

## **All Cognates are not Created Equal: Variation in Cognate Recognition and Applications for Second Language Acquisition**

### **No todos los cognados fueron creados iguales: variación en el reconocimiento de cognados y su aplicación en la adquisición de segundas lenguas**

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The similarities between cognates in first and second language suggest that these words would be easier to learn. However, this is not always the case; studies focusing on teaching cognates are few in number and have yielded contradictory results. Furthermore, the definition of ‘similarity’ with regard to cognates remains difficult to adequately define. An experiment with 39 native-English speakers was carried out with close attention to variation in cognate recognition. A Principal Component Analysis (PCA) found significant variance in the data. This study demonstrates that not all cognates are recognized and processed in the same way by language learners. The pedagogical implications of these findings suggest that teachers should not assume that students will recognize all types of cognates. Therefore, it is important to include more activities that teach cognate recognition and the proper contexts in which they can be adapted.

**Keywords:** second language acquisition; vocabulary acquisition; cognate recognition; word frequency.

Las similitudes entre cognados en una primera y segunda lengua sugieren que son un vocabulario fácil de aprender. Sin embargo, los estudios que se centran en la enseñanza de cognados son pocos y sus resultados, contradictorios. Asimismo, la definición de «similitud» que se aplica a dichas palabras es difícil de precisar. Este artículo presenta un experimento con 39 estudiantes de ELE anglófonos y está centrado en la variación del reconocimiento de cognados. El análisis de los componentes principales (PCA) muestra una variación significativa en los resultados. Este estudio demuestra que los estudiantes no reconocen ni procesan todos los cognados de la misma manera. Las implicaciones pedagógicas de estos hallazgos sugieren que los profesores no deben asumir que los estudiantes reconocerán todo tipo de cognados y, por tanto, es importante incluir más actividades que enseñen cómo reconocerlos y los contextos apropiados en los que se pueden usar.

**Palabras clave:** adquisición de segundas lenguas; adquisición de vocabulario; reconocimiento de cognados; frecuencia de vocabulario

## 1. INTRODUCTION

Vocabulary acquisition is crucial for the successful development of a second language (L2) (Gass, 1990; Schmitt, 2000; Nation, 2001; Fitzpatrick & Barfield, 2009), yet building and expanding vocabulary knowledge is a key challenge at all stages of L2 acquisition. This study focuses on English-Spanish cognates, which are defined as words with similar roots, sounds and meaning in the first language (L1) and L2 (for example, ‘university’ [yʊnəˈvɜːrsɪti]/‘*universidad*’ [uniβersiðað] (Friel & Kenninson, 2001: 249)). In previous research and guidelines of best practices (Schmitt, 2000; Salaberry & Armstrong Lafford, 2006; Shrum & Glisan, 2010), cognates have been considered as easy vocabulary items for L2 learners due to their apparent similarities (Ellis & Beaton, 1993: 610). Indeed, it is difficult to find textbooks that explain what a cognate means or activities that help their recognition or use. A number of introductory Spanish language textbooks such as *Dos Mundos*, *Nexos*, *Imagina*, *Pura Vida*, among others, present limited explanations of cognates hidden at the bottom of some pages, pressuring that the information lacks importance or application. Nevertheless, L2 Spanish learners usually do encounter cognates in classroom settings, considering the high number of cognates between Spanish and English. In fact, Montelongo, Hernández and Herter (2009) point to the existence of 20,000 Spanish-English cognates; Lobo (1966, as cited by Meara, 1993: 282) created a corpus with a 10,000 Spanish word vocabulary expanded from 3,000 English cognates; Nation and Meara (2002: 49) claim that “almost all the basic Anglo-Saxon words have parallel forms based on Latin and Greek, which are used in particular, in specialist discourse.” Even if the exact number of cognates between English and Spanish has not been determined, this topic has gained increased importance in the literature in second language acquisition (SLA). Studies that have documented what students actually do with cognates (see literature review) vary in results and few have examined the beginner’s level.

Defining what a cognate is or is not remains to be a simple task from the student’s point of view. On one hand, the phonetics of the word can be very different in the two languages, thus causing confusion. On the other hand, not all written cognates have the same classification of similarities between words. This study develops three measures of the scale of orthographic similarities; ‘identical’ cognates (e.g. ‘mural’ [ˈmjuərəl]/‘*mural*’ [muˈral]), ‘similar’ cognates that only differ by one or two consecutive letters (e.g. ‘inherent’ [ɪnˈheɪənt]/‘*inherente*’ [ineˈrente]), and ‘partial’ cognates that differ by two or more letters (e.g. ‘conclude’ [kənˈkluːd]/‘*concluir*’ [koŋˈklwir]). These cognates’ characteristics are defined in more details in the methodology section. Orthographic overlap (i.e. form overlap) is an important factor to look at because several scholars participating in the current debate on cognate status (e.g. Dijkstra, Miwa, Brummelhuus, Sappelli & Baayen, 2010) believe that the special status of cognates, as opposed to non cognates, is the shared orthographic level. Taking this into account, do students demonstrate processing differences between identical, similar, and partial cognates?

The subjects, 39 university students of beginner L2 Spanish, were divided into two groups: control and experimental. Data were collected through a translation task that focused on recognizing and processing cognates. The results of this study show that at the novice level, the main interference is found at the orthographic level. In addition, not all cognates are recognized at the same level. Furthermore, there are a myriad of factors that can influence word recognition, including the L1 knowledge of the students, along with their cognitive capacity for word relation, which provides a number of implications for the classroom. For instance, teachers and class

materials should focus on the more difficult items, such as partial cognates, and should not take for granted that students recognize all type of cognates.

