Towards Effective Reading Instruction for Chinese EFL Students: Perceptions and Practices of Lexical Inferencing

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ABSTRACT

This study examined a group of learners' lexical inferencing strategy use, their vocabulary size, and their success in guessing word meaning. Participants responded to a questionnaire, and then performed a one-time reading of a short passage containing ten unknown words. A sub-sample of ten students participated in an interview. Four tests measuring their ability to recognize and recall form and meaning of the target words were used. Results revealed that (a) those who performed sufficiently in these tests used certain strategies more effectively than those who had relatively lower scores in these tests; (b) learners' vocabulary size played a significant role in using context effectively, and learners with a larger vocabulary size made more correct lexical guesses than those with a smaller one; (c) learners presented the best scores in form recognition, followed by meaning recognition, recall of meaning, and recall of form, which showed a gap between receptive learning and productive learning of an unknown word. Follow-up individual interviews showed that these learners' actual lexical inferencing practices in the reading experiment were in line with learners' self-reported strategy, reinforcing the validity of the study.

KEYWORDS: reading, lexical inferencing, strategy, vocabulary size

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Introduction

Students learning English as a Foreign Language (EFL) are likely to encounter unknown words in their interaction with texts. Research on the way how learners infer the meaning of unknown words during reading has become the focus of many empirical studies in recent years (Hu & Nassaji, 2014; Schmitt, 2010). To this end, language learners are encouraged to use some compensation strategies to make up for the limited vocabulary knowledge needed for reading (Oxford, 2002). One of the strategies is attempting to locate the meaning of the word from the context (Harley & Hart, 2000), and this strategy is often perceived as one of the most useful strategies in reading (Fan, 2003; Nation, 2001; Walters, 2006). Likewise, the importance of lexical inferencing in reading is widely acknowledged. Lexical inferencing is a process involved in guessing the word meaning of unknown words with all available linguistic cues in context and the learners' background knowledge of the world, their awareness of the co-text and relevant linguistic knowledge (Haastrup, 1991).

Recent studies have focused on discovering what factors affect lexical inferencing (Hu & Nassaji, 2014; Teng, 2014a). In addition, there has been a sustained awareness that aptitude is not the dominant factor in language learning. This supports the proposal that language achievement is not innate. It depends quite heavily on a learner's efforts. Therefore, much research has been conducted on how learners perceived and practiced lexical inferencing. Research on lexical inferencing was widely conducted in a learner's first language (L1) (Dubin & Olshtain, 1993; Haastrup, 2008), their second language (L2) (Nassaji, 2004; Qian, 2004) and EFL context (Kaivanpanah & Moghaddam, 2013). However, much still remains to be solved, especially how Chinese EFL learners perceive and practice lexical inferencing, and few studies have been directly conducted on how learners perform receptive and productive learning in terms of inferencing, which are the purposes of the current study.

Literature review

Guessing the meaning of an unknown word, also called lexical inferencing (Schmitt, 2010), has been widely promoted in the last several decades. In terms of perception, learners reported that they often guessed meaning from context (Gu & Johnson, 1996; Harly & Hart, 2000; Qian, 2004; Teng, 2014a). Another common method of locating an unknown word's meaning is through reference materials, such as a dictionary. Schmitt (1997) has documented taxonomy of strategies for L2 vocabulary learning by surveying a sample of 600 Japanese EFL learners. He found that 85 % of learners used a bilingual dictionary, and among the learners who used this reference, 95 % responded that they found it helpful. Similar results were found in Harley and Hart's (2000) study, where they surveyed 35 secondary school learners of French in Canada, and found that these learners regarded guessing word meanings from context and using a bilingual dictionary as useful strategies. Gu and Johnson (1996) showed that contextual guessing and skillful use of a dictionary were positive predictors of outstanding scores in the vocabulary size test and the college English test. Knight (1994) also found that contextual guessing and using a dictionary together facilitated learners performing sufficiently in learning and retaining words.

In terms of practice, quite a number of studies have shown the advantages of using lexical inferencing in reading. For example, Day, Omura, and Hiramatsu (1991) divided 181 high school and 397 university EFL students into two groups. One group read short stories silently. Their results showed that the group with silent reading outperformed the group without silent reading, thus concluding that guessing the meaning of unknown words is the prerequisite in recognizing those words. As Deschambault (2012) proposed, lexical inferencing is among the most common

techniques for L2 learners to guess the meaning of unknown words because it can help learners understand cues, knowledge, and context. He also proposed think-aloud as a useful method of lexical inferencing. Zhang and Koda (2011) measured the direct and indirect effects of lexical inferencing on reading comprehension among Chinese EFL students, and discovered that the mediation of lexical inferencing contributes to morphological awareness and has a significant indirect effect on reading comprehension. Similar findings can also be found in Parel's (2004) study, wherein he proposed that lexical inferencing could compensate for low receptive vocabularies, thus helping learners comprehend reading better.

