# The integrated effects of extensive reading and speed reading on L2 Japanese learners' reading fluency

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This study seeks to fill a void in the current body of research on extensive reading by investigating the integrated effects of extensive reading and speed reading on L2 reading fluency. It examined the effects of an extensive reading program that included speed reading trainings and found that the reading rates of the participating L2 Japanese learners ($N$ = 11) increased significantly over two academic terms when analyzed by three methods. The participants' reading rate gains occurred without the expense of comprehension and when speed reading trainings were given only once a week. This study has supported that Nation and Waring's advice—that extensive reading programs should ideally have a targeted speed-reading component—was sound, and if followed, positively impacts learners' reading fluency.

Second language curricula need to be balanced between accuracy and fluency orientation as well as between form-focus and meaning-focus orientation. Nation (2007) suggests that second language programs should be comprised of four equal strands—meaning-focused input, meaning-focused output, language-focused learning, and fluency development—in order to provide L2 learners with balanced opportunities for learning their target languages. Extensive reading (ER) is recommended as part of this to promote two of these strands: meaning-focused input and fluency development in reading. Numerous studies of ER have demonstrated its benefits within these strands, with increases in reading comprehension (Jeon & Day, 2015), motivation to read in L2s (Judge, 2011; Mori, 2002; Ro, 2013, 2016; Takase, 2007), incidental vocabulary learning (Laufer & Rozovski-Roitblat, 2011; Pigada & Schmitt, 2006), and reading fluency (Beglar & Hunt, 2014; Beglar et al., 2012; Bell, 2001; Huffman, 2014; McLean & Rouault, 2017).

However, insufficient attention has been paid to the applied ideas put forward by Nation (2007) and Nation and Waring (2020), which emphasized that ER programs should ideally contain a component that specifically targets fluency development. More precisely, they claimed that about one-third of ER time should be allocated for reading fluency development via reading very easy graded readers[1] and/or receiving speed reading (SR) trainings. While there have been some studies that have examined the effects of SR trainings (Chung & Nation, 2006; Macalister, 2010; Tabata-Sandom, 2017; Tran, 2011, 2012; Tran & Nation, 2014), few studies have reported back on the augmented effects that may have been created by ER and SR.

Hence, the current study attempts to examine the integrated effects of ER and SR when conducted within one program. This represents significant addition to the current body of research given that many researchers have noted a large gap in the reading rates between first language (L1) readers and second or foreign language (L2) learners (Chang & Millett, 2015; Grabe, 2009; Nation & Waring, 2020; Suk, 2017; Tran, 2011). According to Grabe (2009), this gap is large, and the reading rates of university-level EFL learners are only a third of that of L1 readers. Reflecting the fact that many alphabetical L1 background learners of Japanese struggle with decoding Japanese texts due to the wide orthographic difference between L1 and L2 (Ellis et al., 2004; Grainger, 2005), the current study's attempt to reveal the additional potential of Japanese ER programs when combined with SR trainings on reading fluency could have a significant impact on learning outcomes. The findings of this study will shed light on ER programs' maximizations in similar L2 reading pedagogical contexts.

## Literature Review

### ER in the context of L2 reading

In order to facilitate reading in L2 classes and make reading accessible for L2 learners, Day and Bamford (1998) proclaimed that L2 reading pedagogy should abolish the "no-pain, no gain" orientation and encourage learners to read a lot of comprehensible and interesting materials in ER programs. Since then, ER has been growing in terms of the number of suitable materials (such as graded readers) available, institutions who employ it, and studies that are examining it. Nevertheless, there are still lasting problems with L2 reading instruction, as described by Grabe and Stoller (2019) below:

> What rarely occurs in the traditional reading class is a lot of reading, purposeful rereading, strategic reading, or *reading to learn*. The absence of actual silent reading time (as opposed to time spent on reading exercises and discussions of answers) is unfortunate because students become better readers by reading a lot and reading often. (p. 11, italics original)

This problem, the slighting of silent reading in L2 reading classes, has been pointed out by other researchers (e.g., Day & Bamford, 1998; Nation & Waring, 2020; Park, 2022). Behind these less than optimal circumstances are some learners' and school administrators' views that silent reading is neither active learning nor worthwhile as a classroom activity (Macalister, 2014). Attempts at ER research have also had some internal issues that have subsequently hindered ER's expansion (e.g., elusive definitions of ER). Nation and Waring (2020) addressed these issues and claimed that ER is probably the best remedy for problematic

L2 curricula. They also clarified the definition of ER as being learners silently and independently reading a lot of texts at the right level with adequate comprehension.

With Nation and Waring's (2020) empirically-based yet practitioner-oriented input, it is expected that the current ER research and practice will be maximized. One positive change is the availability of more options for practicing ER. For example, it is now possible to conduct ER fully online using online tools such as Xreading (https://xreading.com) and some studies have reported that online ER has benefitted learners' reading habits and reading fluency (Bui & Macalister, 2021; Zhou & Day, 2021). The current study will pursue another way to advance the current ER research and practice. It will take into account that, as pointed out earlier, when an ER program contains a SR component, SR will have additional effects on the learners' reading fluency and other learning outcomes.

