

Do Translation Students Learn Vocabulary When They Translate?

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The study investigates whether translation students learn new vocabulary when translating texts from a second language (L2, English) into their native language (L1, Spanish). Despite the belief of many translation teachers and students that one learns vocabulary when translating, no empirical study has ever been conducted to investigate the validity of this assumption. In this study, 38 undergraduate Translation Studies majors at a Spanish university were given eight English-language texts to translate into Spanish in which 19 target words, assumed to be unfamiliar to the students prior to the study, appeared at different frequencies. Tests were administered immediately after completion of the translation tasks, and again six weeks later, to gauge the extent to which the students had learned the target words. Results obtained from the immediate and delayed tests show significant gains in passive vocabulary learning; however, delayed test results indicate no active vocabulary gains, even for the target words appearing most frequently in the texts. Possible causes of these poor results are the low level of deep processing present when translating from an L2 to an L1, and the lack of intentional learning on the students' part.

Keywords: translation students; vocabulary learning; active vocabulary; passive vocabulary; deep processing; intentional learning

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¿Aprenden vocabulario los estudiantes de traducción cuando traducen?

El estudio que se presenta investiga si el estudiante de traducción aprende vocabulario cuando realiza una traducción directa, es decir, desde una segunda lengua (inglés) a la lengua materna (español). No existe ningún estudio experimental que haya analizado si el traductor profesional o el estudiante de traducción aprende vocabulario cuando traduce, algo que con frecuencia se da por hecho entre profesores de traducción y estudiantes. Este estudio ofrece resultados sobre aprendizaje de vocabulario inglés por parte de 38 estudiantes de traducción tras traducir al español ocho textos escritos en inglés en los que aparecían de manera repetida 19 palabras desconocidas para ellos en distinto grado. Los resultados obtenidos tanto en el test inmediato como en el retrasado indican que traduciendo se producen ganancias significativas en el aprendizaje de vocabulario pasivo. Sin embargo, en el test retrasado no se producen ganancias de vocabulario activo, ni siquiera de palabras con las que se han tenido diez o más contactos en los textos. Se sugieren como causas de estos pobres resultados la ausencia de procesamiento profundo cuando se hace traducción directa y la ausencia de intención de aprender.

Palabras clave: estudiantes de traducción; aprendizaje de vocabulario; vocabulario activo; vocabulario pasivo; procesamiento profundo; aprendizaje intencionado.

1. INTRODUCTION

Despite the obvious importance of lexical knowledge for professional translators, it seems that many translation teachers and students simply assume that vocabulary learning occurs naturally when translating and, thus, the subject requires little direct attention in translator training programs. To the knowledge of the author, however, no empirical studies exist that test the truthfulness of this assumption. It is the aim of the present article, therefore, to shed light on the question of whether, and to what extent, vocabulary is learned when translating a written text from a second language (L₂) into a native language (L₁).

This is the specific perspective from which the term *translation* is used and discussed throughout the present article. The clarification of this term takes on great importance in relation to the coherence of the study when one considers the multiple contexts and perspectives from which it has traditionally been used, understood and studied. Some of these include (a) written and oral translation (interpretation); (b) translation of texts into L₁ and L₂; (c) translation of contextualized or decontextualized words or passages; (d) translation for learning purposes and translation for professional/communicative purposes; and (e) active translation for instructional purposes (the learner does the translation) and passive translation for instructional purposes (the learner receives the previously-completed translation for contrastive analysis).

It is surprising that given this plurality of contexts and perspectives, each with its distinct emphasis on different elements and manners of translating, authors have not felt the need to more clearly position themselves and the term when writing about translation. As a result, the literature reveals strikingly different characterizations of translation. For instance, O'Malley and Chamot equate the strategy of translation for language learning with that of repetition, both of which they describe as activities “that require little conceptual processing” (1990: 120-21). Hummel, on the other hand, expresses amazement with this analysis and asserts that “translation does in fact require access to a conceptual level, particularly when linguistic units beyond single words are translated” (2010: 62). The question arises here of whether the authors are indeed speaking about the same thing when they talk about *translation*.

2. LITERATURE REVIEW

Relationships between vocabulary and translation have always existed in second language teaching, ranging from the Grammar Translation Method to more recent proposals for the use of translation as an explicit form of vocabulary instruction in a communicative framework. Versions of these latter proposals include Focus on Form —explicit teaching of linguistic features *within* a communicative task environment (Nation 2001; Laufer 2005; Webb 2007; Laufer and Girsai 2008), and Focus on FormS —explicit teaching of linguistic features *outside of* a communicative task environment (Nation 2001; Laufer 2006, 2010; Agustín-Llach 2009).

