

# A study of L2 incidental vocabulary acquisition through different translation tasks

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**Abstract.** To date, most studies have focused on IVA through reading, speaking and listening, with few research on the function of translation tasks. This study investigates the effectiveness of different translation tasks on college student L2 IVA and retention. 60 Chinese College students taking English as L2, were divided into 2 parallel groups, finished different translation tasks (L1-L2 and L2-L1) respectively, and then underwent immediate and delayed vocabulary post-tests. The results showed that (1) both translation tasks facilitate learners' L2 IVA with L1-L2 translation task performing better; (2) L1-L2 translation task generates a higher level of productive vocabulary knowledge; (3) the IVA of both tasks decrease dramatically over time, and the advantage of L1-L2 in promoting higher level of vocabulary knowledge gradually vanishes. The findings enrich the scope of IVA study, verify the value of translation exercise on L2 IVA and provide useful and practical implications for IVA teaching and learning.

**Keywords:** Translation task, IVA and retention, Second language learning.

## 1 Introduction

Since firstly proposed by Nargy, Herman & Anderson<sup>1</sup>, incidental vocabulary acquisition (IVA) has been a hot topic in second language learning. As IVA has been defined as “learners acquire vocabulary as the by-product of any activity not geared to vocabulary learning”<sup>2</sup>, L2 IVA can be understood as the acquisition of new vocabulary in a second language (L2) that occurs incidentally, without explicit learning or memorization efforts. To date, most studies on L2 IVA have focused on the learning of vocabulary through reading from different perspectives, such as types of words, the use of glossing, exposure frequency. Besides, L2 IVA through listening also drew a lot of attention as young learners began to study more through internet and mobile network. At present, IVA through different kinds of media, such as TED talks, movies, soap operas and etc, has been gaining popularity as young learners were provided more channels of learning. Compared with the enthusiasm on L2 IVA through reading, listening and speaking, the studies on IVA in second language learning through translation remain scarce. This situation deteriorated with the emergency of CLT (Communicative Language Teaching) teaching approach in

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1970s, which advocated that communication should serve as the core of language teaching thus L1 should be ultimately avoided for enhancing learning environment. Despite the disfavor, some early researchers also tried to shift their attention to the field. Prince<sup>3</sup> and Grace<sup>4</sup> showed that vocabulary learning was more successful when translation was used in comparison to graphic illustrations, sentence samples, and other methods. Källkvists<sup>5</sup> illustrated that translation exercises encouraged comparisons between languages and allowed for more in-depth processing of target words, resulting in improved vocabulary retention. There were fewer studies on the comparison of different translation tasks. Kroll & Stewart's<sup>6</sup> experiment 3 in their study showed that the incidental recall following translation from L1 to L2 was better than that from L2 to L1 in that the first required concept mediation. Liu<sup>7</sup> and Qu<sup>9</sup> proved that superiority of L1-L2 translation task on vocabulary acquisition and retention by an empirical studies of first-year English majors and non-English major postgraduates. However, the results was quite different by Hummel<sup>8</sup>, whose experiment of intermediate level EFL learners proved that there was no significant difference in learners' recall of L2 target words between the L1-L2 translation group and the L2-L1 group.

Based on the discussions above, it could be seen the correlation of translation and L2, especially the comparison of different translation tasks, has been far from adequate exploration, even remained controversial. This study aims to investigate the influence of different translation tasks, namely, L1-L2 and L2-L1, on college student L2 IVA and its retention, and whether translation tasks in different directions generate their different levels of receptive and productive vocabulary knowledge. Specifically, it seeks to answer three questions:

- (1) Can translation tasks facilitate learners' L2 vocabulary?
- (2) Do different translation tasks, namely L1-L2 and L2-L1, generate different levels of IVA?
- (3) Which different translation task perform better in IVA and its retention?

