

【原著】

# The Relationship between Extensive Reading and TOEIC Score Gains

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多読と TOEIC のスコア増加の関連性

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## Abstract

Extensive reading programmes are a common aspect of many language courses. The effectiveness of extensive reading has been established, but existing studies on its link to reading score gains on a popular test in Japan, the Test of English for International Communication (TOEIC), have shown mixed results. This study uses quiz data from the website MReader, a common tool used to track students' extensive reading progress, to analyse the link between extensive reading and TOEIC through total words read, regularity of reading, and comprehension. 105 students' MReader data from four cohorts of reading class students was correlated with TOEIC reading section gains after 10 months of the programme. Small but statistically significant relationships were found between total words read, average quiz scores, and TOEIC reading score gains. The authors suggest that these results support the effectiveness of extensive reading for increasing TOEIC reading scores, but more research is needed.

## 概 要

多読プログラムは多くの語学授業において用いられている。多読の効果はすでに実証されているが、日本で人気のあるTOEICのリーディングセクションのスコア増加との関連性についての研究では、様々な結果が報告されている。本研究では、学習者の学習状況が追跡できるウェブサイトとして広く利用されているMReaderのクイズデータを用い、読んだ本の単語総数、多読の頻度、内容理解という点から多読とTOEICの関連性について分析する。過去4年間でリーディングの授業を受けた総数105名の学生のMReaderデータを、多読プログラム開始10か月後のTOEICリーディングセクションのスコアと突き合わせた。わずかではあるが、単語数、クイズの平均点、TOEICのリーディングスコア増加の間に統計的に有意な関連性が確認できた。これらの結果は、多読がTOEICのリーディングスコア増加に繋がるという効果を裏付けるものではあるが、よりさらなる研究が必要である。

## 1. Introduction

Extensive reading has become a popular component of many second-language programmes, both

in Japan and around the world. In extensive reading, students self-select easy materials on a wide range of topics and read as much as possible for pleasure, information and general understanding (Bamford & Day, 2004, pp. 2-3). One method of assisting students in choosing materials that are at an appropriate level for them is through the use of graded readers, which are books, both fiction and non-fiction, that use limited numbers of total words and unique words, or headwords.

A common goal of extensive reading programmes is to increase students' reading fluency in the second language (L2) and to increase students' vocabulary through incidental learning (the acquisition of vocabulary items from context). To achieve these gains, extensive reading should be carried out on a regular basis, with a book a week considered to be a reasonable target (ibid.). This study aims to explore the links between the amount of extensive reading, the frequency of reading and the depth of understanding and gains on a standardised reading test. A number of studies have addressed the effectiveness of extensive reading programmes, but there are few that use the Test of English for International Communication (TOEIC) as a measure. Given that this is a ubiquitous exam in Japan, establishing a link between TOEIC score gains and ER could help legitimise the use of ER in language classrooms in Japan.

## 2. Literature Review

### *2.1 Benefits of Extensive Reading*

Many studies have proved the effect of extensive reading on language learning and recognized its impact in multiple aspects of language development. Tanaka and Stapleton's 2007 study on Japanese high school students revealed that students who read graded readers voluntarily outside class improved their reading comprehension. Comparing two cohorts from different years, one group which engaged in outside-class extensive reading and one which didn't, Robb and Kano (2013) found students in the former cohort achieved higher scores on the reading section of a test.

Some studies report the benefit of extensive reading on reading fluency or reading speed. Iwahori (2008) carried out research on high school students and found that students' reading speed improved after seven weeks of an extensive reading programme. Tanaka and Stapleton (2007) also found their students' reading speed increased after engaging in extensive reading.

Extensive reading has also been found to be effective for vocabulary acquisition. Wang (2013) tested the effects of extensive reading on 45 low-level learners of English in Taiwan, and the results suggested a modest but positive effect on vocabulary gains. The post-test revealed that extensive reading helped the students learn 6% to 15% of 50 unknown words compared to the pre-test, which was conducted four months before the study. Alavi and Keyvanshekouh (2012) compared two groups: one experimental group required to read at least 12 books using MoodleReader, and one control group which required extensive reading using four books assigned by their teacher. They found the former group had higher gains in vocabulary acquisition.

