Chinese Gloss or English Gloss

－Which Is More Effective for Incidental Vocabulary Acquisition through Reading?

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1. Introduction

Experience teaches us, and abundant research confirms the indispensable role that words play in human communication. Without words, language for us would be only a discourse of iconic gestures and symbols, just as a building cannot be constructed without building materials. This reliance on the lexicon requires that even a beginner in a language should accumulate a repertoire of thousands of words to be a communicator. Estimates indicate that an educated adult native speaker of English knows no less than 50,000 words (Aitchison 2003:7). It is further estimated that an L2 (Second Language) learner of English must acquire a minimum of 3,000 word families, which include the base word, all of its inflections and its common derivatives, to be able to read an average text (Schmitt 2000:74).

Since building and maintaining a large word stock is such an essential part of achieving proficiency in a language, many researchers in recent years have turned their attention to vocabulary studies. Schmitt (2000:116) argues that L1 (First Language) vocabulary acquisition has to be achieved simply through exposure to the language, for the vocabulary is too large to be learned solely from formal instruction. The case is the same with second language vocabulary acquisition, but with contexts different from children learning their native language. This touches upon two main processes of vocabulary acquisition: incidental learning (learning from context) and explicit learning (direct learning; rich instruction).

Plenty of evidence suggests that learners can acquire vocabulary through reading only. For intermediate and advanced learners with a vocabulary size of more than 3,000 or so words, reading provides access to exposure to all the remaining words (Schmitt 2000:150). However, low-level Chinese-English EFL (English as a foreign language) learners, whose vocabulary size is less than 3,000, are most in need of rapid vocabulary expansion and cannot independently get access to authentic text, which is defined as "[a] natural or real teaching material; often this material is taken from newspapers, magazines, radio, TV or podcasts" [Wikia 2009]. For them, learning vocabulary through reading comprehension can be achieved

through a combination of reading with explicit vocabulary instruction, but also through choosing appropriate textually supported reading materials. One method is making certain words salient by glossing them clearly in the book margin.

1.1 Aim

The present study aims to investigate whether Chinese EFL learners at a low level benefit from incidental English vocabulary acquisition through reading aided by glosses, whether they prefer glosses in reading materials, and whether Chinese gloss and English gloss differ in effectiveness on incidental vocabulary learning.

1.2 Material and Method

To carry out this investigation, both the participants and materials are selected with deliberation. Moreover, pre-tests and post-tests supplemented with a face-to-face interview are adopted as research methods.

1.2.1 Participants

The subjects of the survey are Chinese students majoring in Business at a university in the south of Sweden. They are all Chinese- English EFL learners and have learned English for 6 years in junior high school and senior high school in China, having the same English learning background. Fifteen students, whose previous academic performance in the International English Language Testing System-IELTS was 5 points, are selected. Judging by the band scores on the IELTS homepage-*IELTS: International English Language Testing System* (2009), these participants with band 5 are likely to make many mistakes and can only handle basic communication in their own field. Additionally, it is assumed that the participants' vocabulary size is less than 3,000 words based on the results of Laufer and Nation's Vocabulary Level Tests (Laufer & Nation 1995), which they take after they are selected. Although they might

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differ in language proficiency, this difference is controlled since the study employs a within-subject design. This design allows the same participants to be exposed to two different experimental conditions so that it can ensure reduction in error variances associated with individual differences, such as intelligence and memory skills.

1.2.2 Reading Material and Target Words

The reading materials used in the study are two short passages from *College English Extensive Reading 2*, a text book edited by both EFL educators and native English experts in China and published by Shanghai Foreign Language Education Press. One passage is a short story named *A Scary Night* with 390 words, and the other is a 207-word article about traditional education (See Appendix A). The basic reason for this selection is that they are suitable to the participants, with appropriate syntactic complexity causing no grammatical difficulties. With regard to the contents, it is unlikely for them to read the passages before the study because they are selected from a text book used by college students in China.

The 20 target words from the reading materials are selected on the basis of the results of a pre-test. They are glossed and divided equally into List 1 and List 2. Accordingly both the reading texts are adapted into two forms: one containing words from List 1 with Chinese glosses, that is, Mode 1; the other from List 2 with English glosses, that is, Mode 2, placed on the same line as the glossed words. To obtain the most appropriate definitions of the English words, a bilingual dictionary, *Advanced Learner's English-Chinese Dictionary* (2005), is referred to.

1.2.3 Pre-test

A pre-test is administered to the participants prior to the experiment to measure their knowledge of the glossed words. The test contains 33 words selected according to the order of the appearance in the two passages and the participants are instructed to put a check mark by the words they know and give the meanings either in L1 (Chinese) or L2 (English). The

selected words to be tested here presumedly meet the participants' level of English. In terms of part of speech, all the chosen words are verbs or adjectives to narrow the variables affecting the result of the study. Schmitt (2000:60) claims that nouns are the easiest word class to learn, adverbs the most difficult and verbs and adjectives are in the middle. If a word in the test is known to most participants, then it should be excluded from the study. The results of the pre-test in Table 1 below show the participants' knowledge about these words. Consequently, twenty words, which the participants have little or no knowledge about, in other words, whose numbers of correct recognition is less than 4, are selected as the target words for the present study. All the target words are marked with * in Table 1.

Table 1 results of the vocabulary pretest

Vocabulary of passage 1	Number of correct recognition	Vocabulary in passage 2	Number of correct recognition
ponder*	1	contemporary*	2
burst	9	ethical*	0
startle*	0	academic	14
shatter*	1	emphatic*	1
rake*	1	presume	8
dawn*	0	imperative*	0
burglarize*	2	overcome	13
dash*	2	stimulate	7
search	15	foster*	2
hide	15	relish*	0
yell	4	integrate*	3
tumble*	0	generalize	5
grin*	2	render*	0
sob	12		
greet	15		
inquire	6		
scribble*	0		
shiver*	1		
pour	13		
gape*	0		

1.2.4 Post-test

Four post-tests are administered to the participants at different stages of the experiment: two immediately after the reading task and the others two weeks later. Each post-test is composed of two parts: a definition-supply and a recognition test. The format of the definition-supply test is similar to the pre-test in which the participants are asked to mark the words they remember and supply their meanings in L1 (Chinese). The recognition test consists of the target words with four multiple-choice answers for each item. The participants should select the most appropriate definition of the given word from four choices written in L2 (English). The definitions of the words in the test come out of the passages but the phrasing is a bit different from what they are glossed in the text to avoid the participants' mere memory of the meaning in glosses instead of really understanding what they mean.

1.2.5 Procedure

The experimental procedure consists of several stages (See Table 2). In Stage 1, the 15 participants are given a brief introduction to their tasks. Then they are asked to read the selected passages with words glossed in Chinese, underlined and boldfaced in the text. Afterwards, the reading materials are collected and the participants are unexpectedly asked to take Vocabulary Test 1, which is used to determine the participants' vocabulary gain. The subjects finish the definition-supply part first, and then they receive the word recognition part. This order can ensure that the participants do not get any hints for the definition-supply test from the recognition test.

In Stage 2, the same participants are asked to read the selected passages and consult the underlined and boldfaced words glossed in English. Then without advance notice, they are required to take Vocabulary Test 2 with the same purpose and order.

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Table 2 experimental procedure

		Tasks
Stage 1	Day 1	Participants complete word learning in Mode 1.
	Day 1	Participants take Vocabulary Test 1.
Stage 2	Day 2	Participants complete word learning in Mode 2.
	Day 2	Participants take Vocabulary Test 2.
Stage 3	Day 3	Participants are engaged in a face-to-face interview.
Stage 4	Day 16	Participants do Vocabulary Re-test 1 and Re-test 2 for testing word retention.

In Stage 3, the participants are involved in a face-to-face interview concerning their opinions towards the use of the two gloss modes. Two questions are involved:

1) Do you like to have glosses in reading materials? Why or why not?

2) If you said yes in question 1), which gloss mode do you prefer?

In Stage 4, without any advance notice, the participants are given delayed vocabulary tests, Re-test 1 and Re-test 2, to estimate the effect of the gloss modes on the long-term vocabulary retention. The test formats are exactly the same as the immediate post-tests. The only difference lies in the orders of the test items in each definition-supply and recognition part.

For each test item, there is only one correct answer, and a correct answer is awarded 1 point and an incorrect one 0 points. Two raters, the researcher himself and another highly proficient bilingual speaker, examine the answers. When any discrepancy in scoring arises, especially in the definition-supply test, to which the participants might offer various answers, the two raters discuss them, and then upon agreement, 1 point or 0 points is given to the discussed answer.