**Three approaches for reading fluency development**

Traditionally, the three approaches employed to develop L2 learners' reading fluency are repeated reading (RR), ER, and timed reading (TR). RR is an approach within which learners read the same text repeatedly until they can read and comprehend it with ease. Taguchi and his colleagues examined reading rate changes, comprehension changes, and the relationship between these two factors as a result of RR treatments in their series of studies (Taguchi, 1997; Taguchi et al., 2012; Taguchi & Gorsuch, 2002). Chang and Millett (2013) also found that words (read) per minute (WPM) of the 13 L2 English students in the RR group increased more than those in the control group, both with the

practiced and unpracticed texts: 47 and 45 WPM versus 13 and 7 WPM respectively. In the L2 Japanese context, Gorsuch, Taguchi, and Umehara (2015) reported that beginner L2 Japanese learners at a US university increased their syllabary and word decoding skills, and comprehension after 23 RR treatments, all of which resulted in their active strategy use and higher L2 reading confidence. More recently, Taguchi, Gorsuch, and Mitani (2021) found the facilitative effects of audio-supported RR on the reading rate of 27 learners of Japanese at an American university. The study also demonstrated that the participants' reading rate growth transferred to unpracticed passages (See also Fujita, 2012; Liu & Todd, 2014 for RR studies in this context). ER also effectively builds L2 learners' fluency (Beglar et al., 2012; Grabe, 2009; Nation & Macalister, 2021; Nation & Waring, 2020). One of the most representative studies that examined the effects of ER on reading fluency is probably a study by Beglar, Hunt, and Kite (2012). In their study, the three groups who engaged in pleasure reading (often used as an alternative term for ER) outperformed the intensive reading (IR) group in reading rate gains. It was further reported that the participants' reading rate gains did not occur at the expense of reading comprehension, and simplified texts produced greater reading rate gains than unsimplified texts. Finally, TR is an instruction in which learners read texts under time-pressure, which resultantly enhances their reading rate, reading accuracy, and comprehension (Hamersley, 2015). One of the TR activities is SR and it is the focus of the current study. It is an approach in which—over a language course—learners read a series of texts that are all the same length and do not contain any unknown words, record their reading time, and then (without referring to the text) answer several comprehension ques-

tions that test their general understanding of the text. This kind of SR is recommended as the classic way of increasing careful silent reading speed by Nation (2009) who proposes that SR materials be written within a controlled vocabulary in order for the learners not to be "held up by unknown words" (Nation, 2009, p. 139). To recapitulate, when learners read texts that do not contain any unknown words under some pressure to perform at a faster-than-normal rate, their reading process tends to be more fluent. Such SR trainings develop learners' reading fluency. Among SR studies conducted in this manner to date (Chung & Nation, 2006; Macalister, 2010; Tran, 2011, 2012; Tran & Nation, 2014) in the L2 English context, Macalister (2010) and Tran (2012) both proved that the gains provided by undertaking SR courses were not limited to the linguistically-controlled texts provided, but rather transferred to the reading of texts targeting native readers as well. In the context of L2 Japanese, Tabata-Sandom (2017) reported that 21 upper intermediate and advanced learners' reading rates did not increase significantly after ten SR trainings, probably due to the infrequency of the SR trainings. And even in that context, half of the participants were shown to be in an 'improvement pattern.' That means, the average of their last three readings was larger than that of the first three readings and that of all ten readings.

Some researchers have compared the effects of these three approaches. Taguchi, Takayasu-Maass, and Gorsuch (2004) compared the effects of RR and ER and found the participants who engaged in RR significantly increased their reading rates. Shimono (2018) used oral RR and TR in his quasi-experimental study and found that both TR by itself and a combination of TR and oral RR were efficacious in developing

the reading fluency of 55 Japanese university EFL students. Other TR studies have also reported its beneficial effects on L2 reading rate gains (e.g., Gui et al., 2020).

**The integrated effects of ER and SR**

As set out above, an increasing number of studies have been examining each approach's individual effects on learners' reading fluency. However, few studies have reported on the effects of ER programs when accompanied by SR trainings. McLean and Rouault (2017) suggested that their participants' statistically significant reading rate gains were partly due to weekly SR trainings the ER group received. Specifically, their first-year Japanese university students belonging to the ER group ($N = 23$) showed an increase of 30.96 standard words per minute in their reading rates, whereas those belonging to the control group (IR group, $N = 27$) only showed an increase of 5.26 standard words per minute although they also received SR trainings. The ER group's increase is almost six times more than that of the control group, which seems to imply that the ER group may have received accelerated and augmented benefits from the combination of ER and SR. However, SR was not the study's focus. That is, their focus was not to examine the combined effect of ER and SR.

The practice of ER accompanied by targeted SR is strongly recommended by Nation and Waring (2020). In making this claim, the two authors explained that the ER fluency gains reported by Beglar, Hunt, and Kite (2012) were much less than what could be achieved with the addition of SR trainings. The authors also claimed that:

The effectiveness of extensive reading over a range of learning outcomes is likely to be substantially increased by in-

cluding a targeted fluency development course as part of the extensive reading program. (p. 93)

Hence, this study will fill this gap by examining the enhanced effects of an L2 Japanese ER program that contains SR trainings on learners' reading fluency. Japanese, along with the other non-alphabetical languages such as Chinese, Korean, and Arabic, requires much more time to attain the same proficiency compared to alphabetical languages such as Italian and Spanish, largely due to its complex orthography (Grainger, 2005). Therefore, studies that examine how to maximize opportunities of developing learners' reading fluency are more necessary for these non-alphabetical languages. This study will also respond to a need specific to the L2 Japanese ER research and practice. That is, as this context has been predominantly affective-oriented to date, more quantitative studies that investigate the effects of ER on language improvements (Watanabe et al., 2015) are needed. The study also offers a practical benefit. As reported by the authors of the many SR studies above, an SR session takes less than ten minutes, and therefore SR is easy to implement as a small component of ER in busy L2 classrooms. The current study will answer the following research questions (RQs):

RQ1. To what extent does an ER program when accompanied by SR trainings help to increase the participating L2 Japanese learners' reading fluency?