## 2 Experiment method

### 2.1 Participants

The participants of the study were 60 college freshmen from an Engineer university of China. All of them were non-English majors but had studied English as a second language for over 8 years. So here, L1 and L2 refers to Chinese and English respectively. Based on previous studies, IVA occurs when learners have mastered a certain amount of words, but learners' vocabulary size should not be too large, in case it is difficult to choose target words in natural context<sup>9</sup>. The participants, who were required 3,500 English words in the college entrance examination, met this criteria. The 60 students were randomly divided into 2 experimental groups, 30 students each, based on their English scores in the College Entrance Exam and Nation's<sup>10</sup> Vocabulary Levels Test was employed to test their vocabulary size. The results showed no significant difference ( $T=1.479 < 1.96$ ,  $P=.847 > .05$ ). At the same time, another parallel group 3 of 30 students was chosen through the same procedure with the same level of language or vocabulary proficiency for pilot study.

### 2.2 Material and target words

The translation material was taken from lesson 44 *The Price on pollution*, in *New Concept English* Book 3. It was a narration about pollution influence on people's daily life. There factors were considered for decision before the selection: first, it is from authoritative

source in both Chinese and English versions, the Chinese version being used for L1-L2 translation tasks and English version for L2-L1 translation task; second, the content is relevant to learners' everyday lives without too much inference of background information; third, the length and level of difficulty is appropriate for the participants to finish at given time. According to Laufer <sup>11</sup>, successful incidental vocabulary acquisition required whole comprehension of the text and learners should be familiar with at least 95% words in the text. Here the English version had approximately 240 words, whereas the Chinese version around 400 Chinese characters, which could be finished within 40 minutes after pilot test by group 3.

The target words were determined by 2 pilot tests. In test 1, pilot group 3 read and wrote down the unfamiliar words in the chosen material and finally 14 English words were picked up. Then to ensure the 14 English words were new to the 2 experimental groups, the researcher prepared a PPT with the 14 picked words and another 36 words from Test for English Majors-Band 8. To distract students' attention, the 14 picked words were scattered in the middle of the PPT. In test 2, the 2 experimental groups watched the presentation of each word and told its meaning. Each word were shown to the students automatically for 2 second whether they can tell the meaning or not, in case students would memorize them or look up them after the test. It turned out among the 14 words, 4 words were recognized by some of the students. Therefore, the remaining 10 words were confirmed as the target words. Therefore, the density of the new words accounted for 4%, which was within 5%.

### 2.3 Procedures

**Table 1.** Procedures of the experiment.

Week	Procedure	Duration	Activity
Week 1	pre-test	20 min	To conduct vocabulary tests of the 3 groups for comparability
	Pilot test 1+2	20min+10min	To decide the target word (parallel group test+experimental groups test)
Week 2	Treatment	40 min	To assign each experimental group with one translation task
	Immediate post-test	10min	To test learners' immediate vocabulary test of target words
Week 4	Delayed post-test	10 min	To test learners' vocabulary retention of target words

The entire duration of the experiment spanned over a period of 4 weeks in the second semester of the students' first academic year as shown in Table 1. In week 1 and week 2, the participants and target words were decided. In Week 3, two translation tasks and the immediate post-test were organized. Before start, the researcher instructed all the participants that this was only a test of their translation skill but would contribute to a small portion of their overall semester scores to ensure their commitment to the tasks. Therefore, the participants were not aware of the real objective of the task to prevent deliberate memorization of the target words. Then the 2 experimental groups finished L1-L2 (Chinese to English) and L2-L2 (English to Chinese) translation task respectively within 40 minutes. The target words in the texts were highlighted in bold and glossed in the margin with their corresponding English or Chinese versions. When translating, students were required to use the given words. After the translation tasks, all the translation materials were collected, and the participants were given an unexpected immediate post-test to measure their initial

learning of target words. They were required to complete the test within 10 minutes. After 10 minutes, the teacher collected all the test papers.