A few studies report that extensive reading can also be beneficial in the affective or cognitive aspects of language learning. Yamashita's 2013 survey on university students found a positive impact of extensive reading on students' reading attitude. The students in her study recognized the intellectual value of extensive reading and increased comfort while reducing anxiety towards reading. Chien and Yu (2015) also investigated the benefits of extensive reading on learners' attitudes towards reading. The study revealed that unmotivated Taiwanese university students became more aware of the benefits of reading for improving their reading skills and increasing future career opportunities while it also reported negative effects on the affective aspect of extensive reading in students' responses. The researchers attribute these negative results to the lack of adequate monitoring by teachers, additional workload generated from extensive reading, and the delayed time frame and type of research instruments. Demirci and Gobert's 2015 study reports that their students also realized the values and enjoyment of reading after an extensive reading programme. Finally, Fernández de Morgado's study in 2009 did not reveal a significant difference in language gain between her treatment group and control group but reported the extensive reading group's higher satisfaction and positive perception towards the extensive reading programme; namely, they recognized the value of extensive reading for their language development.

### *2.2 Time and Amount of Reading Required for Extensive Reading*

As discussed above, many studies have contributed to the growing body of research into extensive reading by proving the benefits of extensive reading in language learning. However, some of the studies described above recognized the importance of study length and amount of reading input. While Tanaka and Stapleton's 2007 study suggested positive effects from extensive reading, they found that one of the programmes, the Home Reading Program, did not improve the students' reading comprehension. They attribute this to the lack of reading volume and the short time frame of the reading programme. Referring to Kanatani, Nagata, Kimura, and Minai's studies in 1991 and 1992 which suggest that it takes as long as six months after the programme has finished for the benefits of an extensive reading programme to appear, they also note the possibility that positive effects could have been seen only after a certain period had passed. Wang (2013) also notes that the length of her programme was short, and extensive reading could have possibly been more effective if it were carried out for a longer period, concluding that "extensive reading needs to be applied long term and on a regular basis to produce and maintain improvement in reading and vocabulary learning" (p. 74). Nation (2009) also argues an effective extensive reading programme requires a considerable amount of reading and time, suggesting that students should read approximately 500,000 running words or 25 graded readers per year for several years. Nation also states that students should already know almost all the vocabulary items in the book so they can focus on the meaning of the text. This focus on reading easy materials is backed up by Bamford and Day, who claim that ease of reading material is "the most important principle of extensive reading for language learning" (2004, p. 2).

### *2.3 Effects of Extensive Reading on TOEIC scores*

There are some studies on the relationship between extensive reading and TOEIC score gains.

Nishizawa, Yoshioka, and Itoh (2006) compared two groups from the same grade: one had an extensive reading class and one didn't. They reported a statistically significant difference between these two classes, demonstrated by the fact that there were fewer students who scored less than 100 points on the TOEIC reading section in the former group. Although they couldn't find a significant difference between the two groups' TOEIC total average scores, the percentages of the students who scored over 400 points on TOEIC in both classes were 43% and 25% respectively. Nishizawa, Yoshioka, and Itoh (2007) carried out a study among 78 students who are in the second year of an extensive reading class, dividing them into three groups by the number of words read: 50,000 to 130,000 words, 140,000 to 240,000 words, and over 250,000 words, to try and find a relationship between the amount of reading and TOEIC scores. The study revealed that the students who read more were more likely to achieve a score of 450 on TOEIC, and the number of students with low scores (less than 350 points) decreased as the amount of reading increased. Nishizawa, Yoshioka, and Fukuda (2010) conducted a further study with 37 students who had four years of a weekly 45-minute extensive reading programme. Examining three groups divided by their amount of reading over four years, 280,000 to 390,000 words, 490,000 to 820,000 words, and 1,100,000 to 12,000,000 words, the study revealed a strong correlation between the students' amount of reading and TOEIC score gains, showing that these students' TOEIC scores improved by 9-18 points every 100,000 words. The study also revealed that it takes as much reading as 300,000 words before significant score gains to appear, suggesting the positive effects of long-term extensive reading on TOEIC score gains. Mason (2011) also reported a case study in which an adult learner gained 180 points on TOEIC or 105 points on the reading section of the test after spending 217 hours on extensive reading in a year.

