GRAPHO-MORPHOLOGICAL AWARENESS IN SPANISH L2 READING

by

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This paper contributes to the literature on the transferability of grapho-morphological awareness (GMA) for L2 learners by analyzing L2 learners' morphology knowledge at the word and text level. GMA helps readers to identify grammatical categories, infer meanings of unfamiliar words, and access stored lexical information (Koda, 2008). Previous research indicates that L2 GMA is influenced by L1 GMA (Fender 2003; Hancin-Bhatt & Nagy, 1994; Koda, 2000; Ramirez, et. al., 2010; Schiff & Calif, 2007).

In this paper, native speakers of Spanish (n=30) and native speakers of English learning Spanish as an L2 (n=46) completed four tasks: two timed lexical decision tasks (LDT) in English (only English speakers) and Spanish; three short passages followed by multiple choice questions; a cloze task; and an interview to discuss their answers. L2 learners show a native-like word recognition pattern (Clahsen & Felser, 2006a, 2006b), providing evidence for a language-specific morphological processing. L2 learners could recognize and decompose words into morphemes and lexemes through the different tasks, which implies that they neither ignore morphology nor follow a whole-word reading approach. However, this ability did not always help them to access the right word meaning. Also, orthographically similar words from L1 and L2 interfere with word recognition of inflected and derived words. Despite showing interference in inflected words during the timed LDT, they show a greater control during the interviews. However, derivational morphology is more difficult for L2 learners since they do not know derivational

constraints either implicitly or explicitly. The results suggest that intermediate L2 learners with an alphabetic writing system in their L1 can go beyond transfer in an alphabetic L2, and that the relationship between proficiency and GMA might be reciprocal (Kuo & Anderson, 2008).

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PREFACE

I want to thank my advisor, Alan Juffs, for his guidance and support. Thank you to my committee members, Erin O'Rourke and Gregory Mizera, for your help and feedback with this project. I am grateful to the Hispanic Languages and Literatures Department and their instructors for letting me conduct this research, and thank you Elaine Rubinstein for your assistance with statistics. I also want to thank my fellow students of Hispanic Linguistic and Linguistics. Finally, I wish to recognize my parents, family, friends, and especially Damian. Your support has helped me through this writing process. Thank you to everyone!

1.0 INTRODUCTION

This paper contributes to the literature on the transferability of grapho-morphological awareness (GMA). There are three main goals in the study: (1) to assess the level of GMA of L1 English speakers who are learning Spanish at an intermediate level in an undergraduate class; (2) to observe the relationship between L1 English and L2 Spanish GMA; and (3) to establish a relationship between GMA in word recognition and reading comprehension.

From a psycholinguistic perspective, reading requires complex cognitive processes in order to decode and comprehend a text. Moreover, "since decoding is the process of extracting linguistic information from print, it benefits directly from metalinguistic awareness" (Koda & Zehler, 2008, p. 4). Therefore, metalinguistic awareness, defined as "the ability to identify, analyze, and manipulate language forms," (p. 4) is a key element to explain the complex reading processes. More precisely, metalinguistic awareness is an explicit knowledge that implies a "mental representation of (a) rule, which becomes explicit in a context where metalinguistic activity is required" although a speaker might not be able to explicitly explain the rule (Kuo & Anderson, 2008, p. 40).

Metalinguistic awareness can be divided in different aspects: phonological awareness, semantic awareness, morphological awareness, syntactic awareness, grapho-phonological awareness, and grapho-morphological awareness (GMA). The main idea is that metalinguistic awareness "can be universal, rather than language-specific" (Kuo & Anderson, 2008, p. 42),

which is supported by the fact that L1 morphological awareness transfers into L2 reading (Fender 2003; Hancin-Bhatt & Nagy, 1994; Koda, 2000; Ramirez, et. al., 2010; Schiff & Calif, 2007). Since all these studies deal with printed input, they can be generalized to GMA.

In instructed L2 learning, the printed word is usually present from the first contact with the new language. Thus, it is necessary to approach L2 morphological awareness adding the orthographic dimension, which means analyzing GMA. According to Kuo and Anderson (2006), the term GMA first appeared in Nagy, Kuo-Kealoha, Wu, Li, Anderson and Chen (2002) study, where it was "defined as an understanding of 'the nature of the writing system and of the mappings between the elements of the spoken and written language'" (p. 64, quoted in Kuo & Anderson, 2006, p. 163). In this paper, this is not the definition followed, but the one proposed by Kuo and Anderson.

GMA is namely "the ability to reflect upon how semantic information is encoded in the orthography and how orthography provides cues to meaning" (Kuo & Anderson, 2008, p. 54). The reader "coordinate(s) orthographic, morphological, and semantic information" and also phonological information (Kuo & Anderson, 2006, p. 162). Thus, GMA allows the reader to identify grammatical categories, to infer the meaning of unfamiliar words, and to access stored lexical information. That is why L2 reading might be greatly facilitated if the L2 learner is able to find morphological cues in unknown words, especially since one of the differences between L1 and L2 readers is that L2 readers lack a full command of the L2 oral language. Due to the relative new introduction of the term GMA, the term morphological awareness seems to be still preferred.

Koda (2008, p. 75) summarizes the main findings of research on L1 monolingual reading and morphological awareness. According to her summary, inflectional morphology is already

developed before schooling whereas derivational morphology develops later "between grades four and eight." Moreover, morphological awareness is "a reliable predictor for reading achievement," and, at the high-school level, it makes a difference between "skilled" and "less skilled readers." During primary school years, the latter group made "more omissions of inflectional and derivational morphemes … in writing and speaking" (p. 75). Specifically to the relationship between morphological awareness and orthography, beginner readers rely on morphological decoding rather than on orthographic decoding (Mahony, Singson & Mann, 2010). In addition to this, Carlisle (2000) found a relationship between awareness of morphological printed structure and ability to define morphological complex words among third and fifth graders with English as L1. However, she was cautious to establish a causal relationship between reading comprehension and morphological awareness because the amount of printed experience could be a more determinant factor.

Since the pervasiveness of morphological awareness for L1 reading is persistent, albeit "small in terms of total variance" (Mahony, Singson & Mann, 2010, p. 215), the aim of this study is to assess its role in L2 readers adding the orthographic dimension and following a transfer perspective. Discussion on transfer started with Lado's "Contrastive Analysis Approach" in the 50s. Although a strong view of this approach is rejected, the existence of transfer in SLA is generally accepted. Holm and Dodd (1996) point out that the transfer discussion is no longer an issue, but it is necessary to know "how these skills are applied" because problems in L2 learning can be due to "inadequate or inappropriate" skill transfer (p. 121). For instance, adult L2 learners who are "highly literate in [their] first language show reading behaviors typically associated with poor readers" (Koda, 2008, p. 71).

Nevertheless, there are still different points of view about what is transferred. From a functionalist approach, what is transferred are "the internalized form-function relationships and their mapping skills" (Koda, 2008, p. 70). Based on this approach, the Transfer Facilitation Model emerges to illustrate "how metalinguistic awareness developed in one language promotes learning to read in another among diverse groups of second-language learners" (Koda, 2008, p. 77). In this model, there are four fundamental hypotheses. The first hypothesis is that "strong relationships exist between first-language metalinguistic awareness and second-language decoding skills" (p. 79). The second hypothesis is "that first-language metalinguistic sophistication and second-language print experience are both strong predictors of the rate at which corresponding metalinguistic awareness matures in a second language" (p. 80). Thirdly, "the distance between the two languages accounts for the differential rates in which second-language metalinguistic awareness and related reading sub-skills develop among learners with diverse first background" (p. 81). Finally, "that variations in second language processing procedures are attributable, in part, to differential processing requirements imposed by both first- and second-language writing systems" (p. 81).

Therefore, this study will try to corroborate that GMA is transferred across both languages, English and Spanish; it will be shown how GMA helps English speakers learning Spanish as a foreign language to understand a text better at the local level, which refers to morpheme, word and even sentence reading. This, by extension, will help to understand at the global level (the whole text), and also to understand better the structure of the Spanish language and infer new meanings. That is, the first and second hypotheses of "The Transfer Facilitation Model" will be analyzed so that the relationship between the mature English GMA and the evolving Spanish GMA is clearer. Additionally, an important issue to discuss is how L2 morphological knowledge

evolves in a classroom setting. For L1 speakers, inflection develops before derivation, which requires "more complicated relational, syntactic, and distributional knowledge" (Kuo & Anderson, 2006, p. 166 based on Tyler & Nagy, 1989).

In an L2 classroom, there is a clear difference in instruction between inflection and derivation. Inflectional morphology is intensively studied, and students are expected to process and produce it thanks to the clear formation rules in Spanish inflection (e.g. verbs ending in <-ar>, <-er>, <-ir> take the present 1st person ending is <-o>). Moreover, inflection morphemes are numerous and provide much grammatical information. However, little time is spent on derivational morphology since formation rules are not so clear, and it is not as productive as inflection. Nevertheless, morphological understanding can be increased if students explicitly work with derivational morphemes (Morin, 2003).

Because of this classroom focus on instructed word decomposition, L2 learners should be explicitly grapho-morphological aware. However, it is claimed that L2 learners avoid morphological decoding by concentrating on the word as the decoding unit. VanPatten's studies (VanPatten, 2007) support this statement: given limited computational resources, L2 learners will focus on meaning rather than on form. Therefore, learners will ignore morphological cues if other salient elements are available. In addition, Clahsen and Felser (2006a, p. 35) propose the "shallow structure hypothesis according to which the sentential representations that adult L2 learners compute for comprehension contain less syntactic detail than those of native speakers."[1] Another similar hypothesis is the "interactive-compensatory approach" proposed by Alderson and Urquhard (1985, quoted in Urquhard & Weir, 1998, p. 44): "a weakness in one area of knowledge could be compensated by stress in another area." This implies that L2 learners can

[1] Although they are not explicitly talking about reading, it seems to be applicable to reading.

ignore L2 morphology information and still not fail completely to grasp the text content by focusing on other elements.

Inferring from these hypotheses, the transfer of GMA cannot be visible until some morphological structures are already mastered and recognized by the L2 learner. This study focuses on the L2 learners' ability for word reading to see how intermediate learners deal with morphology "only," and what morphological structures they recognize. Actual morpheme reading is still little known for L2 reading tests rarely assess derivational or inflectional morphological knowledge. Furthermore, although vocabulary knowledge is basic for reading comprehension (Nation, 2001), GMA is also crucial for word decoding of morphologically complex words and, therefore, for reading comprehension.[2] A better grasp of the learners' GMA will help SLA researchers and foreign language teachers to better understand L2 reading processes and transfers. In the following section, a brief literature review of literacy development from L1 to L2, Spanish and English morphology, morphology processing, and reading models and assessment in the L2 classroom will be provided. After that, the quantitative and qualitative analyses will be explained followed by their results. Finally, in the concluding section, it will be discussed how GMA is more language-specific than universal and how important it is for word and text comprehension.

[2] This seems to be a circular argument since "reading facilitates derivational knowledge" (Schmitt & Zimmerman, 2002, p. 149).

2.0 LITERATURE REVIEW

2.1 LITERACY DEVELOPMENT FROM L1 TO L2

There is a current interest in exploring how reading is learned across the three different writing systems - alphabetic, syllabic and logographic - and how previous L1 reading proficiency affects L2 reading (Koda, 2008; Saiegh-Haddad & Geva, 2010). There is, however, a "distance effect" to consider between writing systems and differences in the learning context – what Koda calls the "dual language involvement." For example, a Chinese college student will already have a fully developed reading ability in a logographic L1 writing system when he starts learning English, an alphabetic system, whereas a seven-year-old Spanish ESL learner will have just learned to read in his native language. That is, there is a full array of situations with different "dual language involvements." There are also great differences between L1 reading and L2 reading. On the one hand, prior to print exposure, children do not know how their writing system and their orthography might work. However, their spoken language proficiency is already high. On the other hand, adult L2 learners approach the new reading task with assumptions based on what they know about L1 reading and a low level of proficiency in the spoken language. In fact, in the language classroom, written and spoken languages are taught together so that written language, in the case of alphabetic systems, can act as a springboard to the spoken language.

However, reading metalinguistic skills are common across languages, which is explained by Reading Universals (Perfetti, 2003). The most basic universal is "the Language Constraint on Writing Systems", that is, "writing systems encode spoken language," but not meaning (Perfetti, 2003, p. 3). From the "Language Constraint on Writing Systems," the "Universal Phonological Principle" (UPP) is derived. UPP states that "word reading activates phonology at the lowest level of language allowed by the writing system: phoneme, syllable, morpheme, or word" (Perfetti & Dunlap, 2008, p. 14); which means that every reader has to learn the mapping from their spoken language into their writing system. An alphabetic system makes a correspondence between graphemes and phonemes while a syllabic system maps graphemes to morphemes and a logographic system maps graphemes to morphemes or even words.

Several studies (Fender, 2003; Holm & Dodd, 1996; Koda, 2000; Zhang, Perfetti, &Yang 1999) have proved that there are some skill differences depending on the writing system one is literate in. For example, Holm and Dodd showed how logographic literates possess a lower level of phonology awareness than alphabetic literate, which interferes with L2 reading and learning. Moreover, there is also a difference in reading different alphabetic orthographies (Aro & Wimmer, 2003; Fender, 2003).

Spanish and English share the same writing system, namely an alphabetic system, which means that both languages map graphs onto phonemes. However, they differ in their orthography,[3] that is, "in the transparency of mappings between graphemes and phonemes" (Perfetti & Dunlap, 2008, p. 17) and also in their phonology. Alphabetic orthographies are divided into shallow and deep orthographies. The former one implies that the relationship is one

[3] "An orthography is the implementation of a writing system to a specific language…Within alphabetic writing systems, orthographies vary in the transparency of mappings between letters and phonemes" (Perfetti & Dunlap, 2008, p. 17):

grapheme: one phoneme; whereas in the latter one the relationship is one grapheme: many phonemes and vice versa, showing many exceptions or irregular words (see Perfetti & Dunlap, 2008, p. 18). Since orthography is language-specific, these differences present difficulties for L2 learners of different orthographies. Spanish is a shallow orthography, whereas English is a deep orthography. For example, in Spanish, graphemes <b> and <v> are /b/ and <a> is /a/; in English, <th> can be /□/ or /ð/ and <a> can be /a/, /ə/ and /æ/ but these graphemes cannot be anything else, and the reader knows that.