One week later, a delayed post-test was conducted to measure the participants' memory of acquired vocabulary. They were asked to finish a vocabulary test in the same format as the immediate post-test, only with a change in the order of target words.

## 2.4 Instruments and scoring

**Table 2.** Sample of immediate and delayed vocabulary test.

Self-report choice
A. I have never seen this word before.
B. I have seen this word before, but I don't know what it means.
C. I know this word, it means _____ (synonym or translation)
D. I can make a sentence with this word: _____ (write a sentence).

(Cited from Qu, 2018)<sup>9</sup>

The instruments used here were a modified version of Wesche and Paribakht's<sup>12</sup> Vocabulary Knowledge Scale (VKS). It was adapted into 4-point scale of self-report items shown in Table 2. Choice A suggested that the word was completely unfamiliar. Choice B implied that the word may be familiar, but its meaning remained unknown, that was a partial understanding of the word. Choice C signified that learners had comprehended the meaning of the acquired word. Lastly, Choice D (Choice D) indicated that learners had grasped the uses of the word.

The scoring method was shown in Table 3. It should be noticed that if D was chosen with a grammatically correct sentence with the target word, 3 points would be rewarded, otherwise only 2 points would be given. Here if a grammatical error did not involve the target word but only other parts of the sentence, 3 points shall also be awarded. For example, 3 points would be given if a student wrote "The water contain pesticides". However, only 2 points would be counted for a sentence "The water contains many pesticide" or "The water contains much pesticide", because it showed the student was not clear that the target word "pesticide" is a countable noun.

**Table 3.** Scoring method of vocabulary test.

Choice	score	Score meaning
A →	0	I am totally unfamiliar with the words.
B → unclear.	1	I am familiar with its form but the meaning is unclear.
C → L1 synonym.	2	I can write down correctly its L2 translation or L1 synonym.
D →	3	I can make a sentence with it with grammar accuracy.

In addition to total scores, the score distribution of the four choices here were also collected. It can be seen B (word form) and C (word meaning) were measures of receptive knowledge of vocabulary, and D (word usage) is a measure of productive knowledge of vocabulary. Thus, the tests and scoring system reflected both the overall incidental vocabulary gain as well as the different levels of word knowledge.

### 3 Results and discussion

#### 3.1 Effects of different translation tasks on IVA

Tables 4 and 5 showed the results of the immediate and delayed post-tests for the two experimental groups. Firstly, it could be seen the mean scores of two translation groups in immediate pro-test were 22.5454, 19.5909, indicating both groups had acquired a certain amount of vocabulary in the immediate test, that was, translation tasks did facilitate IVA. Moreover, in both the immediate test ( $t=2.2874$ ,  $p=0.027$ ) and the delayed test ( $t=2.647$ ,  $p=0.009$ ), there was a significant difference ( $p<0.05$ ) between the two groups, with the L1-L2 group outperforming the L2-L1 group by a higher mean score ( $22.5454>19.5909$ ,  $19.9257>17.3042$ ). This indicated that the L1-L2 translation task performed better on generating IVA of L2 learners.

**Table 4.** Independent Samples T-test for immediate pro-test.

Group	N	Mean Score	Std.Deviation	T	P
L1-L2 Group(C-E)	30	22.5454	3.80		
L2-L1 Group(E-C)	30	19.5909	4.71	2.2874	0.027

**Table 5.** Independent Samples T-test for delayed pro-test.

Group	N	Mean Score	Std.Deviation	T	P
L1-L2 Group(C-E)	30	19.9257	3.78		
L2-L1 Group(E-C)	30	17.3042	3.05	2.647	0.009