## 2. LITERATURE REVIEW

The studies that focus on cognate recognition point to the fact that even though a precise definition of cognates is warranted to fine-tuned research objectives about this topic, there is no consensus on the definition of this term in the literature (Friel & Keninson, 2001: 251; de Bot: 2004: 19). However, as Friel and Kenninson (2001: 249) note, most researchers agree that cognates are words with similar roots; hence they show similarities in sound and appearance. De Bot (2004: 19) defines cognates as “words with similar form and meaning in two or more languages”. This broad definition tries to include different perspectives, such as the one followed by historical linguists, who define cognates as orthographically identical words that share form and meaning; and psycholinguists, who understand cognates as words with phonological and orthographical similarities and equivalent translation (Otwinowska, 2015: 44). The meaning of similarity between cognates is another controversial topic. Lubliner and Hiebert (2011) and Otwinowska (2015) examine the degree of orthographic similarities by calculating the Longest Common Subsequence Ratio (LCSR). This statistical method entails dividing the longest sequence of letters shared by two words by the total number of the longer word. The present study utilizes a similar strategy; however, cognates are categorized into three types to study students’ recognition. Furthermore, most studies of cognate recognition and processing have focused on bilingual students (Costa, Caramazza & Sebastian-Galles, 2000; Sherkina-Lieber, 2004; Hoshino & Kroll, 2007). Studies dealing with novice students are infrequent and display conflicting conclusions. For instance, as Otwinowska and Szewczyk (2017: 2) point out, experiments conducted in laboratory settings such as Hall (2002) and Hall, Newbrand, Ecke, Sperr, Marchand and Hayes (2009) lack ecological validity because of the use of pseudowords that differ greatly from how words are acquired in a classroom. Studies carried out in classrooms, such as Holmes and Ramos (1993), Cunningham and Graham (2000), and Tonzar, Lotto and Job (2009) concluded that novice L2 students can recognize cognates as a natural strategy for understanding language. However, Lightbown and Libben (1984), Harley, Hart and Lapkin (1986), Tréville (1996), and Otwinowska (2009) who also worked with beginner L2 students, conclude that students do not readily recognize cognates and must be instructed on how to recognize and work with them.

More specifically, Holmes and Guerra Ramos (1993) worked with Brazilian students with almost no familiarity of the English language. The authors suggested a method for recognizing cognates in reading comprehension tasks using think-aloud protocols (TA) – students read silently through an English text and orally summarized their understanding in Portuguese, their L1. At the same time, they spontaneously commented on the task. The authors concluded that cognate recognition was a ‘natural’ strategy; however, there was variation in recognition between students. To explain these variations, the authors stated that “cognate identification seemed to be personal, with some subjects inclined to be more liberal than others admitting a word cognate” (Holmes & Guerra Ramos, 1993: 89). Limitations in the group work have also been found. Were cognates universally recognized or just by the best students in each group? In addition, another interpretation to be considered from reading this article is that students are not always ‘liberal’ in recognizing cognates because, perhaps, they do not recognize them.

Cunningham and Graham (2000) studied fifth and sixth grade English native speakers in a Spanish as an L2 immersion class. Authors matched the 30 immersion students with 30 English monolinguals on grade, sex, and verbal scores on a fourth-grade Cognitive Abilities Test (CAT). The students completed 60 consecutive Peabody Picture Vocabulary Test (PPVT) items, and a 20-item Spanish–English Cognate Test similar to the PPVT on recognizing low-frequency English words with high-frequency Spanish cognates. The CAT and conventionally scored PPVT revealed comparable verbal ability between groups, but on 60 consecutively scored PPVT items, immersion students did better than control students because of cognates. They also significantly outperformed control students on the Spanish–English Cognate Test. Findings support the premise that Spanish immersion has English-language benefits because of the positive vocabulary transfer.

Furthermore, Tonzar et al. (2009) evaluated the vocabulary acquisition of Italian native speakers among different age groups, comparing two teaching/learning methods: word–word, picture–word. In addition, the authors assessed the role of cognate status in the learning process. The results show that students were able to remember the cognates better than non-cognate words after several weeks, showing that cognates are easier to learn than non-cognates. However, like in the previous experiment, Tonzar et al. (2009: 639) concluded that not all cognates present the same characteristics in relation to how they are processed and recalled.

In contrast, several studies (Lightbown & Libben, 1984; Harley et al., 1986; Tréville, 1996; Otwinowska, 2009) have concluded that students do not recognize cognates, suggesting that instructors should include more cognate recognition activities in their classes. Lightbown and Libben’s (1984) research goal was to explore the role of transfer in the L2 lexicon or, more specifically, the use of cognates. The study was based on comparisons of free compositions, a cloze test<sup>1</sup>, and a word acceptability judgment task performed by two separate groups – one consisting of native French speakers learning English as an L2, and another consisting of native English speakers. After seeing that not every student used the cognates in the same context and in all the tasks, the authors created a cognate classification criterion related to the context:

- 1) Appropriate cognate in both languages
- 2) More appropriate in French
- 3) More appropriate in English
- 4) Appropriate in neither language

The authors also mentioned that it is possible that the students did not trust words with similar spellings in the two languages or that the students simply were unaware of the relationships between English and French words. Due to this fact, the authors stated that students need to be taught how to recognize all the potential relationships between languages.

In a longitudinal study of Americans in first to sixth grades living in Canada, Harley et al. (1986) sought to determine whether or not knowledge of cognates in French was an advantage for immersion students. The authors compared the performance of traditional students vs. immersion students to observe whether or not immersion students would perform better than regular students overall on a vocabulary knowledge test focused on English lexical items that were cognates in French. The authors reached the same conclusion as Lightbown and Libben (1984: 407): “one cannot assume that the existence of cognates between languages will ensure

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<sup>1</sup> Cloze test: consisting of a text with certain words removed, where participants were asked to replace the missing words.

that L2 learners will, without instruction, use or even recognize all the potential relationships between languages”.

