of the pre- and post-tests were 32.67 and 44.41 respectively. The maximum and minimum scores seemed to assure that proficiency of the participants represented a wide spectrum. However, it should be noted here again that the participants spent only 20 minutes on these tests. The scores might have been higher if the time originally set for the test, 60 minutes, had been secured.

Similarly, reading speed ranged from 46 to 236 wpm in April and 63 to 233 wpm in July. In addition to having revealed that reading rate in L2 became drastically slow, Fraser (2007) found that the participants in the previously quoted study, Chinese learners of English, were not capable of adjusting their reading rate in L2 depending on the purpose of reading. The outcome of her research suggests that the students who cooperated in the current study could have been unaware of the existence of various ways of reading and that they might not have had a notion that they were supposed to alter reading speed according to the purpose of reading. When timing themselves, it is possible that some students might have been feeling rushed to read and reading more like scanning and skimming. Some others might have been trying to learn English by reading carefully through translation. The findings by Fraser (2007) seem to justify the mean reading rate of the present study, 113.86 wpm, although Hill (2001) stated it would be desirable for English learners to reach 200 wpm to function effectively in the real world.

Table 3. *Descriptive statistics of the total number of words read, the scores of EPER PPTs, and reading speeds in April and July*

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Max</i>	<i>Min</i>
The number of words read	70	99,739.51	37,280.737	228,262	17,814
pre – EPER PPT	70	32.67	11.908	78	9
post - EPER PPT	70	44.41	11.997	81	20
pre- wpm	70	101.12	33.395	236	46
post -wpm	70	113.86	36.504	233	63

The descriptive statistics of the survey are shown in Table 4. The average was mostly 4, “I think so to some extent.” This indicates that the participants were conscious that they were not translating and paying attention to grammar as much as they used to. Likewise, it can be assumed that they recognized they were reading more smoothly than in April. A completely negative answer “I never think so.” was offered only to Q1 which asked about a decrease in translation overall. This may suggest that their general impression could have been they were still translating regardless of the amount and that their habit of translating was deeply rooted.

Table 4. *Descriptive statistics of the questionnaire*

<i>N</i>	<i>M</i>	<i>SD</i>	<i>Max</i>	<i>Min</i>	
Q1: less translation overall	70	3.90	.950	6	1
Q2: less translation in the Japanese word order	70	4.41	1.056	6	2
Q3: less translation of words	70	4.19	1.040	6	2
Q4: less translation of frequently used words	70	4.61	1.026	6	2
Q5: less translation of familiar words	70	4.56	1.044	6	2
Q6: less vocalization	70	4.06	1.202	6	2
Q7: pausing at the sight of unknown words	70	4.41	1.028	6	2
Q8: pausing at the sight of seemingly familiar words	70	4.19	1.011	6	2
Q9: less attention to grammar	70	4.61	1.018	6	2

Improvement in Reading Proficiency and Speed

Two-tailed paired *t*-tests were applied to examine the improvement in reading comprehension and reading rate. Table 5 displays the outcomes. The gain in the test scores did not happen by chance according to the result of the *t*-test ($t = -13.741, p < .001$). The increase in reading rate was also statistically significant at the $p < .001$ level ($t = -3.387$). Although these gains were not solely from ER as ER was not the only study the students were undertaking, it seems feasible to conclude that the participants were engaged in ER and ER at least had a positive impact on reading proficiency and rate.

As briefly explained in the method section, EPER PPT is a cloze test. One of the cloze tests that are considered to measure reading proficiency effectively is C test (Iwahori, 2008). According to Connelly (as cited in Iwahori, 2008), C test is created by replacing the last few letters of every other word from the 2nd sentence on in a reading passage by a dash. On EPER PPT, which consists of carefully omitted blanks, no clues such as the first few letters of a word are provided. Test takers are required to use their grammatical knowledge, to figure out appropriate vocabulary and expressions from context and to spell out English words accurately. Therefore, the statistically significant gain can be proof that the participants improved syntactically,

semantically, and orthographically.