Shallow orthographies are easy to read since one of the differences between both orthographies is that speakers of a language with a deep orthography are usually worse at reading non-words. Perfetti and Dunlap (2008, p. 19) reported experiments comparing English with Welsh, German, and Italian respectively, which show how "readers of English may use a large portion, or 'grain size,' of the printed word to map onto spoken language." This grain-size reading is also a skill for reading the smaller units within a word, which are the morphemes.

In Kuo and Anderson (2006) literature review on L1 morphology awareness and reading, it is emphasized that "the importance of [derivational] morphological awareness to reading development appears to increase with age" (p. 173) while inflectional awareness only seem to contribute to "comprehension but not to the decoding skills" (p. 170). For beginner readers, phonological awareness is the most important element in their reading development. These authors also stressed Nagy, Berninger, Abbott, Vaughan, and Vermeulen (2003) "holistic study on morphological awareness" (p. 174) where it was asked for the inclusion of "orthographic awareness in examining the relationship between morphological awareness and reading achievement" (p. 174). Moreover, Gaustad (2000) supports a reading instruction model based on "morphographic analysis" (other name for GMA) for deaf students based on the fact that

"morphology as a word identification factor is accessible through vision" (p. 68). Again, since L2 learners lack a fully developed phonology system, this access through vision to morphology can help them to better understand. For alphabetic readers, this "morphological analysis" can be easily transferred. Moreover, both Spanish and English adult readers might be using this grain-size reading or morphological reading due to these languages' morphological complexity. This point will be further discussed once the Spanish and English morphology systems are shown.

2.2 SPANISH AND ENGLISH MORPHOLOGY

In addition to a shallow orthography, Spanish has a rich morphological system, which makes GMA fundamental in reading development (Ramirez et al., 2010; Sainz, 2006). Most of Spanish words are polymorphemic. This means that they consist of a base and several bound morphemes. Polymorphemic words have a hierarchical organization: derivational morphemes come before inflectional morphemes, and there is an order in the derivational morphemes that can be added as well as in the inflectional morphemes (Pena, 1999). These derivational morphemes have lexical and grammatical meaning, whereas the inflectional morphemes have only grammatical meaning. Both kinds of suffixes will be analyzed in this paper regarding GMA.

The different levels of transparency of complex words makes it necessary to divide "derived words" and "palabras afijadas" (words with two bound morphemes) (Piera & Varela 1999, p. 4373). The term "derived words" refers to words that show a clear meaning of their base and morphemes from a synchronic point of view. The term "palabras afijadas" deals with words that do not provide speakers with enough synchronic and semantic information so that they can

recognize the base and the morphemes. In this study, Spanish words are mainly "derived words" with a high degree of transparency.

In the following table (see Table 1), the differences between inflectional and derivational suffixes are illustrated.

Table 1. Differences between derivational and inflectional suffixes

(Pena, 1999; Piera & Varela, 1999)

Characteristic of Suffixes	Derivation	Inflexion
1. Outside element		√
2. Change of word class or subclass[4]	√	
3. More combinations of morphemes	√	√
4. Change does not affect the syntactic structure	Subclass der.√	
5. Organized in paradigms	√(open)	√(closed)
6. Always a predictable meaning		√
7. Automatic productivity		√
8. Restrictions in productivity	√	
9. Addition process	√ (root)	√ (theme)
11. It doesn't select word class	√	
12. Nouns, adjectives and verbs as base	√	√
13. Prepositions and adverbs as base	√	
14. It can be blocked by synonym word	√	√ (irregulars)
15. Recursivity	√	

[4] Examples: Change in word class: fácil (Adj: *easy*) → facilitar (V: *to make something easy*)
Change in subclass: ropa (N: *clothes*) → ropero (N: *wardrobe*)

English inflectional morphology is limited to a reduced number of suffixes that often overlap. For example, [s] can mean 3rd person singular present tense, plurality for nouns and possessive. All in all, the above illustrated table works perfectly to explain English morphology. Consequently, there is nothing "new" when English L2 learners encounter Spanish morphology.

Native speakers presumably utilize a dual-mechanism "for processing and mentally representing morphological complex words: an associative system of full-form representations stored in lexical memory, and a set of rulelike operations for decomposing inflected and derived words into their morphological constituents" (Clahsen & Felser, 2006a, p. 5). Ullman (2004) divides this dual-mechanism into "the declarative/procedural model (DP) model of language" basing this on Chomsky's "memorized 'mental lexicon'" and the "computational 'mental grammar'" (p. 233), and on the "distinction between declarative and procedural memory" (p. 233). According to the DP, bound morphemes, words and idiomatic phrases are memorized in the mental lexicon; whereas the mental grammar provides rules of grammar. The "rule governed behaviour" affects morphology and syntax, and its knowledge is implicit. Nevertheless, high frequency complex words do not need to "be computed anew each time they are used" (p. 234) and can be stored directly in the mental lexicon. In principle, this dual-mechanism could be available for L2 learners, but Clahsen and Felser (2006b) claim that grammatical processing is "fundamentally different" between L1 and L2 and present the above mentioned "shallow structure in L2 processing." L2 learners will "lack complex hierarchical structure and abstract, configurationally determined elements such as movement traces" (p. 111), although they present a "nativelike grammatical processing" in "word segmentation or morphosyntactic agreement between closely adjacent constituents" (p. 111) and, in sentence processing, they show "sensitivity to argument structure, thematic and plausibility information" (p. 112).

L2 readers differ from adult L1 readers in morphological reading at the global level (the whole text). However, both groups will react to inflection violations in word recognition since both of them know the inflectional rules - the L1 reader implicitly, and the L2 explicitly; whereas their reaction to derivational violations might be different. L2 learners might be clueless with a whole word or they might recognize some parts of the word. For example, they might know the bound morphemes, but not the base, or they might know the base, but not all bound morphemes. L1 learners might rely only on their lexicon and not on their mental grammar. Although a deep analysis of the DP and the "shallow structure hypothesis" goes beyond the scope of this study, it is necessary to take them into account. The design of this study to measure GMA is based on a dual-route of morphological processing, for native and non-native speakers.

In the two next sections, a brief description of reading processing will be provided, and finally, once all the basic concepts are clear, the hypothesis and objective of this paper will be depicted.

2.3 READING MODELS AND READING ASSESSMENT IN THE L2 CLASSROOM

During the 70s, a top-down approach to reading based on Goodman's work was the prevailing reading model. It went "against a pedagogical tradition which stressed a fairly strict bottom-up approach" (Urquhard & Weir, 1998, p. 43), and it was a reader-driven model where the main focus were reader's expectations. However, now the bottom-up approach is back since it is known that "while all readers use context, good readers are less dependent on it than poor readers" (p. 44).

There is currently agreement in the existence of a dual-route model of word reading "lexical" and "nonlexical" (Coltheart, 2005), also called whole word and grapheme-phoneme conversion route (Ahlsén, 2006) or "lexical orthographic-graphemic code" and "a nonlexical phonemic code" (Sainz, 2006). Sainz indicates that it is usually assumed that the "lexical orthographic-graphemic code" is used in deep languages, such as in English; and the "nonlexical phonemic code" is used in shallow languages, as Spanish. However, he warns about the risk of forgetting the rich morphological system of Spanish that resembles the one used in deep orthographies. According to Sainz, syllabic and phonemic instruction in L1 reading can be negative if no attention is paid to morphemic instruction since "that competes with syllable-based parsing" (p. 162). That is, the "large portion, or 'grain size'" reading in deep orthographies, pointed by Perfetti and Dunlap (2008), can also be used in Spanish reading. As mentioned already, reading of isolated words is not the most common reading in the classroom. There are usually five kinds of reading to be encountered: search reading, skimming, scanning, careful reading (at the local level) and browsing (at the global level); and the preferred reading in the L2 classroom is usually careful reading (Urquhard & Weir, 1998, p. 100-101). L2 reading assessment usually focuses on reading comprehension and interpretation at the global level, but the language teacher is usually ignorant about the ability of his students to analyze morphology. In spite of that, Urquhard and Weir indicate that expeditious and careful reading at the global and at the local level are considered the four main components in reading, although current research suggests that is very difficult, and even impossible, to differentiate between components. Both authors explained different assessment formats as cloze task, multiple-choice questions or short-answer questions that, in principle, should deal with these different reading levels. Urquhard and Weir warn about excessive emphasis on careful local reading since it cannot "give an accurate

picture of the reading ability of all the individuals who sit at a test" (p. 167). Although readers can perfectly understand a text without reading carefully at the local level, it is important to know how exactly their reading works and to establish a relationship between GMA and reading. Then, it could be seen if grapho-morphological aware readers easily infer grammatical categories and unknown meanings from word's morphemes.

3.0 RESEARCH STUDY

The three main goals of this study as mentioned in the introduction are: (1) to assess the level of GMA on L1 English speakers who are learning Spanish at an intermediate level in an undergraduate class; (2) to observe the relationship between L1 English and L2 Spanish GMA; and (3) to establish a relationship between GMA in word recognition and reading comprehension. In order to do that, three specific questions were asked:

1. Do L1 English speakers, learners of Spanish at the undergraduate level (age 18 to 24) use GMA to recognize lexemes, inflectional, and derivational morphemes in a word?
2. Do they transfer their GMA from English into Spanish?
3. Does GMA allow them to comprehend better?

The "unique, cross-linguistic, nature of second-language reading" (Koda, 2008, p. 227) is explored with these three questions, which take into account "transferred" L1 GMA, "evolving" L2 GMA and L2 proficiency. It was expected that the results would support the two first hypotheses of the Transfer Facilitation Model and show that the transferred GMA allows English L2 readers to understand better. It was expected that less-skilled L2 readers would not decompose a word and would use the word as the decoding unit, while more skilled readers would decompose a word into a base and its morphemes. A multiple choice reading (MCR) was designed to measure reading understanding based on GMA and to attempt to predict reading comprehension based on GMA.

Although all participants belonged to a fourth semester Spanish class, L2 proficiency would vary. Therefore, since GMA could be driven by higher proficiency, a measure of proficiency was taken in the form of a cloze task (CT). It was expected that readers would be better in decoding inflectional than derivational morphology since they received formal instruction in this area. However, since they had received explicit instruction on diminutive and augmentative morphemes in Spanish, it was anticipated that L2 readers would be able to recognize these highly productive morphemes. It was conceived that L2 learners would be able to recognize lexemes with ease.

A timed lexical decision task was used to measure GMA in Spanish. If participants were not paying attention to the lexemes and morphemes as independent units, it should have taken them the same amount of time to recognize known lexemes (with allowed and non-allowed derivational and inflectional morphemes) and pseudo-words. They would just see an existing whole word or a non-existing whole word. However, if participants were focusing on the different intraword units, the times would be different since they were seeing a "correct" part of the word, and it might take them longer to recognize if the whole word was a non-existing word. They would be using their GMA. If they were not relying on the morphological suffixes and paying attention to the lexemes, they would still be faster recognizing pseudo-words as non-words than words with non-allowed morphemes. Finally, words with inflectional affixes should have been recognized faster than words and pseudo-words with derivational affixes, if instruction were making them more aware of inflection. This ability should have been more automated. To triangulate the results of the observational experiments, four participants were interviewed to get a better insight into the data.

This study allows for the differentiation of GMA as a specific reading skill from other sub-skills. Once it is clear how GMA transfers among intermediate college students, specific morphological classroom instruction and assessment can be designed to facilitate word recognition and reading understanding in Spanish.

4.0 OBSERVATIONAL EXPERIMENTS

4.1 PARTICIPANTS

Participants were 46 students (33 women, 13 men, M_{age}=19.3, age range: 17 to 25) taking a fourth-semester Spanish course (Span 004) at the University of Pittsburgh. They were informed of the study by their class instructor or the researcher, who was the same person for one of the sections. Those who volunteered were compensated with extra participation points for the week. Since all students but one had previous exposure to Spanish before coming to the university (M_{years}=4.48, *SD*= 2.126, years range: 0 to 11), they were placed in different courses to study Spanish at the university. Therefore, they have different exposures to Spanish at the university at that time (M_{terms}= 2.46, *SD*=.86, Mode= 2 terms, terms range: 1 to 4). Albeit all being monolingual English native speakers, 8 participants had studied another foreign language and 1 participant had studied 3.

A group of 30 native speakers of Peninsular Spanish (19 women, 11 men, M_{age}=37.62, age range: 18 to 62) was also tested as a control group. The sample was gathered by snowball sampling technique, and no one received any compensation.

4.2 MEASURES

Participants were tested with four different instruments: a lexical decision task (LDT) in English (only for English speakers), a LDT in Spanish, a cloze task (CT) and three short readings with multiple choice questions (MCR). A background questionnaire was also administered the results of which were above reported (See Appendices B and C).

4.3 MATERIALS AND PROCEDURES

All these tasks were administered in one session that lasted approximately 1 hour and 1 hour and 30 minutes. The English participants and one of the Spanish speakers took the tests in the SLA lab at the University of Pittsburgh. The Spanish speakers took the tasks in Spain in quiet rooms.

4.3.1 Spanish LDT

The Spanish LDT measured reaction times (RTs) and accuracy so that it could be seen how participants reacted to inflectional and derivational morphology by showing differences in both measures when unknown lexemes or violations of morphology appeared.

The task was run on a laptop using the E-Prime 2.0 software. Participants were asked to decide if the word they saw on the 15.4 inch-laptop screen was a Spanish word. In that case, they had to press 1 and write down the English translation for that word. If the word they saw was not a Spanish word, they had to press 2. They had 4 seconds to make a decision before the word disappeared, and the answer was no longer valid. Once they had pressed 1 or 2, they saw an

asterisk in the center of the screen. This was the designated time for translating. Once they were ready, they could press the space bar to continue. For the Spanish participants, the only difference was that they were not asked to translate, and after they pressed 1 or 2, they saw an asterisk for 2 seconds before a new word automatically appeared.