Support for Lightbown and Libben (1984) and Harley et al.’s (1986) findings on the importance of training students to recognize cognates is also found in Tréville’s (1996) study on lexical reading and cognate recognition in French as an L2. She worked with 105 university-level beginner and false beginner learners<sup>2</sup> of the L2, all of whom were Anglophone. Students were divided into two groups: experimental and control. The experimental group participated in a modified portion of the course focused on cognates, while the control group did not receive this portion of the course. At the end of the course, both groups were given a special exam, the TARC (Test of Aptitude in Recognizing Written Cognates). Tréville found that the experimental group performed better in word recognition, application of interlexical correspondence rules, identification of grammatical categories, generalization of interlexical rules, and the selection of appropriate words in given contexts.

Otwinowska (2009) carried out a survey with beginners, intermediate, and advanced Polish learners of English as an L2. The results show that students are not aware of the similarities between languages; therefore, they do not take into consideration the potential of the cognate vocabulary they already know. The author not only presents several vocabulary learning strategies to trigger positive transfer from Polish in receptive and productive vocabulary tasks, but also shows how it is possible to change students’ attitudes and the use of vocabulary strategies to boost the use of cognates. The strategies were adapted from Wenden and Rubin (1987) and included contextualization, grouping, transfer, directed physical response, translation, auditory representation, and resourcing. Consequently, the author claims that language awareness is essential in cognate recognition.

The aforementioned research studies yield two different outputs: 1) cognates represent relatively easy vocabulary to recognize; and 2) teachers or textbook publishers should not presume that the existence of cognates between languages will guarantee that L2 learners will recognize or use cognates properly. Nonetheless, they also demonstrate the importance of previous language knowledge. For instance, Holmes and Guerra Ramos (1993: 92) mention that their participants were students of Portuguese Philology and Educational Psychology; therefore they were familiar with word formation. Due to their prior background in linguistics, the outcome of this study could also indicate that these students recognized cognates precisely because of their previously acquired knowledge. Also supporting this idea, cognates were not universally recognized in all studies. There are two possible explanations for this: individual differences, and internal cognate differences. With regard to internal differences as an explanatory factor, Tonzar et al. (2009) and Lightbown and Libben’s (1984) results show a variation in recognition in response to varying similarity between words, yet they do not explain this pattern in depth.

As previously mentioned, there are few studies that deal with novice students (Lightbown & Libben (1984); Harley et al. (1986); Holmes & Guerra Ramos (1993); Tréville (1996); Cunningham & Graham (2000); Otwinowska, 2009; Tonzar et al. (2009)) even though this developmental level is integral to the language learning process. Also, the studies related to cognate recognition do not share similar results; SLA texts books rely on the unconfirmed assumption that cognates are recognized by students. Furthermore, the explanation of the meaning of ‘similarities’ between cognates is not always taken into account in the studies. Most

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<sup>2</sup> False beginner: A learner who needs or chooses to start over with her language studies (Frantzen & Magnan, 2005: 171)

classroom studies neglected the characteristics of the word items, therefore these studies are not able to show if formal crosslinguistic similarity between L1 and L2 words truly helps L2 acquisition. Consequently, a more robust empirical study is needed to better define the role that cognates play in SLA.

### **3. PHONOLOGICAL EFFECT**

Contemporary discussion regarding word recognition has been mainly addressed by two models: The Revised Hierarchical Model (RHM) (Kroll & Stewart, 1994) and the Bilingual Interactive Activation Plus Model (BIA+) (Dijkstra, Grainger & Van Heuven, 1999). The present study is informed by the latter because it represents the most relevant model regarding bilingual visual word recognition. Furthermore, the BIA+ includes an explanation of the lexical processing in SLA and presents a general evolution of the lexicon in the L2 learner, while the RHM focuses on bilingual words and concept recognition.

The BIA+ model is an evolution of the BIA model. The BIA model asserts that the bilingual lexicon is integrated, and lexical access is non-selective. The proposed model consists of a network of nodes representing orthographic, phonological and semantic representations. According to the BIA model, when a proficient bilingual student reads a word, regardless of the language, several lexical candidates are activated. The authors cite as evidence the existence of a phonological effect during task recognition (Dijkstra et al.1999). The findings showed cross-language effects of phonological overlap between words; while orthographic and semantic overlap were shown to result in facilitory effects relative to controls, phonological overlap induced inhibition. The authors mentioned that “phonological inhibition now occurs because, after a given letter string activates all compatible phonological codes independent of language, this competition results in a delayed identification of the item in the target language” (Dijkstra et al., 1999: 512).

Phonological interference and other issues found through several experiments generated a new diagram to represent the BIA+ model (Dijkstra & Van Heuven, 2002). The improved model rests on the following ideas: 1) Bilingual word recognition is affected not only by cross-linguistic orthographic similarity effects, but also by cross-linguistic phonological and semantic overlap; 2) The first stages of word recognition are carried out as described in the BIA model – several lexical candidates, regardless of the language, are activated depending on their similarity to the input word, and on other individual factors such as use frequency, subjective frequency, L2 proficiency, etc.; 3) Orthographic representation becomes activated at the same level as phonological and semantic representations; and 4) With linguistic or non-linguistic context effects, the BIA+ model predicts that the type of task will have an influence on word recognition processing. When a word recognition task is inserted into a sentence context, the process is sensitive to syntactic and semantic context information. For example, context information might inhibit or reduce the activation of lexical candidates or induce a more flexible activation of lexical candidates in the two languages.

BIA+ presents a bottom-up processing from feature into letter into word, and correspondingly from feature into phoneme into word. When this phonological interference arises, it can have an inhibiting effect on word recognition. As previously mentioned, the aim of this study is to observe whether there is a difference between orthographic only vs. combined orthographic and phonological cognate recognition. It could be the case that not only the shared

form (i.e. orthography) but also the phonological representation carried by the L1 word is responsible for variation in word recognition.