The use of translation as a resource for teaching and learning has generally adopted three basic forms: (a) translation of the equivalent in the L1 of a word from an L2 input (e.g., glosses), (b) lists of associated word pairs, and (c) translation from an L2 to an L1 or vice versa of sentences or texts in which particular L2 elements (in this case, lexical) are targeted for learning. While a great deal of scholarly work exists regarding the efficiency of the first two forms, much less has been written about the third (the closest to the focus of the present article). What follows is a brief examination of the efficiency of these three different learning and instructional techniques.

With regard to the first, a significant number of studies (e.g., Nation 1982; Hulstijn, Hollander and Greidanus 1996; Lotto and de Groot 1998) have demonstrated that language learners, particularly at beginner level, understand a particular received input (generally written) and retain new vocabulary present in that input better when a translation of the new vocabulary, or sentences (Grace 1998) containing the new vocabulary, are provided. Nevertheless, the size of these vocabulary gains has been shown to be relatively small (Hulstijn 1992; Nation 2001; Laufer 2003; Schmitt 2010).

The second method, focusing on the use of associated word pairs in lists or flash cards, has always had its share of critics, who highlight the importance of context for word retention and productive learning.

That said, several studies have demonstrated the efficiency of associated word pair techniques for initial lexical learning (Thorndike 1908; Crothers and Suppes 1967). This efficiency, furthermore, has been shown to be greater than that of other techniques including incidental learning (Prince 1996; Laufer and Shmueli 1997; Waring 1997, 2001), particularly when learners possess a low level in the L2 (Cohen and Aphek 1981; Prince 1996). While it is often advised that vocabulary words be contextualized, at least within sentences, in order to increase learning efficiency, results of studies aimed at supporting this intuitive position have been inconclusive (Nation 2001: 309; Webb 2007). Nation summarizes his vision of language learning techniques using associated word cards when he writes, “The strength of learning from word cards is that it is focused, efficient and certain” (2001: 300).

As such, the translation of decontextualized sentences, be it from an L2 to an L1 or vice versa, was used as a language learning technique in many parts of the world (Richards and Rodgers 1985: 5). The technique, having received support from some experts in psycholinguistics (Prince 1996), has nevertheless failed to win over experts of second language acquisition, particularly those who ground L2 acquisition in the L2 input received by the learner (Krashen 1989, 2004). Despite this, the general shortage of empirical research on such a central and controversial issue is striking. That said, two recent contributions stand out and merit further discussion.

In Laufer and Girsai (2008), the effectiveness of three different instructional conditions —meaning focused instruction, non-contrastive form-focused instruction, and contrastive analysis and translation— on the learning of L2 English vocabulary was tested using 75 Hebrew-speakers aged 15 to 16. In the data collected from tests

administered to the subjects directly after and one week following the completion of the learning tasks, the best results were obtained by students taught by the contrastive analysis and translation method, while meaning focused instruction produced the weakest results.

In a study by Hummel (2010), 191 French university students with an intermediate level of English were tested on their learning of 15 English-language words following translation activities using texts in which the words appeared. For the translation tasks, Hummel divided the students into three groups with the first performing translations of the texts from English to French, the second translating from French to English, and the third copying the French texts and their English equivalents. From a single test administered upon completion of the different tasks and to the surprise of the author, students from the copy group were found to have achieved significantly better results than those from the two translation groups. Another intriguing finding was that results attained by the group translating from French (L1) into English (L2) were not significantly better than those for the group translating from English into French.

In light of these findings, it is important to note that in the literature relating lexical learning and the use of translation in one of its many forms, the latter has been shown to be an effective tool for the former when intentional learning is present. This has been the case both for associated word pairs (Thorndike 1908; Crothers and Suppes 1967; Cohen and Aphek 1981; Prince 1996; Laufer and Shmueli 1997; Waring 1997, 2001) and for contrastive analysis and translation (Laufer and Girsai 2008).

When a student possesses a clear intention to learn, the degree to which vocabulary is acquired, through the application of any one of a number of diverse techniques, is often very high (Prince 1996; Hulstijn 2003; Laufer 2005; Schmitt 2008), at times surpassing 70% (Nation 2001: 297-99; Laufer 2005).

