The Effect of Non-English Cognates on L3 Vocabulary Learning: Depth of Processing and Vocabulary Learning

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Literature Review

Understanding how learners can most effectively store a new word in their memory is important for both teachers and researchers because memory is a key factor in vocabulary learning. One important aspect of memory retention is depth of processing, a concept introduced in Craik and Lockhart’s (1972) landmark paper. They argued that long-term memory is not as much affected by the amount of time a piece of new information is stored in short-term memory, as it is by the degree of depth (or shallowness) with which it is initially processed. According to Craik and Lockhart (1972), there are multiple levels of processing depth. For example, processing the phonological form of a new word is shallow, whereas processing the meaning of the word is far deeper. Depth of processing theory has been used by many researchers, though it is important to note that there are no operational definitions determining clearly which level is deeper than another, and as such should be regarded as a framework for further research (Lockhart and Craik, 1978).

Hulstijn and Laufer (2001) developed a study to delve into the question of whether, based on the idea of depth of processing, “instructional tasks can be classified in terms of their vocabulary learning effectiveness” (p. 540). In their study, they had three treatments (which they call learning tasks). These tasks were, in order from the least amount of depth of processing to the most: reading comprehension, comprehension plus filling in target words, and composition-writing with target words. The researchers used 10 unfamiliar words and tested both short- and long-term retention. As hypothesized, Hulstijn and Laufer (2001) found that, for their subjects, the long-term retention of the words was highest in the composition task and lowest in the reading only task.
Though Hulstijn and Laufer (2001) tested depth of processing in a receptive (reading) versus productive (writing) context, our study uses Craik and Lockhart’s (1972) original idea when learners have access to more lexical meaning of a word, and therefore a deeper level of processing and, there will be a greater chance of the word being stored in long-term memory.

Therefore, in our study, we established three levels of processing. For our shallowest level of processing, Treatment 1, we elected to use a picture of each target word. We had two main reasons for this: first, Nation (2001) states that “showing pictures or diagrams” is a common way of communicating the meaning of a lexical item. Secondly, Nation (1978; 2001) also points out that, although pictures are often seen “as the most valid way of communicating the meaning of a word,” this way is “indirect” and therefore “likely to be misinterpreted” (p. 85). Our study, therefore, used this popular mode of vocabulary presentation as its most shallow treatment.

Our middle level of processing, Treatment 2 (direct L1 translation), was chosen because “translation has the advantages of being quick, simple, and easily understood” (Nation, 2001, p. 86). In addition, Paivio and Desrochers (1981) point out that in the case of direct translation, dual encoding occurs. This means the lexical item is stored in two modes—linguistically and visually—unlike the treatment just using pictures. We hypothesize that learners who see both a picture and a direct L1 translation will be more likely to remember the vocabulary word, due to this dual encoding.

For our deepest level of processing, Treatment 3, we decided to look at cognates in trilingual speakers. Cognates, or words that “have common etymological roots and similar forms of meaning” (Dressler, Carlo, Snow, August, & White, 2011, p. 243), qualify as a deep level of processing because they allow for the learner to grasp the meaning of the word through L1 or L2
transfer. Previous studies have shown that L1-L2 cognates can facilitate vocabulary learning (Chen, Ramirez, Luo, Geva & Ku, 2012; Kelly & Kohnert, 2012). However, little work has been done on L2-L3 cognates. Our study allowed Spanish learners to access L2 vocabulary knowledge and transfer it to the French target language. Studies have shown that, “In the case of relatively closely related languages”, such as Spanish and French, oral proficiency and literacy in one language can be used to facilitate literacy development in the target language (Dressler, et al., 2011, p. 243). Similarly, Nation (2001) explains that “making the form-meaning connection is easier if roughly the same form in the first language relates to roughly the same meaning” (p. 48), as is the case with cognates. As Nation (2001) describes, the presence of cognates and loan words between two languages makes learning much easier.

**Hypothesis**

Because of the link between cognates and vocabulary learning, our hypothesis is the following:

Students who compare new words to cognates in a third language (not English) will have higher delayed post test scores than students who only study words with their English equivalents.

**Subjects**

This study took place in a basic French language classroom. This class is intended to be the students’ first time learning French. However, in the group of ten students who participated in this study, one student who was not a true beginner. As will be shown, their results on the immediate posttest and delayed posttest suggest that this student already knew the target words before the study started, and for this reason, their results were thrown out.
Ten French students participated in this study, eight of which were native speakers of English. Six of the eight native English speakers claim that they know more Spanish than French. The other two native English speakers said that they have never studied Spanish. There were also two non-native English speakers who participated: one is a native speaker of Arabic, and the other is a native speaker of Portuguese. Both of these students have advanced English proficiency.