Finally, the scores of both immediate post-tests and delayed post-tests are analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows software 15.0 to find out whether there is any significant difference between the two modes. Later on, the results of the questions of the interview are analyzed to indicate the subjects' attitudes toward the two types

of glosses.

2. Theoretical background

This part consists of a review of the literature on second language vocabulary acquisition through reading, and a critique of the research paradigm in which the reviewed studies are grounded.

2.1 Historical overview of second language vocabulary teaching

Since second language vocabulary acquisition gained increasing attention by linguists, educators and others involved in second language vocabulary learning, various practical teaching and learning methods have been studied and adopted. This part will seek to show how vocabulary has been viewed, researched, and presented throughout the history of second language acquisition so that second language vocabulary learners and teachers can establish a better understanding of the past and indicate probable lexical pedagogical development in the future.

Cheryl Boyd Zimmerman, leading off with a historical survey of vocabulary teaching methods, states that vocabulary is central to language and words are critically important to the typical language learners. In her study *Historical trends in second language vocabulary instruction* (1997), she briefly examines the major second language vocabulary teaching methods, including the Grammar Translation Method, the Reform Movement, the Direct Method, the Reading Method and Situational Language Teaching, the Audiolingual Method, Communicative Language Approaches, the Natural Approach and currently the Lexical Approach. With reference to Boyd Zimmerman (1997:5-19), some of the methods which relate to the present study are illustrated in the following sections.

2.1.1 The Grammar Translation Method

This approach has its origin in the teaching of classical languages. Its purpose was to facilitate students' understanding of literature rather than develop fluency in the spoken language, and students were expected to benefit from mental exercise to get their intellectual and academic abilities. A typical Grammar-Translation lesson heavily emphasized explaining grammatical rules, memorizing lists of words and translating text from L1 to L2 or vice versa. Students were expected to use bilingual dictionaries as reference tools since they were supposed to learn the necessary vocabulary through bilingual word lists. This method was challenged. One main challenge against it was the neglect of realistic, oral language.

2.1.2 The Direct Method

This method had developed by the end of 19th century. It was named from the priority of relating meaning directly with a target language without the step of translation. It stated that interaction was at the heart of natural language acquisition. Its proponents proposed that concrete vocabulary should be explained with labeled pictures and demonstration, while abstract words be instructed through the association of ideas. However, it received many criticisms, including its oversimplification of the similarities between L1 and L2 and its lack of consideration of the practical logistics of the public classroom.

2.1.3 The Reading Method/ Situational Language Teaching

These methods were developed in the 1920s and 1930s respectively. The Reading Method was aimed primarily at the development of reading skills, stressing the need to facilitate reading skills by improving vocabulary skills. Michael West recommended using word-frequency lists as the basis for selecting vocabulary in students' reading materials. It was at this time that vocabulary was regarded as one of the most important parts of second language learning.

2.1.4 The Audio-lingual Method

This approach was based on behaviorism, which essentially claimed that language learning was a result of habit formation. It emphasized teaching structural patterns. Students were expected to learn through drills rather than through analysis of a target language. Vocabulary items were selected based on their simplicity and familiarity. The vocabulary needed in the drills was relatively easy and new words were added when necessary to keep the drills viable. Although "it was assumed that good language habits, and exposure to the language itself, would eventually lead to an increased vocabulary" (Coady 1993:4), Wilga Rivers, according to Boyd Zimmerman (1997:11), pointed out the following:

> Students often failed to realize that meaning is expressed in groups of words and in combinations of language segments, and that the meaning of an individual word is usually difficult to determine when it is separated from a context of other words and phrases. Traditional vocabulary list rarely provide contexts of this type.

Subsequently, Wilga Rivers proposed that new words should be introduced in interesting activities with ensuing practice for long-term retention.

2.1.5 Communicative Language Teaching

Dell Hymes introduced the concept of communicative competence and defined it as "[t]he internalized knowledge of the situational appropriateness of language" (Boyd Zimmerman 1997:12). This brought about a shift of language instruction from the command of structures to communicative proficiency. It focused on the message and fluency rather than grammatical accuracy. In class, students were taught through problem-solving activities, and tasks in which students had to negotiate the exchange of information. Nevertheless, vocabulary was given a secondary status. Little guidance was given about how to handle vocabulary other than as support for the appropriate use of communicative categories. Many researchers in this field suggest that "since vocabulary development occurs naturally in L1 through contextualized,

naturally sequenced language, it will develop with natural, communicative exposure in L2" (Boyd Zimmerman 1997:15).

2.1.6 The Natural Approach

Primarily designed to "[e]nable a beginning student to reach acceptable levels of oral communicative ability in the language classroom" (Boyd Zimmerman 1997:15), the Natural Method emphasized comprehensible and meaningful input instead of grammatical production. Therefore, vocabulary, the bearer of meaning, is considered very important to the language acquisition process. Krashen and Terrell (1983：155）claim that without comprehension of vocabulary items, acquisition will not arise. He recommends that interesting and relevant vocabulary input such as free voluntary reading of one's own interest should be provided to language learners in order to help them achieve the mastery of language.

2.1.7 Summary of the overview of vocabulary teaching and learning

Reviewing language teaching methodologies through ages, we can find that there have been numerous different approaches to language teaching and learning, each with a different perspective on vocabulary. It is worth noticing that there has been a shift towards communicative methodologies that place emphasis on the use of language rather than the formal instruction of it. This leads to a view that language teaching should encourage learners to communicate and that one effective way to increase learners' capability of communicating is to expand their vocabulary. Since effective communication relies less on the mastery of grammatical structures than adequate possession of vocabulary, teachers should try to equip learners with as much necessary vocabulary as possible. The most direct way to provide second language vocabulary seems to be through vocabulary instruction, however, taking the large quantity of vocabulary into consideration, only a small fraction can be acquired through formal study. The rest, as Schmitt (2000:3) maintains, has to be either acquired through exposure to the target language or neglected.

2.2 Two processes of vocabulary acquisition: explicit vs. incidental learning

There is a general consensus that L2 vocabulary acquisition is a complex phenomenon which involves several different learning processes. Schmitt (2000:120) suggests that explicit and incidental learning are the two approaches to vocabulary acquisition.

2.2.1 Explicit learning

Explicit learning refers to the learning through the focused study of words on the part of learners through the application of vocabulary learning strategies. Nation (2001:95) further explains that it "[i]nvolves giving elaborate attention to a word, going beyond the immediate demands of a particular context of occurrence." In general, it holds that the employment of vocabulary learning strategies, even direct memorization can facilitate and enhance vocabulary acquisition (Segler 2001). It is appropriate for elementary learners in an EFL environment to learn high-frequency words and the words learners have special needs in their own fields.

As a traditional approach to vocabulary acquisition, the values of explicit learning are as follows:

> (1)it is efficient in terms of return for time and effort, (2) it allows learners to consciously focus on an aspect of word knowledge that is not easily gained from context or dictionary use and (3) it allows learners to control the repetition and processing of the vocabulary to make learning secure (Nation 2001:302).

However, many researchers question the value of spending time on particular words, especially the explicit learning process. On the one hand, they argue that it is time-consuming and it would be too laborious to learn an adequately sized target vocabulary. As Schmitt (2000: 137) states, since lexical acquisition is an incremental process in nature, multiple exposures to the target words are required. Explicit learning, however, can only provide learners with valuable first introductions to a word, but lacks the varied contexts which lead learners to

broader understanding of its collocations, additional meanings and other aspects. Nation also contends that the rare or infrequently used words are hardly referred to due to the limited class time (Arnaud & Savignon 1997:158). On the other hand, there are many other ways of expanding vocabulary size which require less teaching effort, less classroom time, and have other benefits.

2.2.2. Incidental learning

In an L1 research shows that incidental learning is the dominant way of acquiring vocabulary. Many linguists state that this really has to be the case because parents do not teach their children most of the vocabulary they acquire, although they adjust their speech to make it more comprehensible. Similarly, in the case of second language vocabulary acquisition, it should follow the same process (Schmitt 2000:122).

In recent years, incidental learning has been increasingly addressed by researchers and language educators, realizing the shortcomings of explicit learning. Incidental learning is defined as "[l]earning through exposure when one's attention is focused on the use of language, rather than the learning itself" (Schmitt 2000:116). It can occur when one is using language for communicative purposes, and so gives double benefits for the time expended.