While the studies above reported a positive impact on TOEIC score gains, other studies found no such effects. Storey, Gibson, and Williamson (2006) studied two groups of students who voluntarily enrolled in a TOEIC training programme: one did extensive reading as homework and one received extra TOEIC reading exercises, for eight weeks. Although they didn't find a significant difference in the TOEIC score gains in the two groups, their closer look into the students' reading records and post-questionnaire revealed better score gains in the students who devoted more time to read, concluding that the results could have been better if the study had been conducted with a larger sample size for a longer period. Carney (2016) also found no statistically significant difference between an extensive reading group and groups which did not do extensive reading, concluding with a call for more collaborative studies on this matter.

### 3. Research questions

Given the mixed results reported by studies that have used TOEIC to measure reading gains, the current study was conducted to investigate the relationship between individual learners' extensive reading activity and their language gains over one academic year, as measured by TOEIC. The data collected was also used to analyse two other aspects of extensive reading that are considered important in the literature, namely regularity of reading and the ease of materials that students are reading.

## The Relationship Between Extensive Reading and TOEIC Score Gains

1. Is there a statistically significant relationship at the .05 level between the number of words read and TOEIC reading score gains after 10 months?
2. Is there a statistically significant relationship at the .05 level between the frequency of reading and TOEIC reading score gains after 10 months?
3. Is there a statistically significant relationship at the .05 level between reading quiz scores and TOEIC reading score gains after 10 months?

### 4. Materials and methods

#### 4.1 Participants

The participants in this study were 105 female Japanese students in the Global Communication Department at Hiroshima Bunkyo Women's University taking a compulsory weekly reading class across four cohorts.

*Table 1. Average starting TOEIC reading score by cohort.*

Cohort	Participants	Average starting TOEIC reading score
2013	27	114.37
2014	33	121.02
2015	29	119.84
2016	16	112.22
Total	105	116.86

Students who left the university or for whom pre- and post-test TOEIC data were not available were removed from the study group.

As can be seen from Table 1, the average TOEIC reading score at the start of the class was similar. We therefore decided it was reasonable to group the cohorts for data analysis, as many other aspects of the cohorts, such as their demographics, department and other classes are very similar across cohorts.

#### 4.2 MReader and Graded Readers

Extensive reading data was measured using the website MReader.org. This website provides quizzes to check whether students have really read a book, and to track reading progress (for more information on the benefits of using MReader to track students' progress, see Robb, 2015). All students were given an MReader account at the start of the year. Approximately 1,000 graded readers, of various genres and ranging from Level 0 to Level 9, are kept in the Self-Access Learning Center of the university, which students can visit any time of the day to check out books they are interested in reading. At the beginning of the reading course, students were recommended to try certain levels (usually level 3 for the upper streamed class and level 2 for the lower), but

the decision on which level to read is left to individual students. Extensive reading was conducted outside class.

After students have read a graded reader, they log on to the website and search for the book they have read. They then take an open-book quiz on the content of the book to assess whether or not they have read the book. Students answer 10 multiple-choice questions in 15 minutes. Questions typically ask students to identify which character spoke a certain line, and to put the main events of the book in order. If they pass the quiz, they are given credit for the number of total words in the book. The motivation for students to read graded readers and use MReader is that their total words read at the end of each semester, as recorded in MReader, forms 30% of their final grade. Although the exact calculation varied slightly from year to year, the more words students read the more points they received, with no upper limit on how many points they could gain.

Data available on MReader includes score, date of quiz and number of words credited. From this data, frequency of quiz completion was calculated. In-semester time was divided into weeks, and the weeks in which at least one quiz was successfully completed was divided by total weeks to give a reading frequency percentage. For example, a student in the 2014 cohort who completed at least one quiz in 20 of the 33 weeks of the school year had a reading frequency score of  $20/33 = 60.6\%$ .

To measure how easy a book was for students, average quiz score was used. Although MReader quizzes are designed to check whether a student has read a book, not to test comprehension (Robb, 2015), we assumed that learners who easily understood the content of a book would be able to achieve a high score on its MReader quiz. Average quiz score for every quiz passed was used for the analysis. Various combinations of the above variables were also calculated to investigate their interactions from different angles.