The research mentioned above supports the role of lexical inferencing in reading. However, some prerequisites must be met. First, learners need a certain level of vocabulary size in order to conduct this practice (Hatami & Tavakoli, 2012). Second, the degree to which learners use inferential strategies affects their success in inferring word meanings from context (Hu & Nassaji, 2014; Nassaji, 2004). Third, the density of unfamiliar words in a text is related to whether learners can infer word meaning or not (Hu & Nation, 2000).

The current study

The current study was conducted to uncover how learners perceive lexical inferencing and measure learners' ability to recognize and recall form and meaning of new words in practice. The following research questions were addressed:

(1) What strategies do EFL students often use when encountering unknown words?
(2) To what extent can EFL students recognize and recall the form and meaning from a one-time reading?
(3) Is vocabulary size a predictor in EFL students' scores of the four measures?
(4) What lexical inferencing strategies will help learners perform positively in lexical inferencing practice?

Methodology

Participants

An intact second-year class of 45 students majoring in Business English at Nanning University was chosen as the participants. The participants were all native Chinese-speakers with an average age of 21, and they had never studied abroad. In order to understand participants' vocabulary size before the experiment, they were required to take Nation & Beglar's (2007) vocabulary size test (VST).

Reading materials

In order to control the density of unfamiliar words in a text, a short text containing 10 unknown words was prepared for the participants (See Appendix A). The text was adapted from the American Native Reading Series: *Reading Explorations* (Napoli & Widerner, 2002). The vocabulary size test mentioned above was used. The largest vocabulary size of the participants was between 3,000 to 4,000 words (see the results section). In order to guarantee the validity of the reading text, several steps were taken. First, the *Range* program (Heatley, Nation, & Coxhead, 2002) was used, and it was verified that the ten highlighted words (*bakers, splinters, dilapidated, stagnated, explode, demolished, hitched, hydrants, dynamite, ashes*) were out of the most frequent 3,000 words. In addition, 90% of the other words in the text were from the most frequent 1,000 words, and 8% were from the most frequent 2,000 words. Second, a vocabulary knowledge scale (Read, 1993), designed to measure lexical knowledge of specific target words was used, thus it was verified that all the participants had no prior knowledge of these ten words, which accounted for about 2% of the text. It was assumed that participants would not have great

lexical barriers for reading this text because they had understood at least 95% of running words in the text (Laufer & Ravenhorst-Kalovski, 2010; Nation, 2001).

Instruments

Vocabulary size test (VST)

The validity of this test was presented in Schmitt (2010). This test measures a learner's vocabulary size from the first 1,000 to the fourteenth 1,000 word families. There are 140 multiple-choice items, with 10 items from each 1,000 word family level. A sample test item of the first 1,000 can be seen below:

Time: They have a lot of **time**

a. money b. food c. hours d. friends

The *c* option has a similar meaning as *time*. The learner will achieve one point for choosing the correct item. A test-taker's total score was multiplied by 100 to get his/her total receptive vocabulary size (Nation & Beglar, 2007).

Questionnaire

The questionnaire, which was adapted from Qian (2004), was applied to explore how EFL learners usually approach and guess the meaning of the unknown words. It contained ten questions. Four selective items listed 'always', 'often', 'seldom', 'never' were presented in each question (See Appendix B).

Designed vocabulary test

Vocabulary tests adapted from Webb (2007) were applied to measure the learners' ability in lexical inferencing after reading (See Appendix C). In Webb's (2007) study, he used 10 tests to measure knowledge of form, meaning, orthography, association, grammatical functions, and syntax. The present study mainly measured form and meaning, because form-meaning mapping is one of the basic processes involved in acquiring a new word (Nation, 2001). In addition, the acquisition of form and meaning in a new word has remained the focus of attention in vocabulary acquisition (Schmitt, 2010).

The first test was recall of form, where the teacher pronounced each target word twice and the students were required to write down the item within ten seconds.