#### 4. THE CURRENT STUDY

To begin, two refinements of our understanding of the term cognate are needed. First, an explanation of what is considered a cognate is required, as well as a clarification of what is meant by “similarity” between words. For the purposes of this investigation, a cognate is considered to be paired lexical items with shared orthography and meaning (De Bot, 2004: 19) in this case Spanish and English. Therefore, no false friends have been used in this study. In addition, in classroom settings cognates have been classified in three types (Exact: have same spelling, different pronunciation; Direct: spelled almost the same in two languages; and Indirect: may not look similar in spelling but one can indirectly associate the meaning) (Nassi, 1973: 243). However, this classification does not explain precisely how to classify cognates. A proprietary scale of orthographic similarities between words is applied:

- 1) Identical cognates are completely orthographically equal: e.g. ‘mural’ [ˈmjʊərl] / ‘*mural*’ [muˈrəl]. Accent marks do not impact the classification; ‘utopia’ [juˈtʰoʊpiə] / ‘*utopía*’ [uˈtoˈpia].
- 2) Similar cognates are those which only differ by one or two consecutive letters: e.g. ‘inherent’ [ɪnˈheɪənt] / ‘*inherente*’ [ineˈrente]. Phonological parallels have been taken into account. For example, the letters [ph] are counted as only one letter because they represent only one sound, e.g. ‘telephone’ [ˈtʰeləfoʊn] / ‘*teléfono*’ [teˈlefono].
- 3) Partial cognates are those which differ by two or more letters (not necessarily consecutive): e.g. ‘Conclude’ [kɒnˈkluːd] / ‘*concluir*’ [koŋˈklwir] and ‘access’ [ˈækses] / ‘*acceder*’ [akˈse ðer].

A minimal level of similarity is also used to delimit the partial cognates. At least three of the same letters have to remain. For example, words as ‘luxury’ [ˈlʌkʃəri] and ‘*lujo*’ [ˈluɣo] are not included in the study. Furthermore, the Latin cognates come into English via two options: 1) French as a result of the French domination of England from 1066 through 1399; and 2) they entered English during the Renaissance to meet demands for a sophisticated scientific and literary register that the English language lacked (Barber, 2002, as cited by Lubliner & Hiebert, 2011: 77). Most of the cognates selected for this study belong to the first category; this vocabulary entered English through old French (see Appendix 1). However, there are several words that come into English via middle Latin, a couple from modern Spanish, such as ‘rich’ or ‘cafeteria’ (1800 from Puerto Rican Spanish and Mexican Spanish correspondingly), and several loan word, such as ‘pyramid’ borrowed from Hebrew, ‘toucan’ from Tupi, and ‘mummy’ from Persian. Nevertheless, there is no correlation between word recognition and word origin.

According to the aforementioned scale of orthographic similarities, this study addressed the following questions:

- 1) Do native English-speaking students of second semester L2 Spanish recognize cognates in written form without explicit instruction, as has been assumed by elementary Spanish

textbook publishers and some other authors (Holmes & Guerra Ramos, 1993; Hall, 2002, Hall et al., 2009; Tonzar et al., 2009)?

- 2) Does the degree of similarity between cognates (identical, similar, and partial) have an effect on student recognition and processing of these vocabulary items?
- 3) Does the type of task have an effect on word recognition? Can the pronunciation of an L2 word influence the results?

The BIA+ model proposes that when a letter string is read, several lexical candidates are activated. Moreover, word recognition is affected not only by cross-linguistic orthographic similarity effects, but also by cross-linguistic phonological and semantic overlap. For the present study, the BIA+ model best informs the inquiry into whether or not the phonology overlaps with word reading recognition.

Think-aloud protocols (TA) were used as one method to interpret students' answers while they were in the process of recognizing cognates. TA protocols involve participants thinking aloud as they are performing the task. Only participants in the experimental group were asked to read the texts aloud and say whatever came to their minds as they completed the task. This process provides observers insight into the participants' cognitive process, rather than the final product. Furthermore, all verbalizations offer a phonological interpretation of the data. Although there is a possibility that using TA protocol during the tests could influence participants' performance, no literature has been found to support this idea, and TA protocol were used with only one group. The hypothesis is that there will be significant differences between the two groups because the group using TA will process and represent cognates better than the group that proceeds with the task silently. If the influence of TA protocol is positive, this could mean that TA can help students recognize and process cognates. It is possible that the act of saying the cognates aloud could improve comprehension of those words because it may help participants realize that the L2 word is similar to the L1 word. However, as the BIA+ model suggests, phonological interference can arise and have an inhibiting effect.

## **5. METHODOLOGY**

### *5.1 Participants*

Participants were 39 native-English speaking (22 female, 17 male) Auburn University students taking Elementary Spanish II (A1 level based on the Common European Framework of Reference of Languages). None of them had previously studied another romance language, or any other foreign language. The majority studied Spanish at High School, which made this course their third or fourth year of Spanish; that is, they had an average of 200 hours of language instruction. The students were randomly divided by task.

### *5.2 Stimuli*

Three advertisements of vacation packages in Spanish, presented with the software E-prime, were used for the purpose of the study. Seventeen comprehension questions were included as well. In the literature review, a number of confounding factors were noted in some experiments; such as a lack of context, repetition of words (allowing subjects more opportunities to recognize



some words), and a very high number of items so students could easily tire while doing the tasks. To solve these methodological issues, cognates were given in a context related to the material students saw in class. With this in mind, the text that was used was a travel advertisement that featured topics, grammar expressions, verb conjugations, vocabulary, and length, where the number of words had been adapted to the students' level (elementary) by the National Council of State Supervisors for Languages. Another improvement from some prior studies is the reasonable number of cognates given to students during the experiment. The total number of words did not demand excessive cognitive effort, given their level of proficiency. The text had a total of 318 words, and the total number of cognates to consider was 69, with each cognate appearing only once). There were 21 identical cognates; 23 similar cognates; and 24 partial cognates; the other 250 words were fillers.