RQ2. Is the learners' reading comprehension affected by reading rate changes?

RQ3. How feasible is it to use different analysis methods to examine the learners' reading rates?

## Method

### Participants

The participants in this study were 11 learners of Japanese who were studying at a national university in western Japan. The student cohort consisted of international under- and post-graduate students. A scale of seven proficiency levels was designated by the university, and the current participants' levels on this scale ranged from Level 5 to Level 7, which are the upper intermediate to advanced levels. They were all enrolled in two consecutive elective ER courses entitled 'Learning Japanese through ER' that were not compulsory. All the students in the two courses were invited to participate in the current study and those who agreed to do so were given sufficient information about the study and consent forms. The two courses took 16 weeks over two academic terms (hereafter each eight-week course will be referred to as a term[2]). There was one 120-minute lesson each week. The participants had been taught Japanese in their home countries before coming to Japan. Although detailed information regarding the type of L2 Japanese instruction the participants had received in their home countries was unavailable, comments given in the end-of-term narratives made it clear that they mostly received IR instruction. Table 1 provides their background information. The participants are referred to as Participant A—K.

**Table 1. Participants' background information**

| Participant | Level at the university | Nationality | L1 | Length of studying Japanese |
|---|---|---|---|---|
| A | 6 | US/Japan | English | 13 years |
| B | 5 | China | Chinese | 2 years 1 month |
| C | 6 | China | Chinese | 5 years 1 month |
| D | 7 | Korea | Korean | 1 year 1 month |
| E | 5 | Korea | Korean | 1 year 8 months |
| F | 7 | Korea | Korean | 10 months |
| G | 6 | China | Chinese | 5 years 1 month |
| H | 5 | China | Chinese | 2 years |
| I | 6 | China | Chinese | 2 years 1 month |
| J | 6 | China | Chinese | 2 years 1 month |
| K | 5 | China | Chinese | 2 years |

**Procedures**

**Class content.** The two courses each followed the same routine each lesson (Table 2):

**Table 2. The content of a weekly class**

| Total:<br>120 minutes<br>one lesson per week | 10~15 minutes | Each student introduced a book she/he read within small groups |
|---|---|---|
| | 45~50 minutes | ER session |
| | (10 minutes) | (Break) |
| | Up to 10 minutes | SR training |
| | About 40 minutes | ER session |
| | 10 minutes | Students chose books they wanted to read at home |

**ER sessions and materials.**

The course coordinator gave a thorough lecture regarding ER during the participants' initial session, emphasizing that the aim was for learners to read a lot of easy texts quickly without a dictionary in an engaged manner. She clarified the differences between ER and IR, and presented Banno and Kuroe's (2016) positive findings regarding the motivational changes created by ER in a similar cohort of L2 Japanese learners: almost all the survey respondents strongly agreed that ER was effective for their Japanese language learning and improved their reading skills. Nuttall's (2005) vicious and virtuous circles were also explained to help make the participants aware of the importance of reading fast (the virtuous circle being 'read fast → be able to read a lot → be able to understand well → enjoy reading'). The coordinator then continued monitoring the participants' reading behaviors over the course and gave guidance about ER when necessary.

Roughly 130 Japanese graded readers, comic books, books targeting native children, and books targeting native readers that have reading supports on *kanji*[3] (*furigana*[4]) were the books used in the ER sessions. The participants chose their books themselves from the aforementioned books. They were also allowed to read their own books. After they finished reading a book, they filled in a book report with that book's title and some brief comments. The participants conducted the reading both in and out of class. The participants gained a full mark if they read more than 40 books each term. The participants read 36.7 books each term on average, at a rate of roughly four books per week, regardless of their reading levels. The most avid reader who participated in this study read 140 books over two terms, whereas the least active participant read only 44 books over that same period of time[5].

**SR trainings and materials.**

Quinn, Nation, and Millett's (2007) model of SR trainings was followed in this study. The participants received ten SR trainings and they read one specially constructed text per training over the two terms (See Appendix A for the details of the ten SR materials). The authors of the current study created the ten texts (See Appendix B-1 for an example text), within which an average of 98.3 % of the running words were from the first 4,000 words of J-LEX (Suganaga & Matsushita, 2013). Four thousand words was used as the cut-off to mirror the study done by Tabata-Sandom (2017), whose participants were comparable to the current participants in terms of their Japanese proficiency. The fact that J-LEX designated four thousand words as the lower intermediate level was another reason to use this criterion. As the participants were above the lower intermediate level, using this criterion was thought to be appropriate to construct materials suitable for SR trainings. The length of the ten texts ranged from 446 to 457 words. The reason that the text coverage of the ten texts was not 100%, as recommended by Nation (2009), was that many loan words and well-known proper nouns were treated as presumably-known-words (e.g., タイタニック [Titanic]) even though they were outside the designated word level (the first 4,000 words of J-LEX). All the *kanji*, or Japanese logographs, had reading support, *furigana*, so that the participants' reading processes were not interrupted by their knowledge of *kanji* readings. The syntactic difficulty of these ten texts was controlled using the Learning Item Analysis System (Student Center at the University of Tsukuba, 2012) to ensure that they were written within the confines of elementary and intermedi-

