

# Reading and Second Language Acquisition

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## **Abstract**

*This paper presents a critical review and synthesis of 9 studies on the effect of reading on second language development. In particular, it examines how various factors affect the impact of reading on L2 vocabulary acquisition and grammar development. These factors include learner engagement in question and summary tasks after reading, learner exposure to meta-cognitive strategy training and language-focused instruction conducive to the effective use of meta-cognitive strategies, frequency of learner exposure to new words through reading, learners' reading proficiency and familiarity with the topics of the reading materials, availability of effective typographical cues in reading materials, learner engagement in post-reading discussion tasks, and the presence of lexical temporal indicators within texts. Pedagogical implications are discussed following a review of these factors.*

## **1. Introduction**

According to Davis (1995), extensive reading bears several implications for implementation in the language (both L1 and L2) classroom:

An extensive reading program is a supplementary class library scheme, attached to an English course, in which pupils are given the time, encouragement, and materials to read pleurably, at their own level, as many books as they can, without the pressures of testing or marks... The watchwords are quantity and variety, rather than

quality, so that books are selected for their attractiveness and relevance to the pupils' lives rather than for literary merit. (p. 329)

From this classroom implementation perspective, much research have been conducted which have supported the effectiveness of extensive reading for second language development. De'Ath's (2001) introduction of the Shared Book Method to 89 Niuean-speaking Grade 3 students in Nieu (an island in the South Pacific) in the 1970s resulted in great success after one year of implementation. Specifically, the students in the reading group outperformed those involved in the audiolingual classroom in L2 English reading comprehension, word recognition and oral sentence repetition. Elley and Mangubhai's (1983) study of 380 Fijian and Hindi-speaking pupils (Grade 4 and 5) in Fiji also revealed the power of extensive reading, especially after two years of its implementation. While the book flood students were superior to the audiolingual students in only some measures of L2 English ability after one year, by the end of the second year they outperformed the regular students in all measures of language proficiency, including vocabulary, grammar, reading, listening and writing. Together with De'Ath's findings in Nieu, these heartening results lend much credence to extensive reading as a viable means to promote second language acquisition.

Implementation of extensive reading at the secondary school level, however, showed mixed findings. The Project to Assist Selected Schools in English Skills in Singapore ran an extensive reading program from 1985 to 1990, and by the end of the five years, the program succeeded in raising the target schools' English Language pass rate to above the national average (Davis, 1995). This result is especially revealing in view of the fact that the forty schools were originally the weakest

secondary schools in the Singapore school system.

This jump in language proficiency, however, was not met by similar improvements in student performance in another extensive reading program. Wong (2001) indicated that the Hong Kong Extensive Reading Scheme in English (HKERS) did not seem to rescue students' declining English proficiency since its introduction in 1991 and that student motivation to read remained at the same low level. To explain HKERS's failure, researchers have examined the implementation of the program from various aspects.

Diverse reasons have been proposed for HKERS's failure. The teachers neither guided students in their book selection nor presented themselves as committed readers to promote enthusiasm about reading (Green, 2005; Macalister, 2008). The selection of reading materials was limited and students found little purpose in reading materials irrelevant to their culture (Wong, 2001). The program neither provided classroom instruction of L2 reading skills to enhance comprehension nor connected reading with writing in a meaningful way (Wong, 2001). Last but not least, the project did not include tasks to promote student attention to language forms (Green, 2005).

To investigate the theoretical soundness of some of these suggested reasons for HKERS's failure, and in search of other factors related to the success of reading programs, the current paper presents a critical review and synthesis of nine studies on the effect of reading on L2 language development (The 9 studies are summarized in Appendix A and B.) In particular, the paper examines how various factors affect the impact of reading on L2 vocabulary acquisition and grammar development. These factors include:

- learner engagement in summary tasks and comprehension question tasks after reading;

- learner exposure to meta-cognitive strategy training and language-focused instruction conducive to the effective use of meta-cognitive strategies;
- frequency of learner exposure to new words through reading;
- learners' reading proficiency and familiarity with the topics of the reading materials;
- availability of effective typographical cues in reading materials;
- learner engagement in post-reading discussion tasks;
- and the presence of lexical temporal indicators within texts.