Furthermore, over the last few decades cognitive psychologists (Craik 1977, 2002; Craik and Lockhart 1972; Craik and Tulving 1975; Jacoby and Craik 1979; Eysenck 1982; Anderson 1990) have indicated that the durability of memory traces depends in large part on the depth of processing or the degree of analysis of learnable linguistic elements, to which Baddeley added the importance of repetition (1997: 123). Elements highlighted in the literature as important with respect to information processing for the learning and retention of L2 features (Schmidt 1990; Norris and Ortega 2000; DeKeyser 1998, 2003; Ellis 2001) and, more specifically, L2 vocabulary (Ellis 1994; Paribakht and Wesche 1997; Paribakht 1999; Nation 2001; Hill and Laufer 2003; Hulstijn 2005; Laufer 2005, 2006; Pellicer and Schmitt 2010) include the degree of consciousness raising and noticing through attention to form, suggesting that intentional learning and deep processing may be two decisive factors in vocabulary learning and, particularly, for the active recall of vocabulary.

When intentional learning is not present, such as in cases of translations of texts from L1 to L2 or vice versa (Hummel 2010) or in reading for meaning glosses (Hulstijn 1992; Nation 2001), vocabulary learning results have been much poorer.

3. THE STUDY

3.1. Research questions

The present study was designed to provide answers for the following questions:

Question 1: Is there a significant difference between the number of target words test subjects recognize in the immediate passive knowledge test and the number of target words recognized in the passive knowledge pretest?

Question 2: Is there a significant difference between the number of target words test subjects recognize in the delayed passive knowledge test and the number of target words recognized in the passive knowledge pretest?

Question 3: Is there a significant difference between the number of target words test subjects remember in the delayed active knowledge test and the number of target words recognized in the passive knowledge pretest?

With each of the questions, two additional sub-questions were also considered; namely, are results significantly different (a) if only a subset of target words with which subjects had 10 or more contacts is considered and (b) if only a subset of target words with which subjects had less than 10 contacts is considered?

3.2. Study participants

Participants for the study were selected from second and third-year undergraduate translation and interpreting majors at a Spanish university. While the study initially included 54 subjects, only 38 fully completed the three different stages comprising the study, namely, (a) regular translation of specific texts (b) regular classroom attendance, and (c) completion of the four diagnostic tests administered by the study author. Results obtained for the remaining 16 students were discarded and are not reported here.

The 38 participants were native speakers of Spanish, and studied English as a foreign language at an upper-intermediate level (i.e., roughly B2+/C1 within the *Common European Framework of Reference for Languages*). All of the participants also studied French or German as a foreign language subject. Permission was received from students prior to the commencement of the study and general information regarding the study and its aims was given to the students on a need-to-know basis.

3.3. Text translation and correction stages

The first two stages of the study consisted of the translation into Spanish of eight English-language texts and the subsequent in-class correction and discussion of each translated text. In total, the two stages were completed in four weeks. The texts, slightly modified to increase the number of times the 19 target words appeared, were each approximately 400 words in length and of varied types (a sports article, a description of a vacation, an article on fitness and food, an accident report, a crime report, etc.). According to the results of a pretest administered prior to the translation of the different texts, only an approximate 2.5% of the total words from the texts were previously unknown to the test subjects, thus allowing for a quite fluent reading of the texts by the students (Hirsh and Nation 1992;

Laufer 1992; Nation 2006). For the purposes of the study, distinct derivations of a word (e.g., *assess* and *assessment*) were treated as a single word (Hirsh and Nation 1992: 692). All target words were lexical words and none were Spanish-English cognates.

From the outset, the author was conscious of the fact that, prior to the translation stage, some subjects would likely be familiar, with some of the target words appearing in the texts. Nevertheless, all 19 words were maintained without change due to the fact that the selection of a corpus of target words completely unknown to each of the students would have at times required convoluted textual modifications.

While the frequency with which one has contact with a specific word is understood to be an important factor for the learning of that word (Saragi, Nation and Meister 1978; Elley and Magubhai 1983; Nagy, Herman and Anderson 1985), the number of contacts necessary for word retention has been a topic of great debate. Recently, various studies have situated this retention threshold at around eight or ten contacts (Horst, Cobb and Meara 1998; Pigada and Schmitt 2006; Pellicer and Schmitt 2010). In the present study, target words were classified into two subsets: one comprising words with which subjects had ten or more contacts (nine target words) and another for words with less than ten contacts (ten target words). Since students had contact with the texts and the target words appearing therein on two different occasions —once while translating, and once while correcting and discussing their translations— the number of contacts per target word was calculated as twice the number of times the word appeared in the texts, as shown in Table 1.