There was a practice trial with 8 words for the English speakers and with 4 words for the Spanish speakers. The E-Prime 2.0 software randomized the 118 words which were divided in eight conditions (see Appendices E, F and G):

i) pronounceable pseudo-words (PW) with

(1) allowed derivational affixes (10 words)

(e.g. "cofete**dero,**" a non-existing lexeme is added a suffix for substantives and postverbal adjectives)

(2) allowed inflectional affixes (10 words)

(e.g. "cofet**ían**," a non-existing lexeme is added the inflection for 3rd person plural imperfect)

ii) lexemes they know with

(3) allowed derivational suffixes (21 words)

(e.g. "busca**dor**" *searcher*, *search engine*)

(4) non-allowed derivational suffixes (19 words)

(e.g. "busqu**ero**," this is a postnominal suffix that can not be added to a verb to create a noun)

(5) allowed inflectional suffixes (17 words)

(e.g. "busc**aron**" *they looked for*)

(6) non-allowed inflectional suffixes (19 words)

(e.g. "busqu**ieron**," 3rd person plural ending for <–er> and <–ir> verbs. "Buscar" is an <-ar> verb with a different conjugation)

(7) easy words (11 words)

(e.g "tomate" *tomato*)

(8) easy words with complex morphology (11 words)

(e.g. "tomat**itos**" *little tomatoes*)

In order to create the non-allowed inflectional suffixes, the different Spanish conjugations endings were interchanged. For instance, the form of preterit of the verb "tomar" (1st conjugation verbs ending in –ar) was conjugated as if it were an "-er verb" (3rd conjugation). Instead of "tom**aron**" (they took), *"tom**ieron**" was given. The lexemes were chosen from a first semester Spanish book (Mosaicos, 2006) assuming participants would be familiar with them. All derived and inflected words had transparent morphology, which means that their base and morphemes are easily recognizable from a synchronic perspective. The lexemes for the pseudo-words were taken from Rodriguez-Fornells, Münte, and Clahsen (2002).

4.3.2 English LDT

The English LDT followed the same structure described above for the LTD for Spanish native speakers. The lexemes were taken from the lower level frequency list provided by Kilgarriff (1998) taken from the British National Corpus (BNC) (see Appendix I). Eleven more lexemes (condition 7 and 8) were given to have a balance of words and non-words. They were taken from the sublist 10 in the Academic Word List (AWL) (see Appendix J). The lexemes for the pseudo-words were taken from the Oxford English Dictionary (see Appendix K).

i) pronounceable pseudo-words (PW) with

(1) allowed derivational suffixes (10 words)

(e.g. “londit**er**”)

(2) allowed inflectional affixes (10 words)

(e.g. londit**ing**)

ii) lexemes with

(3) allowed derivational suffixes (20 words)

(e.g. “extrem**ity**”)

(4) non-allowed derivational suffixes (20 words)

(e.g. “extrem**itant**”)

(5) allowed inflectional suffixes (20 words)

(e.g. “extremiti**es**”)

(6) non-allowed inflectional suffixes (20 words)

(e.g. “extremit**ing**”)

(7) AWL words (10 words)

(e.g. “invok**er**”)

(8) AWL with inflectional morphology (11 words)

(e.g. “invoke**s**”)

4.3.3 Cloze Task

The cloze task (CT) function was to measure reading proficiency of the participants and, at the same time, to provide a measure of productive morphological knowledge. The CT was developed following the fixed-ratio deletion, every seventh word (plus or minus two), and had thirty-four blanks since it is usually considered appropriate from 30 to 50 blanks (Brown, 2004,

p. 202). It was adapted from an article on the digital version of El País called "Matriculado en la euphoria y licenciado en el desastre" from Amanda Mars on November 5th 2009 (Appendix D). Participants were given 20 minutes to complete this passage; although time was not strictly controlled, and some participants took a bit longer. The appropriate word scoring was used; that is, a point was given "for supplying any word that [was] grammatically correct and that [made] good sense in the context" (p. 202) for the strict scoring. There was also a medium scoring where grammatically correct words were accepted even if the semantics was wrong, and a laxer scoring where a point was given just for providing the right word category (see Table 11).

4.3.4 Multiple Choice Reading

Three short passages followed by eight multiple choice questions were created (see Appendix H). The questions were designed to analyze inflectional (four[5]) and derivational (eighteen) decoding. Two questions were related to content (1A and 2A). Participants were given four options and a "no sé" ("I don´t know") option to avoid guessing. Additionally, participants were explicitly told to avoid guessing. In two questions, two answers were possible since one was the semantic right answer, and the other was a morphologically acceptable answer. Cognates were avoided as much as possible, and six words with complex derivational morphology were invented. Three had invented lexemes but possible suffixes (*lequito, lequista, polamente*), and three were possible but non-existing words (*porrezno, idealecta, espaldal*) so that all information for that item was given through the suffix and the sentence context. Participants were given 20

[5] The four questions were B7, C1, C5 and C8.

minutes to complete this section. Nevertheless, time was not strictly controlled and some participants took a bit longer.

4.4 RESULTS

4.4.1 Results LDT

In order to accept a result as accurate, the English participants needed not only to have said that the item was a word or not a word when they were in the LDT, but also to have provided the right translation. Therefore, all errors were deleted for the subsequent RT analysis. However, since these translations help to understand what clues the participants were using to look for the words' meanings, they will be analyzed in section 6. Table 2 shows the results of the lexical decision accuracy of the Spanish learners and the Spanish native speakers in the Spanish LDT in all eight conditions. The left column presents the results of the Spanish learners in the English LDT, their native language.

Table 2. Mean lexical decision accuracy results of the English speakers and Spanish speakers across the 8 conditions

	Spanish LDT				English LDT	
	English Sp.		Spanish Sp.		English Sp.	
	M	SD	M	SD	M	SD
	N = 46		N = 30		N = 46	
(1) PW + der.	.82	.18	.89	.13	.97	.05
(2) PW +infl.	.81	.19	.91	.10	.95	.06
(3) Allowed der.	.25	.09	.87	.09	.82	.10
(4) Violation der.	.83	.16	.86	.14	.90	.08
(5) Allowed infl.	.63	.15	.90	.06	.82	.09
(6) Violation infl.	.69	.17	.93	.08	.91	.08
(7) EW	.92	.06	.97	.05	.85	.14
(8) EW + morph.	.60	.13	.96	.07	.97	.05

Sp. speakers; PW, pseudo-words; der., Derivation; inf., Inflection; EW, easy words; EW + morph., easy words with morphology (inflectional morphology for English speakers).

For English speakers reading Spanish words, an ANOVA comparing the eight conditions was significant $F(7,315)=112.23$, $p < .001$. Thus, post-hoc comparisons were carried out. Of the 28 possible differences between pairs of conditions, 22 are significant, and only 6 are not significant ($p< .05$).

Table 3. ANOVA for English speakers' word-recognition accuracy in Spanish

Cond.	1	2	3	4	5	6	7	8
1		NS	*	NS	*	*	*	*
2			*	NS	*	*	*	*
3				*	*	*	*	*
4					*	*	*	*
5						NS	*	NS
6							*	NS
7								*

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

**p<.05 two-tailed*, NS = no significant difference

Interestingly, there was no statistically significant accuracy result in reading violations in inflection (6) and allowed inflection (5) or between reading pseudo-words (1 and 2) and violations in derivation (4). In Table 2, it can be seen that participants were more accurate indicating non-existing words than existing words.

For participants' accuracy in their native language, the distributions were considerably skewed to the left since most scores were high. Because of the violation of the assumption of normality, a nonparametric test was used instead of an ANOVA. The outcome of the Friedman test indicated that there were significant differences, $\chi^2_r = 36.28$ (7, n= 30), p<.001 for native Spanish speakers. A Wilcoxon signed ranks test was used to identify specifically where

significant differences occurred. Conditions from 1 to 5 were statistically different from (7 and 8) easy words reading ($p<.05$). In fact, native Spanish speakers were most accurate in conditions 7 (M= 97) and 8 (M = 96). Moreover, violations in inflection (6) were also significantly different from the other conditions, but not from pseudo-words (1 and 2) and easy words reading (7 and 8). These results can be seen in Table 4.

Table 4. Accuracy of Spanish speakers reading Spanish with Wilcoxon T analysis

Cond.	1	2	3	4	5	6	7	8
1		NS	NS	NS	NS	NS	*	*
2			NS	*	NS	NS	*	*
3				NS	NS	*	*	*
4					NS	*	*	*
5						*	*	*
6							*	NS
7								NS

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

$p<.05$ two-tailed, NS = no significant difference

For the English speakers, the outcome of the Friedman test indicated that there were significant differences, $\chi^2_r = 137.81$ (7, n= 46), $p<.001$. The Wilcoxon signed ranks test showed that all conditions were statistically different from reading pseudo-words (1 and 2), and (8) easy words with inflection ($p<.05$). There was no statistical difference in word recognition accuracy of the same lexemes in derivation and inflection (3 and 5) or violations in these (4 and 6). But the

difference between reading violations from no violations (3 and 4) in derivation and (5 and 6) in inflection was statistically significant. All results are summarized in Table 5.

Table 5. Accuracy of English speakers reading English words with Wilcoxon T analysis

Cond.	1	2	3	4	5	6	7	8
1		*	*	*	*	*	*	*
2			*	*	*	*	*	*
3				*	NS	*	NS	*
4					*	NS	NS	*
5						*	NS	*
6							NS	*
7							`	*

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

**p<.05 two-tailed,* NS = no significant difference

When the results of accuracy of the Spanish and English LDT for the English native speakers were compared (see Table 6), negative and positive medium correlations were found ($p<.05$, two tailed).

Table 6. Accuracy correlations LDT English and Spanish for English speakers

Span. Acc.	1.	2.	3.	4.	5.	6.	7.	8.
Eng. Acc. 1.	.114	.068	-261	.195	.030	.001	-.235	-.075
Eng. Acc 2.	.205	.110	-.326*	.187	-.127	.045	-.302*	-.072
Eng. Acc 3.	.001	-.155	.064	-.187	.354*	.021	-.032	.360*
Eng. Acc 4.	.330*	.107	.012	.214	177	.177	.150	.143
Eng. Acc 5.	-.175	-.304*	.271	-.335*	.329*	-.129	-.85	.213
Eng. Acc. 6	.208	.154	-.207	-.197	.245	.184	.197	.241
Eng. Acc. 7	-.136	-.169	.228	-.116	.311*	-.105	-.331*	.314*
Eng. Acc 8.	-.040	-.190	.114	.080	.084	-.158	.320*	.019

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

**p<.05 two-tailed*

These results were testing the transferability of GMA from English into Spanish. The only condition that correlates between both languages is condition 5 (inflection). There were also negative correlations between condition 2 and 4 in Spanish and condition 5 in English. These correlations do not provide much information since they are medium and, even, low as well as positive and negative. Table 6 does not offer a clear pattern between English and Spanish accuracy transfer.

A posterior analysis of RT on the eight conditions was performed taking into account only the accurate answers in the three samples. The results are summarized in Table 7.

Table 7. Mean lexical decision RT results of English speakers and Spanish speakers across the 8 conditions

	Spanish LDT				English LDT	
	English Sp.		Spanish Sp.		Native English	
	M	SD	M	SD	M	SD
	n= 46		n= 30		n = 46	
(1) PW + der.	2256	482	1744	465	1277	378
(2) PW +infl.	2350	491	1748	462	1252	311
(3) allowed der.	1983	566	1204	284	1253	278
(4) violation der.	2193	396	1665	429	1472	346
(5) allowed infl.	2007	470	1182	295	1219	267
(6) violation infl.	2361	488	1613	414	1458	340
(7) easy words (EW)	1472	378	914	222	1229	320
(8) EW + morph.	1871	477	1144	295	1042	258

Sp. speakers; PW, pseudo-words; der., Derivation; inf., Inflection; EW, easy words; EW + morph., easy words with morphology (inflectional morphology for English speakers).

As well as the accuracy ANOVA, the ANOVA comparing RT conditions was significant $F(7,315)=43.26$, $p < .001$ for English speakers reading Spanish. Thus, post hoc comparisons were carried out because the ANOVA was significant. Of the 28 possible differences between pairs of conditions, 18 are significant, and 10 are not significant (see Table 8).

Table 8. Significant Differences of English speakers' RT reading Spanish

Cond.	1	2	3	4	5	6	7	8
1		NS	*	NS	*	NS	*	*
2			*	NS	*	NS	*	*
3				NS	NS	*	*	NS
4					NS	*	*	*
5						*	*	NS
6							*	*
7								*

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

$p<.05$ two-tailed, NS = no significant difference

Furthermore, the normality assumption with the RTs' results was not violated by any of the native speakers' group. An ANOVA of the Spanish speakers RT of the eight conditions was statistically significant $F(7,203)=80.80$, $p < .001$. Post-hoc comparisons were carried out. In table 9, it can be seen how word-recognition of words with violations in morphology (4 and 6) or pseudo-words (1 and 2) was significantly different from reading allowed words. Word-recognition of more frequent words (7) was also statistically different from the more complex morphological words (3, 4 and even 8).

Table 9. Significant Differences of Spanish speakers RT reading Spanish

Cond	1	2	3	4	5	6	7	8
1		NS	*	NS	*	NS	*	*
2			*	NS	*	*	*	*
3				*	NS	*	*	NS
4					*	NS	*	*
5						*	*	NS
6							*	*
7								*

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

**p<.05 two-tailed*, NS = no significant difference

Moreover, an ANOVA of the results of the English speakers reading English showed that there were statistical differences between the RT in the different conditions $F(7,315)=29.45$, $p < .001$. A post-hoc analysis showed that 11 were not significant and 17 were significant ($p < .001$). There were statistical differences between reading violations in derivation (4) and all the other conditions, but not in violations in inflection (6). Reading derivation or inflection does not seem to be statistically different in English (3 and 5), but word-recognition of allowed and non-allowed derivations (3 and 4) and allowed and non-allowed inflections (5 and 6) are statistically different. Reading easy words with inflection (8) was significantly different to the other readings (see Table 10).