Nation (2001:232) holds that "incidental learning via guessing from context is the most important of all sources of vocabulary learning". Learning from context is taken to mean the incidental learning of vocabulary from reading or listening to normal language use while the main focus of the learners' attention is on the message of the text. Thus, learning from context includes learning from extensive reading, and learning from listening to stories, radio, or watching films, television. Nation and Newton (1997:242) cite studies conducted by Simcock (1993) and Elly (1989). Both studies demonstrate that incidental vocabulary learning plays an important role even though learners' attention is mainly on meaningful communication and not language itself.

2.3 Contextualized approach vs. decontextualized approach

In her study *Current Trends of Vocabulary Teaching and Learning Strategies for EFL Settings* Shen (2003) refers to Oxford and Crookall (1990), who examine a number of different techniques for vocabulary teaching and learning and group them into 4 categories: (1) fully contextualized: reading, speaking, listening and writing; (2) semi-contextualized: word grouping, association, semantic mapping, and so on; (3) decontextualized: word lists, flashcards, dictionary use; (4) adaptable: structured reviewing. They argue that contextual, semi-contextual, and decontextual techniques are all required to facilitate vocabulary learning. For one thing, based on the Input Hypothesis put forward by Krashen (1985:2-3), learners will learn all the vocabulary they need from context as long as they get access to comprehensible authentic input. Therefore, vocabulary learning should involve various dimensions of the mental lexicon. For another, a range of strategies are necessary to enhance vocabulary consolidation, such as decontextual techniques.

In addition, Oxford and Crookall (1990) conclude that not all techniques are equally beneficial to students and that different ones may be appropriate to different students. They also arrive at the conclusion that incidental or indirect vocabulary learning through L2 use is vital for language improvement (Shen 2003).

2.4 Guessing from context in extensive reading

According to Carter and McCarthy (1988:102), "context can be viewed as morphological, syntactic, and discourse information in a given text which can be classified and described in terms of general features. This is the context within the text". Apparently many words can be incidentally learned through verbal communication, but corpora research suggests that spoken discourse is primarily related to more frequent words than written discourse. Written discourse, such as extensive reading, however, is inclined to use a wide variety of vocabulary

including difficult or low frequent words, becoming a better resource for acquiring a broader range of words (Schmitt 2000:73-74).

In recent years, numerous studies have reported the effectiveness of extensive reading in EFL and ESL (English as a second language) contexts on facilitating reading ability and language competence as well as improving students' attitudes and increasing their motivation toward learning English (Mason & Krashen 1997). Nuttall (1996:62) even claims that "an extensive reading programme is the single most effective way of improving vocabulary". Krashen (1993:23), quoted by Rosszell (2006), holds the following view of extensive reading:

> Reading is good for you. The research supports a stronger conclusion, however: Reading is the only way, the only way we become good reader, develop a good writing style, an adequate vocabulary, advanced grammar, and the only way we become good spellers.

In short, Krashen argues that language learners acquire vocabulary and spelling most efficiently by accessing comprehensible input while reading.

The question is how incidental vocabulary acquisition occurs in reading comprehension. Reading theory gives a clue that reading comprehension is a process involving complex interaction between a reader and text which requires the reader to use clues from context and other knowledge, such as background knowledge, to analyze unfamiliar or partially known individual words. It can be argued that the amount and kinds of cognitive processing required in the process lead to comprehension of unfamiliar target words (Paribakht & Wesche, 1997:176).

However, successful incidental vocabulary learning through guessing from context in reading cannot be achieved easily. One prerequisite is the vocabulary threshold for reading comprehension. The vocabulary threshold refers to the minimal vocabulary size one should know in order to use the higher processing strategies successfully (Laufer 1997:23). Citing Davis (1968,1972), who investigated whether there are subskills within the overall ability to read, Coady and Nation (1988:98) conclude that there are four identifiable factors: 1)

recalling word meaning; 2) determining meaning from context; 3) finding answers to explicit questions; 4) drawing inferences. Of all the factors, vocabulary has the most important effect. As is argued by Urquhart and Weir (1998:72), neither reading skills nor familiarity with the content can compensate for a lack of linguistic proficiency.

Summarizing other researchers' studies, Schmitt (2000:142-143) points out that a vocabulary size of about 2,000 is the primary goal for second language learners. Apart from ensuring basic everyday communication, this size of vocabulary is considered providing a solid foundation for developing more language skills. When a language learner is more proficient and can communicate everyday topics, the next step is moving into reading authentic texts. There is a consensus that 3,000-5,000 word families are needed to have initial access to this kind of reading material. Another critical factor, mentioned by Nation (2001:233), is that at least 95% of the words in the running text should be known to learners for this guessing to happen.

In addition, we should take the factors affecting successful guessing into account. Inferring or guessing from context is a complicated process, and we cannot take it for granted that learners with a vocabulary size of 3,000 words will succeed. In addition to the vocabulary threshold, a considerable amount of research indicates a number of other factors that affect the possibility of successful meaning inference. Schmitt (2000:153) highlights the following:

> 1) the context must be rich enough to offer adequate clues to guess a word's meaning; 2) readers are better able to use local clues in proximity to an unknown word than more global clues that are located further away; 3) learners may mistake an unknown word for one they already know with a similar orthographic or phonological form; 4) cognates can help guessing from context if they are used prudently; 5) background knowledge about the topic and culture being discussed aids inferring; 6) learners need to be skilled in guessing; 7)guessing a word from context does not mean that it will be remembered.

As Coady (1997:227) argues, most of the subjects in the L2 incidental vocabulary acquisition studies are at an intermediate level of FL (Foreign Language) instruction. Certainly, for those EFL learners at a low level with a vocabulary size of less than 3,000 words, they cannot have

access to authentic reading materials independently, for chances are those learners run the risk of failing to verify the correctness of inferences and can learn words incorrectly.

As far as the subjects in the present study are concerned, their low level of English proficiency, especially their limited vocabulary size, impedes them from acquiring new words by guessing from context in extensive reading efficiently. In other words, authentic texts are beyond the ability of most learners at a low English level. Therefore, they should be dealt with in other ways.

2.5 Simplified text and dictionary look-up

Intermediate and advanced learners can take advantage of various authentic texts to gain new vocabulary, but for those at a low level, a simplified text or graded reader is an alternative. The assumption behind this is that the burden of acquiring the language is greatly eased by eliminating all words beyond the readers' present vocabulary capacity. Hill and Reid-Thomas (1988:44) define a graded reader as "[e]ither a simplified version of an original work or an original work written in simple English". According to Schmitt (2000:151), Nation illustrates the benefits of simplified texts: they provide readers with an opportunity to practice guessing skills from context to expand vocabulary, and known or partially known words are recycled so that they will be consolidated.

However, the use of this kind of simplified texts has been challenged because they are not regarded as authentic. Coady (1997:231) argues that the process of simplification involves writing, which tends to eliminate much of the normal syntactic and pragmatic usage of an authentic text. In addition, less frequent vocabulary is missing. Even worse, many of such simplified texts are poorly written and dull to read. Accordingly, some proponents propose that simplified texts be used for beginners, but they should shift to more authentic texts as quickly as possible.

Learners of English as a foreign language often meet with words they have to verify before they can go on with the text they are working on. In addition to other learning strategies, such as inferring from context, asking their teacher for explicit explanation, or asking for help from their peers, they can refer to the substantial information contained in their dictionaries. If unknown words block comprehension, it is reasonable for learners to make use of this help. Nonetheless, using dictionaries for language learning has been discouraged by English teachers in class. They insist that words should not be learned individually, but should only be decoded by means of contextual clues, and dictionaries therefore reinforce learners' tendency to learn words in isolation. Another disadvantage of the use of any dictionary is that it distracts "[t]he flow of concentration when the student is reading a passage" (Carter & McCarthy, 1988:113). Therefore, occasional rather constant use of dictionaries is preferred.

2.6 Gloss

Drawing on the noticing hypothesis, proposed by Richard Schmidt, Lightbown and Spada (2006:45) argue that second language learners begin to acquire a language feature only when they become aware of it in the input. Numerous studies show that learners' attention towards unfamiliar words and clear indications of meanings of these words facilitate vocabulary learning more than learners reading without deliberately focusing on new words (Nation, 2001:252; Schmidt 1990).