Pedagogical implications are discussed following a review of these factors.

## **2. Research on Reading and Second Language Vocabulary Acquisition**

Paribakht and Wesche (1999) have done a study on the effect of post-reading tasks on incidental L2 vocabulary acquisition in 10 intermediate English learners of various L1 background (French, Chinese, Farsi, Spanish, Vietnamese and Arabic). Each of Paribakht and Wesche's participants was required to read a text and engaged in a post-reading question task and a summary task in a 2-hour research session. Half of the participants did the question task first and the other half did the summary task first. The introspective and retrospective (during and after task performance) think-aloud protocols showed that the strategy that the learners used in discerning unfamiliar word meanings was influenced by the different types of post-reading tasks, that is, the summary tasks were generally more likely than the comprehension question tasks to make unknown words salient to the learners and lower learners' tendency to ignore new L2 words. Specifically, verbs tended to bring about more inferencing in the question task

than in the summary task; however, adjectives appeared to induce more inferencing in the summary task than in the question task, and nouns elicited about equal amounts of inferencing in both tasks.

Paribakht and Wesche's results argue in favor of the use of post-reading summary tasks to promote higher-level input processing in learners. One can also draw further conclusions from Paribakht and Wesche's findings: if most of the target words to be acquired through reading belong to a specific word category (i.e., verbs, nouns or adjectives), educational practitioners may even consider choosing post-reading tasks in accordance with this information in order to bring about optimal lexical input processing. Other factors that can affect incidental vocabulary acquisition according to Paribakht and Wesche included the level of engagement that texts afforded learners, text difficulty level, inter-relatedness of text themes, learner motivation, and learners' previous formal study of grammar (which may help them in making inferences about word meaning).

Fraser (1999) investigated the effect of meta-cognitive strategy training and language-focused instruction on learner use of lexical processing strategies (LPS) during reading. Her study provided eight intermediate French learners of English with eight hours of meta-cognitive strategy training given over one month, followed by eight hours of language-focused instruction, also over one month. Each participant then read an article and answered comprehension questions. The researcher met with the participants individually for a post-reading retrospective think-aloud interview both before and after each of the two instructional phases to gauge how often they employed lexical processing strategies such as inferencing and dictionary-consultation to make sense of unfamiliar words during reading. To assess the maintenance of the effect of

instruction, the researcher also asked each participant to performed a recall task one week after each treatment phase and self-report, on a 5-point scale, his/her level of familiarity with each of 10 words that he/she had indicated to be unknown in the retrospective think-aloud interview. Data showed that the two types of instruction independently had positive effects on learner's success in the inferencing of word meaning and word retention. Fraser's research also showed that employing "inferencing" and "dictionary-consultation" strategies in combination sharply increased learners' word recall rate from 31% and 30% respectively to 50%. Fraser suggested in conclusion that reading programs shall include meta-cognitive strategy training, language-focused instruction as well as training on the effective use of dictionary.

Another factor that affects the impact of reading on L2 vocabulary uptake has to do with the frequency of learner exposure to new words through reading. Pigada and Schmitt (2006) conducted a one-month case study on a low-intermediate Greek learner of French who also spoke fluent English as a second language. One-on-one interviews took place before and after the one-month extensive reading program to gauge his acquisition of the spelling, meaning and grammatical behavior of the target words to be learned through reading. In the 90-minute spelling test, the participant was asked to write down words that the researcher read aloud to him. In the two-and-a-half-hour-long "meaning and grammar" test, he was given a list of words and asked to report any knowledge he had about the meaning of the words; he was also required to report any prepositions or articles that would collocate with the target words. Data indicated that only when words were encountered above 19 times would all three aspects of word knowledge (spelling, meaning and grammatical properties) have a fair chance (60%) of turning into uptake.