ate grammar. The authors strove to choose topics that did not favor any one particular participant, choosing general topics for which no expert knowledge would be necessary to understand the texts. Each text was accompanied by 13 four-option, multiple-choice questions. The questions tested the readers' general and literal understanding of texts. They did not require the readers to conduct inferencing to answer (See Appendix B-2 for an example set of 13 four-option, multiple-choice questions). These main texts and questions were pre-assessed by several teachers of Japanese. They especially checked for the possible ambiguities within the four-option, multiple-choice questions. The procedure followed that of the previous SR studies: the participants read a text, recorded their reading time, and answered the 13 questions without referring to the text just read. As mentioned above, one full SR training took less than ten minutes. It should be noted that the participants were given a practice session prior to the first SR training so that they could familiarize themselves with this novel style of learning.

## Analyses

### Analyses of reading rate changes

In this study, reading rates were used to indicate the participants' reading fluency, and WPM was used to measure reading rates. Although Kramer and McLean (2019) claimed that standard words per minute should be used as a more accurate measurement of reading rates in the L2 research and pedagogy instead of the traditional WPM, this study used WPM. This is because it has not been empirically established whether the aforementioned claim is applicable to the Japanese orthographic system.

### Three analysis methods for reading rate changes

The analysis methods employed by this study to analyze reading rate changes were an adaptation of those of Chung and Nation (2006). Specifically, a paired *t*-test was used to compare the following three factors: (1) the average of the first five reading rates of each participant obtained in the first term to that of the latter five reading rates of each participant obtained in the second term (adapted average method); (2) the slowest reading rates of each participant to the fastest reading rates of each participant (extreme method); and (3) the last (10th) reading rates of each participant to the first reading rates of each participant (last against first method). The rationale of using the three methods follows the argument given by Chung and Nation (2006). The adapted average method was used to prevent the reading rate gains from being exaggerated or lowered by extraordinary reading rates possibly created by the first and last texts. While the adapted average method tends to gain conservative scores, the extreme method could exaggerate the reading rate gains. However, this extreme method can show how much learners could gain. Finally, the last against first method tests the assumption that learners read faster with the last text than with the first text, after SR trainings.

The *t*-test assumptions were checked and met. In the analyses, because three *t*-tests were conducted, *p*-values were adjusted by the Holm-Bonferroni method (Holm, 1979) to reduce the chance of a Type I error. Significance of the results was reached when the *p* values obtained were ordered sequentially from smallest to largest and compared to the adjusted alpha level of *p* ≤ .017, .025, and .05, respectively. In addi-

tion, effect sizes were calculated. This is because, *p*-values, while informing whether an effect exists, do not reveal the size of the effect (Sullivan & Feinn, 2012) and also get affected by the sample sizes (Wei et al., 2019). In interpreting effect sizes, this study employed Plonsky and Oswald's (2014) suggestions for *d* values: .60 as generally small, 1.00 as medium, and 1.40 as large for within-group contrasts.

**The patterns of reading rates and reading comprehension**

The participants' reading rate patterns were investigated by examining first whether they tended to experience their slowest rates earlier and fastest rates later, when they generally tended to do their fastest reading, and then what types of texts they tended to have their fastest and slowest reading rates for. Furthermore, the participants' success rates on the four-option, multiple-choice questions were examined in order to see whether their reading rate changes affected their reading comprehension.

## Results

### Reading rate gains

*P*-values and effect sizes are provided in the following section.

### Adapted average method.

Using the adapted average method, the average reading rates of the latter five readings were significantly faster than those of the first five readings with a medium to large effect size (*t* = -3.89, *p* = .003, df = 10, *d* = -1.17, 95% CI [-42.62, -11.58],

**Table 3. The average rates of first and latter five readings**

| Participant | Average rate of the first five reading | Average rate of the latter five reading | Differences |
|---|---|---|---|
| A | 181.42 | 178.04 | -3.38 |
| B | 233.67 | 269.56 | 35.89 |
| C | 280.08 | 328.47 | 48.39 |
| D | 230.62 | 271.23 | 40.61 |
| E | 176.43 | 173.59 | -2.84 |
| F | 164.01 | 201.38 | 37.37 |
| G | 232.54 | 271.96 | 39.42 |
| H | 176.42 | 168.67 | -7.75 |
| I | 251.38 | 261.80 | 10.42 |
| J | 217.99 | 268.65 | 50.66 |
| K | 216.57 | 265.87 | 49.30 |
| *M* | 214.65 | 241.75 | 27.10 |
| *SD* | 36.29 | 52.40 | |

see Table 3). The participants' reading rates were significantly faster in the second term. Table 3, however, shows that three participants' latter average reading rates slightly decreased (Student A: -3.38 WPM; Student E: -2.84 WPM; Student H: -7.75 WPM), while the other participants' average reading rates across the latter five readings increased by 39.01 WPM (*SD* = 12.89) on average. Students A, E, and H were the second, third, and fourth slowest students according to their first five reading rate averages.

**Extreme method.**

There was also a significant difference be-tween the slowest reading rates of each participant and the fastest reading rates of each participant with a large effect size ($t$ = -7.57, $p$ = .000, df = 10, $d$ = -2.28, 95% CI [-156.15, -85.13], see Table 4). Although the texts with which each participant experienced her/his fastest and slowest reading rates varied as shown by Table 4, the qualitative investigation of the participants' reading rate patterns showed that eight participants experienced their fastest reading rates in the second term. Predictably, ten participants experienced the slowest reading rates in the first term. The texts which the participants experienced their fastest and slowest reading rates for were diverse as Table 4 demonstrates.