The second test was form recognition, where participants were required to choose the correct spelling from four options with three distracters, for instance:

a. bager b. baker c. bakar d. bakker

The students were expected to choose option *b* if he/she could recognize the form.

The third test was recall of meaning, where the learners were to define the key word in Chinese; for example, "Some *bakers* were just opening their shops."

The fourth test was recognition of meaning, where the participants were to circle the letter of the definition with the closest meaning to the key word in the given sentence, e.g.,

Some *bakers* were just opening their shops

a. a building b. a person who repairs c. a shop d. a person who bakes

The tests were carefully sequenced and conducted separately to avoid earlier tests affecting later tests.

Learners dichotomously achieved one point for a correct answer and zero points for an incorrect answer. The first author marked the four tests while the second author reexamined the test results. This ensured the validity of test results.

Interview

Ten students were invited to an individual interview. The interview was carried out to probe the inferencing process leading to the test results. The interviews were conducted in Chinese. The first author asked the questions while the second author transcribed it through a voice recorder. The two authors translated and verified the content after the interviews were completed.

As an example, an excerpt from the interviews is provided as follows:
Relevant text: It was very early in the morning. San Francisco was very quiet. Some *bakers* were just opening their shops. But most people were still in bed.

Interviewer : what does 'baker' mean here?
Student : I think it is a shop owner… it refers to some person.
Interviewer : Shop owner? So what made you figure out this meaning?
Student : Er…it stated 'their shops' here in the text.
Interviewer : So you guessed the meaning from the context?
Student : yes
Interviewer : What will you do after learning this new word?
Student : I would like to write it down in a special notebook, and then I can review it anytime, anywhere.

In this inferencing process, although the student did not figure out the exact meaning of the target word *baker*, she approximately approached the general meaning by context.

Procedure

The study was carried out in three phases. The first phase was to administer the questionnaire to the 45 participants. In the second phase, all participants were invited to read the text and accomplish the vocabulary test, which lasted for one hour. They were instructed to read and guess the meaning of unknown words without resorting to any dictionaries. In the third phase, a sub-sample of ten participants were randomly selected and invited for an individual interview. To motivate the interviewees to speak more, the interview was conducted in Chinese. All the three phases lasted for about two hours, with 20 minutes for the questionnaire, 1 hour for completing reading and tests, and about 40 minutes for the interviews.

Results

VST Results

The results of the test are shown in Table 1.

Table 1
Results of VST

	Lower than 10	10-19	20-29	30-39	Above 40	M	S.D.
						22.08	8.17
Number	0	20	17	8	0		

It is concluded from Table 1 that the participants had a relatively small vocabulary size (M=22.08), and individual variance is large (S.D.=8.17) with eight participants at a 3,000 to 3,900 vocabulary size, 17 participants at a 2,000-2,900 vocabulary size, and 20 participants at a 1,000-1,900 vocabulary size.

Results of questionnaire

The 45 participants' perceptions of reading behaviors when encountering unknown words while reading were summarized in Table 2.

Table 2
Frequency of learners' self-reported reading behaviors in dealing with unknown words while reading (n=45)

Behavior (When you encounter unknown words while reading, …)	Number (%) of participants			
	always	sometimes	seldom	never
1. Do the new words make you stop reading?	1 (2.2)	4 (8.9)	34 (75.6)	6 (13.3)
2. Do you skip and continue further reading?	6 (13.3)	24 (53.4)	15 (33.3)	0 (0.0)
3. Do you guess the meaning according to the context?	8 (17.6)	24 (53.2)	12 (26.8)	2 (4.4)
4. Do you stop to check the dictionary immediately?	7 (15.6)	8 (17.8)	28 (62.2)	2 (4.4)
5. Do you use a dictionary to locate the meaning?	3 (6.7)	17 (37.8)	20 (44.4)	5 (11.1)
6. Do you make a note of the unknown words during reading?	14 (31.1)	14 (31.1)	13 (28.9)	4 (8.9)
7. Do you consult your teacher?	2 (4.4)	9 (20.0)	28 (62.3)	6 (13.3)
8. Do you consult your classmates?	2 (4.4)	4 (8.9)	26 (57.9)	3 (6.8)
9. Do you refer to the previous reading when encountering the same words?	5 (11.1)	14 (31.1)	25 (55.6)	1 (2.2)
10. Will you prepare a notebook to write down the new words for later review?	3 (6.7)	4 (8.9)	29 (64.4)	9 (20.0)

As Table 2 shows, context is frequently used as the source of meaning inferencing. About 17.6 % of the participants indicated that they *often* guessed the word meaning from context. About 53.2 % stated that they *sometimes* used context to infer the meaning of unknown words. These two groups make up for 70.8 % of the sample.