**Methodology**

This study took place at the beginning of a class period, before the planned instruction for the day took place. Before we started the vocabulary learning treatments, we explained a little about what we were doing and why we were doing it, without giving away any treatment information. Students were told not to talk to anyone during the teaching or the study period. They were also told that they would get some extra credit for participating and more points if they got one hundred percent on the immediate posttest. Two days later, when we administered the delayed posttest, we told students they would get more extra credit if they received fifty percent or higher on the test. These incentives were offered to increase student motivation on the two tests.

On the day of our language teaching, we started by presenting each of our target words to the students. Initially, the students watched a PowerPoint presentation containing each of the words. Each slide had the target word in French and an image that corresponded with the word’s meaning. Students were given ten seconds to look at each slide and the teacher said the word in French one time while the target word was visible. These statements gave students another source of input.
After this initial exposure, students were given study sheets (See Appendix A). These sheets corresponded with their individual treatment groups, meaning Treatment 1 received exact replicas of each slide, Treatment 2 received the images with an English translation added, and Treatment 3 received the images, an English translation, and a Spanish cognate added. These study sheets presented the words in the same order as the PowerPoint presentation of the initial vocabulary exposure. Before the sheets were handed out, students were told they would get two minutes to study these words and that there should be no talking or sharing information during the study time. The sheets were then passed out, and students were given two minutes to study their treatment information. During this time, some students chose to rewrite the words several times. Others chose only to look at the words and information they were given.

At the end of the study period, the study sheets were collected, and students were given the first fill-in-the-blank test (See Appendix B). This test used the same images as the study sheets and the PowerPoint to elicit responses; however the images were in a different order than the two teaching tools. The order was changed to reduce the chances of the posttests being exercises in rote memorization instead of in vocabulary learning. Students were given four minutes to complete the test. Even though they were not told how much time they would be given before the test started, four minutes was enough time for all of the students to complete the exam, or at least to complete as much of it as they were capable. Tests were picked up in the exact same order they were distributed to avoid giving any student an advantage or disadvantage in time.

Three days later, a time period that included a weekend, students were given a delayed posttest. This test was given without warning, as students had been made to think the study was over at the end of the immediate posttest. The delayed posttest used the same images as had
been used at the beginning of the study, but the order was again changed. Like with the immediate posttest, students were given four minutes to complete the fill-in-the-blank exercise, and all students had completed as much as they were capable of finishing in this time.

When the immediate posttest and delayed posttest were scored, all students were given a reasonable amount of flexibility on their spelling. Any answer that was identical to the Spanish word was considered wrong, because some students outside of Treatment 3 also had some knowledge of Spanish. Responses were not considered wrong if the gender was wrong or if they had two letters or fewer wrong. For example, the response *un cinture* instead of *une ceinture* would not be scored as incorrect even though the gender is wrong and the spelling has one letter missing. However, *une corbate* instead of *une cravate* would be scored incorrect, because more than two letters are different. As long as extra letters fell within the two letters or fewer limit, responses were not counted as incorrect. These scores on the tests were gathered and organized not only by total score on the posttest and the delayed posttest, but also by answers for each individual vocabulary item.

**Results and Discussion**

To analyze our data, we first ran an ANCOVA in SPSS. The ANCOVA, as shown in the Table 1, showed that none of our treatments was significant.
This lack of significance could be attributed to several things. In our methodological design, we assumed that none of the students had been exposed to the target lexical items before our treatments. This was a reasonable assumption because the students were supposed to be taking their first ever French class. However, one participant in Treatment 1 group knows more French than a basic student should, according to the instructor. This student already knew the lexical items before the vocabulary learning treatment, which may have skewed the data. In addition, the other two students in the Treatment 1 group, though fluent in English, did not speak it as their L1. Instead, these students spoke Arabic and Portuguese as their first languages, and informed us after the experiment that there were cognates to some of our target words in both of their native languages. Therefore, we decided to throw out the student with above basic French.
proficiency and add the Arabic and Portuguese L1 speakers to Treatment 3 (speakers who received cognates), since these students were also relying on cognates to learn the target words.

We, then, ran a T-Test to determine if there was a significance as displayed in Table 2.

<table>
<thead>
<tr>
<th>Group Statistics</th>
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</thead>
<tbody>
<tr>
<td>VAR00003</td>
</tr>
<tr>
<td>VAR00001</td>
</tr>
<tr>
<td>VAR00002</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Independent Samples Test</th>
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</thead>
<tbody>
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<td>Levene's Test for Equality of Variances</td>
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</tr>
<tr>
<td>0.00</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>

Table 2

As evidenced in Table 2, even after accounting for the Treatment 1’s linguistic backgrounds, the results between the new Treatment 3 (n=5) and the unchanged Treatment 2 (n=4) were still not significant. One possible reason for this may be further due to our participants’ linguistic backgrounds. We determined who should be in Treatment 3 (Spanish cognates) via an informal survey asking whether they consider themselves fluent or proficient in Spanish. However, it seems that 6/10 students in the class actually know more Spanish than French, but only 3/10 were placed in the Spanish cognate group. In addition to the Arabic and Portuguese L1 students making cognate connections from their first languages to French, it also seems plausible that students from all 3 treatment groups were drawing on cognates to remember the target words, not just the designated Treatment 3. Further evidence pointing to this was found on a student not in
Treatment 3’s study sheet where they wrote the Spanish cognate in himself. Because the linguistic backgrounds of our participants were not delineated clearly, it may be that cognates did indeed increase long-term vocabulary learning across all three treatments.