Such findings was consistent with Theory of Depth of Processing and The Involvement Load Hypothesis, namely, that the more difficult translation direction resulted in better incidental learning of target words. The Theory of Depth of Processing focuses on the depth of processing involved in memory and posits that the more information that is processed, the longer a memory trace will last. The level of processing necessary for learners to finish the translation assignments in this study was notably varied. L2-L1 translation task took place at a comparatively shallow lexical level because the collation and syntactic of target L1 was relatively easy for learners to organize. However, L1-L2 translation task remained deeper and more demanding because it involved both unfamiliar words and L2 collocation and cohesive sentence structure challenge. Thus, deeper levels of initial processing of L1-L2 translation task led to the better memory and retention of the information. In the theory of Involvement Load Hypothesis, the ability to remember unfamiliar words depends on how much involvement is needed to process them. The involvement loads in different translation tasks can be investigated from lexical and conceptual levels. Kroll & Stewart once explained the question by stating “the lexical and conceptual links is bidirectional in bilingual memory, but they differ in strength as a result of the different proficiency of two languages and different processes of learning two languages”<sup>6</sup>. So it was easy to see here that the lexical association from L2 to L1 was stronger because L2 learners first acquired the meanings of new L2 words in the L2-L1 direction, whereas L1 -conceptual memory link was stronger because it developed from an early childhood. Therefore, students might use their L1 lexicon directly during the L2-L1(E-C) translation challenge. However, in the L1-L2(C-E) translation assignment, students firstly had to associate the L1 word with its concept before searching their L2 vocabulary for the appropriate L2 term. This extra concept mediation process increased the

underlying participation burden in the L1-L2(C-E) translation task, leading to improved incidental vocabulary learning.

### 3.2 Effects of different translation tasks on L2 IVA retention

**Table 6.** Paired samples T-test for 2 translation groups in immediate and delayed post-tests.

Group	Time	N	Mean Score	Std.Deviation	T	P
L1-L2 Group(C-E)	Immediate test	30	22.5454	3.80	2.86	.002
	Delayed test	30	19.9257	3.78		
L2-L1 Group(E-C)	Immediate test	30	19.5909	4.71	2.45	.001
	Delayed test	30	17.3042	3.05		

Table 6 showed the results of paired-samples t-tests for 2 translation groups in immediate and delayed post-tests. As can be seen from the table, in the delayed post-tests, participants recalled much fewer words. And furthermore, the P values, or probability of significance, were 0.002 and 0.001 for both groups, much smaller than 0.05, suggesting a significant difference between the immediate and post-test scores of the two groups. It could be concluded that the retention rate of the vocabulary in both experimental classes decreased to a greater extent after 1 week.

The target words' single appearance in the translated material could be one of the reasons for the decline. The necessity of target word repetition for IVA has been shown in numerous researches. Ellis<sup>13</sup> and Eckerth<sup>14</sup> once reported a significant relationship between vocabulary growth and high frequency new terms are encountered in task materials. However, in current study, learners only came across the target terms once through the translation assignments, which made it challenging for them to remember and retain the recently learned vocabulary. Another explanation could be that students forgot the relevant information because they did not use or come across the newly learned words following the instant post-test. According to the Ebbinghaus Forgetting Curve, practically all knowledge may be recalled immediately after learning, around 58% after twenty minutes, and approximately 25% after six days. Therefore, it was understandable that there was a noticeable decline in both translation assignments during the delayed vocabulary test after a week interval. The results showed that the acquisition of new vocabulary cannot be guaranteed if it is not reviewed and consolidated often.

### 3.3 Effects of different translation tasks on receptive & productive vocabulary knowledge acquisition

Table 7 showed the score distribution and P value of the 4 choices in immediate post-test. From descriptive analysis, it revealed that for L1-L2 translation group, the productive word knowledge(choice D) gain was 50.33%, higher than receptive word knowledge(choice B+C, 46%); while for L2-L1 translation group, the gain of receptive word knowledge(55.67%) was higher than productive word knowledge(37.66%). And also their P values were respectively .026 and .024(both < .05), suggesting a significant difference. Hence, it can be readily observed that the L1-L2 translation task resulted in a notably higher acquisition of productive vocabulary knowledge. Additionally, the L1-L2 translation task produced noticeably more receptive vocabulary knowledge. In all, the L1-L2 translation task proved more effective in acquiring a higher level of vocabulary knowledge.