### 4.3 TOEIC

TOEIC Listening and Reading is an internationally-administered, norm-referenced test of business English. Each section contains 100 multiple-choice questions, and correct answers are scaled to give a score out of 495 points (Educational Testing Service, 2018). It is particularly popular in Japan (Kamijo, 2010), and is used as a measure of progress in the Global Communication Department. Students must take the test at least once a year, and a target score of 600 points overall is set for graduating students. Given the students' familiarity with the test and its high level of recognition in Japan, we decided that this would be an appropriate measure of reading gains.

## 5. Results

Descriptive statistics for the variables used are given in Table 2.

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Table 2. Descriptive statistics for variables analysed (n=105).

Variable	Minimum	Maximum	Mean	Median	Std. deviation
TOEIC reading gain	- 85.00	130.00	25.71	20.00	41.36
Total words read	6,685.00	520,208.00	63,381.36	53,114.00	60,879.84
% weeks read	9.09%	100.00%	51.05%	44.12%	23.79%
Total words x % weeks read	810.30	441,388.61	39,940.98	23,512.27	52,247.63
Quiz score average	71.86%	93.80%	80.84%	80.08%	4.68%
Total words x quiz score average	4,843.34	424,360.19	51,395.16	42,686.22	49,811.56
Total words x % weeks read x quiz score average	587.07	360,063.19	32,481.96	18,302.07	42,682.77

Scatterplots of all independent variables compared with the dependent variable (TOEIC reading score gains) were created, and two outliers were removed: one with a very high number of words read (520,208) and one with a highly negative TOEIC gain (-85%). As the variables are quantitative and appeared to have a linear association, Pearson product-moment correlations were run on the data. Results are summarised in Table 3.

Table 3. Pearson product-moment correlations (n=103) between TOEIC reading score gains and other variables.

Independent variable	Correlation (r)	Significance (p)	Effect size (r <sup>2</sup> )	Variance accounted for
Total words read	.211*	.016	.044	4.4%
<i>% weeks read</i>	<i>.141</i>	<i>.078</i>	-	-
<i>Total words x % weeks read</i>	<i>.103</i>	<i>.151</i>	-	-
Quiz score average	.259*	.004	.067	6.7%
Total words x quiz score average	.228*	.010	.052	5.2%
<i>Total words x % weeks read x quiz score average</i>	<i>.116</i>	<i>.121</i>	-	-

Results that are significant at the .05 level are denoted with an asterisk. Non-significant results are denoted in italics.

## 6. Discussion

The answer to research question 1 (is there a statistically significant relationship at the .05 level between the number of words read and TOEIC reading score gains after 10 months?) is yes. Although the result is statistically significant, the amount of variance accounted for is modest at 4.4%. The remaining 95.6% may be accounted for by such factors as study time in other classes and independently, motivation, and attitude towards reading in both first and second language. It should also be noted that only one student surpassed the 500,000 words per year threshold suggested by Nation (2009), and she had to be removed as an outlier, so it is perhaps not surprising that a stronger correlation was not found. As TOEIC is a widely-used measure of English ability in Japan, establishing a correlation between words read and reading score gains could help to provide legitimacy for extensive reading programmes in Japan.

The answer to research question 2 (is there a statistically significant relationship at the .05 level between the frequency of reading and TOEIC reading score gains after 10 months?) is no. This was a slight surprise, as many authors have suggested that regular reading is an important component of extensive reading programmes. Instinctively, we would expect a student who has read regularly to make more reading ability progress than one who attempts to read a lot in a short space of time, but there was no evidence for this in our data. There could be many reasons for this, including faults with our method of measuring reading regularity (percentage of semester weeks in which students read at least one book).

The answer to research question 3 (is there a statistically significant relationship at the .05 level between reading quiz scores and TOEIC reading score gains after 10 months?) is yes. The correlation between average MReader quiz score and TOEIC reading gains was in fact the strongest correlation in our data, accounting for 6.7% of the variance. This could provide support for Bamford and Day's statement that ease of reading material is the paramount concern in extensive reading programmes (2004). If regular reading of easy materials allowed students to improve their reading fluency and learn new vocabulary items in context, their TOEIC reading scores may have improved more than those of their peers who chose materials that were too challenging and did not receive these benefits. Such an occurrence is in accordance with studies that have suggested that when learners don't know 20% of the words in a text they do not gain adequate comprehension (Hu and Nation, cited in Nation, 2009).