Table 5. Means, standard deviations, gains, and *t* values of the test scores and reading rates in April and July

	<i>M</i>	<i>SD</i>	Gain	<i>t</i>
pre- EPER PPT	32.67	11.908		
post- EPER PPT	44.41	11.997	11.74	-13.741***
pre- wpm	101.12	33.395		
post- wpm	113.86	36.504	12.74	-3.387***

*** = $p < .001$

It may be beneficial to identify how much reading attributes to the development of reading rate. Beglar (2012) calculated the standard words²⁾ necessary to be read to gain 1 wpm by utilizing the data from various studies. According to his analysis, reading 12,000 to 17,000 standard words leads to a 1 wpm gain. In the current study, the number of running words required to obtain the same reading rate was pursued since GRs nowadays have the number of running words contained printed on or inside the cover so that readers can be informed of how many words they have read. A study by Nishino (2007) estimated that 7,519 and 9,965 running words were read for two Japanese high school students to progress by 1 wpm. The 1 wpm gain in Imamura's research (2012) was the outcomes of reading 1,980 and 1,405 running words. In the present study, the participants read an average of 99739.51 running words and obtained a mean speed of 12.74 wpm. The result of this calculation, 7,828 running words per 1 wpm, is close to that of Nishino's investigation (2007). Discrepancies in the number of words essential to gain 1 wpm suggest the necessity of more research, analysis, and discussion.

Research Question #1

The first research question posed was if translating ER books into Japanese affected reading comprehension and reading speed as well as the number of words read in an ER program. Prior to regression analyses that would pursue the answer to this question, principal component analysis was first carried out on the 9 items of the questionnaire without rotation so that the number of variables would be reduced. Two factors were extracted. The first one was comprised of Q1, Q2, Q3, Q4, Q5, and Q7. It represented a decrease in the amount of translation as well as grammatical analyses. The other factor, consisting of Q7 and Q8, was named pausing less often. Q6 was excluded as the loadings were close to or below 0.5, and it did not cluster with the two factors. Both of the two factors had high reliabilities, Cronbach's alpha = .84 and .81 respectively. The results were summarized in Table 6.

Table 6. *Factor loadings of the principle component analysis*

	Decrease in translation & grammar analyses	Pausing less often
Q1: less translation overall	.679	-.365
Q2: less translation in the Japanese word order	.705	-.142
Q3: less translation of words	.732	-.058
Q4: less translation of frequently used words	.725	-.514
Q5: less translation of familiar words	.717	-.404
Q6: less vocalization	.503	.367
Q7: pausing at the sight of unknown words	.467	.691
Q8: pausing at the sight of seemingly familiar words	.563	.682
Q9: less attention to grammar	.724	.222

With the number of words read, the results of the posttest and wpm in July as dependent variables, regression analyses were performed. The factor scores of the two factors were independent variables. The first factor, a decrease in translation and grammar analyses, correlated with the amount of reading at the $p < .05$ level ($R^2 = 0.089^*$), with reading comprehension at the $p < .01$ level ($R^2 = 0.123^{**}$), and with reading speed at the $p < .05$ level ($R^2 = 0.090^*$). The other factor, pausing less often, was not statistically significant with any of the dependent variables. The results of these regression analyses showed that refraining from translating and thinking about grammar was related to the reading amount, improvement in the post-test scores and advancement in reading rate.

This can be explained by discussing fluency and automaticity. Summarizing a number of studies regarding reading fluency, Wolf and Katzir-Cohen (2001) concluded that the complicated process of reading fluency included “lower level attention and visual perception, phonological representation and phoneme awareness, short-term and long-term memory, lexical access and retrieval, semantic representation, decoding and word identification, morphosyntactic and prosodic knowledge, and connected-text knowledge and comprehension” (p. 220). More components are involved for the Japanese learners of English who are inclined to translate when they read. Moreover, the difference in the writing system can be an additional burden. As stated earlier, the capacity of memory is finite. By avoiding translating in the word and sentence levels, Japanese students may be able to read faster. They may be able to use memory span efficiently to retain information vital to comprehend the content within a time frame. Automaticity of these sub-skills listed by Wolf and Katzir-Cohen (2001) must be enhanced to achieve reading fluency. An attempt to refrain from translating could reduce the workload of the brain. This could result in aiding the development of reading fluency since the memory system plays a primary role in improving automaticity.