Table 1. The 19 Target Words in the Study

TARGET WORDS	NUMBER OF APPEARANCES IN EACH OF THE EIGHT TEXTS (including derivations)								CONTACTS (Translation & correction)
	T1	T2	T3	T4	T5	T6	T7	T8	
<i>Assess</i>	1	1					1		3 (6)
<i>Aware</i>	1				1	2			4 (8)
<i>Choke</i>		3			2	1			6 (12)
<i>Crave</i>	2		1	3	2		2	2	12 (24)
<i>Crush</i>						3	1		4 (8)
<i>Daunt</i>		1		1		1		2	5 (10)
<i>Haunt</i>			2		1	1	1	2	7 (14)
<i>Hint</i>						1			1 (2)
<i>Humble</i>		1							1 (2)
<i>Issue</i>			6						6 (12)
<i>Mesmerize</i>			2						2 (4)
<i>Mug</i>	1							1	2 (4)
<i>Peer</i>			3						3 (6)
<i>Rate</i>			1						1 (2)
<i>Shatter</i>	1	2		1				1	5 (10)
<i>Stroll</i>	1	1		1				2	5 (10)
<i>Untoward</i>	1	1	1		2		1		6 (12)
<i>Utterly</i>		1			1				2 (4)
<i>Wistful</i>	1		2			1	1		5 (10)

3.4 Testing Stage

During the course of the study, four tests were administered to the subjects: a passive knowledge pretest, an immediate passive knowledge test, a delayed active knowledge test, and a delayed passive knowledge test. The terms *active knowledge* and *passive knowledge*, used here in the manner employed by Nation (2001), denote, in the former case, the knowledge necessary to provide the equivalent of a word (generally given in an L1) in an L2 and, in the latter case, the knowledge necessary to provide the meaning (generally in the L1) of the L2 word. While this distinction has some debatable aspects (Meara 1990; Nation 2001: 24-25), its basic features have nevertheless received general acceptance (Laufer 1998; Nation 2001).

Each of the three passive tests contained 19 decontextualized sentences with a missing word denoted by a blank and corresponding to one of the 19 target words from the study. Tests were presented in multiple-choice format with four different words to choose from, one of which being the corresponding target word (Read 2007: 106). An example is offered below:

I had a _____ on the violin prodigy.

a. shatter b. fount c. leash d. crush

The aim of the pretest was to determine how many of the target words study participants could recognize prior to the translation and correction stages of the experiment. Immediately following completion of these two stages, a 4-week process, students completed the immediate passive test with the same structure and distracters as in the pretest. Six weeks after the completion of the two stages and the immediate passive test, students were given the delayed active test which required the 19 target words to be translated from Spanish (L1) into English (L2). To prevent the students from providing synonyms of the target words rather than the target words themselves, the first letter of each of the target words was given in the test as demonstrated below:

Anhelar, ansiar: c _____

Directly following the delayed active test, the delayed passive test was administered. The test order was thus to avoid the passive test exerting an effect on the active test had the order been reversed. Furthermore, and to avoid the answers from the recently completed active test providing clues, the three distracter words for the 4-option multiple-choice passive test all began with the same letter as the answer word. An example is provided below:

That meant the absolute security for which she had always _____ .

a. choked b. craved c. cropped d. cued

In the evaluation of the delayed active test, small spelling errors in the responses were not taken into account, save in cases where the error led to the production of a different word. Thus, while *assessment* was accepted for the target word *assessment*, *hunt* was not accepted for the target word *haunt*.

In each test, a correct answer was worth a point, resulting in a maximum possible score of 19 points per test. While the tests had no bearing on students' course grades, subjects were told that incorrect responses resulted in a one-point deduction to avoid random guessing. However, no points were actually deducted for incorrect answers in the study results.

3.5 Descriptive statistics

In all the Tables that follow, a distinction is made between results obtained for the total target word set (19 words), the high contact frequency target word subset (9 words) and the lower contact frequency target word subset (10 words). Table 2 presents the results from the pretest.