The three advertisement texts were tested in a pilot study before the experiment was completed. The aim of the pilot study was to find out whether the cognates selected for the main experiment were words that students were likely to already know. The use of unknown Spanish words for the main experiment relies on the idea of observing whether or not students can recognize words based on the orthographic similarities between the L1 and the L2, and whether or not there is an effect based on the type of words (identical, similar, partial). To measure this, two hundred and eight students enrolled in Elementary Spanish I were tested. Words that were translated correctly by more than forty percent of the students were considered terms that had already been learned in the Spanish I course; therefore, they were substituted by words considered to be more challenging. These more difficult words were selected from vocabulary lists extracted from Spanish books for advanced students.

### *5.3 Procedure*

All participants read an identical text and answered several comprehension questions. They were also given a translation task that focused on recognizing and processing cognates. Participants started with the translation task where students saw the text (68 cognates and 250 fillers) one word at a time. Having students read the text word by word was an attempt to try and replicate a text-scanning activity commonly used by teachers in which students search for particular words that they know or can recognize. They were asked to respond "yes" or "no" depending on whether or not they could recognize the word that was presented on the screen – students were asked to translate all 318 words. If they responded "yes", the next screen asked them to translate the word they saw before; if they responded "no", they skipped this step and moved to the next word. After reading the text word by word, the complete text appeared, and participants read it again and answered the comprehension questions. The comprehension questions not only had the intention of clarifying if students understood the content or not, but students were also told that the main focus of the study was to check their reading comprehension. Participants were divided randomly into the two groups, referred to in this paper as G1 (n=17) and G2 (n=22). The main difference between G1 and G2 was the use of Think Aloud protocol (TA). That is, students in both G1 and G2 saw the text word by word, translating the words that they recognized first. Afterwards, they saw the whole text and answered the comprehension questions. Only students of G2 participated by using the TA protocol. The TA protocol was recorded and later analyzed to determine what students were thinking while reading or answering the questions. These data were also used to codify how students pronounced the cognate vocabulary. Participants were

trained before the beginning of the study with a text sample, which contained words not included in the research instrument.

Consequently, the dependent variable tested was the students' answers for the word translation task (Yes/No), and the independent variable tested was the type of cognate (identical, similar, and partial cognates).

#### 5.4. Analysis

Two separate methods – quantitative and qualitative – were used to analyze the data. In the quantitative scoring method, participants were scored 1 point for each correct translation, and 0 points for each incorrect answer. In this method for the translation (from Spanish to English) task, spelling inaccuracies such as 'casions' instead of 'casinos', 'elixer' for 'elixir', 'instraments' for 'instruments', were counted as correct answers because these misspellings can be attributed to the difficulties of spelling within the English language. However, the word 'occidental' translated into English as 'accidental' was not consider a spelling mistake because the word 'accidental' is a real word in English in contrast to the other vocabulary previously mentioned. The number of correct and incorrect answers for each condition were compared.

Qualitative analyses were applied to the incorrect answers. Two types of incorrect answers were observed: Participants either incorrectly translated the word, or chose not to respond at all. Among the incorrect translations, a distinct sub-category named 'semi-answer' was created. A 'semi-answer' in the translation task was defined as a word in which a phonological pattern is detected in more than two participants when translating; for instance, multiple participants translated 'occidental' as 'accidental', or 'precio' (price) as 'precious'. TA protocol was used to support the data findings.

## 6. RESULTS

To distinguish the effects of task protocol and cognate category (identical, similar and partial), first the average and standard deviation of the normalized<sup>3</sup> values for each group and word type were calculated. As shown in Figure 1, results suggest that words that have more similarities, such as identical or similar cognates, were easier to recognize than words that did not share as many graphemes, such as partial cognates. Specifically, for G2, which was the group with better results on the translation task, 67% of the identical cognates (21 tokens total) were answered correctly; 60% percent of the similar (23 tokens total); and 38% of the partial (24 tokens total). It should be noted for the identical category that, 33% of the time, subjects were unable to correctly translate words identical in both their native and L2 language. Words such as 'occidental', 'oasis', 'ideal', 'popular' or 'agenda' are included in this list.

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<sup>3</sup> Each group of words has been divided by its corresponding maximum number (21 identical cognates; 23 similar cognates; and 24 partial cognates), the result has been multiplied by 100 to calculate the percentage.

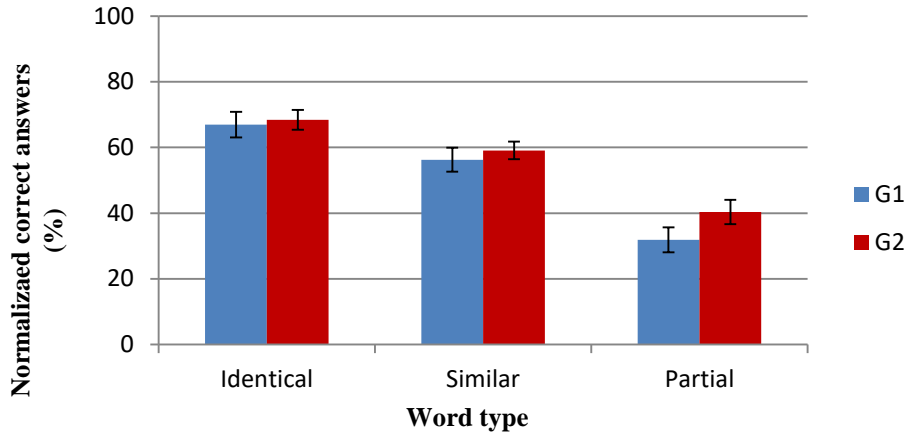


Figure 1: Correct answers based on type of cognates and groups

The sum of the means of the percentages of correct translations for G1 and G2 were compared to test whether the TA protocol could have an influence on word recognition. The result of an ANOVA ( $p < 0.05$ ) show that there are no significant differences, with a  $p$ -value=0.7645.