Therefore, in answering the first question of which strategy is the preferred one among participants, the data revealed that guessing word meaning from context is the most popular one. Interestingly, 31.1% of students *often* and 31.1% of students *sometimes* made a note of the new items, which is the second most popular strategy.

However, 64.4% of participants *seldom* used a notebook to write down the unknown words for later review. 62.3% of learners *seldom* consulted teachers and 57.9% of learners *seldom* consulted classmates when encountering unknown words. In addition, 75.6% of learners *seldom* stopped reading when encountering unknown words and 62.2% of learners continued further reading without immediate dictionary checking, and only 6.7% of learners *often* used a dictionary reference and 37.8 % of learners *sometimes* resorted to a dictionary. The approach of using a dictionary, therefore, appears to be one of the most infrequently used strategies. This is different

from Qian's (2004) and Harley & Hart's (2000) study, which showed that using a dictionary is one of the preferred strategies in guessing word meaning.

Results of the four dependent measures (Form recall, form recognition, meaning recall, and meaning recognition)

The 45 participants' practical performance of recognizing and recalling form and meaning of unknown words in the text are shown in Table 3.

Table 3
Results of Four Dependent Measures （n=45）

Target words	Number (%) of participants							
	Recognition of form		Recall of form		Recognition of meaning		Recall of meaning	
	Right	Wrong	**Right**	Wrong	**Right**	Wrong	**Right**	Wrong
baker	**37**	8	**28**	17	**38**	7	**22**	23
	(82.2)	(17.8)	**(62.2)**	(37.8)	**(84.4)**	(15.6)	**(48.9)**	(51.1)
splinter	**30**	15	**6**	39	**10**	41	**4**	35
	(66.7)	(33.3)	**(13.3)**	(86.7)	**(22.2)**	(91.1)	**(8.9)**	(77.8)
dilapidated	**18**	27	**4**	41	**28**	17	**20**	25
	(40.0)	(60.0)	**(8.9)**	(91.1)	**(62.2)**	(37.8)	**(44.4)**	(55.6)
demolish	**34**	11	**11**	34	**33**	12	**24**	21
	(75.6)	(24.4)	**(24.4)**	(75.6)	**(73.3)**	(26.7)	**(53.3)**	(46.7)
explode	**18**	27	**2**	43	**18**	27	**15**	30
	(40.0)	(60.0)	**(4.4)**	(95.6)	**(40.0)**	(66.0)	**(33.3)**	(60.7)
stagnate	**21**	24	**1**	44	**32**	13	**19**	26
	(46.7)	(53.3)	**(2.2)**	(97.8)	**(71.1)**	(28.9)	**(42.2)**	(57.8)
hitch	**36**	9	**9**	36	**9**	36	**2**	43
	(80.0)	(20.0)	**(20.0)**	(80.0)	**(20.0)**	(80.0)	**(4.4)**	(95.6)
hydrant	**20**	25	**3**	42	**8**	37	**6**	39
	(44.4)	(55.6)	**(6.7)**	(93.3)	**(17.8)**	(82.2)	**(13.3)**	(86.7)
dynamite	**19**	26	**1**	44	**6**	37	**8**	39
	(42.2)	(57.8)	**(2.2)**	(97.8)	**(13.3)**	(82.2)	**(17.8)**	(86.7)
ashes	**26**	19	**5**	40	**14**	44	**1**	31
	(57.8)	(42.2)	**(11.1)**	(88.9)	**(31.1)**	(97.8)	**(2.2)**	(68.9)
M	**25.9**	19.10	**7**	38.00	**17.90**	27.10	**13.80**	31.20
	(57.56)	(42.44)	**(15.56)**	(84.44)	**(39.78)**	(60.22)	**(30.67)**	(69.33)
S.D.	**7.74**	7.74	**8.08**	8.08	**13.69**	13.69	**7.55**	7.55
	(17.20)	(17.20)	**(17.96)**	(17.96)	**(30.42)**	(30.42)	**(16.79)**	(16.79)

