

Self-reported reading as a predictor of vocabulary knowledge

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Summary.—25 engineering students in India, who were highly motivated to improve their English, filled out a questionnaire about their reading habits in English and took a demanding vocabulary test based on words taken from preparation books for the Graduate Records Examination. The correlation between reading habits and vocabulary was substantial ($r = .78$).

A number of studies have reported positive correlations between exposure to print and vocabulary using a variety of measures of print exposure (West and Stanovich, 1991; West, Stanovich and Mitchell, 1993; Lee, Krashen, and Tse, 1997; Krashen and Kim, 1998; Mol & Bus, 2011). These results are consistent with an important generalization: More exposure to print means more reading, and more reading results in more literacy development, including vocabulary (Krashen, 2004).

In this study, we extend this research to advanced performers of English as a second language in India, using a questionnaire probing their reading habits and a demanding vocabulary test, consisting of words taken from Graduate Record Examination preparation books, designed for native speakers of English. The study seeks to determine whether more reading results in greater vocabulary acquisition for highly advanced subjects in a second language, a group not considered in previous research, a test of the hypothesis that reading is a major source of vocabulary development, as well as important information for educators and others interested in vocabulary improvement.

A secondary goal is to determine if reading from the computer is associated with vocabulary knowledge. There has been a steady increase in reading from computer websites among teenagers in the US (Roberts, Foehr, Rideout, and Brodie, 1999; Rideout, Foehr, and Roberts, 2010) and an increase among adults in reading from electronic books (Pew Internet, 2012). Studies have suggested that reading from a computer screen print may result in lower reading comprehension than reading from regular print and that computer reading is more physically and mentally taxing (Jabr, 2013). It is thus important to determine if reading from the computer has an effect similar to that of book reading in terms of vocabulary development.

A related issue is whether computer reading interferes with book reading: Do those who read more from the computer do less book reading? To our knowledge, only two studies have investigated this: de Haan and Huysmans (2004) reported that for adolescents in the Netherlands, greater use of the internet is modestly positively correlated with use of print media ($r = .31$). More recently, Pew Internet (2012) reported that American adults who used any form of technology for reading (e-books, tablets, computers, cell phones) did more reading for pleasure, more reading about current events, and more reading for work and school. These results do not demonstrate causality but are consistent with the hypothesis that computer reading does not interfere with reading in general.

METHOD

Participants

Subjects were 25 engineering students in India, considered to be highly motivated in English. First languages were Tamil (19), Telegu (4), and Malayalam (2), and all spoke Tamil well. Seventeen of the 25 subjects had done all of their schooling in English, five had English-medium instruction from grade 6, and three had studied all subjects in school in their first language. All had passed their English requirement for university study, and were required to read English technical papers for their engineering studies. Four subjects were preparing for the Graduate Record Examination in order to study abroad, and ten were preparing to take the Common Admission Test (CAT), required for admission to prestigious business schools in India. To our knowledge, such highly technical-oriented subjects have never been considered in studies of literacy development; also, previous studies have dealt largely with less advanced acquirers.

Reading Habits Questionnaire

All subjects were asked to fill out a 20-question reading habits questionnaire. Each question probed a specific genre. Subjects answered questions on a 0 to 5 scale, where 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = almost always, 5 = always. Table 1 lists the different types of reading that were investigated, followed by the mean response for each.

TABLE ONE: READING HABITS QUESTIONNAIRE

Reading Questionnaire

<u>“Are you in the habit of reading..”</u>	<u>Mean</u>	<u>SD</u>
1. daily newspaper	3.6	1.04
2. newspaper editorials	3.64	1.44
3. scientific journals	2.84	1.35
4. comics	3.12	1.83
5. short stories	3.12	1.83
6. historical novels	3.6	1.19
7. didactic literature	3.24	1.65
8. sports magazines	3.44	1.45
9. film magazines	2.92	2.04
10. political novels	3.0	1.44
11. science fiction	2.76	1.64
12. biography	2.24	1.31
13. poetry	3.24	1.53
14. jokes in magazines,newspapers	3.23	1.43
15. advertisements	1.76	1.05
16. fiction for children	1.0	.58
17. current affairs (internet)	4.4	7.2

18. academic websites (internet)	4.0	1.14
19. pleasure (internet)	3.6	1.04
20. Internet journals	3.64	1.29

Vocabulary Test

The first author created a vocabulary test modeled after the Graduate Record Exam. Words were used that appeared on both the Hit Parade list of The Princeton Review and the most frequent word list given in the seventeenth edition of Barron's How to Prepare for the GRE. Table 2 presents details.

TABLE TWO: VOCABULARY TEST SECTIONS, NUMBER OF ITEMS, SAMPLE ITEMS

Synonyms (15 items): Choose the word or phrase nearest in meaning to the key word:
sample: ZEALOT

(A) introvert (B) extrovert (C) misanthrope (D) fanatic (E) wager

Antonyms (15 items): Choose the word or phrase opposite in meaning to the key word.
sample: APATHY

(A) caring (B) ennui (C) mimic (D) ante diluvium (E) languor

Analogies (10 items): Choose the best option that matches the given analogy:
sample: EXEMPT: LIABILITY:

(A) flout: authority

(B) bestow: reward

(C) permit: request

(D) restrain: disorder

(A)pardon: penalty

Sentence Completion (10): Complete the sentences with the appropriate word or phrases:

Overindulgence _____ character as well as physical stamina.