Seeing that there were no statistically significant differences between G1 and G2 due to the TA protocol, the two treatments have been considered as only one group for the next analysis. A two-way ANOVA ( $p < 0.05$ ) was carried out to evaluate the effect of translation accuracy and word type – identical, similar and partial. Previous to the statistical analysis, normality and homoscedasticity were checked using Kolgomorov-Smirnov and Levene’s test, respectively. If a significant effect of the word type was observed, a post-hoc analysis (Tukey’s test) was performed to identify the treatment group that reached significance ( $p < 0.05$ ). Statistical analyses were conducted using SPSS statistical software (v.23). An effect on word recognition was found with the following  $p$  values, Identical-Similar  $p=0.0243$ ; Identical-Partial  $p=0.0180$ ; Similar-Partial=0.0403.

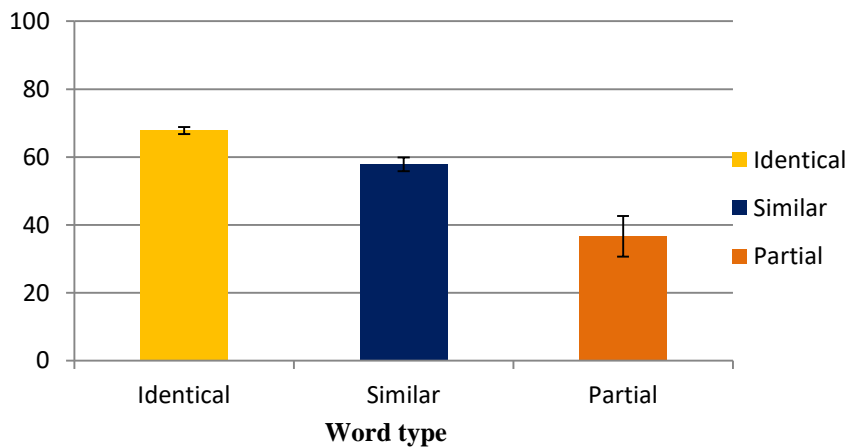


Figure 2: Correct answers based on type of cognates

Also, a Principal Component Analysis (PCA) was carried out with the software JMP (v.8). A PCA reduces the dimensionality of the data set, and it helps to find the causes of the variability of the data and sort the results by their importance. This analysis offers a visualization of the data

based on correct translation variability, whether students translate many words or not. A PCA offers the possibility to observe the internal variance in each group of words, while the analysis of the means and the standard deviation leads to a reduction of information due to the fact that the dimension of the data is limited from a vector of numbers to a single number. The data are plotted from left to right in a scale from “no student correctly translated the word” to “all students correctly translated the word”. Results show that a large number of identical cognates were translated correctly (most of them are in the right axis of ordinate); while similar cognates were translated less often, although there is an important number of them on the right axis of ordinate. Evidently, partial cognates were the least likely to be translated correctly (they are on the left axis of ordinate).

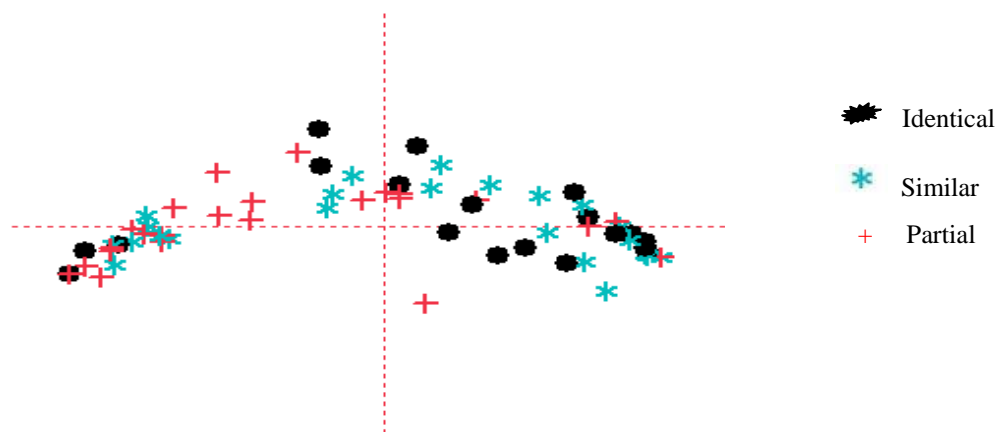


Figure 3: PCA score plot

To be sure that unfamiliarity with the L1 word was not the only reason that impedes the translation of words; this study used the PCA results to observe the relation between incorrect answers and word frequency in the L1. The COCA was used to verify the frequency of the words with a correctness of the answer lower than 50% for the three cognate categories (identical, similar and partial). The corpus allows the choice of a section of language use: Spoken, Fiction, Magazine, and Academic, this option was ignored; therefore the results include all sections.

As can be seen in Table 1, highly incorrect answers were often related to words with high frequency in daily English speech. The words that elicited more incorrect answers are those with a high number of different letters – partial cognates – however, there is no clear relation with the frequency in English language. For instance, words such as ‘access’ which has a frequency of 56,221 in the COCA corpus, ‘nature’ (73,757), ‘price’ (69,480) or ‘offer’ (60,923) have a very high frequency, though they were not translated correctly.

Table 1: *Relation between incorrect answers and word frequency*

Identical			Similar			Partial		
	Results	Frequency		Results	Frequency		Results	Frequency
Occidental	0	568	Tavern	8	2.689	Access	0	56.221
Irascible	3	255	Intrepid	10	860	Legends	5	8.452
Affable	8	2	Gastronomy	13	113	Paradise	8	6.218
Formidable	41	4.234	Sub-aquatic	13	4	Stress	10	6.378
Elixir	44	542	Dunes	13	1.064	Pharaohs	10	752
			Atypical	15	1.158	Price	15	69.480
			Opulent	18	727	Culminate	15	368
			Direct	46	39.768	Discover	15	13.454
			Virgin	46	7.582	Nature	18	73.757
			Sarcophagus	26	274			
			Palms	26	15.825			
			Mummies	31	1.487			
			Offer	38	60.923			
			Toucan	41	56			
Conquer	49	1.858						

On the other hand, students correctly translated words with a very low frequency rate, such as the identical cognate ‘colossal’ (2), ‘anaconda’ (271), or ‘to invite’ (7,030).