Research Question #2

The other research question asked what degree of translation influenced the number of words read, reading comprehension and reading speed in an ER program. In an attempt to reveal it, one-way ANOVA was run. The independent variables were 2 groups: Group P (the students who provided a positive answer to a question in the questionnaire) and Group N (the participants who answered negatively). The dependent variables were the total number of words read, the results

of the posttest and wpm in July. First, the difference in the means of Q1, 3, and 9 between Group P and Group N was statistically significant on the post-test scores, $F(1, 68) = 5.355, p < .05$, $F(1, 68) = 7.543, p < .01$, $F(1, 68) = 4.004, p < .05$ respectively (see Table 7). Q1 was “Translation appears in my mind less often,” Q3 “I translate English words less often,” and Q9 “I think about English grammar less often.” A positive answer “I think so” to these three statements made a difference in the post-test scores. Secondly, Table 8 demonstrates the outcomes of ANOVA on the number of words read as the dependent variable. Q1, 2, and 9 were statistically significant. Agreeing to a decrease in translation overall (Q1), $F(1, 68) = 4.034, p < .05$, a decrease in translation in the Japanese word order (Q2), $F(1, 68) = 6.906, p < .05$, a decrease in grammar analyses (Q9), $F(1, 68) = 9.494, p < .01$, made a difference in the mean number of words read. These results can be interpreted as less translation overall, less word translation, and less grammar analysis could enhance reading comprehension. Likewise, less translation overall, less translation in the Japanese word order and less grammar analysis could increase the amount of reading. It is noteworthy that word-level translation could affect reading proficiency, while sentence-level translation may influence the number of words to be read.

Table 7. Results of ANOVA on reading comprehension

		SS	df	MS	F
Q1 P = 52 N = 18	Between Groups	724.964	1	724.964	5.355*
	Within Groups	9206.021	68	135.383	
	Total	9930.986	69		
Q3 P = 54 N = 16	Between Groups	991.560	1	991.560	7.543**
	Within Groups	8939.426	68	131.462	
	Total	9930.986	69		
Q9 P = 59 N = 11	Between Groups	552.280	1	552.280	4.004*
	Within Groups	9378.706	68	137.922	
	Total	9930.986	69		

** = $p < .01$, * = $p < .05$

Table 8. Results of ANOVA on the reading amount

		SS	df	MS	F
Q1 P = 52 N = 18	Between Groups	5.371E+9	1	5.371E+9	4.034*
	Within Groups	9.053E+10	68	1.331E+9	
	Total	9.590E+10	69		
Q2 P = 58 N = 12	Between Groups	8.841E+9	1	8.841E+9	6.906*
	Within Groups	8.706E+10	68	1.280E+9	
	Total	9.590E+10	69		
Q9 P = 59 N = 11	Between Groups	1.175E+10	1	1.175E+10	9.494**
	Within Groups	8.415E+10	68	1.238E+9	
	Total	9.590E+10	69		

** = $p < .01$, * = $p < .05$

The means of both of the number of words read and the post-test scores were higher among the participants who agreed that they translated and thought about grammar less often in July (Q1 &

Q9). These 2 questions constituted the first factor in the principle component analysis. Thus, the same theory can be adopted here. Less translation and attention to grammar could have supported the development of fluency and automaticity. What should be more focused on here appears to be the relationship between Q3 and the increase in reading proficiency along with the relationship between Q2 and the amount of reading.

A decrease in word translation (Q3) had an effect on the mean of the post-test scores. A lot of English vocabulary has multiple meanings. However, what students learn by rote with their vocabulary lists at junior and senior high schools is just one Japanese equivalent to each English word. They have to cram themselves with so many words at one time. This is their tactic to score high in exams. Let us look at an example below.

Jack tripped and injured himself.

Japanese students naturally think that this sentence means *Jack traveled somewhere and injured himself*. They do not learn the other meaning of *to trip, to stumble*, that is less likely to appear in exams. It is probable that they pause and wonder, “Traveled where?” They are then inclined to feel sorry for Jack who might have needed to go to the hospital in an unfamiliar place. Their interpretation can be different from the original meaning especially in terms of the degree of bad luck. This could lead to misunderstanding the storyline and influence comprehension unfavorably. Another example is words that orthographically look similar such as *to adapt* and *to adopt*. Students tend to pause to search for the correct meaning when they encounter confusing English words. This happens probably due to the fact that students just memorize meanings in Japanese without context. Ordinarily, output is not expected for most of the English words they learn by rote. Pausing to retrieve memory can be problematic. Wolf (2008) reported that a special feature of eye movement allows readers to get information about the next 14 to 15 letters coming after the focused word. This facilitates the cognitive process of reading and enhances automaticity. Students could take advantage of this feature by not translating every word. Finally, paying attention to the meaning of individual words and grammatical features is a sign of bottom-up processing (O’Malley & Chamot, 1990). However, top-down processing is indispensable to imagine the overall picture of a story during ER. Refraining from translating and focusing on grammar could cultivate top-down processing.