Table 3 shows the mean scores of the four dependent measures, and the data revealed the answer to the second question: To what extent can learners recognize and recall form and meaning of unknown words? First, form recognition is the highest on the four dependent measures (M=25.90), followed by recognition of meaning (M=17.90), and recall of meaning (M=13.80). The counter-intuitive results lay in the recall of forms, for which learners showed the lowest mean scores (M=7.00). However, variance between words occurred in the process of recognizing the form. For instance, 82.2% of the learners could recognize the form of *baker.* However, only 40% recognized the form of *dilapidated.* This is evident that learners' ability in recognizing the form of unknown words is easily affected by the formation of the words. Put succinctly, learners acquired the easy form of words before they could acquire the complex form of words

incidentally from reading. Likewise, for the words *baker* and *dilapidated*, 62.2 of learners could produce the form of *baker* but only 8.9% of learners could produce the form of *dilapidated*. A gap between receptive learning and productive learning was also shown, because learners generally performed better in recognizing receptive form rather than recalling productive form. Similar results were also found in learning word meaning. Learners recognized the meaning before they could recall the meaning.

The factor of vocabulary size and strategy use

The predictive effects of vocabulary size and strategy use on learners' performance of lexical inference are shown in Table 4.

Table 4
Vocabulary size, strategy use and lexical inferencing

V.S.	Recognition of form	Recall of form	Recognition of meaning	Recall of meaning	Popular strategy use (questionnaire and interview data)	
					Guessing from context	Make a note of unknown words
1,000-1,900 (n=8)	4.65 (2.45)	0.50 (1.00)	3.60 (1.50)	2.45 (1.63)	Seldom/ Never	Seldom/ Never
2,000-2,900 (n=17)	5.94 (1.08)	1.59 (0.80)	4.47 (1.28)	3.00 (2.15)	Sometimes	Sometimes
3,000-3,900 (n=20)	7.63 (1.51)	4.13 (1.13)	6.50 (1.85)	4.87 (1.45)	Always	Always

Note V.S. =Vocabulary size n=number Maximum score= 10 Standard deviations are in parentheses

As shown in Table 4, the mean scores for the participants of a 3,000-3,900 word vocabulary size were higher on all four dependent measures, followed by the mean scores for participants of a 2,000-2,900 word vocabulary size, then the participants of a 1,000-1,900 word vocabulary size. Therefore, in answering the third question of whether vocabulary size is a predictor in lexical inferencing, the data revealed that vocabulary size provided a significantly predictive power in lexical inferencing. Interestingly, the participants with a larger vocabulary size tend to use the two popular lexical inferencing strategies more frequently than the participants with a smaller one. Thus, in answering the fourth question of which strategy is related to the performance of lexical inferencing, guessing from context and making a note of unknown words facilitate learners in inferring word meaning.

To measure whether there were any significant overall differences among the three groups with different vocabulary size, a multivariate analysis of variance (MANOVA) was used with collected scores on the four dependent measures. The independent variable was three groups with different vocabulary size; the dependent variable was the scores of the four measures. The MANOVA showed an overall statistically significant difference between the three groups, $p<0.01$, $\eta^2=0.36$. Thus, the validity of findings mentioned above for answering question three and four was confirmed.

Data from interviews

Excerpts 1, 2, and 3 were translated from three students' interview responses in Chinese. Excerpts 1 and 2 were representative of successful inferencers. Excerpt 3 was representative of less successful inferencers.

Excerpt 1 Target word: **Stagnate**
Relevant text: Then people noticed the smoke. Fires were breaking out all over the city. The electricity was **stagnated** due to the earthquake.

Interviewer : What does 'stagnate' mean here?
Student : I think it means 'stop' or something like that.
Interviewer : Stop? So how did you guess out this meaning?
Student : En…because it is about earthquake, usually earthquake may cause the electrical system pause. In addition, fires were breaking out; I guess something terrible would happen.
Interviewer : So you figure out the meaning based on the context of earthquake?
Student : Yes.
Interviewer : What will you do after learning this new word?
Student : I am not sure; I think I will write it down in a notebook, because I like to review it later to keep it in my mind.

Excerpt 2 Target word: **Dynamite**
Relevant text: The police and the army tried another way to stop the fires. They used **dynamite**. They blew up buildings close to the fires.

Interviewer : What does 'dynamite' mean here?
Student : I think it means something to explode.
Interviewer : Explode? So how did you guess out this meaning?
Student : Well…because it says 'buildings are blown up', so I guess 'explosives'. Moreover, I guessed using 'dynamite' is one way for them to stop the fires, because those buildings were close to the fires.
Interviewer : So you figure out the meaning based on the surrounding information?
Student : Yes.
Interviewer : What will you do after learning this new word?
Student : I like to write any words that I don't know in a notebook, and I think I will forget this word if I don't review it in time.

