Can Second Language Acquirers Reach High Levels of Proficiency Through Self-Selected Reading? An Attempt to Confirm Nation's (2014) Results

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Abstract

An analysis done by Nation (2014) leads to the conclusion that readers in English as a foreign language can gain about one-half a point on the TOEIC test for every hour of independent English reading. A statistical analysis of progress made by seven adult acquirers of English living in Japan was performed to confirm this conclusion: All were intermediates, but there was considerable variation, with TOEIC scores ranging from 220 to 705. All engaged in self-selected reading, and took pre and post TOEIC tests. Hours spent reading was an excellent predictor of gains on the TOEIC and the rate of improvement was nearly exactly the same as that reported by Nation.

Keywords: TOEIC, self-selected reading, graded readers**,** case histories

On the basis of a corpus analysis, Nation (2014) estimated that readers can move from elementary levels of vocabulary knowledge in a second language (knowledge of 2000 word families) to a very high level (knowledge of 9000 word families) after a total 1,223 hours of reading, about one hour a day over three years. Nation concluded that a "vocabulary size of 9,000 words or more is a sensible long-term goal for unassisted reading of simplified texts" as it will "provide coverage of over 98% of the running words in a wide range of texts."

Table 1 presents Nation's conclusions of the hours required to reach each level en route from a knowledge of 2000 word families to a knowledge of 9000 word families, as well as sample texts (from McQuillan, 2015).

Table 1. *Cumulative hours of reading required for each 1000 word level (from Nation, 2014), with examples (McQuillan, 2015)*

Level	Hours	Sample Texts
2K	22	Graded readers
3K	33/55	Graded readers
4K	56/111	Boxcar Children, Sweet Valley Kids
5K	112/223	Goosebumps, Agatha Christie novels
6K	167/390	Sweet Valley High, Twilight, John Grisham novels
7K	222/612	Tom Swift, The Master Spy (Gask)
8K	278/890	Zane Grey novels, Hunger Games
9K	333/1223	

Level: K = 1000 word families
Hours: Hours of reading required to reach each level/Cumulative hours
Texts: Texts that can be read comfortably at each level, assuming that readers need to already know 98% of the words in the text, from McQuillan (2015). McQuillan points out that "texts that can be read at 98% coverage at a given 1,000 word family level are used to help readers acquire words in the next 1,000 word level. For example, texts that can be read at 98% coverage at the 4,000 word family level are used to help the reader acquire the word families at the 5,000 word family level, and so forth."

The goal of this paper is to examine case histories of adult second language acquirers to determine if their progress matches Nation's conclusions.

The Case Histories

Mason (2011, 2013a, 2013b) has described progress made by adult acquirers of English as a foreign language living in Japan. All had completed or were enrolled in an EFL class with Prof. Mason that focused on hearing stories in class and reading graded readers as homework. These dedicated adults were interested in continuing to improve in English after the class ended. Mason helped each acquirer engage in a self-selected independent reading program, with each reader reading only those books he or she wanted to read. Readers were asked to keep a log of what was read and the number of pages read, but were not asked to write summaries or book reports.

Three of the subjects were enrolled in Prof. Mason's classes at the time they were doing independent reading. In these cases, time spent in class was included in the analysis as "listening" and graded readers read for the class were included as "reading." One subject was enrolled in a conversation class, and time in this class was included as "listening."

The duration of the individualized reading program varied, as did the books read, since they were selected by the subjects. Subjects ranged in age from 21 to 78 years old.

Table 2 presents a description of the subjects. Also included is the number of weeks subjects dedicated to self-selected reading.

Table 2: Description of subjects

Reader	Gender	Age	Duration
Okada	Female	21	22 weeks
Kobayahsi	Male	22	45 weeks
Kashihara	Male	35	156 weeks
Tanaka	Male	42	52 weeks
Adachi	Female	53	28 weeks
Fujita	Female	66	55 weeks
Nakano	Male	78	162 weeks

Table 3 presents examples of what the subjects read, as described in their logs.

Table 3. *Reading choices*

Okada	Books for young adults (e.g. books by Judy Blume) and easy best sellers
Kashihara	Graded readers and other books for young adults (e.g. Harry Potter), and bestsellers
Tanaka	Graded readers and books for young adults (e.g. the Marvin Redpost series, books by Judy Blume and Louis Sachar) and young adult bestsellers (e.g. Twilight)
Adachi	Graded readers
Fujita	Graded readers. Books for young adults (e.g. The Book Thief, Twilight, Smart Women, You Belong to Me)
Nakano	Graded readers and books for young adults (e.g. Anne of Green Gables, Super Fudge and other Judy Blume novels, The Giver, Every Living Thing by Herriot)
Kobayashi	Graded readers and other books (e.g. The Giver, Harry Potter series, books by Judy Blume)

Comparison of table 3 with table 1 shows that subjects read at various levels, including graded readers, books for young adults, and some books aimed at adult readers. McQuillan (2015) describes an optimal path, with texts at each level slightly harder than those at lower levels. We do not know if our subjects followed a similar path of gradually increased difficulty.