Unknown words can be glossed in text so that they are salient for second language learners. Nation (2001:174) defines gloss as "[a] brief definition or synonym, either in L1 or L2, which is provided with the text". Very often the glossed words in text are marked or highlighted. There are different types of gloss, which can be textual, visual, both textual and visual, and auditory. The present study addresses the first type. Textual glossing can be in either L1 or L2. It can be placed in different positions in text. The choices are: (1) in text directly after the glossed word, (2) in the margin on the same line as the glossed word, (3) at the bottom of the page containing the glossed word, and (4) at the end of the whole text. Research comparing

the choices of positions indicates that learners clearly prefer marginal glossing. It seems best to follow this preference, particularly where vocabulary learning is the goal of glossing (Nation 2001:176).

Research on glossing unanimously consents the following advantages of the use of gloss in text. Firstly, it ensures the authenticity of the reading text. Since it allows texts that are too difficult for learners to read without glosses to be readable, unsimplified and unadapted texts can be used. Secondly, by providing accurate meanings of unfamiliar words that might be inferred incorrectly from context, glossing guarantees the flow of vocabulary learning and comprehension. Thirdly, compared with the use of dictionaries, which is much more time-consuming, glossing is more accessible and easier to use, providing minimal interruption of the reading process. Fourthly, glossing draws learners' attention to both the word form and its definition and thus encourages seeing the word as an item to learn and not just a part of the passage. Because the gloss contains the word form, learners' reading back and forth between the target word and its gloss entails word retention (Nation 2001:174-176).

2.6.1 The effectiveness of L1 and L2 gloss

In his study *The Role of First Language in Foreign Language Learning*, Nation (2003) concludes that studies comparing effectiveness of various ways of conveying the meaning of an unknown word, such as a definition in L2, a demonstration, a picture or a diagram, L2 context clues, and an L1 translation, come up with the result that an L1 translation is the most effective, for L1 translations are usually clear, short and familiar to learners. He also argues that simultaneous presentation of word forms and their corresponding meanings in L1 provides a clear connection between words and their definitions and saves learners' time to guess word meanings. Hence, learners' focus can be quickly passed to other aspects of words such as pronunciation and the relation of these words to learners' background knowledge, which is contributive to having a deep knowledge of words.

However, other research favors using the target language in glosses. Communicative approaches to language learning in the 1970s and 1980s regarded the use of L1 as undesirable (Boyd Zimmerman 1997:13). It is commonly believed that when learners learn a language, they should be exposed to the setting of the target language; in other words, what they see and hear should be in the target language. In this way, they can be accustomed to the expressions in the target language and improve their language proficiency. As a result, glosses in the target words are also favored. In other words, English vocabulary explanations should be adopted in glosses in EFL or ESL learning.

From the perspective of word meaning and concept association, De Groot and Kroll (1997:178) argue that since L2 learners initially depend on L1 for access to meaning, L1 conceptual links are stronger than L2 conceptual links; direct conceptual links are acquired with L2 learners' increasing proficiency. In other words, learners at the lower language proficiency level use L1 in order to translate their thoughts into L2. Since most of the words encountered in the beginning stages are concrete and imaginable, it is easier and more convenient for learners to link the new word form to the L1 expression of the meaning.

A growing number of studies in recent years have investigated effectiveness of different gloss types on word retention. Watanabe (1997) contends that learners' rehearsal involvement after referring to glosses aids vocabulary learning. Meanwhile, Martinez-Fernandez (2008) points out that the higher the degree of involvement load is with incidental tasks, the more conducive it is to the processing of unfamiliar words. By proposing the level of processing in the cognitive psychology field, Craik and Tulving (1975) suggest that remembering information depends not only on having attended to it during its occurrence or having rehearsed it after its occurrence, but also on how deeply it is processed. To further explain, Paribakht and Wesche (1997:176) maintain that learners' amount and kinds of cognitive processing involved are related to the acquisition of unfamiliar words. In other words, retention of words learned with more mental effort is better than that of those with less mental effort.

2.6.2 Perspectives on L1 and L2 gloss from empirical studies

Although most studies have found that the use of glossing is more faciliatative for learners' incidental vocabulary learning in reading than no glossing (Nation 2001:176), there is no consistency in the effectiveness of L1 or L2 glossing. Some studies have shown that there is no significant difference between L1 and L2 glossing.

Jacobs et al. (1994) investigated the effect of vocabulary glossing on recall and vocabulary learning, as well as learners' preferences as regards to glossing. Eighty-five native speakers of English studying Spanish at university level as participants read a Spanish text under one of three treatment conditions: no gloss, L1 (English) glosses, or L2 (Spanish) glosses. They then were asked to write what they recalled of the passage, translate a list of the glossed vocabulary, and complete a questionnaire. The translation task was repeated four weeks later. Results showed that those who had glosses outperformed their peers who had no glosses on the translation task administered immediately after they had read the text, but the difference between L1 and L2 condition was not statistically significant. The results of the questionnaire showed that the participants expressed preference for glosses, wished that they be located in the margin, and favored L2 (Spanish) glosses if they were comprehensible.

Bell and LeBlanc (2000) investigated students' preferences of L1 glosses and L2 glosses when they read L2 texts, and showed their level of reading comprehension in each case. The participants were forty students enrolled in four sections of third-semester Spanish at Florida State University and most of them intended to fulfill their degree requirement and all of them were non-native speakers of Spanish. The participants were divided into two groups. Group one (18 students) read a Spanish text with English glosses and group two (22 students) read the same text with Spanish glosses. Bell and LeBlanc (2000) administered five experimental instruments to the students while they were reading and after they had read the text: a language experience survey, a vocabulary knowledge survey, a gloss tracking system, a post-reading comprehension test, and an exit survey. The results of this study indicated that the participants greatly showed their preferences of English glosses over Spanish glosses.

However, there were no statistically significant differences in the students' post-reading comprehension test.

Yoshii (2006) examined the effectiveness of L1 and L2 glosses on incidental vocabulary learning in a multimedia environment. The investigation included the effects of additional pictorial cues in L1 and L2 glosses, and how these additions affect vocabulary learning. A total of 195 students from two universities in Japan studying English as a foreign language participated in the study. The gloss types included: (1) L1 (Japanese) text only; (2) L2 (English) text only; (3) L1 (Japanese) text plus picture; and (4) L2 (English) text plus picture. The participants read a 390-word story including 14 target words and 6 distracters (familiar words) highlighted in the text. As the students clicked on a word, a gloss appeared on the right-hand side of the screen. In case of the text plus picture glosses, the students saw both glosses at the same time on the screen. The participants received two vocabulary post-tests: one immediately after the treatment and the other two weeks later. Each post-test contained two tests: a definition-supply and a recognition test. The results indicated no significant differences between L1 and L2 glosses for definition-supply and recognition tasks. The findings also suggested that both L1 and L2 glosses are effective for incidental vocabulary learning.

While the above studies indicate that there is no statistically significant difference between L1 and L2 glossing, other research proves that L2 glossing is different from L1 glossing in the effectiveness on incidental vocabulary learning. Huang (2003) investigated the impact of vocabulary glosses and example sentences on learners' reading comprehension and vocabulary learning. The subjects were third-year students in a junior high school in Taiwan, whose average age was 16. The subjects in the experiment were randomly divided into four groups: the E-gloss group (reading texts with English glosses), the C-gloss group (reading texts with Chinese glosses), the E-gloss-Ex group (reading texts with English glosses plus example sentences), and the No-gloss group (reading texts without any help in vocabulary). A pre-test, a reading text, and recall tests were given for all the subjects and a questionnaire was distributed to the E-gloss, C-gloss, and E-gloss-Ex group respectively to fill in after text reading. The study indicated that the Chinese glosses led to better learning results than the English glosses and the

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results of the questionnaire showed different opinions on preference for types of glossing. Most of the subjects supported the use of vocabulary glosses and example sentences. About half of the subjects in the E-gloss and E-gloss-Ex group favored comprehensible English, but most of the subjects in the C-gloss group opted for Chinese.

Ko (2005) investigated how different types of gloss conditions affect Korean college students' reading comprehension. One hundred and six undergraduates at a university in Korea participated in the study. They read the material under one of three conditions: no gloss, Korean gloss (L1 glossing), and English gloss (L2 glossing). After reading, they were asked to take a multiple-choice reading comprehension test and to answer a questionnaire. The results of the quantitative analyses indicated that only the second language (L2) gloss condition significantly affected the students' reading comprehension. However, both types of glossing made their reading comprehension smoother and faster than was possible for those who read without glosses. When surveyed, the learners showed their preference for glosses in the margin: more than 62% of the learners favored L2 glosses for their reading material.