Excerpt 3 Target word: **Splinters**
Relevant text: The huge earthquake did great damage. It ripped apart brick buildings. It broke houses into **splinters**.

Interviewer : Did you notice the words highlighted in bold?
Student : Yes, I found it, and I marked them down here (The student showed the scrap paper).
Interviewer : Can you guess the meaning?
Students : I tried to, I focused on thinking all the possible meaning by using prefix or suffix, but it didn't work.
Interviewer : Why don't you try to guess it from context?
Students : I tried to, but I am not sure with the meaning, I might not understand the surrounding information sufficiently.
Interviewer : Then what would you do?
Student : I might check later from dictionary.
Interviewer : So, will you write down the unknown words after you check the meaning from dictionary?

Student : Seldom, I think it is enough for me to understand the meaning.

In the above three examples, the first one comes from a successful inferencer. As can be seen, the student made his inferencing by repeatedly consulting the background information, paraphrasing and confirming his inference. The second example from another successful inferencer also shows similar features. The student read the text, applied contextual clues, and took advantage of background information to evaluate his inference. The first two excerpts also show that successful inferencers pay attention to learning and memorizing the new words. The last example comes from a less successful inferencer. As indicated, the student did not successfully make use of background knowledge but rather made an abrupt decision. Unfortunately, this decision was based on a false recognition of the target word because he used the strategy of guessing words from prefix or suffix in a random and unrelated manner. The student did not search for clues that could have helped him comprehend the meaning of the target word in the text. The third excerpt also shows that referring to the dictionary is a preferred strategy for students who performed lexical inferencing less successfully. They might not review the word again after they check the meaning from the dictionary.

In summary, the qualitative analysis confirmed that successful inferencers used context more frequently and effectively, demonstrated more active engagement during the inferencing process, and made more efforts at using, learning and memorizing the unknown words at a deeper level. These are what less successful inferencers lacked.

Discussion and conclusion

This study has yielded some interesting findings. The results revealed that EFL students would guess the meaning from the context when encountering an unknown word in a text. The frequency of this behavior, as reflected in Table 2, fully corroborated previous research findings (Gu & Johnson, 1996; Harley & Hart, 2000; Qian, 2004). The present study also created some surprising findings; for example, making use of a dictionary to find out the meaning is an infrequent behavior, which is in line with Harley and Hart's (2000) study. However, Qian's (2004) study found that using a monolingual dictionary is a favored strategy among Chinese and Korean learners. In addition, asking help from teachers or peers was reported as the least used strategy in the present study, as also found in Qian (2004) but was reported as a favored strategy in Harley and Hart (2000). Since results collected from the interviews have demonstrated that what the learners perceived in lexical inferencing is consistent with what they actually did in lexical inferencing process, it now becomes a problem as to why the differences occurred. A further comparison of these studies revealed that, in Harley and Hart's (2000) study, participants are local English-speaking students while participants in Qian's (2000) study are Chinese and Korean tertiary-level students in Canada. However, the participants in the present study have never studied abroad, thus participants' cultural and linguistic backgrounds are different from Harley and Hart (2000) and Qian (2004). This might explain why the learning style is different, because the participants come from different countries and their cultural differences often create variations in perception and performance of learning strategies (Laufer & Yano, 2001). Therefore, the first suggestion for making teaching effective is to take learners' differences into account of learning strategies, checking why and how this occurs.

The present study also evaluated how learners' vocabulary size can affect learners' performances in guessing the meaning of unknown words. As reflected in Table 4, those learners with a larger vocabulary size made a significant contribution to the success in guessing the meaning of unknown words. This finding is consistent with previous research showing that inferential

success in using contextual clues depends on learners' threshold of vocabulary knowledge (Hatami & Tavakoli, 2012; Laufer, 1996; Morrison, 1996; Nation, 1993). Thus, it can be assumed that those learners who possess a larger vocabulary size have better access to linguistic clues needed in constructing an accurate semantic representation of unknown words. Therefore, direct acquisition of a great number of lexical items is imperative, for example, words from New General Service List (Browne, 2013), especially in the early stages of learning when learners' nascent vocabulary inventory is severely limited, a belief espoused by others (Folse, 2004a; Nation, 2001; Schmitt, 2010; Teng, 2014b).