Table 10. Significant Differences of English speakers RT reading English

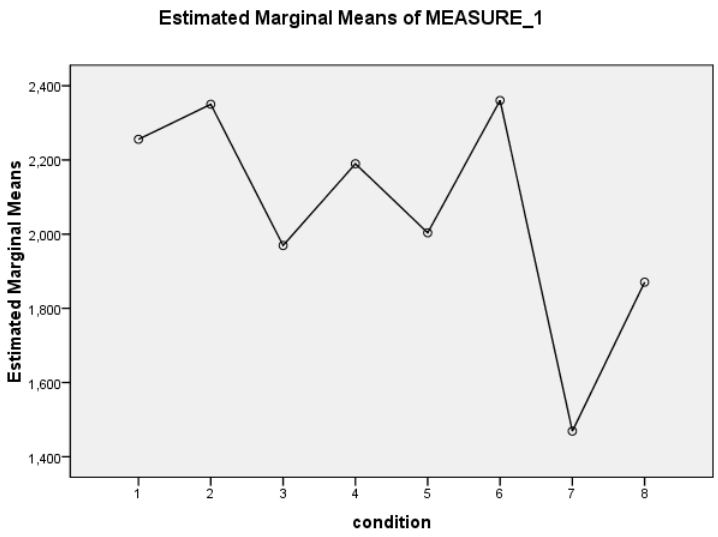
Cond	1	2	3	4	5	6	7	8
1		NS	NS	*	NS	*	NS	*
2			NS	*	NS	*	NS	*
3				*	NS	*	NS	*
4					*	NS	*	*
5						*	NS	*
6							*	*
7								*

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

**p<.05 two-tailed*, NS = no significant difference

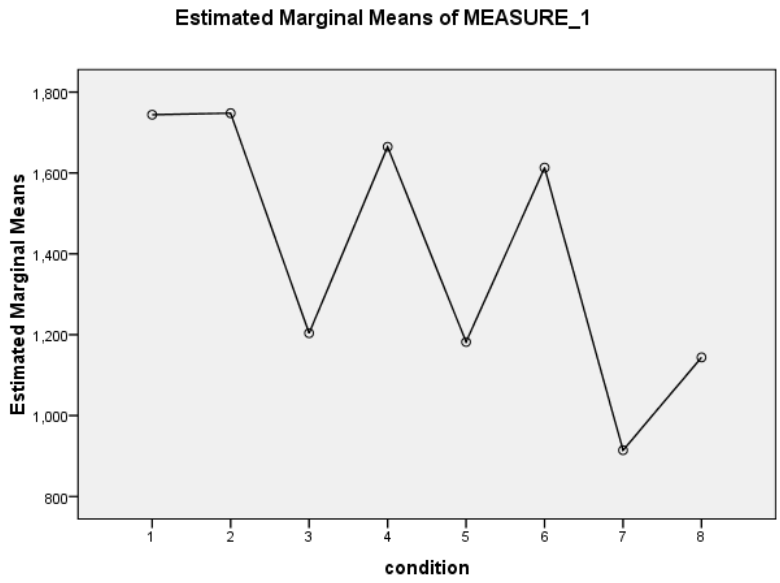
As a summary, the RT's means of all samples are shown in the following three figures. It can be clearly seen that all participants took longer figuring out the violations in derivation (4) and inflection (6) than other words. While for the native speakers, the means of both violations show similar peaks, the means of violations in inflection show a greater peak for the English speakers' learners of Spanish in inflectional than in derivational violations. In addition to this, pseudo-words in Spanish take longer to read for Spanish speakers and English speakers even higher than reading violations, whereas for English speakers this is not the case. The AWL inflected words (8) were read even faster than the words with a simpler morphology (Figure 3). For reading in Spanish, less complex easy words (7) were read faster that more complex easy words (8) (see Figures 1 and 2).

Figure 1. English speakers RT in Spanish



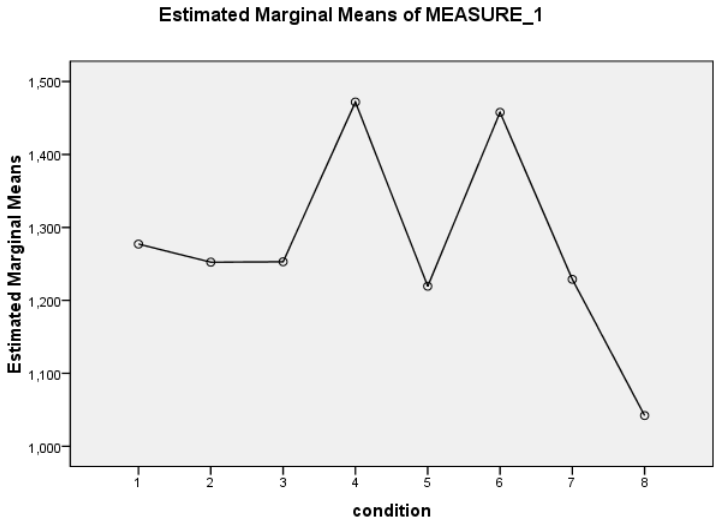
1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology

Figure 2. Spanish speakers RT



1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology

Figure 3. English speakers RT in English:



1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, AWL words;
8, AWL words with inflection

A correlation of the RTs for English speakers reading English and Spanish RTs, which were depicted on Figures 1 and 3, was carried out. The RTs' correlations were again medium as the accuracy correlations in Table 6. Contrary to the accuracy correlations, condition 3, allowed derivation, of Spanish RTs correlates positively with seven of the conditions (not with condition 7) of the English RTs. This means that if Spanish allowed derivation RTs were low, RTs in the other conditions in English were also low, and if they were high, they were high in the English conditions too. All correlations are depicted in Table 11.

Table 11. Correlations of RTs in English and Spanish LDTs for English speakers

Span. RT.	1.	2.	3.	4.	5.	6.	7.	8.
Eng. RT. 1.	.131	115	.341*	.082	-.048	-.102	.142	-.002
Eng. RT 2.	.175	.122	.325*	.090	-.033	-.106	.130	.004
Eng. RT 3.	.172	.117	.317*	.284	.043	.061	.152	.029
Eng. RT 4.	.137	.115	.336*	.082	-.039	-.100	.164	.000
Eng. RT 5.	.140	.197	.323*	.285	.059	.130	.180	.146
Eng. RT. 6	.106	.134	.375*	.113	.031	-.010	.200	.046
Eng. RT. 7	.127	.079	.294	.139	.113	.024	.210	.116
Eng. RT 8.	.178	132	.352*	.267	.147	.146	.300*	.169

1, pseudo-words and derivation; 2, pseudo-words and inflection;
3, allowed derivation; 4, violation derivation; 5, allowed inflection;
6, violation inflection; 7, easy words;
8, easy words with morphology (Spanish) and with inflection (English).

*$p<.05$ *two-tailed*, NS = no significant difference

4.4.2 Results of Multiple Choice Reading (MCR) and Cloze Task (CT)

In Table 12, the reading proficiency measures (CT) and the MCR of the two groups of speakers were given. It was necessary to utilize three different scoring methods, since the appropriate word scoring (here called stricter CT) provided a very low mean (*M*=11.54, *SD*= 3.53) for the English speakers. The laxer scoring (a point was given if the right word category was provided) produced the higher scores for the English speakers (*M*=24.19, *SD*=4.5) closer to the score of the native speakers (*M*= 30.7, *SD* =2.45).

Table 12. Means English and Spanish speakers in MCR and three different CT's scoring

	English Sp.			Spanish Sp.		
	M	SD	Range	M	SD	Range
	N = 46			N= 30		
MCR	14.73	3.64	7-23	19.1	4.54	7-24
laxer CT	24.19	4.5	12-31	30.7	2.45	24-33
medium CT.	20.24	4.71	8-29	30.5	2.56	24-33
stricter CT .	11.54	3.53	5-22	28.16	3.73	20-33

It was necessary to correlate both tasks to provide a measure of proficiency for the English speakers. The stricter scoring provided the higher correlation ($r=.405$, $p<.01$) with the reading task (see Table 13).

Table 13. Correlations of English speakers in the two tasks Multiple Choice Reading (MCR) and Cloze Task (CT)

	Stricter CT	Medium CT	Laxer CT	MCR
MCR	.405**	.389**	.304*	___
laxer CT	.630**	.921**	____	____
medium CT.	.779**	____	____	___

**p<.05 two-tailed*
***p<.01 two-tailed*

For the native speakers, there was no correlation between the MCR and the CT. All different scorings for the CT correlated (see Table 14).

Table 14. Correlations of Spanish Speakers in the two tasks Multiple Choice Reading (MCR) and Cloze Task (CT)

	Stricter CT	Medium CT	Laxer CT	MCR
MCR	.338	.134	.177	___
laxer CT	.842**	.971**	____	____
medium CT.	.818**	____	____	____

***p<.01 two-tailed*

4.4.3 Correlations

There was no significant negative or positive correlation among the English speakers' RT in Spanish and any of the other reading tasks (MCR and scoring for the CT). However, there were

correlations among four of the conditions' accuracy (1, 3, 5 and 8) and the MCR and the CT, which showed medium correlations ($p<.05$) (see Table 15).

Table 15. Pearson correlations English speakers' accuracy in LDT, Multiple Choice Reading (MCR) and Cloze task (CT).

English Sp. LTD accuracy	1.MCR	2.LaxerCT	3.MediumCT	4.StricterCT
1	.016	.113	.163	.313**
2	-.243	-.085	.020	.177
3	.280	.363*	347*	.022
4.	.028	-.070	.060	.205
5	.360*	.234	.362*	.281
6	-.062	.048	.120	.211
7	-.006	.010	-.009	-.242
8	.375*	.320*	.440*	.437*

**p<.05 two-tailed*
***p<.01 two-tailed*

Contrary to the English participants' results in Spanish, there were negative correlations among Spanish participants' RT and their other reading tasks. The medium negative correlations were among five of the conditions (2, 3, 4, 6 and 7) ($p<.05$). These data is summarized in Table 16.

Table 16. Pearson correlations Spanish speakers' RT in LDT, Multiple Choice Reading (MCR) and Cloze task (CT).

RT of LDT	1.MCR	2.LaxerCT	3.MediumCT	4.StricterCT
1	-.349	-.289	-.356	-.330
2	-.204	-.309	-.376*	-.302
3	-.277	-.329	-.379*	-.358
4	-.322	-.426*	-.481**	-.384*
5	-.302	-.206	-.266	-.227
6	-.330	-.356	-.424*	-.369*
7	-.447*	-.171	-.220	-.154
8	-.361	-.151	-.205	-.168

**p<.05 two-tailed*

***p<.01 two-tailed*

Table 16 illustrates how those Spanish speakers who were faster in the LDT were more accurate in the CT, especially in the medium CT scoring. All correlations were negative, but only condition 4 (non-allowed derivation) showed medium correlations with the CT. However, there were no correlations between CT and accuracy in the LTD for Spanish speakers. There were only correlations among MCR and LDT accuracy. The correlations of the MCR were among the following conditions: (1) PW (r= 381, p<.05, two-tails), (2) PW + inflection (r=.449, p<.05), and (5) violation infl. (r=.496, p<.05). The correlation shown among MCR and (5) was large r^2=.25.

Since the correlations were not robust, it was necessary to find another way to look at the data. Therefore, to summarize the results of English speakers reading in Spanish, participants

were organized in six different groups according to their tendencies in the LDT's eight conditions accuracy results as well as the other two scores, MCR and Medium CT. In RTs, participants were consistent in all conditions. The participants who were the fastest in condition 1 were also the fastest in condition 2 and so on. However, for accuracy, participants were not constant across conditions. The method used was the Hierarchical Cluster Analysis, and its purpose is to identify groups of participants who are similar to each other with respect to selected variables. The ranking for the participants was into 3 levels: above average, average and below average. The purpose of this analysis was to determine if it was possible to isolate GMA as an independent variable that could be manipulated in posterior studies. Table 17 presents the different groups.

Table 17. Groups according to accuracy cluster in LTD, MCR and Medium CT (n=46)

Groups	Description
Group 1 16 participants	General tendency: Below average or average on the MCR and Medium CT Average or above average on accuracy in conditions 1, 2, 4, 6, and 8. Below average or average on accuracy in conditions 3 and 5. Mixed on accuracy in condition 7.
Group 2 12 participants	General tendency Average or above average on all measures.
Group 3 2 participants	Above average in conditions 2, 3 and 8, and Medium CT Average or below in 1, 4, and 7, and MCR Average or above in 5 and 7. Mixed on accuracy in 6.
Group 4 14 participants	General tendency: Average or above average on MCR Mixed on accuracy in condition 7 Below average or average on all other measures.
Group 5 1 participant	Below average in 1, 5, 6, 8 and MCR and CT. Average in 7 Above average in 2, 3 and 4
Group 6 1 participant	Below average in 1 and 8 Above average 2, 4, 5, 6 and MCR. Average in 3 and Medium CT.

There were three main groups: Group 1, 2 and 4. Group 1 showed lower word recognition skills since they were low in MCR, Medium CT and real words (conditions 3 and 5). However, they were average or average in non-words (1, 2, 4 and 6). Group 2 showed greater proficiency in all tasks than the other groups. Finally, Group 4 presented a consistency across the LTD and the CT for average or below average scores. This group was better in word recognition in context since their MCR was average or above average. As suggested by the correlations, these tendencies do not show a clear-cut distinction between higher scores in LDT and reading comprehension in the MCR. For example, Group 1 and 4 had below average or average results in the LDT, but their MCR's score were different: Group 4 had higher scores.

5.0 INTERVIEW METHOD

Finally, a stimulated recall interview was used to obtain a "more reflective analysis or description of…how they have arrived at their performance" from four participants (Chaudron, 2003, p. 783). This method might shed a light into the results of the lexical decision task because it allows a triangulation of the quantitative results with the participant's explanations of metalinguistic awareness.