**Table 4. The slowest and fastest reading rates**

| Participant | Lowest rate | The text with which the participants experienced the lowest rate | Highest rate | The text with which the participants experienced the highest rate | Differences |
|:---:|:---:|:---:|:---:|:---:|:---:|
| A | 163.11 | 4th | 219.19 | 2nd | 56.08 |
| B | 214.22 | 8th | 340.25 | 6th | 126.03 |
| C | 248.26 | 1st | 455.59 | 6th | 207.33 |
| D | 205.65 | 5th | 311.16 | 7th | 105.51 |
| E | 148.68 | 1st | 210.47 | 5th | 61.79 |
| F | 154.83 | 5th | 237.35 | 10th | 82.52 |
| G | 201.94 | 1st | 305.45 | 6th | 103.51 |
| H | 107.76 | 5th | 223.28 | 4th | 115.52 |
| I | 203.46 | 3rd | 311.86 | 10th | 108.40 |
| J | 180.40 | 1st | 318.57 | 7th | 138.17 |
| K | 150.33 | 1st | 372.50 | 10th | 222.17 |
| M | 179.88 | | 300.52 | | 120.64 |
| SD | 39.38 | | 74.89 | | |

**Last against first method.**

The participants' last reading rates were significantly faster than their first reading rates with a small to medium effect size ($t$ = -2.62, $p$ = .025, df = 10, $d$ = -.79, 95% CI [-108.16, -8.80]). That means the participants read the last text significantly faster than the first text. Table 5 indicates that nine participants read the last text faster than the first text. The two participants whose last reading rates were slower than their first reading rates (Students A and H) also showed a slight decrease between their first five and last five reading rate averages.

**Table 5. The first and last reading rates**

| Participant | First reading rate | Last reading rate | Differences |
|---|---|---|---|
| A | 182.84 | 170.83 | -12.01 |
| B | 216.48 | 273.67 | 57.19 |
| C | 248.26 | 301.35 | 53.09 |
| D | 229.32 | 268.20 | 38.88 |
| E | 148.68 | 176.45 | 27.77 |
| F | 175.71 | 237.35 | 61.64 |
| G | 201.94 | 301.35 | 99.41 |
| H | 193.29 | 116.61 | -76.68 |
| I | 233.28 | 311.86 | 78.58 |
| J | 180.40 | 273.67 | 93.27 |
| K | 150.33 | 372.50 | 222.17 |
| *M* | 196.41 | 254.89 | 58.48 |
| *SD* | 32.93 | 74.11 | |

**The comparison of the three methods.**

Table 6 below provides the actual average reading rates as per the three analysis methods.

**Table 6. The actual average reading rates as per the three analysis methods**

| Method | Actual average reading rates* | | Differences** |
|---|---|---|---|
| Adapted average | First five reading rates' average | 214.65 | 27.10 |
| | Last five reading rates' average | 241.75 | |
| Extreme | Slowest reading rates | 179.88 | 120.64 |
| | Fastest reading rates | 300.52 | |
| Last against first | First reading rates | 196.41 | 58.48 |
| | Last reading rates | 254.89 | |

*Note.* *WPM; ** Differences are equal to reading rate gains.

The actual average reading rate gains of the three analysis methods line up in the same manner as Chung and Nation's (2006) results: extreme (120.64 words) → last against first (58.48 words) → adapted average (27.10 words). However, it should be noted that this study conducted statistical analyses using raw scores, unlike Chung and Nation (2006). The *p* values sequenced from smallest to largest were compared to the adjusted alpha levels, $p \leq .017$, .025, and .05, respectively. Then the significant differences were obtained, which lines up in a different manner: extreme ($p = .000$) → adapted average ($p = .003$) → last against first ($p = .025$). The effect sizes also showed the same sequential order: extreme with a large effect size ($d = -2.28$) → adapted average with a medium to large effect size ($d = -1.17$) → last against first with a small to medium effect size ($d = -.79$). In terms of statistical significance, the extreme method was the most polarized while the last against first method is the most conservative.

Regarding the employment of the three analysis methods, using the adapted average and extreme analysis methods demonstrate how differently reading rate gains could be presented depending on the conservative and extreme scoring methods. Also, the combined positive effects of ER and SR on the participants' reading rates is convincing as both the adapted average and last against first analysis methods together showed the participants' reading rate increase as the program progressed.

The extreme analysis method indicated a possible maximum reading rate for upper-intermediate and advanced L2 Japanese learners such as the current participants. However, it should be noted that the average scores masked the complex interplays among the content of the texts, individual factors, and reading rates.

The fact that all three methods provided significant reading rate gains supports the conclusion that the participants' reading fluency in terms of their reading rate gains significantly increased over the two-term ER program that contained the ten SR trainings.

**Reading comprehension**

As did the other SR studies above, having to answer the accompanied comprehension questions after reading prevented the participants from reading too fast, therefore they were able to understand the content of the texts in this study. The participants' reading comprehension was 94.48% on average. All the reading comprehension scores except in one case (Student I's first reading comprehension score was 61.54%) were above 70%, which is referred to as adequate understanding by Anderson (2008), as well as in former SR studies. Thus, the participants' reading fluency increases in terms of their reading rate gains did not occur at the expense of reading comprehension overall. Table 7 presents the participants' average scores of the comprehension questions.