One reason Pigada and Schmitt noted for this lack of a steady increase of learning along the frequency scale was the general ineffectiveness of inferencing as a strategy for vocabulary acquisition. Nevertheless, according to Fraser (1999), word retention rate would sharply increase when inferencing and dictionary-consultation strategies were used in combination. Explicit instruction on the skilful use of lexical processing strategies, therefore, may contribute to lowering the exposure frequency threshold beyond which vocabulary uptake starts taking place. Of course, at the same time of exposing learners to meta-cognitive strategy training, it is always advisable for educational practitioners to choose reading materials that involve sufficient recycling of its content so as to ensure frequent learner exposure to target words. Pigada and Schmitt even went so far as to suggest learners to read one graded reader per week so as to “meet repetitions of the new words soon enough to reinforce the previous meeting” (Nation & Wang, 1999, as cited in Pigada & Schmitt, p. 8).

Learner-based factors may also have an effect on learner processing of reading materials. Pulido (2009) examined how learners’ reading proficiency and background knowledge (topic familiarity) affected their L2 lexical input processing and retention through reading. Pulido’s study involved 35 English-speaking learners of Spanish at various proficiency levels, including 8 beginning, 8 intermediate, 6 high-intermediate, 11 advanced and 2 high-advanced learners. Data collection took place in two phases. In the first phase participants were only required to complete a reading proficiency test and a topic familiarity questionnaire. Reading proficiency was gauged with a 35-minute test involving 48 multiple choice items that assess learner comprehension of two given texts. Topic familiarity was assessed with a 10-item Likert scale questionnaire in which participants rated their own familiarity with routine activities involved in the reading

passages to be used in the second data-gathering phase.

In the second phase, which took place one week later, participants' lexical input processing skills were examined through a lexical inferencing task that required participants to guess and write down the L1 translation or definition of 16 bold-faced nonsensical target words in two reading passages. After the lexical inferencing task the participants were given a verification task where they were given marginal glosses with L1 translations of the nonsensical target words and instructed to confirm or correct their previous guesses of the meanings of the target words. The participants' retention of these word meanings was not studied until they had been engaged in two other tests (a target-word episodic memory test and a strategy questionnaire) that assessed how deeply the target word forms had been processed. Participant retention of target word meanings was then examined in two respects. Productive retention of word meaning was assessed with a translation production exercise in which participants were asked to supply an L1 translation for each of the nonsense target words. Receptive retention of word meaning was assessed with a translation recognition exercise in which participants were required to choose the correct translation of each nonsense word in a multiple-choice test. Participants completed a set of tasks in one sitting in the second data-gathering phase: a lexical inferencing task, a verification task, a episodic memory test, a questionnaire on strategy use, a translation production task and a translation recognition task.

Data analyses revealed that greater general reading skills and familiarity with a passage topic independently led to more successful lexical inferencing during reading. Increased L2 reading ability and topic familiarity also independently led to greater receptive but not productive retention of meaning. Pulido's findings bear two main pedagogical implications. The



important role that reading proficiency plays in learner processing and retention of lexical input may suggest a need for classroom instruction of reading skills. The positive effect of topic familiarity on learner processing of reading materials also helps to direct teacher attention to the selection of suitable readers with topics relevant to students' daily life and culture.

### **3. Research on Reading and Second Language Grammar Development**

Rodrigo, Krashen and Gribbons (2004) studied how L2 learner grammar was affected by "extensive reading" and "reading combined with discussions" respectively over one semester. 23 intermediate English-speaking learners of Spanish were divided into an extensive reading group, a reading-discussion group and a control group. The extensive reading group (consisting of 8 students) read a combination of assigned graded readers and self-selected readings. The reading-discussion group (7 students) only read the assigned readers and participated in in-class discussions in Spanish after the readings. The control group (8 students) attended traditional grammar and composition classes that involved intensive reading and explicit instruction of Spanish grammar. The effect of treatment was assessed with a grammar test published by the Ministry of Education and Science of Spain, which was comprised of 30 multiple choice questions based on Spanish grammatical features. The test was used both as a pre-test and post-test.