5.1 PARTICIPANTS

Four participants that took part in the previous experiment were contacted to be interviewed. They were assigned anonymous IDS of three figures that started with 2. Their cloze task's (CT) scores were the criterion to choose this subset sample. The CT was a measure of proficiency in Spanish reading and morphology production, and it was expected that participants with highest proficiency were more grapho-morphological aware. They all studied Spanish before coming to the university (Mode= 4 years), and none of them had studied another foreign language for more than one term (208). Two of the participants had the highest scores in the laxer CT (216 and 220), and two had the lowest scores of the sample (208 and 233). In their MCR scores, the participants with the higher scores were above the 60th percentile, and the participants with the

lower were below the 25th percentile. In Table 18, the main background information of the participants as well as the percentiles of the different tasks are illustrated.

Table 18. Background information of interviewed participants

Participants:	208	216	220	233
Age	19	18	21	20
Sex	female	female	male	female
Years learning Spanish before the university	4	4	3	4
Terms at the university	3	2	2	3
Other languages	Portuguese (1 term)	No	No	No
MCR Perc.	22th	80th	68th	15th
Laxer CT Perc.	2nd	95th	100th	4th
Medium CT Perc.	4th	93th	100th	2th
Stricter CT Perc.	9th	84th	100th	9th
Accuracy cluster (Table 17)	4	2	1	1

Perc., percentile

(See Table 11 and Table 17 for general references)

Although participant 220 and participant 233 were in the same group cluster (see Table 17), participant 220 was above average in the CT and average in the MCR while participant 233 was below average in both tasks. This reminds the reader that the 6 groups show tendencies, but not all participants in the same group had the same level. They differ mostly on the CT and the MCR.

5.2 PROCEDURE AND DESIGN

The interviews with the four Spanish learners took place between three and five weeks after the first session. The participants met individually with the researcher, who was not the instructor for any of them. The interview lasted around forty-five minutes and was recorded with a digital audio recorder. After that, the recording was transcribed for the analysis. Participants were asked if they wanted to be interviewed in Spanish or English. Only participant 220 asked to be interviewed in Spanish. Nevertheless, English was also used for the most complex discussion in the interview.

Each interview was slightly different since it was based on each participant's answers to the different tasks. However, the main structure was the same. Participants were showed some of the words that appeared in the LDT and asked to report if they remembered if they said it was a word or not, and if they didn't remember, they should just tell what they thought at the time of the interview. Then, they were asked to justify their answers. For example, the researcher would ask them if they could separate the word in parts. Then, they were asked about the MCR and asked to remember why they chose an answer or if they could provide an answer where they circled "I don't know." After that, they were asked about some of the words and blanks they

wrote down in the CT. Finally, some of the words of the English LDT were also discussed. To conclude, the researcher asked the participants if they knew what the main goal of the study was. Participants 208 and 216 also asked the interviewer questions to corroborate their answers or to get more information. This was not the case with the other two participants. The researcher tried not to influence their choices, but due to the interaction style with 208 and 216, these participants obtained greater feedback on their tasks.

5.3 RESULTS

Without time pressure, all four participants were able to correct themselves when confronted with the non-allowed inflection (condition 2). Inflection of present, past and future tenses were mastered to a great extent.

Participants 216 and 220 showed a higher knowledge of metalinguistic terminology being able to distinguish between word categories. They claimed they had learned most of these terms in high school. However, the participants with the lower scores, participants 208 and 233, did not seem so familiar with metalinguistic vocabulary. Although they sometimes knew the right word category, they could not name it. This is illustrated in the following example (Conversation 1). Albeit giving a plausible final answer, the participants' use of metalinguistic terms is inadequate. In line 6 and 8, she says she will need a noun for the gap. In line 12, she indicates a "pronoun like a name or something" will work. Finally, she gives a possessive adjective (line 16).

Conversation 1:

R: so for example you have here "pero ahora con la crisis ____ primer empleo precario" [but now with the crisis, _(the/el)___ first precarious job]" What do you think you need? What do you think you need there?

P 233: [reading]

R: Do you need a noun?

P233: Probably...a noun...ahmm

R: A noun?

P233:A noun or an adjective...ahmm not an adjective...I will go with a noun because "primer empleo" can be describing a noun.

P: Do you know this word "empleo" [job]?

P233: "Employee".

R: "Employee"? Okay...so...What kind of noun could you use?

P233: It could be a pronoun like a name or something.

R: But you can not think of any?

R: We might need a comma here.

P233: It is definitely a person...probably a pronoun...maybe "su" [his/her].

Also, in line 8, 233 justifies why she would need a noun by saying that "primer empleo" can be describing a noun. This structure is definitely not possible in Spanish since "primer empleo" is already a full noun phrase (NP), and it can not be described by another NP. At the

end, she gives the possessive adjective “su” (line 13), which is not what was expected from her explanation, but that is appropriate. The most suitable option, however, will be the definite article “el.” This conversation shows how unclear metalinguistic terminology can be for L2 learners.

For the different tasks, a frequent reason not to accept a word was if the word hadn’t been seen before (see Appendix A1) or if it looked like an English word (see Appendix A2). In general, orthographic interferences of other Spanish and English words motivated successful and unsuccessful answers (see Appendix A3). Reader-driven interpretation was also utilized to understand. From 233’s world knowledge, she inferred the right answer for the activity.

Conversation 2:

P233: Okay...[reading]...I think I put "no sé" [I don't know] because I was not really sure of what answer would fit...so the questions said "how is the place that the nephew used to live in?" and I don't think any answers could really answer that.

R: Okay

P233: It could maybe...

R: So is this first part here clear?

P233: [reading]....ahmm...It could be "limpio" [clean].

R: Why do you think that?

P233: Because he is living with his mother, I know...my mom wants to see the house pretty clean ...

Since none of the answers seems right to her, and she is forced to choose an answer, she turns to a reader-driven or world knowledge strategy. Another important point of this section is that, as indicated in the instructions, she did not guess in the reading task, which gives reliability to the test. Moreover, the vocabulary difficulties were also hindering the understanding of this speaker (see conversation 1).

During the interviews, it was clear that although the texts were not considered difficult, participants were sometimes blocked by their lack of vocabulary and morphological knowledge. For example, they gave a word ending instead of a suffix when asked to look for another word with the same structure (see Appendix A5). However, participants could connect lexemes with

ease. For instance, “reluciente” (*shining*) and “que reluce” (*that shines*) were easily connected. However, participant 208 focused sometimes more on “other words” inside the word when asking to divide. For example, in “dormilón” (*sleepyhead or fond of sleeping*), she saw “dormir,” but also “mil” (*thousand*) or “million.”

All in all, there were several instances along the conversation where the goals of the interviewee and the interviewer were in conflict. Since the interviewer did not explicitly tell them that the main focus was GMA, participants concentrated more on semantic explanations than on morphological analyses. After discussing the tasks in Spanish, participants were questioned about some words from the English LDT. Participants were specifically asked, as in the Spanish LTD, how they could divide the words. Since they knew the word meaning, they focused more on semantics than on morphology and did not always answer the question, or they even said it was not possible to divide the word (see Appendix A6). However, participant 220 always provided grammatical explanations even for the non-words, which was the most difficult point to explain for the rest. Participant 216 even claimed that explicit word recognition was even easier in Spanish since they had been taught how to recognize verbs and its morphemes.

In spite of this different understanding of the interview’s goal, participants provided successful answers to answers which were previously left blank. Also, some incorrect answers were given to substitute right answers. For example, participant 220 changed the corrected meaning of the adjective “parlanchines” (*chatty*) to “people who spoke Chinese.” He kept the meaning of the lexeme “parl-“ (*to chat*), but he did not recognize the adjectival suffix “-ín.” This participant followed a reader-driven approach during the interview’s re-reading since they considered more possible that the elderly people in the park were strolling, which was not stated in the text. This example also illustrates how a learner with a high level of GMA was also able to

be influenced by orthography from his L1 and L2. This word is a bit more complex than other words with the same suffix as “bailarín” (*dancer*) or “pelín” (*small hair, a little bit*) due to the insertion of the infix “-nch.”

Finally, all participants were asked what they thought the goals of this experiment were. Participant 220 pointed out that “it is about how English speakers look at Spanish words and try to pick up the parts of speech that they are based on the endings,” and participant 216 said “I think it is kind of connecting like the different phonetics of words like antonyms. No, I am sorry, just the different parts of words.” Participant 208 said that this was about “reading comprehension and vocabulary,” and participant 233 assumed this was about word-recognition, especially of cognates and false friends.

6.0 ERROR ANALYSIS

For the English speakers, 10% of the items were eliminated because the RT was above 4 seconds. This is, however, not the error analysis this section refers to. As it was shown in Table 2, the accuracy of the English speakers in the Spanish LDT was pretty low, ranging from 25% of allowed derivation (3) to 92% of easy words (7). Only words with the right translation were considered accurate. Through these unaccepted translations, it can be seen what other resources Spanish learners use to understand or which interferences make them take a decision or other. In the report of the interviews with four participants (see 2.3), these different resources or interferences were already illustrated: orthography interferences of Spanish and English, wrong morphological decoding or reader-driven interpretation. This last interference is not relevant to this section since it handles word recognition without context. For all participants, these strategies were used for pseudo-words, violation in derivation and allowed-words. The words with violations in inflection were sometimes just translated with the inflection that belonged to the stem, or the stem was translated so that the inflection fitted (i.e. *"barraste" was translated as "barriste" (right inflection) "you swept" or as "borraste" (change in stem) "you erased"). In the following table, a summary of the resources or interferences is presented.

Table 19. Interferences used for wrong translations

Interferences	Examples
1. Spanish orthography interferences	a. *"matejar" (pseudo-word)→ to kill "matar" b. *"asato" (pseudo-word)→ fried "asado" (roasted) c. "apunte" (note)→ on-time "en punto"
2. English Orthography interferences	a. "bolsear" (to pick sb's pocket)→ "bolster" b. *"pronunamente" (pseudo-word) → pronouncement c. *"cofetedero" (pseudo-word)→ confederate d. "estancia" (stay, living room)→ stance
3. Orthography of both languages	a. "apunte" (note)→ point ("punto") b. "recogían" (they picked up)→ recognized ("reconocían"), recalled ("recordaban") c."recogimiento"(recollection)→ recognition ("reconocimiento"), memory, recognizable
4.morphology interferences	a. "montador" (film editor, fitter)→ rider, horse rider ("montar" means to ride) b. "bolsillo" (pocket)→ little bag (bolso + illo; "bolsillo" is a lexicalized item) c.*"playamiento" (derivation in violation *"beachment")→ ?beachly d. "dormilón" (fond of sleep)→ big dormitory (?"dormitorión") e. "recogían" (they picked up)→ ?they repicked up

From a GMA perspective, group 4 is the most revealing. Participants were able to provide a meaning for the stem and for the suffix. Unfortunately, both meanings did not work together, but that shows how present GMA is for adult learners. The most ambiguous group is group 3 since the interference probably came only from one language, and it is not clear how to decide which one. This was also the most frequent error since participants showed these interferences with all words, derived and inflected, from the word family of "recog-:" "recogían" (they picked up, inflection), "recogimiento" (recollection) and "*recogero" (violation in derivation), but not with "*recojaba[6]" (violation in inflection). Both inflected forms were often translated with the same words. However, participant 208 (see Table 18) translated "recogían" as "recognized" and "recojaba" as "recorded." This is another example of a participant changing the stem so that the inflection violation is less of a violation since the lexeme received a new meaning, and the new verb can belong to the appropriate conjugation.

There are notable orthographic similarities between "recoger," "reconocer" (to recognize) and "recordar" (to remember). These were the different translations the participants were providing. Additionally, all of these words start with the prefix "re-", which is also a "cognate prefix." It can not be concluded that it is only from the L1 or the L2 since, as Group 1 and 2 exemplify, there are striking interferences from both languages.

The next section deals with the conclusions drawn from all results in the last three sections: observational experiments (4), interview method (5) and error analysis (6).

[6] The stem changes from "recog-" to "recoj-" in "recojaba". However, this is not a stem changing per-se, but an orthographic adjustment. The sound [x] can be represented by <g> before <e> and <i>, and <j> before <a>, <o> and <u>.

7.0 DISCUSSION

Three questions were asked in this study dealing with the Transfer Facilitation Model.

1. Do L1 English speakers, learners of Spanish at the undergraduate level (age 18 to 24) use GMA to recognize lexemes, inflectional, and derivational morphemes in a word?
2. Do they transfer their GMA from English into Spanish?
3. Does GMA allow them to comprehend better?

The answer is positive to the first question since L2 learners are able to recognize morphology. With a L1 GMA fully developed, they do not have difficulties recognizing lexemes, inflectional and derivational morphemes. However, as reported in the interviews and in the error analysis, learners do not always rely on morphological awareness. The results, however, do not completely support the Transfer Facilitation Model since the RTs' patterns of L2 learners is more similar to RTs of native Spanish participants than to themselves taking the LTD in English. This supports the "native like grammatical processing" in word-segmentation for L2 learners (Clahsen & Felser, 2006a, 2006b).

The RTs in Figure 1 show how violations and pseudo-words force L2 learners to longer time intervals. Although not all LDT's conditions show significant differences in RTs (see Table 8), the null hypothesis – L2 learner following a whole-word approach and ignoring morphology- is rejected since there are significant differences in RTs among different conditions. For example, reading of allowed derivational and inflectional words (3 and 5) is statistically different

from reading of pseudo-words both with inflection and derivation (1 and 2). L2 learners do not read the word as a whole since they need different RTs for existing and non-existing words. Moreover, in all three groups, participants are most accurate in non-words, yet they require more time to break down the words' elements. Additionally, reading easy words (7) is different from the other kinds of readings in accuracy and RTs in Spanish reading for both groups. It seems that these responses are more automatic due to their higher frequency, which might facilitate whole word reading. This fact is also predicted by Ullman's DP (2004) since high frequency words will be stored in the "mental lexicon" and do not go through the "computational mental grammar". Since the words for English participants belonged to the AWL, they were not necessarily more frequent than the other words.

Interestingly, condition 8, easy words with complex morphology, is not statistically different from 5 and 6 for L2 learners, allowed and non-allowed inflection. They are as accurate in inflection as in easy words with morphology. This also happens to the Spanish speakers, but not to the L2 learners in their L1 English. Condition 8 is significantly different in RTs and in accuracy for English speakers in all kinds of readings. Inflected morphology of AWL lexemes decreases RTs. It seems that condition 8 in the English LDT slightly differs from the Spanish LTD because the English words are mostly inflected and less morphological complex (see Appendix K).