Table 2. Pretest Scores

WORDS	<i>n</i>	Average Number (Avg #) Correct Responses	Standard Deviation (SD)
Total Target Words	19	6.1	2.8
High Contact-Frequency Target Word Subset	9	2.8	1.7
Lower Contact-Frequency Target Word Subset	10	3.3	1.7

Table 3 details the number of learnable words (*i.e.*, those target words previously unknown to subjects) for each of the three word sets or subsets according to the results from the pretest. The number of learnable words was obtained by subtracting the average number of correct answers given on the pretest for each corresponding set or subset from *n* in each set or subset.

Table 3. Learnable Words

WORDS	<i>n</i>	Learnable words ($n - \text{average correct pretest responses}$)
Total Target Words	19	$19 - 6.1 = 12.9$
High Contact-Frequency Target Word Subset	9	$9 - 2.8 = 6.2$
Lower Contact-Frequency Target Word Subset	10	$10 - 3.3 = 6.7$

The average number of words learned for each word set or subset (see Tables 4-6) was calculated by subtracting the average number of correct responses on the pretest from the average number of correct responses for each distinct test.

Table 4. Immediate Passive Knowledge Test Scores

WORDS	Avg # Correct Responses	SD	Avg # Words Learned	% Words Learned
Total Target Words	12.7	3.4	$12.7 - 6.1 = 6.6$	51
High Contact-Frequency Target Word Subset	6.6	1.9	$6.6 - 2.8 = 3.8$	61
Lower Contact-Frequency Target Word Subset	6.1	1.9	$6.1 - 3.3 = 2.8$	42

Table 5. Delayed Active Knowledge Test Scores

WORDS	Avg # Correct Responses	SD	Avg # Learned Words	% Learned Words
Total Target Words	7.2	5.0	$7.2 - 6.1 = 1.1$	8
High Contact-Frequency Target Word Subset	3.7	2.8	$3.7 - 2.8 = 0.9$	14
Lower Contact-Frequency Target Word Subset	3.5	2.5	$3.5 - 3.3 = 0.2$	3

Table 6. Delayed Passive Knowledge Test Scores

WORDS	Avg # Correct Responses	SD	Avg # Learned Words	% Learned Words
Total Target Words	14.3	3.7	$14.3 - 6.1 = 8.2$	64
High Contact-Frequency Target Word Subset	7.3	2.1	$7.3 - 2.8 = 4.5$	73
Lower Contact-Frequency Target Word Subset	7.0	2.3	$7.0 - 3.3 = 3.7$	55

3.6. Responses to initial questions

Response to question 1: After applying a *t*-test to the data obtained from the pretest and the immediate passive test, it is clear that there is a significant difference between the results obtained in each. Furthermore, the significant difference is present for the set of total target words as well as for the two subsets of high and lower frequency contact words.

Response to question 2: Similarly, the application of a *t*-test indicates that there is a significant difference between the data obtained from the pretest and the delayed passive test, both for the set of total target words as well as for both target word subsets.

Response to question 3: Upon the application of a *t*-test to the data obtained from the pretest and the delayed active test, no significant difference is apparent between the two at either the total set level or the subset level.

4. DISCUSSION

Results from the immediate and delayed passive tests indicate considerable vocabulary gains, over 50% (see Tables 4 and 6). Nevertheless, the question of where the limit should be drawn between learning and what can be considered *efficient* learning is not so clear-

cut. Statistically significant learning can, of course, be objectively demonstrated with empirical data; however, for the further characterization of that learning as efficient, the resources and time employed in order to bring about that learning must be considered, a process with a significant degree of subjectivity. For instance, in a meta-analysis of studies of incidental acquisition of L1 vocabulary through reading tasks, Swanborn and Gloppe (1999) calculated the probability of lexical learning at 15%, a figure considered satisfactory by some authors. In another article, Horst (2005) presented data from studies of incidental L2 vocabulary acquisition through reading tasks. In eight of the nine studies analyzed, vocabulary gains oscillated between 7% and 28%, results also judged to be satisfactory.