**Table 7.** Score distribution and P value of the 4 choices in immediate post-test.

Self-report choice	L1-L2(C-E) group		L2-L1(E-C) group		Differences	
	frequency	percentage	frequency	percentage	U	P value
A	11	3.67%	20	6.67%	Null	Null
B+C	138	46%	167	55.67%	601.000	.026
D	151	50.33%	113	37.66%	578.000	.024
Total	300	100%	300	100%		

**Table 8.** Score distribution and P value of the 4 choices in delayed post-test.

Self-report choice	L1-L2(C-E) group		L2-L1(E-C) group		Differences	
	frequency	percentage	frequency	percentage	U	P value
A	16	5.33%	40	13.33%	Null	Null
B+C	175	58.33%	176	58.67%	775.000	.486
D	109	36.34%	84	28%	652.000	.074
Total	300	100%	300	100%		

Table 8 revealed the retention of receptive and productive vocabulary knowledge after one-week interval. It showed no great difference in retaining receptive word knowledge(58.33%, 58.67%). Concerning productive word knowledge, the L1-L2 group surpassed the L2-L1 group with a score of 36.34% compared to 28%. At the same time, the results of the 2 Independent Samples Mann-Whitney U test from inferential statistics implied no significant difference between the two groups(P=.486 and P=.074 respectively, both >.05).

Consequently, it can be inferred that there was no substantial disparity between the two translation tasks in retaining varying levels of vocabulary knowledge during the delayed pro-test. This implied that over time, the advantage of L1-L2 translation tasks in generating productive higher level of vocabulary knowledge gradually diminished.

## 4 Conclusion and implications

The study made a comparative study of different translation task influence, namely L1-L2 and L2-L1, on college student L2 IVA and retention, as well as the different levels of receptive and productive vocabulary knowledge. There were 3 major findings:(1) Both translation tasks can help with college learners' L2 IVA with L1-L2 translation task showing superiority in learners' overall vocabulary gains and retention; (2) L1-L2 translation task were more effective in generating higher level of productive vocabulary knowledge; (3) both groups' acquisition of words decreased dramatically with the passage of time, and the advantage of L1-L2 translation task in facilitating productive vocabulary knowledge gradually vanished. The findings provides both theoretical and pedagogical implications. Theoretically, it compares the effectiveness of different translation tasks, especially from the perspectives of productive vocabulary knowledge, enriching the study of correlation of translation and L2 IVA. The implications for L2 teachers to facilitate vocabulary acquisition are as follows. Firstly, as translation task is proved as a useful tool in second language vocabulary learning, L2 teachers can reasonably design translation tasks suitable for learners with topic of interest and relevant experiences to their life. The learners can then pay more attention to morphology and meaning of new L2 vocabulary in translation exercises, increase the probability of using words, and acquire desirable vocabulary knowledge, especially productive knowledge. Secondly, as have been discussed, because the memory of the acquired words decreased over time dramatically, it is crucial to



combine accidental and intentional vocabulary learning to enhance the memory trace of the new words and improve its recall. Thirdly, L2 teachers can employ sorts of activities to bring students' attention to target words in the process of translation exercises, and in this way, the reading times and involvement can also be enlarged. In the end, vocabulary tests and review can be organized in the next class after the translation exercise to facilitate target word retention.

The present findings verify the value of translation exercise, especially L1-L2 translation exercise in promoting non-English major college student L2 IVA and provide useful and practical implications for IVA teaching and learning. In the future, further exploration can be done with learner factor and target word factor taken into consideration. For example, the performance may be different among different levels of learners, such as college students and postgraduates, English majors and non-English majors; research design shall also be made to investigate whether different word types of target words generate different vocabulary gains.

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