To sum up, the studies mentioned above manifest the conflicting results about the effects of L1 glosses and L2 glosses on incidental vocabulary learning and learners' preferences for glossing type.

3. Analysis and discussion

To find out the answers to the research questions, all the participants' descriptive statistics of the pre-test, immediate post-tests and delayed post-tests are presented in Table 3, together with comparisons among these tests. In addition, the results of the face-to-face interview are described in Table 4, and then analyzed to reveal the participants' attitudes toward different types of glosses.

3.1 Benefits of glosses on incidental vocabulary learning through reading

As to whether the subjects at a low English level benefit from incidental vocabulary learning through reading aided by glossing, Table 3 manifests the answer clearly.

Table 3 descriptive statistics of the 5 vocabulary tests

Test Type	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test(no gloss)	15	.00	3.00	1.2000	.67612
Im post- test1(L1 gloss)	15	13.00	18.00	14.6667	1.63299
Im post-test2(L2 gloss)	15	11.00	16.00	13.3333	1.34519
Retest1(L1 gloss)	15	5.00	11.00	7.6000	1.95667
Retest2(L2 gloss)	15	7.00	11.00	9.000	1.25357
Valid N	15				

Note: Im refers to immediate. N refers to the number of the participants in the test.

When the subjects took the pre-test containing the target words for the study, the results, with the mean scores of 1.2, show they have little or no knowledge of the given words. However, after reading the texts, either glossed in L1 (Chinese) or L2 (English), their word gain is greatly enhanced, with mean scores of 14.667 in immediate post-test 1 and 13.3333 in immediate post-test 2. Although there is a decline in both retest 1 and retest 2, the two mean scores, 8.1333 in retest 1 and 9.4667 in retest 2, suggest that the subjects have some word retention. Therefore, the conclusion can be drawn that all the subjects achieve word gain and word retention to some extent.

The results that glosses, either in L1 (Chinese) or L2 (English), are beneficial to incidental vocabulary learning are in line with the findings of some previous research (Nation

2001:174-176；Jacobs et al. 1994; Yoshii 2006; Ko 2005). In Jacobs et al. (1994), a text was read under three conditions: reading with no gloss, reading with L1 (English) glosses, and reading with L2 (Spanish). The results of the immediate and delayed translation tasks showed that glosses had no significant effects on reading comprehension; however, the participants with glosses, either in English or in Spanish, performed better than those without glosses on the immediate word translation, but the difference did not exist on the delayed post-test. In other words, glosses benefit incidental vocabulary learning, but not vocabulary retention. Yoshii (2006) examined the effectiveness of L1 and L2 glosses on incidental vocabulary learning, focusing on the use of picture glosses (text-plus-picture). He concluded that although there was no evidence whether L1 or L2 glosses were better, it could be confirmed that glosses as a whole were useful. Ko (2005) also gives supportive evidence that the results in his study showed that there was a significant difference between no gloss and L2 gloss condition ($P < 0.05$, indicting a significant difference).

There are many factors that can contribute to the effectiveness of vocabulary gloss on learners' incidental vocabulary learning. First, the use of gloss arouses learners' noticing to the target words. As is mentioned by Lightbown and Spada (2006:45), noticing is a crucial process in language acquisition, including vocabulary learning. Without these glosses, learners' attention may mainly be directed towards text comprehension, and little attention will be paid to understanding the meanings of unknown words. Their ignorance of unknown words results in failure in vocabulary learning. Instead, the salience of the glossed vocabulary, due to being boldfaced and underlined successfully attracts learners' attention and creates input enhancement. In the present study, the participants are offered reading materials to learn the unknown words in two gloss modes. When input is provided in the two modes, different performances in vocabulary learning suggest that input plays an important role in second language vocabulary acquisition. The study verifies Schmidt (1990) who claims that input does not have equal value and input which is noticed then becomes available for intake and effective processing in that proper input in some way triggers learners' operation of processes and drives their language development forward. As a result, noticing the words operates as a necessary condition for effective processing to take place. If a form is prominently input, it is

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more likely that it will be noticed. This is also true to the present study, as both the two gloss modes can arouse students' attention and set a good start for their later stages of L2 vocabulary acquisition and retention.

In addition to its salience of textual input that enhances learners' attention to unfamiliar words, gloss serves to be complementary to meaning inferring from context. Previous research, such as Nation (2001:233) and Schmitt (2000:153), mentions the drawbacks of guessing meanings of unknown words from context. Clues offered in context for unfamiliar words may vary greatly. Some contexts offer clear clues of the meanings of unfamiliar words while in most cases clues offered in context give vague or partial information. If learners fail to learn the meanings of unfamiliar words, incidental vocabulary learning will not occur. Undoubtedly, learners occasionally overestimate their vocabulary size; that is, there are some words that learners think they know but actually they do not know. Furthermore, contextual clues may direct learners' attention only to the meanings, not to the forms of unfamiliar words. It is widely accepted, however, that both the meaning and the form of a word are important for vocabulary learning. Therefore, learners' inference of unfamiliar words might be incorrect and in turn this causes learners' incorrect word retention. The subjects in the study eliminate the risk of incorrect meaning inference as a result of the availability of vocabulary glosses. The given glosses, especially in L1 (Chinese), help them connect the word form to its meaning immediately, and this can consolidate the form-meaning association. It is worthy of note that with a view to comprehending the reading material, the learners in the present study are more likely to read back and forth between the target words and their glosses in the margin, which confirms Nation (2001:174-176) who affirms that referring to glosses creates multiple encounters of the words and facilitates word retention.

Lastly, glossed reading material makes the reading process more enjoyable for learners. A considerable amount of previous research proves the role that extensive reading plays in enhancing incidental vocabulary acquisition (Schmitt 2000:73-74; Mason& Krashen 1997; Nuttall 1996:62; Rosszell 2006). A few reasons for this are mentioned. It is considered an efficient approach, since two activities – vocabulary acquisition and reading – occur at the

same time. With learners choosing the reading material based on their own interest, this approach facilitates learner autonomy, provides learners with the opportunity to meet words in their context of use, and can be very pleasant and motivating. This can theoretically result in substantial vocabulary learning, which seems difficult to achieve with explicit teaching during the relatively short period of time that L2 learners spend in the language classroom. In fact, Nation (2001: 155) argues that "the use of reading and other input sources may be the only practical options for out of class language development for some learners," especially in EFL contexts. However, the vocabulary threshold, which is the minimal lexical size learners need to know for successful reading (Laufer 1997:23), excludes those whose size of vocabulary is less than 3,000 words. Considering the subjects in the present study, who lack sufficient vocabulary knowledge and good reading strategies, authentic reading material may not be accessible in that "too many unfamiliar words in a passage can render it incomprehensible" (Krashen & Terrell 1983:132). Since simplified text and constant dictionary look-ups have an adverse effect on incidental vocabulary learning (Coady 1997:231; Carter & McCarthy 1998:113), glossed authentic reading material is an alternative. With the explanations of unknown words in glosses, learners know their meanings immediately and proceed with minimum interruption of the reading process. As a valuable tool, glosses make a piece of reading material beyond learners' level comprehensible, and in turn comprehensible input may make a significant contribution to the incidental vocabulary acquisition.

3.2 Preference towards L1 (Chinese) glosses or L2 (English) glosses

The face-to-face interview provides the research with information with respect to the participants' attitudes towards learning vocabulary through glosses in reading. Two questions are involved. Do the subjects prefer reading materials with vocabulary glosses or without any help, and why? What language do they prefer for the glosses- their L1 or L2 and are there any reasons for the preference? In light of the answers to the questions, the subjects' attitudes are elicited. The results of the interview are presented in Table 4.

Table 4: gloss preference

Gloss type	Number	Percentage
L1 (Chinese)	5	33%
L2 (English)	8	53%
No gloss	2	14%

The first question of the interview is designed to ask the participants whether they prefer reading with glosses. On this question, 13 out of 15 subjects said yes, meaning that 86% of them prefer to read articles with glosses. On the whole, most of the subjects feel positive towards the use of vocabulary glosses. As for the reasons why they prefer glosses, the most prominent ones provided by the investigated students are that glosses facilitate understanding of the content, prevent long interruptions resulting from looking up words in a dictionary, provide the most appropriate definitions for context, promote learning new words as a by-product of reading, and prevent wrong guesses from arising from insufficient contextual clues. In a word, the subjects in the present study state that learning vocabulary through reading can be efficient because of the availability of the vocabulary glosses. The reasons are in accordance with those concluded by Nation (2001:176) who holds the same opinion.