Compared to the control group that received explicit instruction on Spanish grammar, the "reading-discussion" group made significantly greater gains on the grammar test over the treatment period. The difference in gain score between the control and "extensive reading" group, however, only *approached* statistical significance. Rodrigo et al. suggested

various reasons for the superiority of the “reading-discussion” group over the “extensive reading” group: discussions afforded students a higher level of participation, stimulated student interest in the reading materials, and increased aural input and oral output opportunities for students. These results speak in favor of the incorporation of interactive follow-up activities into reading programs to enhance the effects of reading on L2 form acquisition.

Ducy-Perez (1993) conducted a similar study on L2 grammar as affected by sustained silent reading (SSR) in academic setting. 186 Beginning and intermediate Spanish-speaking learners of English were divided into an experimental and control group. Both groups followed their usual syllabi, but the experimental group was also engaged in 30 minutes of sustained silent reading every week for a total of 10 weeks. All participants were given a Best and Ilyin English grammar structure exam as pretest and posttest. Like Rodrigo, Krashen and Gribbons’s (2004) finding with their extensive reading group, data in this study also yielded a noticeable yet insignificant positive relationship between SSR and learner improvement in grammar. 92 of the 99 experimental students, however, reported feeling a positive effect of SSR on their L2 vocabulary, grammar, reading as well as comprehension. Such feelings may be indicative of a covert impact of reading on second language development. It is possible that, given longer treatment duration, the positive effects of reading may reach statistical significance, just like how Elley and Mangubhai’s (1983) book flood students categorically outperformed the control group after an *additional* year of treatment. Rodrigo et al.’s (2004) finding of a significant effect of reading on L2 grammar development when it was combined with discussions also suggests a possible accelerative effect of interactive activities on grammar acquisition through reading.

Unlike Rodrigo et al. (2004), who investigated the role of post-reading activities on L2 form acquisition, Lee (2007) examined how the effect of reading on grammar may be enhanced with topic familiarity and typographical cues within texts. 259 Grade 11 Korean learners of English were assigned to experimental and control groups and exposed repeatedly (three 20-minute sessions over a 2-week period) to a familiar or unfamiliar topic with or without typographical enhancement. In the first exposure, half of the participants read a familiar text (on the historical events of Korea) without typographical enhancement of the target form (the English passive structure) and the other half read the same text with typographical enhancement. The second exposure involved the same process but used a different, less familiar text on the process of mummification in Egypt.

The third and last exposure divided the participants into four groups: “-Typographical Enhancement / +Topic Familiarity” (62 participants), “-Enhancement / -Familiarity” (65 participants), “+Enhancement / +Familiarity” (70 participants), and “+Enhancement / -Familiarity” (62 participants). The “+Familiarity” groups read a passage on Korean birthday celebration customs and the “-Familiarity” groups read one on Egyptian beliefs about the dead. As in the first two exposure phases, the only difference between the “+Enhancement” groups and the “-Enhancement” groups in the third phase was that the passive structures of the “+Enhancement” texts were enlarged and boldfaced and came in different fonts. 12 Tokens of the English passive structure were typographically enhanced in each “+Enhancement” text.

Learner acquisition of the English passive voice was assessed right after the third exposure session with a form-correction task containing 10 sentences with ill-formed passive structures. Besides measuring the participants’ grammatical development,

Lee (2007) also administered an additional free-recall task to assess the learners' comprehension of the passage contents. Half of the participants were instructed to write down, in either English or Korean, every idea they could recall from the text about Korean birthday celebration and the other half were instructed to write down ideas from the text about Egyptian beliefs. Lee's research concluded with a trade-off between learners' focus on form and text comprehension.