## 7. Conclusion

This study examined the relationships between extensive reading and reading gains by comparing total words read, frequency of reading and ease of reading measures with gains on the TOEIC reading section after 10 months. A small but significant correlation was demonstrated between total words read and reading ease, as measured by average quiz score, and reading gains. We hope that this can demonstrate the value of extensive reading programmes, especially in situations where TOEIC score gains are highly valued.

As with many studies that attempt to measure the effect of one variable on language improvements, isolating the effect of the variables studied from the many other factors that students are exposed to over one academic year is difficult. Vocabulary knowledge, motivation, reading habit in their first language, prior experience with extensive reading programmes, autonomy, exam anxiety and many other factors besides influence students' language improvements and performance.

For a study such as this, where almost all extensive reading takes place outside the classroom, there is always the possibility that the variable we are actually measuring is motivation, or that average quiz score is indicative of vocabulary knowledge more than reading comprehension. Future studies could try to account for this by including measurements of motivation or vocabulary knowledge in the analysis.

Other limitations of the study are that it was carried out on one year of data. This may not be enough time for a difference to emerge in reading skill between students who read extensively and those who don't. Further studies could utilise a longer data set to investigate whether or not this is the case. A different measurement of reading skill gain could also be used. We chose the TOEIC in this instance because students are required to take it and it is important for them to improve their scores, as they may improve their employment prospects and gain scholarships from the university for studying abroad by doing so. However, being a norm-referenced test that attempts to measure a wide range of abilities, it may not have detected more subtle gains in reading skills among our students.

#### References

- Alavi, S., & Keyvanshekouh, A. (2012). Using the MoodleReader as an extensive reading tool and its effect on Iranian EFL students' incidental vocabulary learning. *English Language Teaching*, 5(6), 135–145. <http://dx.doi.org/10.5539/elt.v5n6p135>
- Bamford, J., & Day, R. R. (2004). *Extensive reading activities for teaching language*. Cambridge: Cambridge University Press.
- Carney, N. (2016). Gauging extensive reading's relationship with TOEIC reading score growth. *Journal of Extensive Reading*, 4, 69–86. Retrieved from <http://jalt-publications.org/content/index.php/jer/article/view/11/9>
- Chien, C. C., & Yu, K. (2015). Applying extensive reading to improve unmotivated learners' attitudes toward reading in English. *International Journal of Learning, Teaching and Educational Research*, 13(2), 1–25. Retrieved from <https://www.ijlter.org/index.php/ijlter/article/view/356>
- Demirci, H., & Gobert, M. (2015). Motivating reluctant readers. In P. McLaren, M. Al-Hamly, C. Gunn, J. Riddlebarger, S. Calladine, D. Anderson, & S. Troudi (Eds.), *Proceedings of the 20th TESOL Arabia conference, methods and means in ELT* (pp. 8–15). Dubai, United Arab Emirates: TESOL Arabia. Retrieved from <https://mreader.org/mreaderadmin/s/html/pubs/Demirci&Gobert-2015.pdf>
- Educational Testing Service. (2018). *Scores overview*. Retrieved from [https://www.ets.org/toEIC/listening\\_reading/scores/](https://www.ets.org/toEIC/listening_reading/scores/)
- Fernández de Morgado, N. (2009). Extensive reading: Students' performance and perception. *The Reading Matrix*, 9(1), 31–43. Retrieved from <http://www.readingmatrix.com/articles/morgado/article.pdf>
- Iwahori, Y. (2008). Developing reading fluency: A study of extensive reading in EFL. *Reading in a Foreign language*, 20(1), 70–91. Retrieved from <http://nflrc.hawaii.edu/rfl/April2008/iwahori/iwahori.pdf>
- Kamijo, T. (2010). TOEIC reading comprehension: Analysis of the texts and questions, practical application,