However, two subjects prefer not to have vocabulary glosses, which accounts for 14% of all the subjects. One subject said that if she read texts with glosses, she would depend on these glosses too much in order to infer unfamiliar words. Instead, she would infer the meanings of unfamiliar words from context and then consult a dictionary to check the inference by herself rather than refer to their glosses. She argued that new words would be kept in mind longer by means of inferring from context and consulting a dictionary than by merely referring to their glosses. The other subject who did not favor vocabulary glosses felt that on account of low English proficiency, he still had difficulty in comprehending the texts even if certain glosses were available. It made no difference for him to read a text with or without vocabulary glosses. Therefore in his opinion, it was not necessary to provide glosses in reading. Here, proficiency level might have played a role in preference for vocabulary glosses or not. The findings in the present research confirm the results of the previous studies that claim that in general learners prefer to have glossed reading materials.

The second question of the interview aims to indicate the participants' preference in terms of the language used in glosses: L1 (Chinese) or L2 (English). As is shown in Table 2, five subjects (33%) of all prefer L1 (Chinese), while 8 favor L2 (English) glosses, which amounts to 53%. Apparently more subjects like to have L2 (English) glossed texts, which is consistent with Jacobs et al. (1994) and Ko (2005). However, the results contradict the findings in Bell, F. L. and LeBlanc, L. B. (2000). In their study, the subjects were surveyed as to which gloss type they preferred, L1 (English) or L2 (Spanish). The results of this study indicated that the participants greatly preferred English glosses over Spanish glosses. In other words, the students more frequently consulted vocabulary glosses that were provided in their L1 (a mean number of 49.67 for consulting English glosses) than those provided in their L2 (a mean number of 26.50 for consulting Spanish glosses).

In the present study, two gloss groups both express their reasons for their preference. As to the reasons for preferring Chinese glosses, Chinese is the participants' native language, by means of which they can get a clear picture of the unfamiliar words instantly. Therefore, they save a great deal of time involved in meaning inferring. These findings accord those of Nation (2003) that L1 translations furnish vocabulary knowledge quickly.

More subjects revealed favor for L2 (English) glosses. Their reasons for this preference are summarized as follows. Firstly, in their opinions, the most effective way of learning unfamiliar words is through learning English explanations. They strongly hold that since English and Chinese are different in lexical, syntactic, and cultural aspects, the loss of some aspects of the meanings in the process of English-Chinese transfer will arise. On the other hand, there is concern that unfamiliar words in English glosses would prevent them from apprehending the English explanations. Therefore they suggest that English glosses should be comprehensible, which matches Krashen (1989:440) who places emphasis on the importance of comprehensible input in language acquisition. Secondly, comprehensible explanations in English glosses can be reminders of their previous vocabulary knowledge and thus consolidate their English skills. Thirdly, by resorting to English explanations in glosses along

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with clues in context, they have to involve more mental effort in learning new vocabulary. As Paribakht and Wesche (1997:176) point out, more mental effort means longer retention of vocabulary knowledge. Fourthly, after reading the text with English glosses, more subjects feel that learning new English words through reading their English explanations is not as frustrating as they expected. Lastly, understanding comprehensible explanations in English glosses establishes their sense of achievement, which can serve as an incentive for their language development.

3.3 Different effects of L1 (Chinese) and L2 (English) on incidental vocabulary learning

The present study, based on the mean scores of the immediate and delayed post-tests, shows that L1 (Chinese) and L2 (English) glosses have different effects on incidental vocabulary learning. The different effects between the two gloss types are discussed in the following sections.

3.3.1 Immediate post-tests

The subjects' performance on the two immediate post-tests is presented in the following Table 5 and Table 6. To make comparisons of the two sets of scores on the two different tests, a paired-sampled t-test is adopted.

Table 5 descriptive statistics of Test 1 and Test 2

Test	Mean	N	Std. Deviation	Std. Error Mean
Test1 (L1 glosses)	14.6667	15	1.63299	.42164
Test2 (L2 glosses)	13.3333	15	1.34519	.34733

Note: N refers to the number of the participants in the test.

Table 6 comparisons of Test 1 and Test 2

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Test1 - Test2	1.33333	1.79947	.46462	.33682	2.32985	2.870	14	.012

＊The mean difference is significant at the .05 level.

Table 5 depicts the descriptive statistics for the two immediate post-tests. As this table clearly shows, the subjects get more correct answers when they read the texts glossed in L1 (Chinese) than when they read the texts glossed in L2 (English), with the mean scores of 14.6667 in test 1, and the mean scores of 13.3333 in test 2 respectively. Table 4 reports a *t* of 2.870, 14 degree of freedom, which reveals there is a statistically significant difference between the effects of the two gloss types on incidental vocabulary learning ($p < 0.05$). In other words, L1 (Chinese) glosses are more beneficial than L2 (English) glosses for immediate word retention.

The findings in the present study contradict some of the previous research (Jacobs et al. 1994; Yoshii 2006; Bell, F. L. & LeBlanc, L. B. 2000), which claims that there is no statistically significant difference between the effects of the two gloss types. In their study, Jacobs et al (1994) divided the subjects into 3 groups and instructed them to read texts with (1) L1 glosses, (2) L2 glosses, and (3) no glosses. The results showed that the two gloss groups outperformed the no-gloss group significantly on the immediate post-tests, but the difference between L1 and L2 glosses was not significant. They pointed out that if learners did not have further exposure to the glossed words, their memory of the new materials would fade away quickly. They also assumed that no advantage of L2 glosses was found in that L2 glosses might not be comprehensible. Finally they concluded that glosses may have a potentially positive effect on vocabulary acquisition but the potential positiveness needed to be reinforced. In another study, Yoshii (2006) compared L1 glosses with L2 glosses and neither the definition-supply nor the

recognition tests showed significant differences between the two types. He explained that one possible reason why L1 was not found to be more effective than L2 might be related to the nature of incidental vocabulary learning. Although learners pick up the meanings incidentally when they encounter words, the rate of learning is still low (Nation 2001:236-240). Even for the L1 group, they still have difficulty making conceptual links in such a short period of time on the first exposure. For learners who are still in early stages, the conceptual links between L1 and concepts would be stronger than the conceptual links between L2 and the concepts, and a direct link to concepts from L2 words would not be possible (De Groot& Kroll 1997). Therefore, Yoshii (2006) argues that the lack of differences between L1 and L2 glosses might result from the assumption that the participants in his study might have had higher proficiency levels than expected or perhaps their levels varied. In addition, Bell, F. L. and LeBlanc, L. B. (2000) studied learners' actual behavior to determine which gloss, L1 or L2, was used more frequently for computer-based reading. The results of the comprehension test after reading showed that the difference between the L1 gloss group and the L2 gloss group was not statistically significant. The English gloss group received a mean score of 5.22 with a range of 2 to 9, while the Spanish gloss group received a mean score of 5.05 with a range of 1 to 9. Thus, the language of glosses was not a significant variable affecting incidental vocabulary learning.

The present study, however, is in line with the conclusions drawn by Huang (2003). In her study, 4 types of gloss were compared, i.e. the E-gloss group (reading texts with English glosses), the C-gloss group (reading texts with Chinese glosses), the E-gloss-Ex group (reading texts with English glosses plus example sentences), and the No-gloss group (reading texts without any help in vocabulary). Although the results of the post-tests showed no significant differences between the C-gloss group and the E-gloss-Ex group, the Chinese glosses led to better learning results than the English glosses. Her research also found out that as for the low proficiency subjects, learning with Chinese glosses was significantly more advantageous than with other types of vocabulary assistance. Both Huang (2003) and the present study offer supportive evidence for Nation (2003), who mentions that with L1 translation, learners obtain vocabulary meanings quickly and pay more attention to other

important aspects of vocabulary, such as pronunciation and the relationship between these target words and the subjects' existing background knowledge, which helps learners retain vocabulary knowledge for a long period of time. When the subjects read the texts glossed in L1 (Chinese), which provides them with a direct and clear correspondence between words and meanings, the task of encountering unfamiliar words is much less challenging and less difficult than that in L2 (English). They do not have to spend extra time guessing the meanings of the unfamiliar L2 words because they are provided with meanings of these unfamiliar words in their native language. The time spent in guessing the meanings is spared for the subjects to observe these words longer, and thus the subjects can have a deeper impression of these words. By referring to the translation in the learning procedure, the meanings of the words are accessed quickly. As a result, the subjects have more time to read text many times and the focus of vocabulary learning can be quickly passed to other more important aspects of the words. Thus the present study supports the view that introducing L1 translation has beneficial rather than adverse effects on vocabulary acquisition.