(A) strengthens (B) stimulates (C) debilitates (D) maintains (E) provides

Subjects took about 20 minutes to fill out the questionnaire.

Reliability (internal consistency) for the test was acceptable (Kudar-Richardson 21 $r = .88$).

RESULTS

Table 3 presents means and standard deviations for the vocabulary test, for the entire reading questionnaire, and for two subsets of the reading questionnaire: “book reading,” total scores for questions related to reading historical novels (question 6), political novels (question 10), science-fiction (question 11) and biographies and autobiographies (question 12), and “computer reading,” questions related to using the internet to read about current affairs (question 17), reading from the internet for academic purposes (question 18), for pleasure (question 19) and reading online journals (question 20).

TABLE 3: MEANS, STANDARD DEVIATIONS, CORRELATIONS WITH VOCABULARY TEST

Variable	Mean	SD	Correlation	p (one-tail)
Vocabulary	30.04	7.39		
Reading Questionnaire (total)	62.8	7.31	0.78	0.000002
Book Reading (4 items)	13.0	3.34	0.36	0.038
Computer Reading (4 items)	15.84	2.25	0.2	0.22

book reading = historical novels, political novels, science fiction, biographies and autobiographies

computer reading = used the internet to read about current affairs, for academic purposes, pleasure, online journals

The reading questionnaire asked subjects to rate the amount they read of each kind of reading on a zero (never) to always (5) scale. The mean item score for the overall questionnaire was 3.18, for book reading the mean item score was 3.14 and for computer reading the mean item score was 3.96. (3 = often, 4 = almost always), indicating that these subjects are frequent readers.

Student responses to the reading questionnaire correlated substantially and significantly with the results of the vocabulary tests: Those who read more scored higher. The book reading items also correlated significantly with the vocabulary tests (table 3), but the correlation between the computer reading items and vocabulary, while positive, fell short of statistical significance. Closer analysis revealed that only one item of the four computer reading items, pleasure reading on the internet, correlated significantly with vocabulary test results ($r = .35$, $p = .044$). Results were confirmed by a multiple regression. Adding computer reading as a predictor added only .024 to the predictive power (r^2) of print reading.

The correlation between book reading and computer reading was positive but very modest ($r = .19$; $p = .18$) indicating no significant relationship between novel reading and computer reading.

Discussion

Engineering students who reported doing more reading scored better on a test of vocabulary. This result is consistent with previous studies as well as the hypothesis that reading is a source of vocabulary knowledge, and extends the results to advanced speakers of English as a second language.

Book reading was associated with higher vocabulary test scores but reading from the computer was not, although the relationship was positive. One of the four kinds of computer reading was related to vocabulary knowledge, simply reading for pleasure, while the others (reading about current affairs, academic website, and internet journals) were not, a finding consistent with the idea that more compelling reading, reading of

greater personal interest, is more effective for language development, a hypothesis that that invites additional research (Lao and Krashen, 2008).

In addition, there was an insignificant positive relationship between book reading and reading from the computer, suggesting that computer reading does not detract from book reading.

Our finding of a positive correlation between reading and vocabulary test scores does not demonstrate causality: Taken alone, it is also consistent with the hypothesis that vocabulary study leads to better and therefore more reading. The results of other studies, however, indicate that vocabulary knowledge develops through reading and that it is unlikely that much vocabulary development results from direct study.

It has been shown that readers can increase their vocabulary knowledge from exposure to unfamiliar words in print with instruction. First language studies include Nagy, Herman, and Anderson (1985), Nagy, Anderson and Herman (1987), and Nagy and Herman (1987). Second language studies include Saragi, Nation and Meister, 1978; Pitts, White, and Krashen (1989), Day, Omura and Hiramatsu (1991), and Pulido (2003). It has also been reported that that students who participate in free reading programs in school show clear gains in vocabulary knowledge, a result that holds for both first (Krashen, 2004) and second language development (Krashen, 2007).

Studies of vocabulary size suggest that vocabulary study cannot account for the number of words that people typically acquire. After studying the size of the vocabulary appearing in printed school English, Nagy and Anderson (1984) concluded that direct vocabulary instruction could not account for the vast number of words that children learn. Older readers face even a greater task. In addition, those with large vocabularies do not typically give the credit to vocabulary learning programs and word study; they credit reading (Smith and Supanich, 1984).

The reading survey accounted for about 60% of the variance in this study ($r = .78$; $r^2 = .61$), suggesting that it was the major source of vocabulary knowledge. To further test this conclusion additional studies with more heterogeneous groups could compare this predictor with amount of formal instruction in English, and specifically with vocabulary study.

Our questionnaire did not ask subjects about reading during certain times in their lives, but only asked them “do you read x”? It is thus likely that the questionnaire probed more of our subjects’ current reading, done over the last few years. Mol and Bus (2011) reported that the relationship between print exposure and vocabulary held for students of all ages, but was larger with older subjects. The effect size they reported for their oldest group, undergraduate and graduate university students, (Fisher’s $z = .58$, which converts to $r = .52$) was somewhat smaller than our results ($r = .78$).

It also needs to be pointed out that these busy engineering students manage to do a lot of reading on their own, as shown by the mean responses to each item, and they also performed very well on a demanding vocabulary test. Even if we correct for guessing (adjusted score = rights - (wrongs/number of choices-1), subjects scored nearly 50% correct (23.87/50) on a test of advanced academic vocabulary.

Our results are the most recent of a substantial amount of evidence indicating that reading is an important source of vocabulary knowledge, perhaps the most important.

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