Specifically, he found that typographical enhancement facilitated Korean EFL learners' acquisition of English passive forms while hindering their comprehension of text meaning, whereas topic familiarity facilitated learners' reading comprehension while producing no effect on their internalization of the passive forms. Lee's results had significant implications for second language education. To counter the negative effect of typographical enhancement on learner comprehension of text meaning, educational practitioners may consider selecting texts with topics familiar to the learners. This way, learners may more effectively attend to L2 forms with the help of typographical cues without trading off too much of their overall comprehension of text meaning.

A different approach to examining textual enhancement is to look at lexical temporal indicators. In Rossomondo's (2007) research, the co-occurrence of lexical temporal indicators (LTI) with target verb forms in reading passages was studied for its effect on L2 learners' incidental acquisition of the 3<sup>rd</sup> person singular form of the Spanish future tense. Examples of lexical temporal indicators included dates (*para el año 2012* "in the year 2012"), temporal adverbs (*algún día* "some day") and noun phrases (*la casa del futuro* "the house of the future"). 140 English-speaking beginner learners of Spanish were divided into +LTI and -LTI groups. The +LTI participants read a

passage containing 13 target forms of the Spanish future tense co-occurring with 13 LTIs while the -LTI group read the same passage without LTI enhancement.

Learner acquisition of the Spanish future tense was gauged with a comprehension task and either a form-recognition or form-production task. (The form-recognition and form-production tasks were each administered to half of the participants in each of the +LTI and -LTI groups.) The multiple-choice comprehension task aimed to assess the participants' comprehension of future actions in the passage and consisted of the English version of the sentences from the -LTI Spanish passage with the target verbs deleted. For each of the 13 multiple choice items, the participants were instructed to choose the appropriate verb from a list of four English verbs (in different tenses) to fill in the blank. The form-recognition task followed the same procedure as the comprehension task, except that the Spanish version of the -LTI passage was used this time. Lastly, the form-production task made use of the same -LTI passage in Spanish with the target verbs deleted and provided in parentheses in the infinitival form instead. The participants were directed to conjugate the infinitives as it had appeared in the original passage. The reading, the comprehension task and the form-recognition/form-production task took place one after another in a 40-minute data collection session.

Similar to Lee's (2007) findings with his familiar topic group above, Rossomondo's (2007) data indicated a significant facilitative effect of the lexical temporal indicators on learner comprehension of future actions but no significant positive effect on learners' noticing of forms in either the form-recognition or form-production task. It was nonetheless important to note that the presence of lexical temporal indicators did not distract the learners from noticing the L2

forms either. This finding helps to augment language teachers' repertoire of tools for implementing reading programs: in addition to selecting texts with familiar topics, teachers may also enhance texts with lexical temporal indicators to oppose some of the negative effects of typographical cues on learners' text comprehension.

Lastly, the positive effect of typographical enhancement (TE) on L2 grammar development as attested in previous research makes it meaningful to investigate whether various TE formats may differentially affect learner intake of L2 forms. Simard (2009) studied how different numbers and choices of typographical cues were associated with L2 learners' intake of plural markers in English. 188 French-speaking secondary one students of English were assigned to 7 experimental groups and 1 control group. Each group read the same text with the English plural markers appearing in different TE formats. The eight types of TE formats under scrutiny were Italic, Underlined, Capital, Bold, Color, 3-cues (simultaneously bold-faced, capitalized and underlined), 5-cues (simultaneously italicized, underlined, bold-faced, colored, and capitalized), and Control (no enhancement). On average, each participant took about 20 minutes to complete the assigned reading. One week prior to the reading, all participants took either Version A or B of a multiple-choice recognition test as a pretest to measure prior knowledge of English plural formation. A participant who had completed Version A for the pretest would be given Version B for the posttest, which took place immediately after the reading task. The multiple-choice recognition test included a passage in which all plural structures were put in parentheses together with similar-looking but ill-formed plural forms of the same nouns. The participants were asked to choose the correct plural structure out of a number of possibilities.