There is no difference in reading pseudo-words with derivation or inflection, which confirms the salient nature of the lexeme in word recognition. Moreover, for RTs in Spanish, conditions 3 and 5 (allowed derivation and inflection) are not statistically different from one another and from 8, which means that the morphological processing was the same for inflection and derivation. For English speakers, this is not the case with condition 8, but with condition 7.

The explanation for this might be that actually the lexemes from the AWL might be more automated in inflection since English inflection is less complex than the Spanish one.

To summarize, the L2 learners' pattern is shared by native Spanish speakers in RTs (see Table 9), but not for inflected pseudo-words (2) and violations in inflection (6) being statistically significant. In fact, the main difference between L2 learners and L1 speakers consists of the derivational morphology. Although reading inflection and violations in inflection are significantly different for both groups, differences between reading allowed derivation and violations in derivation are only significant for Spanish speakers. Furthermore, in the English task, English speakers react to violations in derivation as well as in inflection with statistically significant RTs. Thus, greater vocabulary knowledge might be needed to infer derived words from their base and suffixes. In addition to this, Morin (2003) pointed out that L2 learners do not know distributional constraints or morphological constraints. This is corroborated here since participants give similar translations of both allowed and violations in derivations (i.e. **busquero* and *buscador* both as searcher or explorer). This does not mean that learners avoid morphological decoding or have a less complex syntactic knowledge, just that they do not know either implicitly or explicitly the morphological constraints in derivations. Since both suffix *–ero* and *–dor* can define an agent of an action as a profession, L2 learners are semantically right in their hypothesis. However, *-dor* can be added to a verbal base whereas *–ero* needs to be added to a nominal base. L2 learners do not usually obtain this morphological information in classroom instruction, and even native speakers only know these constraints implicitly.

As expected due to explicit instruction, Spanish learners are more accurate in inflection than in derivation (see Table 2). Derivation is definitely hard for them as it can be seen in the results. The accuracy in allowed derivation is pretty low (25%), and their translations for the

non-allowed derivation (83% of accuracy) show that they are not aware of derivational constraints. In fact, there is a problem with derivational accuracy since some participants have approached both forms of derivation in the same way. That is, by saying that none of the forms are words if they could not put together a meaning based on the lexeme and the derivational suffix since, in the analysis of errors (see Table 19), there are cases where participants provide awareness of both elements. Unfortunately, the translations do not work in those cases due to lexical blocking. Other participants base their criteria on having seen the word before or not. That explains why group 1 of the accuracy cluster (Table 17) is more accurate in 4 and 6 (violations in derivation and inflection) than in 3 and in 5 (allowed derivation and inflection). They just say "no" in both occasions and do not adventure any decoding based on GMA or orthographical clues.

Additionally, the interviews and the results of the MCR, where participants used their GMA to obtain an answer (Table 12), corroborate how GMA is present in L2 reading, especially lexeme and inflection recognition. This is similar to morphological awareness' development in L1 since inflection is acquired earlier than derivation (see Kuo & Anderson, 2006 for a review on morphological awareness in L1). Thus, it is confirmed that L2 learners recognize morphemes and lexemes in a word.

The answer to the second question, "Do L2 learners transfer their GMA from English into Spanish?", is a bit more complex. In the interviews, L2 learners are able to decompose words in both languages. However, the LDT, the main tool to compare GMA in both languages, offers contradictory results. Positive correlations for the L2 learners were expected between LDT accuracy and RTs in both languages (see Table 6 and 11). It was expected that better word recognition skills in English could transfer into Spanish, but the correlations just show a different

pattern. The significant RTs' correlations between both languages are positive and low. This means that if L2 learners are slow in the LDT in English, they are also slow in the Spanish LDT. In addition to this, the Hierarchical Cluster Analysis shows that RTs are constant across participants. Therefore, this data does not tell much about GMA transfer because it seems that being fast does not have anything to do with being more grapho-morphological aware.

Accuracy correlations between both tasks are mainly negative, meaning that if they are more accurate in English, they are less accurate in Spanish (see Table 6). This does not make much sense, and since the correlations are low, such correlations are simply discarded as noise. This lack of high correlations is probably due to a fully developed GMA their L1.

Another point of discussion is the significant negative correlations for native Spanish speakers among RTs and the MCR and CT (Table 16), but not for L2 learners. The explanation might be in the different age and education levels among the Spanish participants. Participants who are used to taking tests should do better in the different tasks. They spend less time in word recognition and are more accurate in the MCR and the CT. For L2 learners, LTD accuracy of allowed word is a better predictor of their results in the MCR and the CT (Table 15). However, for both groups, these correlations are not high, which reduces its importance.

The similarities of L2 participants and Spanish speakers in the LDT can also be due to the transparent nature of Spanish morphology. Morphology, then, seems language-specific. Intermediate L2 learners have gone beyond transfer and have developed a more native-like GMA. For example, during the interviews, participants are having troubles decomposing English words. They concentrate more on meaning (see Appendix A6) and show a shortage of explicit morphological knowledge. Participant 216 even indicates that it is easier for her to decompose Spanish words than English words. This is revealing since one of the critics of L2 learners'

incomplete morphological decoding makes them avoid morphology and concentrate on the whole word as the decoding unit (VanPatten, 2007). Some native speakers can have a hard time decomposing words explicitly, which, of course, does not mean that they have not mastered derivational morphology or the vocabulary. A wider explicit L1 metalinguistic knowledge should be very useful for L2 learners so that they can compare and better understand structures in their L1 and L2.

To the discussion of the importance of GMA for a shallow language as Spanish (Sainz, 2006), its importance seems to be confirmed with Spanish speakers' RTs in the LDT. Ramirez et. al. (2010) also concluded that morphological awareness was essential for 9 and 11-year-old Spanish readers. Their results can be generalized to GMA since they were analyzing morphological awareness in reading. The RTs in Figure 2 show how native Spanish speakers take the longest time reading pseudo-words from all conditions. This can be explained through the contradictory situation created by a non-existing lexeme and an existing suffix. Spanish speakers might recognize both elements separately. Since the pseudo-lexemes are all pronounceable words, they have to make sure these words are not in their lexicon. These RTs with pseudo-words are not significantly different from the other morphology violations. This is exactly the same pattern that the L2 learners apply in their L2, but not for their L1, where the differences between pseudo-words and violations is significant. One explanation is that English speakers might concentrate even more on lexemes for decoding in their own language following the "lexical orthographic-graphemic code" route while, for Spanish, they use the "nonlexical phonemic code" root used in shallow languages (Sainz, 2006). This will also support the idea that L2 learners go beyond transfer in word recognition since English has a "grain-size" reading typical of deep orthographies (Perfetti & Dunlap, 2008).

One of the difficulties of analyzing GMA is that other types of awareness also come into play as orthographic, phonological, syntactic and semantic awareness as well as vocabulary knowledge (Kuo & Anderson, 2006). That is why it is so difficult to separate the different elements that affect L2 reading at the local and global level. Moreover, L2 proficiency is a factor in the level of developing GMA. In fact, as Kuo and Anderson indicate for L1 morphological awareness, GMA and proficiency in L2 might have a "reciprocal rather than unidirectional relationship" (p. 177). Thus, "a reader's ability to unblock the meaning of a novel complex word depends on the reader's inventory of known morphemes," which is dependent on exposure to spoken and printed language (p. 177). This can explain why L1 readers' morphological awareness' importance "increases over the elementary school years" (p. 178). L2 learners might as well show an increase in morphological awareness with more contact with spoken and printed language.

Spanish learners' participants have a proficiently receptive knowledge of inflectional morphemes, especially without time constrains, since they are more used to them than to derivational morphemes. Although their production of inflectional morphology is limited (see Table 12), they can recognize these morphemes. Additionally, the results of the cloze task showed that L2 learners have a high degree of "syntactic awareness" in recognition and production. The laxer CT scoring, giving the right word category, (see Table 12) is the easiest one for all of them. Derivational morphology awareness should come for L2 learners after syntactic awareness.

The answer to the second question, "Do L2 learners transfer their GMA from Spanish into English?", is more complex. It is true that learners have fewer difficulties learning a new language with a shallow alphabetic orthography that works similarly to their deep orthography.

At the beginning, they should transfer their mapping skills (Koda, 2008). However, L2 learners are also able to develop language-specific word recognition skills. For example, derivational morphology is language-specific since every suffix has specific constraints that limit it to certain bases. But L2 learners know how a word family works and that by having a same lexeme the word will have a related meaning to the words from the same family. Therefore, L2 learners might transfer how the mapping works at the beginning, and then go beyond transfer and come closer to native speakers.

A cautious affirmative answer can be given to the third question in this study, "Does GMA allow L2 learners to comprehend better?" In the groups cluster (Table 17), there is a connection between proficiency, understanding and GMA. For example, group 2 is above average or average in all conditions, and group 1 has worse results in MCR and Medium CT than group 4 whose members tend to be more orthographic or morphological aware. Language proficiency consists just of an amalgam of language awareness, and evolving GMA pertains to this proficiency combination.

However, the Hierarchical Cluster Analysis only provides tendencies, and there are still differences among individuals. For example, participant 233 has below average scores in the MCR and the CT whereas participant 220 has above average on the CT and average on the MCR. Besides, Alderson and Urquhard "interactive-compensatory approach" can explain why two L2 learners arrive to the same conclusion despite one having a higher GMA than the other. Moreover, the "dual-language involvement" (Koda, 2008) causes differences in every learner reading process. Thus, the Hierarchical Cluster Analysis does not show a clear relationship between the MCR and the ability to recognize complex morphological words in the LDT, but it shows a relationship between proficiency, morphological decoding and reading comprehension.

Probably a more explicit decomposition analysis, such as the one used by Carlisle (2000), could have shown clearer if explicit GMA presented in word decomposition implies better word comprehension. Additionally, a free recall of the text might have better displayed how global text understanding is related to GMA.

In summary, L2 learners have developed a specific GMA for Spanish starting from explicit knowledge. The Transfer Facilitation Model explains the ability of L2 learners to recognize morphology in Spanish, but not how this recognition changes from the English one into one more Spanish-like. Still, the GMA construct is too complex, and more instruments are necessary to disentangle it. For example, Ramirez et al. (2010) approached the analysis with a battery of tests to analyze morphological awareness in L1 Spanish children learning English L2 at schools in Canada. Those tests measured nonverbal reasoning, working memory, phonological awareness, morphological awareness, vocabulary and word reading in both languages, although working memory and phonological awareness were only tested in English L2. Yet the problem still is that GMA development is even more difficult to see in adults with a fully developed reading ability in their L1. Kuo and Anderson (2006) pointed out that there are noticeable difficulties to split the different aspects of metalinguistic awareness into different variables and to manipulate them. Due to this, most of studies approaching metalinguistic awareness are more observational than experimental. For a language with a shallow orthography and a rich morphology as Spanish, morphological, phonological and orthographic awareness are much intertwined. Morin (2003) tried an intervention with explicit instruction on morphology. Her results, also not very significant for beginners' learners, seem encouraging for exploring these in more advanced learners. Derivational instruction could increase the level of GMA in participants at this level of Spanish.

For future research, it will be necessary to establish the time line between syntactic awareness and GMA to confirm that syntactic awareness is crucial for the development of GMA. More research on derivational instruction will be also necessary to see if L2 learners with enough explicit knowledge are able to develop a more native-like decoding in derivational morphology.

To summarize, intermediate adult L2 learners are able to develop a native like morphological decoding going beyond transfer. They are especially aware of lexemes and inflection. However, derivational morphology is difficult for them since they do not know derivational constraints, neither implicitly nor explicitly. Orthography, from L1 and L2, also highly interferes with their morphological decoding. Derivational instruction could help to develop a more native like decoding. GMA belongs also in the proficiency construct, and GMA and (reading) proficiency have a reciprocal nature for learners of an alphabetic L2 who have an alphabetic L2. This means that more GMA is related to more vocabulary knowledge and more reading understanding, and probably to a higher speaking proficiency. All these elements develop at the same time for adult or young-adult L2 learners since they approach the learning of a spoken language with already oral and written knowledge in an L1.

APPENDIX A

CONVERSATIONS

A.1 CONVERSATION 3

Researcher: There is "tomatitos"…do you remember?

Participant 208: I don't remember what I said but that is not Spanish. This is "Spanglish", isn't it?

R: Okay, why do you think that?

P 208: Well, I don't know…I just think it is…because "tomato" is English and **I have never seen that in Spanish**.

A.2 CONVERSATION 4

R: ¿Te acuerdas qué elegiste en esta palabra...no? ¿Qué elegirías ahora? [word discussed "barriste" preterit form of "barrer" "you swept"]

P 220:mmm...creo que no es una palabra.

R: ¿Por qué no?

P 220: porque...ahh....las palabras de personas profesionales...ahh...suelen...terminar en -a o -o...y esta me aparece que...ahh...pues...es una palabra en inglés..."barrister".

English translation:

R: Do you remember what you chose in that word? What will you choose now? [word discussed "barriste" preterit form of "barrer" "you swept"].

P 220:mmm...I think this is not a word.

R: Why not?

P 220: because...ahh....words for professional people...ahh...tend to...finish in -a or -o...and this seems to me that...ahh.....**it is an English word**..."barrister."

A.3 CONSERVATION 5

R: I have this other word for you "recogimiento" [recollection].

P216: Sure...maybe...it is like "recognition."

[..]

A.4 CONVERSATION 6

Talking about the sentence: “Iré al **caserón** de mi sobrino” [I will go to my nephew’s large house].

P216: all right...that it says one day I will marry my nephew? I will marry of my nephew [**casarse** (to get married) vs. **caserón** (large house)].

A.5 CONVERSATION 7

P208: I don't know... **-ito** is like a Spanish type of …I do not know how you call that…but like -ito is in Spanish words... [diminutive suffix for nouns, adjectives and adverbs].

R: In what other Spanish words?

P208: I don’t know…ohh, like **frito** [irregular participle “fried”].

A.6 CONVERSATION 8

R: Extremities?

P233: It is a noun...**you can not divide it**.