Results also revealed a significant link between vocabulary size and the degree of using a lexical inferencing strategy, and this affected the learners' performance in lexical inferencing. However, the learners' success in lexical inferencing was related to the quality of using certain strategies rather than the quantity of the strategies they used, which is in line with Nassaji (2003). In addition, learners with a lower vocabulary size in the present study rarely used a context-based strategy, suggesting that this strategy should be emphasized while teaching reading for learners with a limited vocabulary size. Previous studies have found the effective roles of teaching strategy for inferential success (Fraser, 1999). Therefore, in order to make teaching reading effective, the role of instructing strategy use must be considered in lexical inferencing training. Teachers should teach students a variety of context clues. For example, it is important to teach how to use context clues at the phrase level (e.g., formulaic languages, collocations), sentence level, and the paragraph level. As proposed by Haynes (1993), learners are good at guessing meaning from the context clues that are near to the target words; however, they are not good at using the context clues that are not located next to the target words.

In Folse's (2004b) study, he proposed that a good reading lesson should focus on a specific context clue, e.g., opposites, descriptions, cause, effect, purpose, appositives, etc. Hence it is essential for the teacher to instruct the students how these and other context clues function when the clues are near the target word as well as when they are not near the target word. Although the use of context clues is definitely a good strategy to improve reading, we should recognize that learners cannot simply rely on this compensation strategy for improving their vocabulary learning. Successful learners in the current study are more likely to write down their words in a notebook for later review. Therefore, instructing the learners to deliberately memorize the target word after successfully guessing the meaning from context is also important.

However, one thing that needs to be taken into consideration is that only the learners of a 3,000-3,900 vocabulary size were successful learners in lexical inferencing in the present study. Those learners succeeded in building a conceptual framework of inferring word meaning by using contextual clues surrounding target words. Most learners in the present study, for example, those with a vocabulary size of 1,000-1,900 words or 2,000-2,900 words, are less likely to go beyond the surface level meaning associated with the local context of a word. For some of them, they did not attempt to infer the word meaning from the context. This is also evident in Hu and Nassaji's (2014) descriptions of both more and less successful learners in lexical inferencing.
In addition, although learners of a 3,000-3,900 vocabulary size were successful in lexical inferencing, they presented relatively lower scores in recalling word form and meaning. Therefore, it is suggested that priority in teaching reading be focused on the depth of vocabulary knowledge, e.g., various productive usage of target words.

Based on the above findings, implications for effective teaching of reading in English can be drawn. First, learners should be encouraged to emphasize not only what strategy is useful for them but also know how to use the strategy appropriately and effectively. Second, for less

successful learners in lexical inferencing, a substantial number of basic words should be taught. In addition, learners should not only focus on the word form, but also be able to understand the usage productively. A final implication to be drawn from the present study is that learners should be taught how to monitor their strategy use. Teachers should provide opportunities for learners to explore different inferential strategies, and evaluate their success when reading.

Limitations and directions for future studies

The present study supports the findings of previous research that learners need a large vocabulary size in order to be able to infer the meaning of unknown words (Hatami & Tavakoli, 2012; Laufer, 1997). Learners using lexical inferencing strategies more frequently showed a better performance in guessing word meaning (Hu & Nassaji, 2014; Nassaji, 2004). However, the contextual factor and frequency of word exposures were not taken into account (Teng, 2014b; Webb, 2008). Learners might produce higher scores in words occurring in a more informative context than words occurring in a less informative context. Likewise, learners might produce higher scores for the words that occurred more frequently. Further research addressing the two issues is necessary. Another limitation is the limited number of participants, as we could not find learners that were more proficient to join the study. However, language proficiency is multifaceted, thus it is essential to investigate further the relationship between the different components of language proficiency and lexical inferencing, for which more learners with a larger vocabulary size, e.g., over 5,000 are needed. The third limitation is that the present study only covered the issue of breadth of vocabulary knowledge. Further research on the depth of vocabulary knowledge is essential because the depth of vocabulary is also a significant predictor in lexical inferencing (Nassaji, 2004; Qian, 1999). More tests for measuring different dimensions of vocabulary are also suggested, because knowing a word does not only mean knowing the form and meaning (Nation, 2001).

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Appendix A

Directions: Please read the following story and try to understand it as much as possible.

The 1906 Earthquake

Once in a while, something happens that changes many lives.