All groups except the control group showed improvement in grammar after exposure to the typographical cues, with the Capital and 3-Cues groups displaying the greatest effect on learner intake of English plural markers as measured by the recognition test. In particular, the Capital group performed significantly better than the control group, the Underlined group and the 5-Cues group. The 3-Cues group also performed significantly better than the control group and the 5-Cues group. This finding provides teachers with practical instructions for the effective implementation of TE in reading programs. Examination of learners' simultaneous exposure to different numbers of typographical cues indicated that the intake of the 1-Cue group (formed by combining all participants exposed to only one typographical cue) did not differ significantly from that of the control group, the 3-Cues group and 5-Cues group.

#### **4. Pedagogical Implications**

Research on how various issues affect L2 vocabulary acquisition and grammar development through reading have shed much light on HKERS critics' suggestions for the implementation of reading programs. The importance of learner familiarity with the reading topics in text comprehension and vocabulary acquisition (Lee, 2007; Pulido, 2009) adds voice to Wong's (2001) call for reading materials relevant to the learners' culture. The positive relationship between learner reading proficiency and vocabulary acquisition (Pulido, 2009), together with the facilitative effects of meta-cognitive strategy training and language-focused instruction on vocabulary development (Fraser, 1999), provide support for Wong's (2001) claim that reading programs should involve explicit instruction to enhance learners' reading skills. In addition, empirical support for the use of post-reading summary tasks and comprehension question tasks to promote

word learning (Paribakht & Wesche, 1999) and discussion tasks to promote L2 grammar development (Rodrigo et al., 2004) lend credence to Green's (2005) suggestion to raise student attention to language forms through a task-based approach.

Research has also revealed other factors that shall be taken into account in classroom implementation of reading programs. The positive effect of typographical cues on grammar acquisition (Lee, 2007), especially the Capital and 3-cues formats (Simard, 2009), argues in favor of their incorporation into reading materials. The importance of frequent exposure to new words in vocabulary development (Pigada & Schmitt, 2006) supports the selection of reading materials with inter-related themes to ensure sufficient learner exposure to lexical items in a given subject area. Another factor in the correlation between reading and vocabulary acquisition has to do with the level of difficulty of the reading materials. Paribakht and Wesche's (1999) study showed that learners tended not to attempt to infer word meanings when the text was either too difficult or too easy for them. Paribakht and Wesche subsequently mentioned the possibility of taking into consideration learners' "threshold level" (p. 210) (number of new words per paragraph) in choosing reading materials for them. Text difficulty has now been coded into levels with the help of graded readers in many reading programs. Lastly, the importance of the duration of reading treatment in the promotion of language proficiency (Elley & Mangubhai, 1983) also suggests reading programs should be implemented on a long-term basis to see beneficial effects.

A couple of studies (Renandya, 2007; Tran, 2006) not reviewed in the current article have produced yet more useful suggestions for classroom implementation of reading programs. Due to the limited scope of this paper, a summary of these suggestions have been made:



- Students receive explicit instruction of 2000 to 3000 high-frequency words before reading
- Students choose to read what they are interested in
- Students read graded readers within their level of comprehension
- Students read large amounts of materials
- Reading materials cover diverse topics and genres.

## **5. Limitations and Directions for Future Research**

While this paper synthesized research on the effect of reading on second language vocabulary and grammar acquisition, due to restricted space it did not look into the relationship between reading and writing skill development. There is, however, reason to believe that reading has a positive impact on student writing as well. Hafiz and Tudor's (1989) study indicated that extensive reading for pleasure over a 12-week period (1 hour everyday for 5 days a week) among 16 ESL learners (aged 10-11) of Pakistani origin in the UK resulted in statistically significant levels of improvement on both tests of reading and writing. Hafiz and Tudor attributed this improvement to two main factors: extensive reading expanded learners' lexical and syntactic resources, and pleasure reading generated a positive attitude toward the target language and a willingness to experiment with it in writing. While Hafiz and Tudor's explanations provided some reasons for the success of extensive reading in promoting L2 writing skills, another study shed more light on the relationship between input and output by virtue of its examination of the areas of success as well as failure of the reading approach.