R: So you can not recognize any part of this word in other words?

P233: “Extremity” ... could be like an arm or leg

R: So because you know...so this could be singular?

P233: Plural...

A.7 CONVERSATION 9

R: Okay, and “summonsity” is a word?

P220: No.

R: Why do you know that?

P220: Because “summons” is a noun, without the “-ity” ...the “**-ity” is a noun ending**...so again...or summons could be a verb also...it could be either one in English...either way the “-ity” wouldn't be necessary on the end.

APPENDIX B

LANGUAGE PROFILE ENGLISH SPEAKERS

Participant number:_____

Language profile

(This information will be kept confidential)

1. Age:_____
2. Sex:_____
3. Place of birth: City:_____ Country:_____
4. What is your first language?
5. University level (circle): 1st year 2nd year 3rd year 4th year

   Graduate Other_____

6. What Spanish courses have you taken at the University of Pittsburgh?

Figure 4. Language profile: Number of courses taken at the university

Courses	Check mark	Term
1. Span 0001		
2. Span 0002		
3. Span 0003		
4. Span 0004		
5. Span 0020		
6. Span 0025		

7. Did you study Spanish before coming to the University of Pittsburgh? For how long?

_____

_____

_____

_____

8. Have you ever spent time in a **non** English-speaking country?

_____

If so, fill in the table below:

Figure 5. Language profile: Time in a non-English speaking country

country	date	Duration of stay
1.		
2.		

3.		
4.		

You can ask for more paper, if you need more space.

9. Do you know any other language(s) besides English and Spanish?_____

If so, fill in the following table

Figure 6. Language profile: Knowledge of other languages in addition to English and Spanish

Language	Time studying the language	Estimate your **oral** proficiency (beginner, intermediate, advanced, native-like, native)	Estimate your **reading** proficiency (beginner, intermediate, advanced, native like, native)
1.			
2.			
3.			
4.			

You can write on the back if you need more space.

10. What opportunities do you have to use your foreign/second languages? (Explain)

_____

_____

_____

_____

11. Do you consider yourself a good reader?_____

If so, explain:

_____

_____

_____

_____

12. How much time do you spend reading a day?

_____

_____

_____

_____

APPENDIX C

LANGUAGE PROFILE SPANISH SPEAKERS

Participant number:_____

Language profile

(This information will be kept confidential)

1. Age:_____
2. Sex:_____
3. Place of birth: City:_____ Country:_____
4. Occupation:_____
5. What is your first language?
6. University level (circle):

   1st year 2nd year 3rd year 4th year

MA: year:_____ Phd: year_____ Other_____

7. Have you ever spent time in a **non** Spanish-speaking country?

   _____

   If so, fill in the table below:

Figure 7. Language profile: Time in a non Spanish-speaking country

country	date	Duration of Stay
1.USA		
2.		
3.		
4.		

You can ask for more paper, if you need more space.

8. Do you know any other language(s) besides Spanish?_____

   If so, fill in the following table

Figure 8. Language profile: Language knowledge in addition to Spanish

Language	Time studying the language	Estimate your **oral** proficiency (beginner, intermediate, advanced, native-like, native)	Estimate your **reading** proficiency (beginner, intermediate, advanced, native like, native)
1.English			
2.			
3.			

4.			

You can write on the back if you need more space.

8. What opportunities do you have to use your foreign/second languages? (Explain)

_____

_____

_____

_____

9. Do you consider yourself a good reader?_____

If so, explain:

_____

_____

_____

_____

10. How much time do you spend reading a day?

_____

_____

_____

_____

APPENDIX D

CLOZE TASK

Note: possible answers are added in brackets

Instructions:
Complete the following text with one word in each gap.
Time: 20 minutes
Instrucciones:
Completa el texto siguiente con una palabra en cada espacio.
Tiempo: 20 minutos

Matriculado en la euforia y licenciado en el desastre

España vive el drama de una generación que termina la carrera sin apenas perspectivas de trabajar - Buscan desesperadamente empleo sin importar ya las condiciones, el sueldo o la precariedad.

DE AMANDA MARS 05/11/2009 en **El País S.L** ©

El día que Cristina Carbó asistió a su _(primera)___clase en la escuela superior de diseño, el 3 de octubre de 2005, la ___(cifra)_____ de desempleo estaba en uno de los niveles más ___(bajos)_____ de las últimas décadas. España, en definitiva, sacaba pecho en

Europa, con un __(crecimiento)_____económico del 3,4% aquel año, casi el triple que la __(zona)_____ euro.

Tres años, ocho meses y 13 __(días)_____ después, el 16 de junio de 2009, Cristina (presentó)__su proyecto de fin de carrera en la ____(escuela)_____ y, al salir de ella con su título de graduada superior, el _(escenario)_____había cambiado: el desempleo castigaba al 17,93% de la población __(activa)_____ y España cumplía su primer año en __(recesión)_____. El llamado "milagro económico español", en resumen, fue dado por __(muerto)_____ ___.

Desde entonces, Cristina ha enviado al menos una treintena de _(currículos)_____ _. A constructoras: nada. Estudios de diseño: _____(nada)_____. Bolsas de trabajo: nada. Ni una sola llamada de _(teléfono)_____, ni una entrevista de trabajo, ni un ___(proceso)_____ de selección en marcha.

Hay casi 1,3 millones de _(jóvenes)_ _____de entre 20 y 29 años en _ (España)_____ que buscan un trabajo. Si se _(acerca)_____ ___ la lupa a esos jóvenes, más de 290.000 __(tiene)_____ formación superior, de los que 26.000 no ha _(trabajado)_____ _ nunca.

El acceso al primer empleo ha sido un _ _(trance)_____ difícil para todas las promociones de universitarios, __(por)_____ el círculo vicioso de que sin _____(experiencia)_____, no hay trabajo, y, sin un trabajo, no se _(logra)____ esa experiencia. Pero ahora, con la crisis, _ __(el)_____primer empleo precario, ha caído en las bolsas de ___(trabajo)_____. Con lo que muchos jóvenes optan _ _(por)_ _____alargar su etapa educativa.

Más de 1,3 millones de jóvenes se __(matricularon)_____ en las universidades españolas el año_____(pasado)_, para el curso 2008-2009. Ellos, al revés que Cristina, ____(empiezan)_____ ____ sus estudios superiores en la recesión, y la _____(cuestión)_____ es cuál será el clima ___(económico)_____cuando acaben.

APPENDIX E

SPANISH LEXICAL DECISION TASKS-WORDS

Table 20. Spanish lexical decision task words

Words taken from "Mosaicos" (Spanish 01 and 02) to obtain the lexemes				
Lexemes	Allowed derivation	*Non-allowed derivation	Allowed inflection	*Non-allowed inflection
1. busc(ar) (v-reg) *(look for)* *(f. 173)*	1. buscador *(search engine, searcher)*	1. busquero	1. buscaron *(they looked for)*	1. busquieron
2. mir(ar) (v-reg) *(look at)* (f.142)	2. miradero *(vantage point)*	2. mirero	2. miraste *(you looked at)*	2. miriste
3. mont(ar) (v-reg) *(to ride, to mount, to assemble)* (f.998)	3. montador (*fitter*, *cutter*)	3. montamente	3. montado *(ridden)*	3. montido

4. sac(ar) (v-reg) *(to take out…)* (f. 228)	4. sacadera *(landing net)*	4. sacal	4. sacaron *(you took out.)*	4. saquiera
5.apunt(ar) (v-reg) *(to make note)* (f. 1361)	5. apunte *(note)*	5. apuntero	5. apuntando *(making notes)*	5. apuntiendo
6. cumpl(ir) (v-reg) *(to carry out/fulfill)* (f. 363)	6. cumplidor *(trustworthy)*	6. cumplal	6. cumplía *(he carried out)*	6. cumplaba
7. tom(ar) (v-reg) *(to take)* (f.122)	7. tomadura *(de pelo: mockery)*	7. tomadad	7. tomaron *(they took)*	7. tomieron
8. barr(er) (v-reg) *(to sweep)*(f.3156)	8. barredura *(sweeping)*	8. barredad	8. barriste *(they swept)*	8. barraste
9. segu(ir) (v-ireg) *(to follow)* (f.97)	9. seguimiento *(pursuit)*	9. seguial	9. siguiendo *(following)*	9. sigando
10. ven(ir) (v-ireg) *(to come)*(f. 105)	10. venida *(arrival, return)*	10. venidad	10. vino *(he came,wine)*	10. vinió

11. dorm(ir) (v-irreg.) *(to sleep)*, (f.857)	11. dormilón *(fond of sleeping)*	11. dormial	11. dormíamos *(we slept)*	11. dormábamos
12.est(ar) (v-irreg.) *(to be)*, (f.17)	12. estancia *(stay)*	12. estal	12. estábamos *(we were)*	12. estíamos
13. recog(er) (v-irreg.) *(to pick up)*, (f.634)	13. recogimiento *(recollection)*	13. recogero	13. recogían *(they picked up)*	13. recojaba
14. play(a) (noun) *(Beach)*, (f.1173)	14. playero *(to be fond of the beach)*	14. playamiento	14.playas *(beaches)*	14. playaes
15. fald(a) (noun) *(skirt)*,(f. 3143)	15. a. faldero (*perro faldero=lapdog*) 15.b. faldita *(little skirt)*	15. faldamiento	15. ___	15.faldaes
16. bols(a) (noun) *(bag)*, (f.1915)	16. bolsear *(to pick sb's pocket)*	16. bolsura	16. bolsillo *(pocket)*	16.bolsases

17. camp(o) (noun) *(field),* (f.295)	17. a. campesino *(peasant)* 17.b. campito *(little field)*	17. campomente	17. ____	17.camposes
18. allí (adv) *(there),* (f.167)	18. allí	18. allídero	18. allicito (*there*)	18. allísimo
19. com(er) (verb) (*to eat*) , (f.389)	19. comedor (*dining room*)	19. comero	19. comían (*they ate*)	19. comaban

APPENDIX F

SPANISH LEXICAL DECISION TASK-PSEUDO-WORDS

Table 21. Spanish lexical decision task pseudo-words

Pseudo-words taken from Rodriguez-Fornells, Münte, & Clahsen (2002)		
Pseudo-words verbs	Allowed derivation	Allowed inflection
1. asatir	1. asato	1. asatía
2. arrabar	2. arrabura	2. arrabábamos
3. aclanar	3. aclanamiento	3. aclanó
4. cofeter	4. cofetedero	4. cofetían
5. denar	5. denal	5. denabas
6. tesertar	6. tesertaría	6. tesertaste
7. matejar	7. matejar	7. mateja
8. pronunar	8. pronunamente	8. pronunas
9. tolecar	9. tolecura	9. tolecas
10. taciar	10. tacioso	10. taciaste

APPENDIX G

EASY WORDS

Table 22. Spanish lexical decision task easy words

Easy words with some allowed derivation	Easy words with inflection/derivation
1. Niño	1. niños
2. ropa	2. ropitas
3. escuela	3. escolar
4. universidad	4. universitario
5. amor	5. amoroso
6. hola	6. holita
7. ola	7. olas
8. perro	8. perrazo
9. por	9. porque
10. tomate	10. tomatitos
11. sopa	11. sopas

APPENDIX H

MULTIPLE CHOICE READING (MCR)

Instructions: Read carefully the following texts and answer the multiple choice questions by writing the letter in the gap next to the question.

Prueba de lectura- textos breves

Instrucciones: lee con atención los textos siguientes y responde a las preguntas de respuesta múltiple. Indica la letra correcta en el espacio al lado de la pregunta.

Example:

A nosotros nos encantan los animales. Cuando vamos a la montaña, nos llevamos siempre la cámara.

1. ¿Qué le gusta al narrador?__A__

a. los animales c. la montaña e. no sé

b. la cámara d. nosotros

Texto A

Juan no tenía amigos. Pero encontró un entretenimiento: el parque. Ahora le gusta pasear y mirar a la gente allí. Un día ve un perro con orejotas peludas; otro día ve a niños cantarines; otro día ve a ancianos parlanchines y los días que es suertudo encuentra una monedita reluciente debajo de su banquito preferido.

Esta semana Juan paseaba por el parque y se cayó. Se rompió un lequito, pero todo estuvo bien porque su tío es lequista. Como tiene miedo de caerse, lleva un teléfono móvil en el bolsillo delantero. Lo agarra polamente.

1. ¿Qué hace Juan?_____

a. no tiene amigos c. pasear e. no sé

b. gustar d. aburrirse

2. ¿Qué hacen los niños en el parque? _____

a. jugar c. cantar e. no sé

b. saltar d. mirar

3. ¿Qué tamaño tienen las orejas del perro? _____

a. con pelos c. pequeña e. no sé

b. medianas d. grandes

4. ¿Qué hacen los ancianos en el parque? _____

a. mirar c. parlar e. no sé

b. jugar d. pasear

5. ¿Cómo es la moneda que encuentra Juan a veces? _____

a. grande c. mediana e. no sé

b. es una que reluce d. es una que da suerte

6. ¿Cómo le ayudó su tío? _____

a. le dio dinero c. le llevó al médico e. no sé

b. le curó d. le empujó

7. ¿Por qué lleva Juan un teléfono móvil? _____

a. porque es miedoso c. porque se lo dio su tío e. no sé

b. por el lequito d. porque quiere agarrarlo

8. ¿Dónde lleva el teléfono móvil? _____

a. en un bolso c. al lado del lequito e. no sé

b. en la mano d. en el pantalón

Texto B

A veces tomaba el café con porras, pero ya sólo tomo churros. Mi sobrino me ha influido porque a él no le gusta nada porrezno. Me miraba asqueado y se me quitaba el hambre. Menos

mal que desayuno sola mis churros. No quiero más gente redicha a mi alrededor. Las porras eran mi comida idealecta, espero que los churros las puedan sustituir.

Un día iré al caserón de mi sobrino y le miraré mal aunque mi hermana, que es su madre, me reprenda por mi actitud aniñada. ¡Qué mi sobrino tenga un añico no significa que no me tenga que respetar!