3.3.2 Delayed post-tests

The results, measured by a paired-sample t-test, are presented in the following Table 7 and Table 8 to find out whether there are any significant differences between the two modes of glosses, L1 glosses and L2 glosses, in the effects on long-term word retention.

Table 7 descriptive statistics of Retest 1 and Retest 2

Test	Mean	N	Std. Deviation	Std. Error Mean
Retest1(L1 gloss)	7.6000	15	1.95667	.50521
Retest2(L2 gloss)	9.0000	15	1.25357	.32367

Note: N refers to the number of the participants in the test.

Table 8 comparison of Retest 1 and Retest 2

Retest1 (L1 gloss) – Retest2 (L2 gloss)	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
	-1.4000	2.35433	.60789	-2.0378	.09622	-2.303	14	.037

＊The mean difference is significant at the .05 level.

From the results of the two retests, we can see that the mean score of Re-test 1 is 7.6000, while the mean score of Re-test 2 is 9.000, with the mean difference of 1.4000. Results from a second paired-samples t-test reveal that there is a significant difference between the two mean scores *(t = -2.303; df = 14; p< .05)*. Although an effect of decrease in the two re-tests is observed, we can see that words glossed in L2 (English) offer a better opportunity for participants to retain the target words.

The findings in the present research confirm Ko (2005). His study compared how three different gloss conditions, that is, L1 glosses, L2 glosses, and no glosses, affected learners' reading comprehension, using quantitative and qualitative methods. Multiple-choice reading comprehension test results showed that those who read the L2 glossed texts performed significantly better than those who read the text with either L1 glosses or without glosses. Both of the studies indicate that L2 used in gloss is more beneficial to long-term word retention in the vocabulary learning process than L1. However, Huang (2003) draws a different conclusion. By comparing 4 different gloss types, she found that the effect of English glosses on the E-gloss group was not as expected. It might be that the subjects had no experience in learning English vocabulary from English explanations. Although the explanations in the English glosses were comprehensible for most of them, they still felt anxious about consulting English glosses alone and were not sure whether what they inferred from the English glosses was correct. On the other hand, English glosses plus example sentences had a positive effect on incidental vocabulary learning. The reason was that the

meanings of unknown words inferred from English explanations could also be checked from example sentences and the reading text. In addition, the example sentences exemplified how the target words were used in sentences, thus presented extra information about the target words, such as syntactic, semantic and collocational information.

The present study comparing the two L1 and L2 gloss types shows that the subjects prefer L 2 explanations in glosses. Compared with L1 translations in gloss, L2 explanations are more advantageous to L2 acquisition. Firstly, since the L1 of the subjects is Chinese, which differs from L2 (English) in many ways, L1 translation of a new word may mislead the learner in that it is only partially synonymous and contains some differences in the cultural, stylistic, or grammatical aspects. Understanding the explanations in the gloss, they can know the exact meaning of the unknown word in context. Secondly, L 2 explanations conform to the subjects' English learning environment since they are studying in a country where L2 (English) is their main communicative medium. As they are immersed in much exposure to L2, they adapt to the L2 environment quickly. As a result, glossed words with L2 explanations seem to be the top choice.

However, the reason why L2 gloss is more effective on long-term word retention lies in other aspects. According to research in human memory, the chance that new lexicon be stored in long-term memory is determined by the depth of processing in the encoding process (Craik & Tulving 1975). A learner retains a word meaning if he or she is engaged in deep processing of the particular word, which includes elaboration of word form, word meaning, its context and learners' previous knowledge. In other words, while inferring an unknown word, learners have to exert themselves to extract information from their background knowledge and contextual cues. These efforts make the sense-creation process more elaborate. The high mental effort of sense-creation together with the contextual information helps learners recall the word more easily and retain it longer. One advantage of L1 glosses is that they provide the learners with quick access to meaning. However, understanding quickly does not guarantee higher retention because it does not involve high mental effort. When learners are given meanings in L2, they will invest more mental effort to understand these meanings. Vocabulary

knowledge that has been attained with more mental effort can later be better retrieved and recalled than vocabulary knowledge attained with less mental effort (Hulstijin 1992). Compared to L1 glosses, which require less mental effort and involvement of learners, the use of L2 glosses triggers a deeper processing of words, requires more involvement from learners and thus enhances the subsequent word acquisition and retention (Paribakht & Wesche 1997:176).

Rehearsal involvement or involvement load proposed by Watanabe (1997) and Martinez-Fernandez (2008) can also explain the effectiveness of L2 glosses on word retention. In their view, vocabulary learning is aided by the rehearsal involved as learners return to the text after looking at glosses. In other words, learners read a passage and encounter an unknown word (the first input), look at its gloss to understand its meaning (the second input), and then repeat the word to themselves with a view to remembering the meaning until their attention goes back to the unfamiliar word in the passage to see whether the meaning fits the context (the third input). The subjects in the present study process the words glossed in L2 in the same way, but they have to put more efforts to the second and the third input. Thus, the rehearsal involved in this process might help learners learn the vocabulary and retain its meaning longer.

To sum up, the results in this study show that learners at a low proficiency level can benefit from incidental vocabulary learning through reading with access to glosses. However, the results of the post-tests after text reading suggest that L1 glosses and L2 glosses have different effects. L1 glosses are more effective for short-term vocabulary learning, while L2 glosses are more beneficial for long-term word retention. In addition, the feedback from the interview reveals that most subjects prefer L2 glosses to L1 glosses.

4. Pedagogical implications

The study aims to investigate whether L1 and L2 glosses differ in effectiveness on incidental vocabulary learning through reading. It is expected that the findings can shed a new light on

vocabulary learning and teaching. In light of the major findings of the research, several pedagogical implications are proposed as follows.

The study primarily shows that reading materials, even with complexity, enhanced with L1 or L2 glosses can be assigned to low proficiency level learners for independent reading. Although extensive reading can undeniably lead to incidental vocabulary learning, there is still a concern that learners' text comprehension may not always result in this kind of word processing on account of their limited lexical size. The provision of glosses, however, can solve the problem.

Glosses are beneficial and can be adopted in vocabulary learning and teaching. Firstly, the evidence that English glosses are effective for learners and that learner favor comprehensible English explanations indicates that learning English by means of English is feasible for learners at a low proficiency level and should be advocated. Similarly, learners themselves also show positive attitudes toward learning English from English explanations since in most cases they do not feel satisfied with a parallel Chinese translation with its English equivalent. Traditionally, learners at a low proficiency level are thought to have a too limited size of vocabulary, making it impossible for them to learn English from English explanations. As a result, the traditional way of presenting vocabulary has been through Chinese definitions. However, the evidence of the significant benefits that English glosses bring to learners and learners' preference for comprehensible English may shed a light on a new idea of presenting vocabulary. Therefore, it is advisable to adopt English glosses in reading materials and teach English with English as the medium in the classroom.

Secondly, although learners do receive assistance from English glosses, the words used in forming the glosses must not go beyond their current level since comprehensible input plays an important role in language acquisition. Therefore, gloss should be written in comprehensible English, rather than being mere copies of English definitions from English-English dictionaries. Unknown words in glosses may impede learners'

comprehension of unfamiliar words in text. Consequently, the vocabulary explanation becomes ineffective and the provision of the glosses seems to be unnecessary.