Stopping translating English sentences in the Japanese word order (Q2) caused the amount of reading to grow. A comment by Day and Bamford (1998) can offer insight to this result. They stated that students who learned reading in the grammar-translation method tended to consider study required a lot of effort and work. The regular procedure for learning English that Japanese junior and senior high school students follow involves: 1) look at (not necessarily read) an English sentence, 2) identify unknown words and underline them, 3) check the meaning of those words with a dictionary and write it down in Japanese, 4) look at the sentence again and find out the grammatical structure they are supposed to learn, 5) connect fragments of Japanese phrases, 6) refine the Japanese sentence so that it clearly shows they have understood the grammar of the sentence, and 7) record it in a notebook and be prepared to present it in class. Most of the steps can be eliminated when they are not expected to translate in the Japanese word order. The absence of pressure to prepare fine Japanese sentences may make students feel they do not have to read so carefully and attentively. The task seems so much less strenuous that they might start

feeling at ease. This sense of “slacking off” could be what increases the number of words to be read in ER programs.

The other dependent variable, the post-reading rate, was not statistically significant, possibly implicating the complex nature of reading rate. As estimated earlier, the number of words demanded to be read to gain 1 wpm differed from research to research. One assumption is that reading speed could fluctuate easily due to the psychological state of individual readers. What is on readers’ mind, such as worries and tiredness, could disturb concentration and attention to maintain a steady rate.

Conclusion

Two research questions were under investigation in this study. The first asked if translating ER stories into Japanese influenced the reading amount, reading comprehension, and reading speed in an ER program. The outcomes of the regression analyses indicated that a decrease in translation affected all of the three variables. What degree of translation was influential was the second research question. It was suggested that refraining from translating into Japanese overall and stopping analyzing grammar could result in better reading comprehension and a larger amount of reading. Moreover, less word-level and sentence-level translation could favorably impact on reading proficiency and the amount of reading respectively.

It is inferred from these findings that a decrease in translation has an effect on the number of words to be read, reading proficiency, and reading rate in an ER program. Therefore, students should be encouraged to read ER books in English without Japanese. Instructors can support them by first telling them not to translate into Japanese and not to think about grammar during ER. This can be followed by encouraging them not to move their eyes in the Japanese word order, from subject, object, and then verb. Orientating them to understand English words from context, not through Japanese translation, seems valuable as well. The efficacy of ER cannot be maximized without the appropriate guidance of the teacher. It is obvious that more research needs to be conducted concerning the relationship between translation and ER. However, it is hoped that the results of this study were able to offer some insight and tips for successful ER programs.

Notes

1. Nishino (2007) listed ER books the two students read in the appendices. However, she did not report the number of pages they read for the books they did not finish. Therefore, the exact calculation was not feasible.
2. According to the information provided by Beglar et al. (2012), a standard word is a word consisting of every six character spaces.

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Appendix A

Questionnaire

This questionnaire is only for research purposes to improve the ER program, and is not at all related to your grades. Please answer using the numbers 1 to 6.

6 = I strongly think so.

5 = I think so.

4 = I think so to some extent.

3 = I don't think so so much.

2 = I don't think so.

1 = I never think so.

Compared to April when I started ER,

- 1) Japanese translation appears in my mind **less often** now during ER.
- 2) I translate English sentences into Japanese in the Japanese word order **less often** now during ER.
- 3) I translate English words into Japanese **less often** now during ER.
- 4) I translate frequently used English words into Japanese **less often** now during ER.
- 5) I translate English words I know well into Japanese **less often** now during ER.
- 6) I vocalize English words and sentences **less often** now during ER.
- 7) I stop reading **less often** now during ER when I encounter English words I have never seen before.
- 8) I stop reading **less often** now during ER when I encounter English words I have seen but cannot recall their meaning.
- 9) I think about English grammar **less often** now during ER.

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