1. ¿Qué come ahora la protagonista? _____

a. café c. churros e. no sé

b. porras d. nada

2. ¿Por qué no le gustaban al sobrino las porras? _____

a. porque eran blandas c. porque eran porras e. no sé

b. porque no tenía hambre d. porque era influyente

3. ¿Qué hacía el sobrino? _____

a. cocinaba c. decía cosas a su tía e. no sé

b. jugaba con las porras d. observaba a su tía con asco

4. ¿Por qué comía porras? _____

a. porque le gustaban mucho c. porque eran fácil de cocinar

b. porque a su sobrino no le gustaban d. porque eran sustituibles e. no sé

5. ¿Cómo era el lugar donde vivía el sobrino? _____

a. grande c. bonito e. no sé

b. solitario d. limpio

6. ¿Qué pensaba la hermana de la protagonista? _____

a. que su hermana era tonta c. que su hermana era una niña e. no sé

b. que su hijo era inteligente d. que las porras eran deliciosas

7. ¿Cuándo reprende la hermana de la protagonista a la protagonista? _____

a. hoy c. esta mañana e. no sé

b. ya la reprendió d. en el futuro

8. ¿Cómo era el sobrino? _____

a. mayor c. pequeño e. no sé

b. mediano d. viejo

Texto C

"Lloverá muchísimo" dijo el hombre del tiempo. "Una tormenta azuzadora arrollará muchos arbolillos indefensos. Por favor, cierren las ventanas cuidadosamente y esperen lo peor. " La mujer que lo oyó, sufrió un escalofrío espaldal. Corrió a comprar botes de conserva para la anunciada situación. Había limpiado las ventanas. Su marido también trabajó. Recogió la ropa tendida en el cuquísimo tendedero de la marca Alegría. Juntos cerraron las ventanas y esperaron el azote tormentoso.

Todo resultó felicísimo. No hubo destrozos en las impolutas ventanas ni en ningún otro lugar. El matrimonio se felicitó y se sentó a ver al hombre del tiempo.

1. ¿Cuándo llueve? _____

a. cuando el hombre del tiempo habla c. después de que el hombre del tiempo hable

b. antes de que el hombre del tiempo hable d. mientras el hombre del tiempo habla

e. no sé

2. ¿Cómo son los árboles de los que habla el hombre del tiempo? _____

a. verdes c. grandes e. no sé

b. medianos d. pequeños

3. ¿Cómo tiene que cerrar las ventanas la mujer? _____

a. con rapidez c. con cuidado e. no sé

b. con precisión d. cuando acabé de ver el tiempo

4. ¿Dónde sufrió la mujer el escalofrío? _____

a. al cerrar la ventana c. rápidamente e. no sé

b. en la espalda d. en su cuerpo

5. ¿Cuándo limpia la mujer las ventanas? _____

a. durante la tormenta c. después de la tormenta e. no sé

b. antes de la tormenta d. mientras la tormenta

6. ¿Cómo era el tendedero? _____

a. pequeño c. extensible e. no sé

b. cuco d. grande

7. ¿Cómo eran las ventanas? _____

a. sin polutas c. pequeñas e. no sé

b. grandes d. limpias

8. ¿Qué hace el matrimonio después de la tormenta? _____

a. el hombre y la mujer dicen felicidades c. la mujer dice felicidades

b. el hombre se sienta y la mujer dice felicidades d. la mujer se sienta y el hombre dice felicidades e. no se

APPENDIX I

ENGLISH LEXICAL DECISION TASK-WORDS

Words taken from the BNC (frequency, number of texts). The inflected words share the stem with the words with allowed derivation in fourteen occasions, and the allowed derivation words are inflected fourteen times.

(20 in Spanish)

http://www.kilgarriff.co.uk/BNClists/cg.num.o5

Table 23. English lexical decision task words

Words from	Allowed derivation	*Non-allowed derivation	Allowed inflection	*Non-allowed inflection
1. amicably (7,6)	amicably	amicablage	amicable	amicables
2. compile (7, 5)	compilation (9, 8)	compilist	compiling (7, 7)	compilen

3. egoistic (7, 2)	egoistic	egoistee	egoists	egoisted
4. gratified (7,5)	gratifier	gratifity	gratified (7,5)	gratifien
5. narcissistic (7, 1)	narcissistic (7, 1)	narcissistance	narcissists	narcissisting
6. sewerage (7, 4)	sewerage (7, 4)	sewerous	sewers	sewered
7. coercion (6, 1)	coercion	coercial	coercions	coercioned
8. complies (6,6)	comply	complous	complies	complite
9. corrosive (6, 3)	corrosively	corrosivage	corrosives	corrosiveses
10. envisages (6, 5)	envisage	envisagity	envisages (6, 5)	envisagen
11. inhibit (6, 6)	inhibit	inhibitish	inhibits	inhibitsing
12. summonses (7, 2)	summons	summonsity	summonses (7, 2)	summonsesed
13. pertinent (6, 6)	pertinent	pertinencion	pertinents	pertinented
14. extremities (8, 7)	extremity	extremitant	extremities	extremiting
15. occupant (8, 7)	occupant	occupantive	occupants	occupanted
16. confiscation (9, 4)	confiscation (9, 4)	confiscationee	confiscations	confiscationen
17. preoccupation (8, 8)	preoccupation (8,8)	preoccupationage	preoccupying	preoccupationing
18. squeeze (29, 22)	squeezer	squeezent	squeezed	squze
19. read (22, 19)	reader	Readal	reads	readed
20. break (75, 61)	breaker	Breaky	broken	breaked

APPENDIX J

ENGLISH LEXICAL DECISION TASK-PSEUDO-WORD

Table 24. English lexical decision task pseudo-words

Pseudo-words OED	Allowed derivation	Allowed inflection
1. anneary	1. anneary	1. annaring
2. plindel	2. plindelee	2. plindeled
3. chermadid	3. chermadom	3. chermas
4. como	4. comofold	4. comoes
5. londite	5. londiter	5. londiting
6. creslet	6. cresletly	6. creslets
7. dislune	7. dislunement	7. disluned
8. effilil	8. efililfold	8. efililed
9. fiff	9. fiffiter	9. fiffing
10. poliad	10. poliady	10. poliaded

APPENDIX K

BALANCE WORDS FROM THE AWL

Note: frequencies are taken from www.americancorpus.org (2005-2009); all words have been looked up in the OED.

Table 25. English lexical decision task AWL words

Lexemes from Sub-list 10 in AWL	Allowed derivation	Allowed inflection
1. adjacent	adjacency 0.07	adjacent 11.41
2. odd	oddity 0.9	odd 30.12
3. assemble	assemblage 1.77	assembled 11.03
4. integrity	integrity 17.25	integrity 17.25

5. persist	persistency 0.00	persisting 0.71
6. compile	compiler 0.10	compiled 7.36
7. invoke	invoker 0.0	invokes 1.24
8. straightforward	straightforward 0.12	straightforward 0.12
9. depress	_____	depressed 13.24
10. encounter	encounter 23.6	encounters 8.82
11. colleague	colleague 14.78	colleagues 53.09

BIBLIOGRAPHY

Ahlsén, E. (2006). *Introduction to Neurolinguistics*. Amsterdam/Philadelphia: Johns Benjamins Publishing Company.

Aro, M., & Wimmer, H. (2003). Learning to read: English in comparison to six more regular orthographies. *Applied Psycholinguistics, 24*(4), 621-635.

Brown, H. D. (2004). *Language Assessment: Principle and Classroom Practices*. New York: Pearson Education.

Carlisle, J. F. (2000). Awareness of the structure and meaning of morphologically complex words: Impact on reading. *Reading and Writing: An Interdisciplinary Journal, 12*, 169-190.

Chaudron, C. (2003). Data collection in SLA research. In C. Doughty & M. Long (Eds.), *The Handbook of Second Language Acquisition*. Malden, MA: Blackwell.

Clahsen, H., & Felser, C. (2006a). Grammatical processing in language learners. *Applied Psycholinguistics, 27*, 3-42.

Clahsen, H., & Felser, C. (2006b). Continuity and shallow structures in language processing. *Applied Psycholinguistics, 27*, 107-126.

Coltheart, M. (2005). Modeling Reading: The Dual-Route Approach. In M. J. Snowling & C. Hulme (Eds.), *The Science of Reading. A Handbook*. Malden, MA: Blackwell Publishing.

Davies, M. (2006). *A Frequency Dictionary of Spanish. Core Vocabulary for Learners*. New York: Routledge.

Davies, M. (1990-2009). Corpus of Contemporary American English, from http://www.americancorpus.org/

De Diego Balaguer, R., Sebastián-Gallés, N., Díaz, B., & Rodríguez-Fornells, A. (2005). Morphological processing in early bilinguals: An ERP study of regular and irregular Verb processing. *Cognitive Brain Research, 25*, 312-327.

Fender, M. (2003). English word recognition and word integration skills of native Arabic- and Japanese-speaking learners of English as a second language. *Applied Psycholinguistics, 24*, 289-315.

Gaustad, M.G. (2000). Morphographic Analysis as a Word Identification Strategy for Deaf Readers. *Journal of Deaf Studies and Deaf Education, 5*(1), 60-80.

Hancin-Bhatt, B., & Nagy, W. (1994). Lexical transfer and second language morphological development. *Applied Psycholinguistics, 15*, 289-310.

Holm, A., & Dodd, B. (1996). The effect of first written language on the acquisition of English literacy. *Cognition, 59*, 119-147.

Kilgarriff, A. (1998). BNC database and word frequency lists Retrieved 18 January 2010, from http://www.kilgarriff.co.uk/bnc-readme.html

Koda, K. (2008). Impacts of prior literacy experience on second-language learning to read. In K. Koda & A. Zehler (Eds.), *Learning to Read Across Languages. Cross-Linguistic Relationships in First and Second-Language Literacy Development* (pp. 68-96). New York: Routledge.

Koda, K. (2005). *Insights into Second Language Reading: A Cross-Linguistic Approach*: Cambridge University Press.

Koda, K. (2000). Cross-linguistic variations in L2 morphological awareness. *Applied Psycholinguistics, 21*, 297-320.

Koda, K., & Zehler, A. (2008). Introduction. Conceptualizing reading universals, cross-linguistic variations, and second language literacy development. In K. Keiko & A. Zehler (Eds.), *Learning to Read Across Languages: Cross-Linguistic Relationships in First-and Second-Language Literacy Development*. New York: Routledge.

Kuo, L.-J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational Psychologist, 41*(3), 161-180.

Kuo, L.-J., & Anderson, R. C. (2008). Conceptual and methodological issues in comparing metalinguistic awareness across languages. In K. Koda (Ed.), *Learning to Read Across Languages: Cross-Linguistic Relationships in First- and Second-Language Literacy Development*. New York: Routledge.

Mahony, D., Singson, M., & Mann, V. (2000). Reading ability and sensitivity to morphological relations. *Reading and Writing: An Interdisciplinary Journal, 12*, 191-218.

Morin, R. (2003). Derivational morphological snalysis as a dtrategy for vocabulary acquisition in Spanish. *The Modern Language Journal, 87*(2), 200-221.

Nation, P. (2001). *Learning Vocabulary in Another Language.* Cambridge: Cambridge University Press.

Olivella de Castells, M., Guzmán, E., Lapuerta, P., & García, C. (2006). *Mosaicos. Spanish as a world language*. New Jersey: Pearson Education.

Oxford English dictionary (Online). Oxford, New York: Oxford University Press.

Pena, J. (1999). Partes de la morfología. Las unidades del análisis morfológico. In I. Bosque Muño & V. Demonte Barreto (Eds.), *Gramática Descriptiva de la Lengua Española* (Vol. 3). Madrid: Espasa.

Perfetti, C. A. (2003). The Universal Grammar of reading. *Scientific Studies of Reading, 7*(1), 3-24.

Perfetti, C. A., & Dunlap, S. (2008). Learning to read: general principles and writing system variations. In K. Koda & A. Zehler (Eds.), *Learning to Read Across Languages. Cross-Linguistic Relationships in First- and Second-Language Literacy Development*. New York: Routledge.

Piera, C., & Varela, S. (1999). Relaciones entre morfología y sintaxis. In I. Bosque Muñoz & V. Demonte Barreto (Eds.), *Gramática Descriptiva de la Lengua Española. Entre la oración y el discurso. Morfología* (Vol. 3). Madrid: Espasa.

Ramirez, G., Chen, X., Geva, E., & Kiefer, H. (2010). Morphological awareness in Spanish-speaking English language learners: within and cross-language effects on word reading. *Reading and Writing, 23*, 337-358.

Rodríguez-Fornells, A., Münte, T. F., & Clahsen, H. (2002). Morphological priming in Spanish verb forms: An ERP repetition priming study. *Journal of Cognitive Neuroscience, 14*(3), 443-454.

Saiegh-Haddad, E., & Geva, E. (2010). Acquiring reading in two languages: an introduction to the special issue. *Reading and Writing, 23*, 263-267.

Sainz, J. S. (2006). Literacy acquisition in Spanish. In M. R. Joshi & P. G. Aaron (Eds.), *Handbook of Orthography and Literacy* (pp. 151-169). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Shiff, R., & Calif, S. (2007). Role of Phonological and Morphological Awareness in L2 Oral World Reading. *Language Learning, 57*(2), 271-298.

Schmitt, N., & Zimmerman, C. B. (2002). Derivative word forms: What do learners know? *TESOL Quarterly, 36*(2), 145-171.

Ullman, M. T. (2004). Contributions of memory circuits to language: the declarative/procedural model. *Cognition, 92*, 231-270.

Urquhard, S., & Weir, C. (1998). *Reading in a Second Language: Process, Product and Practice*. Harlow: Addison Wesley Longman.

VanPatten, B. (2007). Input processing in adult second language acquisition. In B. VanPatten & J. Williams (Eds.), *Theories in Second Language Acquisition: An Introduction*. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers. Urquhard, S., & Weir, C. (1998). *Reading in a Second Language: Process, Product and Practice*. Harlow: Addison Wesley Longman.

Zhang, S., Perfetti, C. A., & Yang, H. (1999). Whole word, frequency-general phonology in semantic processing of Chinese characters. *Journal of Experimental Psychology: Learning, Memory and Cognition, 25*(4), 858-875.