Another factor that may have resulted in our study’s lack of significant data is the existence of a variety of cognate types. Dressler et al. (2011) points out that there is a whole area of research devoted to what properties of cognate best facilitate recognition, meaning there may have been different levels of cognates contained within our target words. This is illustrated when the data is analyzed participant by participant in Table 3.

<table>
<thead>
<tr>
<th>Student</th>
<th>Vocabulary Words (/1 point each)</th>
<th>Total (/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment 1</td>
<td>Treatment 2</td>
</tr>
<tr>
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<td>1</td>
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<td>1</td>
<td>1</td>
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<td>2*</td>
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<tr>
<td>10*</td>
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<td>1</td>
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</tbody>
</table>

Table 3

Table 3 shows that although all of these lexical items are French/Spanish cognates, some may be easier than others. For example, all students, from all treatment groups on both tests got “fashion” correct. In a study by Nagy, Garcia, Durgunoglu, and Hancin-Bhatt (1993), it was found that the greater the orthographic similarity between the cognate pairs, the higher the
recognition of the cognate pairs. The orthographic similarity between French *mode* and Spanish *moda* may explain why this particular target item was highly memorable for 100% of the participants. Similarly, the most missed item was *cravate/corbata* (“tie”), which interestingly was one of our least orthographically similar items.

**Conclusion**

The inconclusiveness of this data leads to several thoughts. First, that using cognates with other languages known by students can help some more than others, because the similarities between the words can make them easier to confuse, especially when the language the cognate comes from is not the L1. Some students have more trouble keeping their various L2s distinct than others. The level of similarity between two cognates may also play into this relationship.

We must also consider the cause of score increases between the immediate posttest and delayed posttest. It is impossible to know if these students studied these words on their own after the initial teaching. While they were given no indication that there would be a delayed posttest, particularly motivated students may have decided to study some of the words on their own.

While opinions differ about the effect of cognates on word retention, this study does not support or disprove any benefits. However, the low number of subjects, the low number of words, and the short time span of the study could be the reason for the lack of statistical significance.

For further research, to pursue the same hypothesis, one could perform this study with more subjects. These students should all have the same L1, and only the subjects in Treatment 3 should speak the L2 used as the source of the cognates. One could also use a format similar to this one to look that the different levels of cognates.
Another way to further examine the level of learning would be to change the images used on the tests so that they do not match the images used in the teaching and study sheet portion. In this way, students would have to better prove that they understood the meaning of a word by applying it to a new image.

The scoring of the posttests could be modified to give more points to spelling that were one hundred percent correct than spellings that were one or two letters off. This scoring technique could show if there is any spelling interference of cognates on the target language.
References


Appendix A

Treatment Study Sheets

Treatment 1 Study Sheet

- une chemise
- des gants
- la mode
- une cravate
- un tailleur
- un collier
Treatment 1 Study Sheet

- un imperméable
- des lunettes de soleil
- une ceinture
- des chaussettes
Treatment 2 Study Sheet

- une chemise
  - men's dress shirt

- des gants
  - gloves

- la mode
  - fashion

- une cravate
  - tie

- un tailleur
  - women's suit

- un collier
  - necklace
Treatment 2 Study Sheet

- un imperméable raincoat
- des lunettes de soleil sunglasses
- une ceinture belt
- des chaussettes socks
Treatment 3 Study Sheet

- une chemise:
  - men’s dress shirt
  - camisa

- des gants:
  - gloves
  - guantes

- la mode:
  - fashion
  - moda

- une cravate:
  - tie
  - corbata

- un tailleur:
  - women’s suit
  - traje de mujer

- un collier:
  - necklace
  - collar
Treatment 3 Study Sheet

- un imperméable
  - raincoat
  - impermeable

- des lunettes de soleil
  - sunglasses
  - lentes de sol

- une ceinture
  - belt
  - cinturón

- des chaussettes
  - socks
  - calcetines
Appendix B

Posttests

Immediate Posttest

![Image of a belt and sunglasses]

![Image of a Gucci and Hermès logo, and a man's shirt]

![Image of a necklace and a woman's suit]

![Image of a Chanel and Louis Vuitton logo, and a woman's suit]
Immediate Posttest
Delayed Posttest

- Socks
- Suit
- Raincoat
- Button-down shirt
- Belt
- Sunglasses
Delayed Posttest