Tsang (1996) compared the effects of extensive reading and writing on English writing skill development among 96 Hong Kong students at four form levels (Form 1-4) over a 24-week treatment period. Students in the reading program (48

participants) were required to finish reading 8 books while students in the writing program (48 participants) were assigned 8 essay writing tasks to be completed over the 24-week period. Pretest and posttest data showed that the extensive reading group produced significant improvements in the language use and content of their writing while the writing group exhibited no significant gains in any aspect of writing. However, the reading group did not show significant gains in the organization, vocabulary use and mechanics of their writing. Tsang attributed the lack of improvement in vocabulary to the narrow range of topics covered by the students' self-selected books and the relatively short period of treatment. Tsang also claimed that improvement in organization and mechanics is likely to require explicit instruction.

Both Hafiz and Tudor's (1989) and Tsang's (1996) studies confirmed the value of further research into reading as a tool to develop second language writing skills. Specifically, care should be taken to look into how different factors, such as student affect, treatment duration, selection of reading materials and explicit instruction, affect L2 writing skill development. Together with the various issues investigated in this paper, it is anticipated that such research in the future would further enhance the implementation of reading programs to promote second language acquisition.

## Chio: Reading and Second Language Acquisition

### Appendix A: Overview of Research Studies on How Various Factors Affect the Impact of Reading on L2 Vocabulary Acquisition

Study	N	Participants	Factor(s) investigated	Duration of Treatment	Assessment tasks	Effect on L2 vocabulary acquisition
Fraser (1999)	8	<ul style="list-style-type: none"> <li>✓ L1: French</li> <li>✓ Target language: English</li> <li>✓ Level: Intermediate</li> </ul>	<ul style="list-style-type: none"> <li>✓ Learner exposure to meta-cognitive strategy training</li> <li>✓ language focused instruction</li> </ul>	8 hours of instruction given over 1 month for each of the two types of instructional treatment	<ul style="list-style-type: none"> <li>✓ Retrospective think-loud protocol</li> <li>✓ Learner self-report of word knowledge on a 5-point scale</li> </ul>	The two types of instruction independently had positive effects on learner inferencing of word meaning and word retention during reading
Paribakht & Wesche (1999)	10	<ul style="list-style-type: none"> <li>✓ L1: Various (French, Chinese, Farsi, Spanish, Vietnamese and Arabic)</li> <li>✓ Target language: English</li> <li>✓ Level: Intermediate</li> </ul>	<ul style="list-style-type: none"> <li>✓ Learner engagement in post-reading</li> <li>✓ comprehension question task</li> <li>✓ summary task</li> </ul>	A one-time engagement in a question task and a summary task that took place in a 2-hour research session	<ul style="list-style-type: none"> <li>✓ Introspective think-aloud protocol</li> <li>✓ Retrospective think-aloud protocol</li> </ul>	The summary task had a generally positive impact on effective strategy use during vocabulary acquisition through reading
Pigada & Schmitt (2006)	1	<ul style="list-style-type: none"> <li>✓ L1: Greek</li> <li>✓ L2: English</li> <li>✓ Target language: French</li> <li>✓ Level: Low intermediate</li> </ul>	<ul style="list-style-type: none"> <li>✓ Extensive reading</li> <li>✓ Frequency of exposure to new words</li> </ul>	1 month	One-on-one interviews	<ul style="list-style-type: none"> <li>✓ Extent of positive effect of extensive reading varied across the aspects of spelling, meaning and grammatical characteristics</li> <li>✓ Exposure frequency had a positive effect on all three aspects, but only after exposure exceeded the threshold of 19 encounters</li> </ul>
Pulido (2009)	35	<ul style="list-style-type: none"> <li>✓ L1: English</li> <li>✓ Target language: Spanish</li> <li>✓ Level: 8 beginner, 8 intermediate, 6 high-intermediate, 11 advanced, and 2 high-advanced learners</li> </ul>	<ul style="list-style-type: none"> <li>✓ Reading proficiency</li> <li>✓ Background knowledge</li> </ul>	Not applicable	<ul style="list-style-type: none"> <li>✓ Lexical inferencing task</li> <li>✓ Verification task</li> <li>✓ Target word episodic memory test</li> <li>✓ Translation production task</li> <li>✓ Translation recognition task</li> <li>✓ questionnaire</li> </ul>	The two factors independently had positive effects on <ul style="list-style-type: none"> <li>✓ Learner lexical inferencing during vocabulary acquisition through reading</li> <li>✓ learners' receptive vocabulary retention</li> </ul>