As noted above, several of our subjects were involved in listening to English as well as reading, as part of a story listening class they took with Prof. Mason, another class, or from the radio (table 4).

Table 4. *Listening*

	Conversation class	Story Listening Class	NHK Radio
Okada	None	None	None
Kobayashi	None	Yes	None
Kashihara	None	None	None
Tanaka	None	Yes	None
Adachi	None	Yes	None
Fujita	None	None*	None
Nakano	Yes	None	Yes

*50% of the time Mrs. Fujita spent on test preparation was listening, but this was categorized as "study" (see table 6).
Note that "none" for listening does not preclude occasional movies, TV, and conversations in English. No records were kept for this kind of informal listening.

Several subjects engaged in direct English study on their own. This is described in table 5.

Table 5. *Study*

	Vocabulary Study	TOEIC Test Preparation
Okada	None	None
Kaboyashi	None	None
Kashihara	Yes	None
Tanaka	Yes	None
Adachi	None	None
Fujita	None	Yes
Nakano	None	Yes

The TOEIC

Readers were also asked to take the TOEIC examination at times convenient to them before, during and after their reading program. The TOEIC (The Test of English for International Communications) consists of reading and listening subsections and is used world-wide as a test of English proficiency for older students. The following "TOEIC Conversion" table (from http://wie.ac.nz/toeicconversion.htm) relates TOEIC levels with real-world competence:

Table 6. *TOEIC scores and real-world competence.*

905-990	International Professional Proficiency (Able to communicate effectively in any situation.)
785-900	Working Proficiency Plus (Able to satisfy most work requirements with language that is often, but not always, acceptable and effective.)
605-780	Limited Working Proficiency (Able to satisfy most social demands and limited work requirements.)
405-600	Elementary Proficiency Plus (Can initiate and maintain predictable face-to-face conversations and satisfy social demands.)
255-400	Elementary Proficiency (Speaker has functional, but limited proficiency. Able to maintain very simple face-to-face conversations on familiar topics.)
10-250	Basic Proficiency (Able to satisfy immediate survival needs.)

From: The Waikato Institute of Education; http://wie.ac.nz/toeicconversion.htm

If we hypothesize that a vocabulary size of 9000 word families is roughly equivalent to a TOEIC score of between 905 and 990, following Nation's analysis, it would take about 1223 hours of reading to reach the 950 TOEIC level. Assuming that students are able to begin independent reading (graded readers) at a TOEIC level of about 250, this translates to 700 TOEIC points gained in 1223 hours, or .57 points per hour (700/1223).

The Japanese Ministry of Education is considering interpreting a 780 TOEIC score as equivalent to a perfect score on the Center English Test, a test high school students take before taking college entrance examinations (http://www.sankei.com/life/news/131231/lif1312310010-n1.html). Assuming .57 points per hour, a beginning reader would need to gain 780-250 = 530 TOEIC points to reach this level, requiring a little less than 940 hours of reading, or about two and a half-years, assuming one hour a day of reading.

Table 7 presents statistics on readers' first TOEIC score (pretest), the amount gained, and their activities, including pages read, hours read (based on pages read), hours spent listening and hours spent in study.

We calculated "hours read" assuming a reading speed of 150 words per minute, typical of intermediate acquirers of English as a second language (see research survey in table 4 in McQuillan and Krashen, 2008, which underestimates rates because they are based on assigned, not self-selected texts). We make the undoubtedly incorrect assumption that readers' rates of improvement per hour will remain the same as they progress.

We made the conservative estimate that a typical page has 300 words: the average book page has about 250 words (see e.g. http://www.the-efa.org/res/rates.php) and graded readers typically have even fewer words per page.

At 300 words per page, and at 150 words per minute, a reader will take two minutes or .033 hours to read one page. Total hours of reading was thus estimated by multiplying pages read by .033.

Table 7. *Descriptive data: hours read, listening, study*

subjects	pages	hrs read	hrs listen	hrs study
Okada	3841	127	0	0
Kobayashi	5895	196.5	27	0
Kashihara	19723	651	0	63
Tanaka	6456	213	30	70
Adachi	808	27	27	0
Fujita	10875	359	0	553
Nakano	9267	306	239	22
mean	8123.6	268.5	46.1	101.5
sd	6097	201	86.2	201.5

Our analysis considered predictors of gains on TOEIC scores. This was based on the test scores presented in table 8. Pretest scores were included as controls.