Thirdly, Chinese glosses also make a substantial contribution to learners' vocabulary learning, especially for lower proficiency learners. As a result, integrating Chinese glosses with English glosses in reading texts is recommended. Through this integration, learners may use Chinese or English glosses depending on their own language proficiency levels. With the help of Chinese glosses, lower proficiency learners get a clear picture of what an unknown word means quickly, without being forced to resort to their limited proficiency and feeling frustrated in checking English explanations. Contrarily, by consulting English glosses, intermediate or advanced learners whose size of vocabulary is over 3,000, can benefit greatly from exposing themselves to additional usage of the new words in meaningful context. Integrating these two types of presenting glosses not only caters to the needs of different proficiency learners but also has other advantages. For one thing, Chinese definitions can allow learners to grasp the meanings of unfamiliar words quickly. Thus a large number of words can be learned in a short period of time. For another, approaching new words via learners' native language does not allow learners to obtain an in-depth understanding of the usage of new words, let alone using these words productively, but presenting English glosses can eliminate the shortcomings. These English glosses containing short explanations can provide additional semantic or syntactic information of unfamiliar words. This information, which Chinese definitions do not normally provide, can deepen learners' understanding of words and aid production. Moreover, learners can copy some patterns or phrases from the English glosses and thus find out how some words are used in collocation with others. This knowledge, not provided by the equivalents in learners' native language facilitates vocabulary learning. In terms of pedagogical implications, regardless of the positive contribution that the Chinese and English glosses make, these two gloss types do not need to be presented simultaneously all the time by teachers. Instead, they can be used alternatively in different situations. If an unfamiliar word is concrete, like an object, explaining the word directly through Chinese translation or presenting the real object is much clearer than explaining the word in English. On the other hand, when an unknown word contains abstract notions or

multiple meanings, English explanations, perhaps together with example sentences are more informative than Chinese explanations alone. In addition, English glosses can yield extra information in semantics, sociolinguistics, collocations, and so on. As a result, learners can make a connection between new words and their existing background knowledge.

Fourthly, as Schmitt (2000 117-120) states that L2 vocabulary acquisition is an incremental and gradual process, repeated exposures to the same words in various situations are necessary. A first encounter with an unfamiliar word may draw learners' attention to that item. For words to be learned and retained, learners should be guided to engage in elaborating activities, such as reviewing the newly learned words regularly. Therefore, follow-up vocabulary exercises right after reading should be included in the teaching process to enhance learners' vocabulary retention. Other different reviewing activities or tests still need to be arranged at intervals to consolidate learners' memories of newly learned words. Through repeated reviewing and successive encounters, the integration of these new words and the existing lexicon is reinforced. In addition, to build up learners' confidence in reading, teachers should also devote some time in class to explicit instructions of the necessary skills which can help learners handle unknown words from context.

5. Limitations of the study

The major limitation of the study lies in the subjects' background. The subjects are native speakers of Chinese who are studying at a Swedish university. Although their previous academic performance in the IELTS and in Laufer and Nation's Vocabulary Level Tests indicates their language proficiency, the proficiency level of the subjects in the study does not represent that of freshmen in colleges in China. Thus, the consequences of the study may not be generalized to all the college students in China.

Additionally, the researcher examined the required reading materials and a pre-test was implemented to ensure that these glossed words had not been learned. However, after

encountering these glossed words in the reading text and the immediate post-tests, the subjects might have had a chance to meet these words in other resources, such as magazines and daily conversation, and might have paid attention to these words and memorized them. This unpredictable factor might have influenced the subjects' performance in the delayed post-tests.

6. Conclusion

Considerable research proves the feasibility and importance of incidental vocabulary learning through reading. However, a large vocabulary size as a prerequisite hinders low proficiency level learners' access to authentic reading. The present study, focusing on effectiveness of L1 and L2 gloss types as reading assistance, draws the following conclusion.

Learners can learn vocabulary incidentally from either L1 gloss or L 2 gloss when they are engaged in reading mainly for comprehension of the text. The salient highlighted glosses can trigger learners' noticing of new words and lead them to pay additional attention to them, which in turn can facilitate their vocabulary learning.

Of the two glosses, L1 glosses are more facilitative for learners' short-term vocabulary learning. Since L1 provides clear, short definitions of unknown words, learners can access their meanings quickly and easily link the new words with their existing background knowledge. Meanwhile, since time spent in accessing the meanings of unknown words is saved, learners can spare more time to explore other aspects of word knowledge, such as pronunciation and the relation of the target words with the text.

However, quick access to the meanings of unknown words does not mean longer word retention. Contrarily, this study shows that L2 glosses are more effective for long-term word retention. The findings confirm the previous research that claims that long-term memory depends on the depth of processing in the encoding process (Craik& Tulving 1975). By

referring to the L2 explanations in the glosses, learners have to exert more mental effort to infer the meanings from their background knowledge and contextual cues. This high mental involvement deepens learners' word processing and thus enhances the subsequent word learning and retention.

Additionally, the subjects' attitudes toward the help of vocabulary glosses and their preferences for the language used in the glosses were revealed by the face-to-face interview. The results showed that 86% of the subjects favor the assistance of glosses in reading text. As for the preference of language in the glosses, 53% choose L2 glosses, while 33% prefer L1 glosses.

These findings are expected to give aspiration to reading material editors and teachers. However, considering the limitation of the study, more quantitative and qualitative research is needed. In this way, more generalizable results can be achieved.

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APPENDIX A. Reading Materials

Passage 1 *A SCARY NIGHT*

It's a cold winter night. It's midnight, and it's very quiet. I'm still awake and studying. I have a test tomorrow. I need to read two chapters. I finish one chapter and I read the next chapter. It's too difficult. I can't pass the test. What do I do? Shall I keep studying? Can I take the test some other time? Shall I give up? I'm **pondering** many things. I think my head is going to **burst**.

Suddenly, some noise **startles** me. Something **shattered** on the ground. I look at the window. Wait! What is that? I see a light across the street. It is from a new house. It's strange. Mr. & Mrs. Smith are on vacation now. They asked me to **rake** the lawn for them while they're gone. Nobody should be there. Oh, I see the light again.

Then, it **dawns on** me. Someone is **burglarizing** the house. I'm afraid. What do I do now? I have to call the police. I **dash** to the phone and call the police.

After ten minutes, the police arrive. They enter the house. As the police **search** the house, someone **hides** outside the house. The police **yell**, "Stop, right there!" But the man with a black mask runs into the woods near the house. Then, he **tumbles** down the hill in the woods. The police finally catch him. The police take off the mask. He **grins** first, then, starts to **sob**.

Two policemen come to my apartment. The first one looks very serious. He doesn't **greet** me. He just asks for my name. Then, he says, "Thank you for calling us about this problem." The other one is friendlier. He **inquires** about a couple of things. He wants to know when I first saw the light. He **scribbles** some notes.

The policemen are gone, and everything is quiet now. What a strange night! I'm glad this is over, but I am still **shivering** a little. So I **pour** some milk. This might help me. I can't study any longer and can't sleep right away.

I decide to read a book. I got it at a bookstore yesterday. The title is "American Short Stories." I look at the first chapter. And I **gape** at the title. It says, "My Life as a Burglar" by A Man with a Black Mask.
(390 words in total)

Passage 2

Compared with **contemporary** education, the education of centuries ago put more emphasis on students' **ethical** development than on **academic** performance.

One of the greatest educators, Confucius, had a special philosophy about teaching. He would set a particular criterion for each student, since he was **emphatic** that every student was **presumed** to be an individual with specific traits. Instead of teaching in an **imperative** manner, he would create incentive for learning through everyday experiences. Confucius used what was happening around the students to **overcome** their differences and to **stimulate** them to think independently. Different experiences would be used to **foster** their faculty for solving problems. His pupils could also **relish** learning by pondering the

philosophy of life and **integrating** the knowledge they had gained. Students **generalized** their learning and built a correct outlook on life with the stimuli provided by their teachers. However, academic learning was not the only thing. Using what they had learned and being orderly were the first priorities of learning in the old days.

In addition, the pupils in the old days might not have been able to pay the tuition due to a deficiency of money. To repay their teachers' efforts, students **rendered** great respect to them and achieved their goals in life.

(207 words in total)

APPENDIX B. SAMPLES OF POSTTESTS

Definition-Supply Test
Directions: Please check any of these words you know. Please put [X] in the box.
Please write the meanings either in L1 (Chinese)..
[ ] startle _____
[ ] shiver _____
[ ] shatter _____
[ ] grin _____
[ ] scribble _____
[ ] ponder _____

Word Recognition Test
Directions: Please match the English word with the correct meaning. Put [X] in the box.
1. **ponder:**
[] To study for a test
[] To think very carefully
[] To read something
[] To break open suddenly
2. **shatter**
[] To surprise someone
[] To fall suddenly
[] To break something into pieces
[] To look outside
3. **grin**
[] To cry loudly
[] To request information
[] To hide behind something
[] To have a big smile
4. **gape**
[] To open the mouth wide in surprise
[] To get very angry
[] To laugh loudly
[] To shake from cold or fear