## Chio: Reading and Second Language Acquisition

**Appendix B:** Overview of Research Studies on How Various Factors Affect the Impact of Reading on L2 Grammar Development

Study	N	Participants	Factor(s) Investigated	Duration of Treatment	Assessment Tasks	Effect on L2 Grammar Development
Ducy-Perez (1991)	186	<ul style="list-style-type: none"> <li>✓ L1: Spanish</li> <li>✓ Target language: English</li> <li>✓ Level: Beginning and intermediate</li> </ul>	Sustained silent reading	30 minutes each week for 10 weeks	<ul style="list-style-type: none"> <li>✓ Grammar exams</li> </ul>	Positive effect on L2 grammar
Lee (2007)	259	<ul style="list-style-type: none"> <li>✓ L1: Korean</li> <li>✓ Target language: English</li> <li>✓ Level: Learners had had 4 years of English instruction prior to this study</li> </ul>	<ul style="list-style-type: none"> <li>✓ Typographical enhancement</li> <li>✓ Topic familiarity</li> </ul>	Three 20-minute sessions	<ul style="list-style-type: none"> <li>✓ Form correction task</li> <li>✓ Free-recall task</li> </ul>	<ul style="list-style-type: none"> <li>✓ Typographical enhancement had a positive effect on L2 grammar</li> <li>✓ Topic familiarity had no effect on L2 grammar</li> </ul>
Rodrigo et al. (2004)	23	<ul style="list-style-type: none"> <li>✓ L1: English</li> <li>✓ Target language: Spanish</li> <li>✓ Level: Successful completion of a 3-semester elementary Spanish sequence at the university level in the US</li> </ul>	<ul style="list-style-type: none"> <li>✓ Extensive reading</li> <li>✓ Reading plus discussions</li> </ul>	One semester	Multiple-choice grammar test	Both factors had positive effects on L2 grammar, with the reading-discussion group making greater gains than the extensive reading group
Rossomondo (2007)	140	<ul style="list-style-type: none"> <li>✓ L1: English</li> <li>✓ Target language: Spanish</li> <li>✓ Level: Learners had not completed more than 2 years of high school Spanish</li> </ul>	<ul style="list-style-type: none"> <li>✓ Lexical temporal indicators (LTI)</li> </ul>	The reading of the passage and data collection took place together in a 40-minute research session	<ul style="list-style-type: none"> <li>✓ Multiple-choice comprehension test</li> <li>✓ Multiple-choice form recognition task</li> <li>✓ Form production task</li> </ul>	<ul style="list-style-type: none"> <li>✓ LTIs had no positive effect on L2 grammar</li> </ul>
Simard (2009)	188	<ul style="list-style-type: none"> <li>✓ L1: French</li> <li>✓ Target language: English</li> <li>✓ Level: Beginning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Type of typographical enhancement (TE) format</li> <li>✓ Number of TE formats simultaneously used</li> </ul>	On average, each participant took about 20 minutes to complete the reading	<ul style="list-style-type: none"> <li>✓ Multiple-choice recognition test</li> </ul>	<ul style="list-style-type: none"> <li>✓ The Capital and 3-cues formats had the greatest positive effects on L2 grammar</li> <li>✓ Number of TE formats simultaneously used did not affect the impact of TE on L2 grammar</li> </ul>

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