Table 8. *Pretest and gain scores*

Subjects	pre TOT	gain TOT	pre RC	gain RC	pre LC	gain LC
Okada	705	40	275	35	430	5
Kobayashi	625	170	240	120	385	50
Kashihara	220	400	55	210	165	190
Tanaka	475	180	220	105	255	75
Adachi	365	40	135	10	230	30
Fujita	580	165	310	40	270	125
Nakano	495	170	320	35	175	135
mean	494.9	166.4	222.1	79.3	272.9	87.1
sd	163.8	120.2	96.6	70.3	100.5	65.6

TOT = total test; RC = reading comprehension; LC = listening comprehension

The average gain per hour read was .62 (166.4/268.5), very close to Nation's estimate.

Predictors of Gains in Total TOEIC

Table 9 presents intercorrelations among the predictors. Higher pretest scores were related to lower gains, as is often the case. Hours spend reading was a very strong predictor of gains, while hours spent listening and in formal study were clearly unrelated to gains. Scores on the pretest, however, were clearly related to gains (r = -.63) and hours read (r = -.52).

Table 9. *Correlations among predictors: total TOEIC*

	gains TOT	pre TOT	hrs read	hrs listen
pre TOT	-0.63			
hrs read	0.94	-0.52		
hrs listen	0.03	0	-0.01	
hrs study	0.1	0.14	0.29	-0.24

pre TOT = pre-test, total TOEIC

The small sample size and incomplete data on study and listening time prevented us from performing a multiple regression analysis. (The sample size was, however, sufficient for a correlational analysis. A sample size of six is required a power value of .80 when r = .94, significant at the .01 level, one-tailed. see https://www.statstodo.com/SSizCorr_Pgm.php#Multiple%20calculations%20:%20confident%20interval%20estimation; A power value of .80 means that the researcher has an 80% of observing a real effect if it is present. A power level of .80 is considered to be acceptable.)

To control for the effect of the pretest, a partial correlation was performed. The relationship between hours read and gains on the TOEIC was still very high, r = .85. (Seven subjects are required to achieve a power level of .80 for this size correlation.)

Correlations between hours spend reading were also substantial for gains on each of the subtests, and other predictors, as before, were not. Surprisingly, hours spent reading was more highly correlated with the listening subtest (r = .93) than with the reading subtest (r = .75), and the correlations were not substantially affected when pretest scores were controlled. A larger sample (n=13) is required, however, to achieve an acceptable level of statistical power for the correlation with listening comprehension.

Individual Variation

Table 15 presents the points gained per hour of reading for each subject. Note that there is some variability: some subjects made better gains per hour than others. The variability is most likely related to what was read: Slower rates of improvement may be due to reading material than was too easy or too hard. Some of this, of course, may be due to readers finding books they were very interested in and that they enjoyed, even though they may have been significantly above or below the reader's "reading level." We don't want to discourage this. (For an excellent example of an elementary school child who developed strategies for understanding Moby Dick, see Holt, 1967).

Table 15. *Points gained per hour*

Reader	pts/hr
Okada	0.31
Kobayashi	0.87
Kashihara	0.62
Tanaka	0.85
Adachi	0.50
Fujita	0.42
Nakano	0.56

Summary of Results

Hours spent reading was by far the best predictor of total TOEIC gains, as well as gains on both subtests. The average reader gained about one-half point on the TOEIC for each hour read (mean = .62), nearly identical to the rate derived from Nation's analysis.

Caveats

The failure of hours spent listening to correlate positively with gains should not be taken too seriously: Three readers did no listening at all, and one reader contribued most of the listening hours, a very skewed distribution. Also, we did not include informal listening, eg television, conversation.

As noted earlier, assumptions on rate of reading and average words per page were made that may not have been accurate. It needs to be pointed out, however, that our assumptions are conservative: We assumed that one page contained 300 words, probably an overestimate, and our estimate of reading rate was based on previous research that used assigned, not self-selected, reading.

Nevertheless, this analysis provides a methodology that can be used for studies with more subjects and more details. Moreover, the finding that amount of free reading was strongly related to gains in literacy and language development is highly consistent with many previous studies (eg. McQuillan, 1998; Krashen, 2004; Sullivan and Brown, 2014).

Conclusions

The TOEIC gains per hour achieved by our subjects was nearly identical to the estimate derived from Nation (2014). Our results thus confirm Nation's conclusion that improving language competence through reading is "feasible if texts at the appropriate level are available" (p. 14). Our results, and those of Nation, suggest that a second language reader can move from a low TOEIC score (250) to a very high score (950) with three years of self-selected reading, averaging about an hour a day.

Of great importance is that our subjects selected their reading themselves. To obtain similar results, readers need access to a wide range of reading material that will allow them to follow the kind of pathway described by McQuillan (2015), choosing reading material of great interest to them at all levels.

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Since 1975, Stephen Krashen's work has focused on the comprehension hypothesis, the idea that we acquire language and develop literacy when we understand messages. His recent papers can be found at http://www.sdkrashen.com.

Beniko Mason's previous studies have shown that free voluntary reading is an effective means for second language development, and also that they are also more efficient than traditional classroom teaching practices, including TOEIC and TOEFL test preparation courses. Her publications can be found at http://www.benikomason.net.