Table 2: *Relation between correct answers and word frequency*

Identical			Similar			Partial		
	Results	Frequency		Results	Frequency		Results	Frequency
Colossal	59	2	Excursion	87	1.308	Invite	100	7.030
Anaconda	85	271	Jungle	90	6.245	Crocodile	87	1.213
Cafeteria	97	3.268	Seduce	72	814	Contem- plate	67	2.112

## 7. DISCUSSION

The research questions investigated in this study sought to observe if students recognized cognates that were identical, similar, or partial. Spanish textbook publishers and some researchers (Holmes & Guerra Ramos, 1993; Hall, 2002; Hall et al., 2009; Tonzar et al., 2009) have assumed that cognates are easy words to recognize. Nevertheless, results presented in this study provide support for the ideas presented by Lightbown and Libben (1984), Harley et al. (1986), Tréville (1996), and Otwinowska (2009): namely, that participants do not recognize cognates easily with a high of 67% correct recognition for the ‘identical’ category.

As previously mentioned, students did not accurately translate 30% of the identical cognates, 40% of the similar cognates, and 62% of the partial cognates. There are several factors that can influence the participants’ performance, one being the orthographic similarities between

words, as it is claimed in this research; another factor being their familiarity with the target L1 word. Most of the selected cognates between Spanish and English are words with Latin or Greek origins, and some of these more academic words are not frequently used in everyday English speech. For example, none of the participants could correctly translate the identical cognate 'occidental'. 'Occidental' is an English word; however, English speakers generally use the term 'Western'. As observed in the *Corpus of Contemporary American English (COCA)* (Davies, 2008), the word 'occidental' has 568 tokens; however, 'western' appears 53,747 times. Another similar cognate that presented problems for participants was 'irascible', which only one participant was able to translate correctly. Another word is 'afable', which only three students could translate correctly. 'Irascible' and 'affable' have 255 and 758 tokens respectively in a corpus of more than four million English words. In common speech, people do not usually use these terms; generally, speakers use 'cranky' or 'grumpy' for 'irascible', and 'sociable' or 'friendly' for 'affable'. Corresponding Latin-based words in English are often more sophisticated than the more frequent German-origin vocabulary words. Nevertheless, words such as 'popular', 'agenda', or 'ideal' were correctly identified by almost 100% of participants. These words are more common in regular and everyday conversation. Although the formal resemblance seems to govern the recognition of cognates, this effect is tempered by the frequency effect, namely that cognates whose English translations are rare because of their use in everyday speech are not recognized easily, even when they are identical cognates. Therefore, it is important to be aware of the differences between languages and their frequency in the L1.

As seen in the result of the statistical analysis, there is not a significant difference between groups – G1, which did not use the TA protocol, and G2, which used the TA protocol. Thus, in this study the fact that students pronounced the words did not have an effect on their recognition. Dijkstra et al. (1999) proposed in their BIA+ model a cross-language effect of phonological overlap between words. However, this phonological overlap was not found in my results perhaps due to the methodology. As previously mentioned, none of the participants could correctly translate the identical cognate 'occidental', while several students produced the word 'accidental' (English). This response could seem to produce a negative influence on a participant's ability to recognize a word. However, the impossibility to recognize this word as a cognate is likely related to the fact that this particular word is absent in the students' L1 lexicon. The only alternative for them is to link it to a word that is contained in their vocabulary knowledge, and the research team suspects that the phonological interface would be minimal at this level.

To believe that a cognate will be an easy word to recognize due to sharing a common root and some orthographic similarities is to ignore the multiple factors that are involved in word recognition, even amongst seemingly obvious cognates. An important aspect of this study is the internal division between cognates – identical, similar, and partial cognates – and their effects on word recognition. The results of this study have important pedagogical implications. Firstly, teachers should not assume that students will always recognize cognates, even when they are presented in context and are identical. Rather, teachers should implement more word recognition activities to create larger word-meaning connections. An important point that should be encouraged by teachers as a learning strategy is the close relationship between Indo-European languages. Cognate recognition could be enhanced after the learner becomes aware of their similarities. As seen in this study, a reason why students often fail to recognize easier cognates is the scope of their "individual language" ability, which is limited to one language, English in this case.

Once learners come to understand that many words in English, Spanish, French, Italian or German, among others, utilize different sounds to express the same meaning, learning a new language will not be considered as ‘foreign’. Consequently, words such as ‘occidental’ will not be seen as being too distant from everyday vocabulary. They will instead be recognized as part of a larger and major language scope. Otherwise, if students face the same word in German (*‘okzident’*), they may not be able to match it with ‘occidental’, simply because they do not sound similar, although there are similarities at the written level. Therefore, it is important for language textbooks and curricula to include more explicit activities focused on word recognition and train students in how to use these words appropriately. For instance, Zimmerman (1994) and Paribakht and Wesche (1997) found that reading plus explicit instruction were more effective than reading alone. On this line of research, Jiménez, García and Pearson (1996) propose an activity to encourage low-literacy Latino students to search for cognates (English/Spanish). Afterwards, unknown vocabulary can be resolved making inferences based on cognates. The authors concluded that using cognate recognition strategies resulted in the students producing extended discourse about the text and it augmented their reading engagement.