**Table 7. Participants' average comprehension scores (%)**

| No of texts | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | *M* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Average scores | 86.71 | 97.20 | 95.10 | 96.50 | 97.20 | 94.41 | 88.89 | 92.31 | 100.00 | 96.50 | 94.48 |

## Discussion

Firstly, this study attempts to investigate to what extent an ER program when accompanied by SR trainings helps to increase the participating L2 Japanese learners' reading fluency (RQ1). The participants' reading fluency in terms of WPM increased significantly after SR trainings that were conducted during the two-term-long ER program. This finding corresponds with those of previous SR studies conducted in the L2 English context (e.g., Chung & Nation, 2006; Macalister, 2010; Tran, 2011, 2012; Tran & Nation, 2014). The difference between the foundation of the previous findings and the current findings is, however, that the SR trainings the participants received were conducted as a part of the two-term-long ER program. McLean and Rouault's (2017) experimental ER group similarly demonstrated statistically significant reading rate gains from ER treatments accompanied by weekly SR trainings. However, their focus was to see the relative effects of ER against IR, whereas this study was to see the combined effects of the two approaches. This method may invite criticism on the grounds that the study failed to indicate exactly how ER and SR contributed to the participants' reading rate gains, respectively. In order to clarify such an issue, an experimental comparison group design is required. However, the current authors wish to emphasize that the motive of this study was to examine the integrated effects of ER and SR, prompted by the claim made by Nation and Waring (2020) that: when an ER program contains a clearly-focused SR component, its effectiveness will increase considerably over various learning outcomes.

It is, then, feasible to compare this study to the study by Tabata-Sandom (2017) in order to investigate the considerable increase that has possibly been created by the combination of ER and SR on the participants' reading fluency, as measured by WPM. That is because both studies were conducted in the L2 Japanese context and the participants in both studies are relatively comparable in terms of their Japanese proficiency. Moreover, the former study conducted SR trainings as a stand-alone treatment, unlike this study. Tabata-Sandom's (2017) 21 participants, who received only SR trainings, did not demonstrate significant reading rate gains. They showed the largest gain in the last against first analysis method. Their average reading rates in the method increased only 13.22 WPM after ten SR trainings, an increase from 169.45 to 182.67 WPM. This is a much smaller gain compared to that obtained in this study's same scoring method: 58.5 WPM, an increase from 196.4 to 254.9 WPM. Tabata-Sandom (2017) attributed a non-significant increase obtained in her study to the infrequency of the SR trainings (once or twice per week) and the small number of them (ten in total). She also pointed out that her intermediate- and advanced-level participants did not have much room for growth, compared to those of Tran (2012). Tran's (2012) participants were first-year university students, and thus had more room for growth, which resulted in significant reading rate gains.

The fact that the ten SR trainings were conducted even less frequently in this study (once a week) conflicts with Tabata-Sandom's (2017) argument. Similarly, the current participants' proficiency levels were slightly higher than those of Tabata-Sandom (2017), according to the respective average reading rates of the ten SR trainings (227.6 versus 182.5 in WPM, the latter number having been calculated

from the three numbers provided in Tabata-Sandom, 2017, p. 121). This implies that the current participants probably had less room for growth, even compared to those in Tabata-Sandom's study (2017). In spite of this, the current participants' reading rates increased significantly according to all three analysis methods. This comparison supports the assertion that the ER combined with SR trainings in this study might have had additional effects on the participants' reading rate gains, unlike the stand-alone SR trainings conducted by Tabata-Sandom (2017) that failed to produce significant reading rate gains.

Secondly, this study investigates whether the participants' reading comprehension is affected by reading rate gains (RQ2). In this study, only Student I's first reading comprehension score was below 70%, the adequate understanding level claimed by Anderson (2008). The participants' reading comprehension scores remained high (94.48% on average). Therefore, their reading comprehension was not affected by their reading rate gains. This finding concurs with some other researchers' findings and claims: reading fluency increase can occur without an expense to reading comprehension (e.g., Beglar, et al., 2012; Grabe, 2009).

Thirdly, the study examines the feasibility of using different analysis methods to examine learners' reading rate gains (RQ3). The large difference between the conservative adapted average method and the extreme method indicated that the latter method could exaggerate learners' reading rate gains. On the other hand, the extreme method demonstrated a possible target reading rate L2 Japanese learners could aim for. Furthermore, it should be noted that effect sizes differed according to the analysis methods. The extreme

method obtained a large effect size and the adapted average method obtained a medium to large effect size, whereas the last against first method gained a small to medium effect size. One possible interpretation for this phenomenon is the influence of content. The last text had two major themes rather than one and one of them seemed to be an unfamiliar topic to many of the participants. Therefore, the last text could have been unproportionally difficult to the participants. Since the last against first method involved only two texts, the method may have been more strongly affected by the interplay of content and reading fluency. The influences of content such as cultural and topic familiarities on L2 reading processes were reported by some studies (Alptekin, 2006; Erten & Razi, 2009; Horiba & Fukaya, 2015; Pulido, 2000). Similarly, the fact that the texts which the participants experienced their fastest and slowest reading rates for were diverse implies the complex relationship between the text content and reading fluency. Reflecting this, it is beneficial to use multiple analysis methods when investigating learners' reading rate gains created by SR trainings.