- and its implications. *Ritsumeikan Higher Educational Studies*, 10, 173–185. Retrieved from [http://www.ritsumei.ac.jp/acd/ac/itl/outline/kiyo/kiyo10/11\\_kamijo.pdf](http://www.ritsumei.ac.jp/acd/ac/itl/outline/kiyo/kiyo10/11_kamijo.pdf)
- Kanatani, K., Nagata, M., Kimura, T., & Minai, Y. (1991). Koko ni okeru tadoku puroguramu: Sono seika to kanosei [An extensive reading program at a senior high school: Achievements and possibilities]. *KATE Bulletin*, 5, 19–26. [https://doi.org/10.20806/katejo.5.0\\_19](https://doi.org/10.20806/katejo.5.0_19)
- Kanatani, K., Nagata, M., Kimura, T., & Minai, Y. (1992). Eigo tadoku puroguramu: Sono dokkairyoku, gakushuhoho eno eikyo [An extensive reading program: impact on reading comprehension and learning style]. *KATE Bulletin*, 6, 1–10. [https://doi.org/10.20806/katejo.6.0\\_1](https://doi.org/10.20806/katejo.6.0_1)
- Mason, B. (2011). Impressive gains on the TOEIC after one year of comprehensible input, with no output or grammar study. *The International Journal of Foreign Language Teaching*, 7(1). Retrieved from [http://www.benikomason.com/content/articles/mason\\_tanaka\\_ijflt\\_11-11.pdf](http://www.benikomason.com/content/articles/mason_tanaka_ijflt_11-11.pdf)
- Nation, I. S. P. (2009). Teaching ESL/EFL reading and writing. New York: Routledge.
- Nishizawa, H., Yoshioka, T., & Fukada, M. (2010). The impact of a 4-year extensive reading program. In A. M. Stoke (Ed.), *JALT2009 conference proceedings* (pp. 632–640). Tokyo: JALT. Retrieved from <http://jalt-publications.org/recentpdf/proceedings/2009/E035.pdf>
- Nishizawa, H., Yoshioka, T., & Itoh, K. (2006). Eibun tadoku ni yoru kogakukei gakusei no eigo unyo noryoku kaizen [Improvement of engineering students' communication skills in English through extensive reading]. *Transactions of the Institute of Electrical Engineers of Japan*, 126(7), 556–562. <https://doi.org/10.1541/ieejfms.126.556>
- Nishizawa, H., Yoshioka, T., & Itoh, K. (2007). Nigate ishiki o jishin ni kaeru, eigo tadoku jyugyo no koka [Extensive reading lessons which change the reluctant students to confident readers of English texts, and the effectiveness]. *Ronbunshu Kosen Kyoiku*, 30. Retrieved from <http://jera-tadoku.jp/papers/nishizawa-2007-03.pdf>
- Robb, T. (2015). Quizzes—A sin against the sixth commandment? In defense of MReader. *Reading in a Foreign Language*, 27(1), 146. Retrieved from <http://nflrc.ill.hawaii.edu/rfl/April2015/discussion/robb.pdf>
- Robb, T., & Kano, M. (2013). Effective extensive reading outside the classroom: A large-scale experiment. *Reading in a Foreign Language*, 25(2), 234–247. Retrieved from <http://nflrc.hawaii.edu/rfl/October2013/articles/robb.pdf>
- Storey, C., Gibson, K., & Williamson, R. (2006). Can extensive reading boost TOEIC scores? In K. Bradford-Watts, C. Ikeguchi, & M. Swanson (Eds.) *JALT2005 conference proceedings* (pp. 1004–1018). Tokyo: JALT. Retrieved from <http://jalt-publications.org/archive/proceedings/2005/E034.pdf>
- Tanaka, H., & Stapleton, P. (2007). Increasing reading input in Japanese high school EFL classrooms: An empirical study exploring the efficacy of extensive reading. *The Reading Matrix*, 7(1), 115–131. Retrieved from [http://www.readingmatrix.com/articles/tanaka\\_stapleton/article.pdf](http://www.readingmatrix.com/articles/tanaka_stapleton/article.pdf)
- Wang, Y. (2013). Incidental vocabulary learning through extensive reading: A case of lower-level EFL Taiwanese learners. *The Journal of Asia TEFL*, 10(3), 59–80. Retrieved from [http://www.asiatefl.org/main/download\\_pdf.php?i=56&c=1404265291](http://www.asiatefl.org/main/download_pdf.php?i=56&c=1404265291)
- Yamashita, J. (2013). Effects of extensive reading on reading attitudes in a foreign language. *Reading in a Foreign Language*, 25(2), 248–263. Retrieved from <http://nflrc.hawaii.edu/rfl/October2013/articles/yamashita.pdf>

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