The date was April 18, 1906. It was very early in the morning. San Francisco was very quiet. Some **bakers** were just opening their shops. But most people were still in bed. 1

Then, at 5:12 A.M., the ground began to shake hard. The earthquake lasted for a while. When it was over, much of the city had been destroyed. 2

The huge earthquake did great damage. It ripped apart brick buildings. It broke houses into **splinters**. It pulled pipes and steel rails from the ground. It made bridges crack and fall. Many people were hurt. 3

When the shaking stopped, people came out into the streets. Many were shocked at what they saw. Soon, they heard cries for help. People trapped in **dilapidated** buildings were calling out. Those outside tried to rescue them. 4

Then people noticed the smoke. Fires were breaking out all over the city. The electricity was **stagnated** due to the earthquake. It had caused gas pipes to **explode**. To make things worse, the city's fire alarms were not working. The earthquake had **demolished** them, too. 5

Still, firefighters did their best. All over the city, they **hitched** horses to the fire wagons. They got to many of the fires. They attached their hoses to fire **hydrants**. No water came out! Most of the city's water pipes were broken. With no water to stop them, the fires spread quickly. 6

The police and the army tried another way to stop the fires. They used **dynamite**. They blew up buildings close to the fires. Big spaces appeared where buildings once stood. They hoped these spaces would stop the fires from spreading. The plan didn't work very well. 7

The fires burned for three days. Finally, most of the fires just burned out. They burned until there was nothing left to burn. 8

The city was in ruins. City hall was destroyed. Hotels, libraries, restaurants, and theaters were gone. Dozens of churches and schools were in **ashes**. The whole downtown area was destroyed. More than 250,000 homes were lost. 9

Homeless people walked to the streets. They carried what they owned with them. Many people went up into the hills. 10

City workers got busy right away. They tried to get help for the city and its people. People without homes needed places to stay. Injured people needed care. Almost everyone needed food and water. 11

News of the earthquake spread quickly outside the city. Many other cities sent help. Trains came from around the country. Food, clothes, and other needed things were carried. The government voted to give the city $2.5 million. Money also came from many other countries. 12

At first, life was very hard. People camped out in the parks. Little by little, the people of the city cleaned up. People began to rebuild. The city was on its way back. 13

For some, life returned to normal. For others, life would never be the same. They would always remember 5:12 A.M. on April 18, 1906. 14

Appendix B

Questionnaire

Name ____ age ____ experiences of studying abroad ____ (yes/no)

When you encounter unknown words while reading, …

1. Do the new words make you stop reading?
   a. always b. sometimes c. seldom d. never
2. Do you skip and continue further reading?
   a. always b. sometimes c. seldom d. never
3. Do you guess the meaning according to the context?
   a. always b. sometimes c. seldom d. never
4. Do you stop to check the dictionary immediately?
   a. always b. sometimes c. seldom d. never
5. Do you use a dictionary to locate the meaning?
   a. always b. sometimes c. seldom d. never
6. Do you make a note of the unknown words during reading?
   a. always b. sometimes c. seldom d. never
7. Do you consult your teachers?
   a. always b. sometimes c. seldom d. never
8. Do you consult your classmates?
   a. always b. sometimes c. seldom d. never
9. Do you like to refer to the previous reading when encountering the same words?
   a. always b. sometimes c. seldom d. never
10. Do you prepare a notebook to write down the new words for later review?
    a. always b. sometimes c. seldom d. never

Appendix C

Examples of the four dependent measures (2 out of 10 items).

Part I Recall of forms

Directions: You will hear each target word spoken by the teacher TWICE and have TEN seconds to correctly write the item down.

1. _____ 2. _____

Part II Form recognition

Directions: On this test, the correct spelling of each target word was presented along with three distracters. Please choose the correct word.

1. a. bager b. baker c. bakar d. bakker
2. a. Splinter b. sblinter c. splinder d. slinter

Part III Recall of meaning

Directions: Translate or define the key word in Chinese

1. BAKER Some bakers were just opening their shops.

Meaning:

2. SPLINTER It broke houses into splinters.

Meaning:

Part IV Recognition of meaning

Directions: Circle the letter a-d with the closest meaning to the key word in the given sentence.

1. BAKER Some bakers were just opening their shops.
   a. a building
   b. a person who repairs
   c. a shop
   d. a person who bakes
2. SPLINTER It broke houses into splinters.
   a. thin, sharp thing
   b. a disagreement
   c. pieces
   d. sound