Lastly, knowing that the participants' reading fluency in terms of their WPM significantly increased even when they received only one SR training per week and only ten sessions in total holds a pedagogical meaning. Millett (2008) suggested that SR practice should be conducted at least three times a week to produce satisfactory reading gains. The current findings, however, suggest that when SR is included in an ER program it can produce a significant outcome over fewer class sessions. Similarly, the current study demonstrated that it was worth continuing the SR trainings in the second term, and therefore it was "a productive use of class time" (Chung & Na-

tion, 2006, p. 192). The average of the five reading rates obtained in the second term was statistically significantly faster than that of the first term's five reading rates. Also, the majority of the participants experienced their fastest reading rate in the second term. These findings suggest that continuing the program over two terms was beneficial. It should be noted, however, that Japanese universities' academic terms are shorter than those of some other countries.

In addition to gains in learners' reading fluency, the relevant literature has proved the positive impacts created by SR on L2 learners' affective domains. For example, McLean and Rouault (2017) reported that their ER group participants who also received weekly SR trainings showed more confidence in reading L2 texts smoothly than the IR group who experienced IR and SR. Furthermore, Tabata-Sandom's (2017) 21 L2 Japanese participants who experienced SR rated it as the most facilitative instruction they had received. These findings should act as another recommendation that practitioners implement SR in their ER programs.

**Limitations and future studies**

Although the study obtained statistically significant results in many areas, its sample size is small. This is due to the nature of the L2 Japanese pedagogical context: the population of learners at one institution tends to be small. Replications of this study in the same context will hopefully strengthen its findings. Reflecting the small sample size, this study should have undertaken qualitative data collection methods such as individual and group interviews, as these could have deepened its findings. Had these types of interviews been conducted, it may have been possi-

ble to discover why the two participants who were slower readers at the outset, and therefore had more room for reading development, did not experience reading rate increases. Bui and Macalister (2021) reported that one reason why a few of their participants experienced a decreased reading rate was high engagement in the text content ("Lost in a book", Bui & Macalister, 2021., p. 19). Interviews with the two participants may have shed light on the influence of content on reading rate during SR trainings. Future studies could also quantitatively investigate the influence of content (e.g., cultural and topic familiarity) on reading fluency by using specially modified texts. Similarly, an investigation of practitioners' perceptions of the novel instruction of SR might have added to a well-rounded discussion. Furthermore, future studies can examine the effects of an ER program containing an SR component on various levels and in various L2s including L2 English.

## Conclusion

This study demonstrates the enhanced benefits created by an ER program that includes SR trainings by providing the findings that 11 L2 Japanese learners' reading rates increased significantly while engaged in such a program. Specifically, the participants' reading rates measured in WPM significantly increased in all three analysis methods: the extreme method with a large effect size, the adapted average method with a medium to large effect size, and the last against first method with a small to medium effect size. The modest effect size obtained in the last against first method implies the influences of text content on reading fluency. The participants' reading rate gains occurred without the expense of reading comprehension and

when SR trainings were given only once a week. In conclusion, this study supports that SR trainings that do not take up much class time deserve more attention from ER practitioners as a means to make existing ER programs more efficient and more facilitative.

**Pedagogical implications**

This study provides one practical recommendation. The course coordinator gave the participants an in-depth explanation of SR, ER, and IR, as well as a practice session, which seemed to yield positive results. Probably because of this preparation, the participants were not bound by the idea that silent reading is not active learning or a beneficial class activity (Macalister, 2014). This indicates the importance of enlightening learners regarding reading fluency when they engage in novel processes such as ER and SR.

## Notes

1. Graded readers are materials that are often used in ER. They are within the confines of an established matrix of vocabulary and syntax, and their plots are usually straightforward. These characteristics make graded readers comprehensible reading materials for L2 learners.

2. Many Japanese universities divide an academic year into four. Therefore, 'term' is used in this study, instead of 'semester.'

3. & 4. Japanese is written with *kanji* logographs and two types of syllabaries (*hiragana* and *katakana*). Content words tend to be written in *kanji*, whereas loan words are usually written in *katakana*. Function words (e.g., particles, end of verbs, auxiliary verbs, conjunctions, etc.) are usually written in *hiragana*. *Furigana* is a type of

reading support that is written in *hiragana*. *Furigana* is attached to *kanji* in a smaller font.

5. As the number of words contained in comic books, books targeting native children and adults, and the participants' own books was unavailable, the exact number of words read was not obtainable. However, we calculated the average word number of Japanese graded readers, that is, 1,667 words per book.

## Acknowledgements

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**Appendix A**
**Details of the ten SR materials**

| No | Titles of a text | Length (words) | Text coverage (4000 word level) | Dates of a session (2018 to 2019) |
|---|---|---|---|---|
| 1 | Mother Theresa | 451 | 99.8% | Oct, 21 |
| 2 | A girl who turned into a cow | 453 | 98.7% | Oct, 28 |
| 3 | *Shizutani* School | 451 | 100% | Nov, 7 |
| 4 | *Aum Shinrikyo*: A Japanese doomsday cult | 454 | 95.6% | Nov, 11 |
| 5 | Mother's Day, Father's Day, and Children's Day | 449 | 99.1% | Dec, 2 |
| 6 | The beginning of Japan | 448 | 99.8% | Dec, 9 |
| 7 | Titanic | 446 | 97.8% | Dec, 16 |
| 8 | Life of the old Japanese aristocrats | 457 | 100% | Jan, 6 |
| 9 | St. Valentine's Day: Which chocolate do you want? | 453 | 92.7% | Jan, 20 |
| 10 | Amazing people | 447 | 99.1% | Jan, 27 |

The ninth material above has a much lower text coverage by the first 4,000-word level (Suganaga & Matsushita, 2013). The text is about a Japanese tradition where girls give their favourite boys chocolate on St. Valentine's Day. That is likely because its key word, *chokoreeto* [チョコレート], which is outside of this level, is repeated in the text. *Chokoreeto* [チョコレート] is very similar to its original English word in sound and the concept of it is very familiar. A word like this was treated as a presumably-known-word in the current study.