In the present study, better results were obtained by students in the delayed passive test than in the immediate passive test with respect to the total target word set as well as the two target word subsets. At first glance, this may seem surprising given that—in agreement with what is known about the functioning of the memory (James 1990)—the results achieved on immediate tests are usually stronger than those of delayed tests. The cause of this anomaly can be explained by the fact that some students might have studied the words perhaps out of pure academic interest or perhaps in preparation for the course final exam, which requires a translation without the use of a dictionary. Nevertheless, the time employed to study new vocabulary was apparently not sufficient for the retention of the target vocabulary as active knowledge, given that the number of questions answered correctly in the delayed active test was not significantly greater than in the pretest, not even for the subset of target words with a high contact frequency. In other words, test subjects were unable to actively recall target words that they had translated—in one case, more than ten times—only a few weeks earlier.

This difference between active and passive knowledge test results is common in the literature (Laufer 1998, 2010; Webb 2005; Brown, Waring and Donkaewbua 2008; Laufer and Girsai 2008). Intuitively, it seems understandable that subjects would score higher on tests examining passive knowledge through the recognition of a word or definition from among various options, than on tests examining active knowledge through the production of an L2 word through the translation of a text in an L1 (Stoddard 1929; Waring 1997).

As stated earlier, intentional learning and deep processing may be two decisive factors in vocabulary learning and, particularly, for the active recall of vocabulary. Generally, translators—whether professionals or students—do not count vocabulary learning among their principal objectives when translating. In fact, vocabulary learning does not appear as an objective or strategy in process-oriented translation studies, often based on think-aloud protocols (TAP) (Krings 1986; Kussmaul and Tirkkonen-Condit 1995; Bernardini 2001: 258; Breedveld 2002a, 2002b; Presas Corbella 2003). Intentional learning of vocabulary, therefore, rarely forms part of the translation process.

It could also be hypothesized that linguistic processing may not occur on a particularly deep level when translating. In translation studies, professional translation of a text from an L2 (i.e., source language [SL]) to an L1 (i.e., target language [TL]) is understood as a

three-phase process —pre-writing, writing and post-writing— (Jääskeläinen 1999; Krings 2001; Mossop 2001) where the first two are necessary and the third is optional. While many different strategies exist for the successful completion of each phase (Englund Dimitrova 2005: 242), each phase in fact has certain common defining characteristics.

In the pre-writing phase, a translator needs to understand the source text (ST) and, for that purpose usually makes use of a dictionary whenever the meaning of a particular word is uncertain. Having knowledge of a word in an ST is to (a) understand its function in the context, and (b) be able to attribute a meaning to it in the target language (TL). When the word is found in the dictionary and its specific function in the ST is understood, the translator's specific interest in the word itself disappears, particularly in the case where a clear semantic equivalent in the TL has been found. The translator may, therefore, successfully complete the pre-writing phase without the need for deep processing of the ST or its particular elements in the SL (Königs 1986; Krings 1986).

In the writing phase, the translator reformulates the message of the ST and attempts to produce its equivalent in the future target text (TT). At this point, most translators' energies are probably focused on the TT, and consequently, on the TL, rather than on the SL (Presas Corbella 2003: 41-42). The meaning and function of the previously unknown ST word may be expressed in the TT through a lexical equivalent, various words or may be spread out throughout the length of the sentence. Regardless of the final selection, however, what is important to understand is that the writing phase occurs in the TL, i.e., the translator's L1 (Königs 1986, Königs and Kauffmann 1996: 14), with the translator focused on the best way to express the meaning of the ST in the TL. The word from the ST is neither analyzed nor developed any further and, given that the translator most likely has a dictionary or another reference work at hand, s/he may safely let the word fade from their memory. In the post-writing phase, the translator evaluates the TT produced and any weaknesses identified are generally reformulated in terms of the TL rather than the SL (Englund Dimitrova 2005: 237).

Furthermore, it has been suggested that translators read texts differently from 'normal readers'. Motivated from the beginning by the intention to translate (Reiss and Vermeer 1984: 72), translators approach an ST already thinking about the TT to be produced. Thus, the translator may dedicate less processing to an unknown word than the normal reader, since the latter may choose to develop a further understanding of the word using context-dependent conjectures, something not generally permitted to the translator who is bound to the production of a precise equivalent for the word in the TT.

The translation of text from an L2 to an L1, therefore, may not require deep processing of the L2 (i.e., the SL), particularly when unknown words have a direct equivalent in the L1 (i.e., the TL) allowing for their immediate translation without the necessity for deeper examination.