Nevertheless, word recognition should not be the only goal for cognate instruction. The language skills that students must achieve are not limited to learning a certain system of phonological units, basic syntactical rules, or an extensive vocabulary. Language, as a shared social system, has its standards for proper use in certain situations. Therefore, taking into account its true nature, language instructors cannot forget the three dimensions that are linked within it: form, content and use. Thus, the activities that teachers bring into the classroom must incorporate contextual elements so that students do not only learn how to recognize and connect different words, but also how to use cognates appropriately. Rodriguez (2010) suggests an activity to compare cognates using different texts in the native and target language. The use of texts allows presenting the target vocabulary in context; therefore students can use their background knowledge and the contextual clues to determine the meaning of each word. The proposed activity sequence is as follows: students work in groups and share their guesses of what the target cognates mean, then the teacher presents the students with two or more definitions (only one correct), the students assess the meaning and share their answers and reasons for their choices. Finally, students sort words according to cognates and false cognates. Sorting is an effective way to help students compare and contrast word parts and word meanings (Bear, Invernizzi, Templeton, & Johnston, 2007). Also, this activity helps to better understand the use of near-cognates and false cognates; in relation to the Lightbown and Libben (1984) study, Rodriguez’s (2010) activity promotes the potential of comparing not only the word form but also its context of use. Research conducted by Montelongo, Hernández, Esquivel, Johanna, Serrano-Wall, and Goenaga de Zuazu (2017) pointed out that explicit and meaningful picture book read-aloud activities promote learning new vocabulary. Their study focuses on elementary schoolchildren, who successfully increase their English/Spanish vocabulary knowledge with tandem reading-aloud activities of picture books and explicit activities, such as definitions, examples, imagery, and the morphemic analysis of words. Furthermore, the authors explain: “picture books are ideal for teaching Latino ELLs about cognates, multicultural picture books are exceptional vehicles for presenting them with the stories, poetry, and folklore that reflect their cultural backgrounds and which they can relate to” (2017: 2). Such picture books represent many voices of the Latino culture and provide guidance during reading time.

In terms of phonological overlap, the present findings do not support the idea of phonological interference. The notion that students read a word and pay attention to the

orthographical form appears to be a strong assumption, as illustrated in this investigation. However, results suggest that cognate recognition is also a matter of retrieval and L1 lexical knowledge. Nevertheless, students encounter partial cognates that can be similar in sound but less so in spelling, e.g. ‘peace’ and ‘paz’. There are three phonemes for each word, but there are three graphemes for the Spanish word and five for the English word. As stated above, activities full of context can help vocabulary recognition. Rodriguez (2010) proposes that this type of cognate can be taught by having students listen to the pronunciation of the word and write what they hear, then the teacher would segment each word to allow the students to hear the phonemes again. The students can discuss which phonemes are the same and which are different between the languages. The author also proposes the use of an Elkonin box, which allows students to see and hear words that have varied numbers of phonemes and graphemes. Another useful activity is a journal of cognates, along with a list of words that students have studied.

This research remarks that not all cognates are created equal – identical, similar, and partial – therefore not all cognates are recognized or learned automatically. However, explicit and meaningful activities full of context are a very effective tool for language learners, whose first and second languages share cognates to learn not only how to recognize them but also when to use cognates.

## **7. LIMITATIONS AND FURTHER RESEARCH**

Further cognate research should explore the frequency of words in everyday speech as well as students’ familiarity with the target words in both languages. As previously mentioned, not all cognates are easy words to learn and recognize, even when they seem to be orthographically identical. A possible explanation is that some cognate types presented a mismatch between the frequency level of the Spanish term and the frequency level of the English term. One of the main limitations in this research is that the frequency was not controlled previous to the study. Nevertheless, results show that frequency is not the only factor that can influence students’ responses. It would also be useful to research whether or not the function of the word (nouns, verbs, adverbs, etc.) plays a role in cognate recognition. The assumption that students read a word and process the written form appears to be worth challenging in future research. Another limitation is that word-knowledge vs. word-guessing was not taken into account. Participants’ confidence of each translation should be included in future studies to know which words were truly known by participants. Phonological perception while reading could also be an additional avenue of research in SLA.

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## APPENDIX 1

The three advertisement texts include a total of 308 words. The vocabulary was presented as follows:

- Title: 9 words. 1 partial cognate.
- Text 1: 92 words. 7 identical; 7 similar; 7 partial cognates.
- Text 2: 95 words. 7 identical; 7 similar; 7 partial cognates.
- Text 3: 89 words. 7 identical; 7 similar; 7 partial cognates.
- Final paragraph: 32 words. 2 similar; 3 partial cognates.

**Cognates included in the study.** Proper nouns are in italics, and they were not taken into account in the results.

<b>Identical</b>	<b>Similar</b>	<b>Partial</b>
<b>Text 1:</b> <i>Sahara</i> Occidental <i>Aladín – Aladdin</i> Dimensión – dimension Afable – affable Popular Oasis Regional Àrea – area	<b>Text 1:</b> <i>Bereber – berber</i> Civilización – civilization Atípica – atypical Rica – rich Incluye – include Excursiones – excursions Instrumentos – instruments Dunas – dunes	<b>Text 1:</b> Descubrir – discover Leyendas – legends Desierto – desert Único – unique Palmeras – palm trees Dátiles – dates Paraíso – paradise
<b>Text 2:</b> Irascible Ideal <i>Tarzán – Tarzan</i> Anacondas Cafeterías – cafeterias Agenda Cruel Colosal – colossal	<b>Text 2:</b> <i>Brasil – Brazil</i> Tragedia – tragedy Evento – event Intrépido – intrepid Virgen – virgin Jungla – jungle Tabernas – taverns Opulentas – opulent	<b>Text 2:</b> Estresado – stressed Desconectar – disconnect Contemplar – contemplate Naturaleza – nature Tucanes – toucans Cocodrilo – crocodile Accede – Access
<b>Text 3:</b> Elixir <i>Cleopatra</i> Sublime <i>Cairo</i> Formidable Casinos <i>Sinaí – Sinai</i> Coral Introduce Peculiar <i>Madrid</i> <i>Casablanca</i>	<b>Text 3:</b> Seducir – seduce Melodías – melodies Visita – visit Gastronomía – gastronomy Subacuático – subaquatic Pirámide – pyramid Explora – explore  Directos – direct Excepto – except	<b>Text 3:</b> <i>Egipto – Egypt</i> Faraones – pharaoh Invitamos – invite Conquistar – conquer Culmina – culminate Admirando – admiring Momias – mummies Sarcófagos – sarcophagus  Precio – Price Ofertas – offers Aeropuerto – airport