**Appendix B**

**B-1 Example of the SR materials (the text used at the 10<sup>th</sup> SR training)**

<h1 style="text-align:center">奇跡の人 (Amazing people)</h1>

　「奇跡」とは、信じられないことが起こることです。歴史の中では強い心で信じられないことを起こして、人々に感動を与える「奇跡の人」がいます。その一人が1880年にアメリカで生まれたヘレン・ケラーです。彼女は１歳9か月の時に重い病気にかかりました。そのため、目が見えず、耳も聞こえず、話すこともできなくなりました。しかし、彼女は7歳の時に自分と同じように目の悪いサリバン先生に出会って、勉強を始めます。そして大学に行き、素晴らしい成績で卒業しました。その後、ヘレンは目の見えない人々のために働き、約1億円のお金を目の悪い人の団体のために集めました。また、目の悪い人のための文字が国によって違っていたのを統一しようと努力しました。ヘレンは障害を乗り越えて、明るく一生懸命に生きました。

　今の日本にも奇跡の人がいます。鈴木順子さんです。順子さんは３０歳の時、電車の大事故にあいました。電車がスピードを出しすぎて、近くの建物へ突っ込んだのです。この事故で107人が亡くなりました。助けられた時、順子さんは大けがをして、声をかけても反応がありませんでした。医師たちは順子さんは99パーセント助からないと言いました。しかし、順子さんのお母さんはあきらめませんでした。毎日順子さんに話しかけ、順子さんが好きな本を読んであげました。そのおかげで、事故から５か月後、順子さんは目を開け、「お母さん」と声を出しました。

　順子さんは事故で脳に傷がついたため、言語や記憶に障害が残っています。初めは、歩くことも話すこともできなかった順子さんですが、今は話すことができます。歩く練習もがんばってしています。水泳や料理もできるようになりました。順子さんの明るさ、一生懸命さは多くの人を驚かせています。

　ヘレンと順子さんが奇跡を起こせたのは、彼女たちの強く明るい心があったからでしょう。

**B-2 the 10ᵗʰ texts' multiple-choice questions**

(The first three questions are translated into English below.)

1. この話は、[　]人についてです。
   (1) 重い病気になった
   (2) 事故で亡くなった
   (3) 信じられないことを起こした
   (4) たくさんのことが出来なかった

2. ヘレン・ケラーは[　]で生まれました。
   (1) 日本
   (2) アメリカ
   (3) イギリス
   (4) 中国

3. ヘレン・ケラーは[　]、重い病気にかかりました。
   (1) 生まれた時
   (2) 1歳9か月の時
   (3) 7歳の時
   (4) 20歳の時

4. ヘレン・ケラーは病気で、[　]できませんでした。
   (1) 歩くことが
   (2) 人に会うことが
   (3) 目が見えず、耳も聞こえず、話すことも
   (4) 目は見えましたが、話すことが

5. サリバン先生は[　]人でした。
   (1) 目の悪い
   (2) 耳が聞こえない
   (3) 話せない
   (4) 歩けない

6. ヘレン・ケラーは大学を卒業した後、[　]。
   (1) サリバン先生に1億円をあげました
   (2) 目の見えない人のために働きました
   (3) 耳の悪い人の団体を作りました
   (4) 医者になるため勉強しました

7. ヘレン・ケラーは目の悪い人のための文字を[　]と努力しました。
   (1) 一つにまとめよう
   (2) たくさん作ろう
   (3) 病院で使ってもらおう
   (4) 会社に売ろう

8. 鈴木順子さんは[　]歳の時、電車の事故にあいました。
   (1) 3
   (2) 10
   (3) 30
   (4) 50

9. 電車がスピードを出しすぎて、[　]。
   (1) 橋から落ちました
   (2) 近くの建物に突っ込みました
   (3) 急に止まりました
   (4) 別の電車にぶつかりました

10. 電車の大事故で[　]人が亡くなりました。
   (1) 7
   (2) 30
   (3) 107
   (4) 300



11. 鈴木順子さんが助けられた時、医師たちは[　]と言いました。
   (1) よかった
   (2) すぐに目をさます
   (3) あきらめない
   (4) たぶん助からない



12. 鈴木順子さんのお母さんは、毎日[　]本を読んであげました。
   (1) 水泳の
   (2) 歩く練習の
   (3) ヘレン・ケラーの
   (4) 順子さんの好きな



13. 鈴木順子さんは今[　]。
   (1) 水泳ができます
   (2) まだ話すことができません
   (3) 料理ができません
   (4) 歩く練習をやめました

As the main text explained above, these 13 questions only tested readers' understanding of the gist and/or their literal understanding of texts. The translation of the first three questions is provided below.

1. This text is about people who [　].

   (1) became seriously ill
   (2) were killed in accidents
   (3) accomplished incredible things
   (4) were unable to do many things

2. Helen Keller was born in [　].

   (1) Japan
   (2) US
   (3) UK
   (4) China

3. Helen Keller suffered from a serious illness from when she was [　].

   (1) born
   (2) 1 year 9 months old
   (3) 7 years old
   (4) 20 years old