It is possible, then, that in Laufer and Girsai's 2008 study (see section 2 above), the superior learning results obtained by the contrastive analysis and translation group may not have been due to the translation of text from English into Hebrew. In the study,

students in this particular group completed three different tasks: contrastive analysis, English-to-Hebrew translation, and Hebrew-to-English translation. While it is clear that, taken together, the three tasks fulfill the conditions established for vocabulary learning —noticing, pushed output, and task-induced involvement load (Laufer and Hulstijn 2001)— it is nevertheless possible that the heavy lifting was done by the contrastive analysis —particularly appropriate for noticing— and the Hebrew-to-English translation, rather than by the English-to-Hebrew translation.

In Hummel's study (2010), various possible causes are proposed to explain the poor results obtained by the translation groups relative to the copying group. In one such explanation, the cognitive workload involved in the translation process was hypothesized as having occupied the energy of the subjects, preventing them from memorizing the vocabulary —a hypothesis completely opposing others emphasizing the importance of the processing load for vocabulary retention (Coady 1997; Hulstijn and Laufer 2001; Laufer and Hulstijn 2001; Horst 2005; Peters, Hulstijn, Sercu and Lutjeharms 2009). Hummel also suggests that subjects from the two translation groups —immersed in their translation tasks— had less intention to learn new vocabulary than subjects from the copy group who could afford to dedicate more time and attention to the memorization of the new vocabulary.

It is possible, therefore, to explain the results presented by Laufer and Girsai (2008) as having arisen due to the intentional learning implied by contrastive analysis and to the fact that a certain degree of deep processing may be required by the translation of text from an L1 into an L2. In Hummel (2010), on the other hand, while L1 to L2 translation tasks may have required some deep processing, intentional learning was absent. In the L2 to L1 translation tasks, neither intentional learning nor deep processing was present.

To the extent that intentional learning and deep processing are considered key factors for vocabulary retention, the results of the present study are compatible with those of Laufer and Girsai (2008), and Hummel (2010). Although the vocabulary gains indicated by passive tests were significant, the lack of significant active vocabulary acquisition — even for target words with which students had the greatest number of contacts— raises serious questions about the robustness of the students' vocabulary learning.

5. LIMITATIONS AND FUTURE RESEARCH

As regards potential shortcomings of this study, one may be the generalizability of the results obtained. Simply stated, the degree of post-translation vocabulary learning recorded here for the English (L2)-Spanish (L1) language pair may not necessarily be generalizable to all other possible language pairs.

With respect to the study methodology, one potential shortcoming may be the lack of verification of whether any students had attempted to memorize the target words from the texts. However, the poor vocabulary learning results recorded for students in the delayed active test suggest that this is a rather remote possibility.

That said, a potential shortcoming of greater significance for the conclusions reached here may be found in the number of times study participants were said to have processed unknown words, as well as the depth at which such processing occurred. The present study starts from the assumption that students perform some degree of processing of an L2 term each time it is encountered. Thus, each term was considered to have been processed two times, that is, once when encountered during the translation of the text and another time when encountered during the correction of the translated text. Nevertheless, it is conceivable, for instance, that a particular term could be the object of a student's extended reflection, beginning at the very moment in which it is first encountered.

In future research on the topic, it is advisable to steer experimental data collection methods away from any sort of student evaluation which results in an academic grade. Insofar as a student is conscious of the fact that any part of a translated text or the unknown words appearing therein could be the object of graded testing, the student may make a concerted effort to memorize these, effectively undermining the study objectives.

6. CONCLUSIONS

If one agrees that lexical knowledge is a crucial element for the comprehension of a text (Nation and Coady 1988; Laufer 1992; Nation 2001) and that vocabulary constitutes “the real intrinsic difficulty of learning a foreign language” (Sweet 1900: 66), the necessity of paying specific attention to vocabulary acquisition in translator training programs becomes clear. Nevertheless, two factors have traditionally thwarted the practical application of this conclusion: (1) the fact that a translator may always turn to a dictionary to resolve a lexical doubt and (2) the belief that the mere act of translating results in vocabulary learning. With regard to the former, dictionary searches are time-consuming and, thus, excessive dictionary use becomes antagonistic to efficient professional translation activity. Concerning the latter, it has been hypothesized here that the act of translating a text from an L2 to an L1 lacks two factors —sufficient intentional learning and deep processing— necessary for vocabulary retention. Given that the professional translator requires wide lexical knowledge when translating and that this knowledge cannot always be attained from professional practice, it may be concluded that more specific attention should be paid to vocabulary learning in translator training programs.

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