ANALYZING ISTRUCTION AND LEARNING OF DERIVATIONAL MORHOLOGY IN THE SPANISH FOREIGN LANGUAGE CLASSROOM

by

Nausica Marcos Miguel

Licenciatura, Universidad Complutense de Madrid, 2006

Master of Arts, University of Pittsburgh, 2010

Submitted to the Graduate Faculty of

The Kenneth P. Dietrich School of Arts and Sciences in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy

University of Pittsburgh

2013

UNIVERSITY OF PITTSBURGH

The Kenneth P. Dietrich School of Arts and Sciences

This dissertation was presented

by

Nausica Marcos Miguel

It was defended on

May 20, 2013

and approved by

Dr. Keiko Koda, Professor of Japanese and Second Language Acquisition, Department of Modern Languages

Dr. David Mortensen, Assistant Professor of Linguistics, Department of Linguistics

Dr. Marta Ortega-Llebaria, Assistant Professor of Hispanic Linguistics, Department of Linguistics

Dissertation Advisor: Dr. Alan Juffs, Associate Professor of Linguistics, Department of Linguistics

ANALYZING INSTRUCTION AND LEARNING OF DERIVATIONAL MORPHOLOGY IN THE SPANISH FOREIGN LANGUAGE CLASSROOM

Nausica Marcos Miguel, Ph.D.

University of Pittsburgh, 2013

Morphological awareness can help learners of a second language (L2) infer and learn the meaning of unknown words. It is, however, unclear how morphological awareness evolves in adult English-speaking learners of instructed L2 Spanish and how this development relates to vocabulary knowledge. Moreover, the manner in which derivational morphology is instructed is unknown. This dissertation examines these aspects within four studies.

Study 1 explores the development of morphological awareness for English-speaking learners of instructed Spanish L2 (n=209) and whether development depends on vocabulary size or other factors, such as proficiency. The results suggest that proficiency is the main predictor of morphological awareness. When morphological awareness was receptively measured, i.e., learners analyzed and identified derivational suffixes, higher levels of awareness were reached even at the lowest proficiency level. When it was productively measured, i.e., learners analyzed, identified, and manipulated derivational suffixes, mastery was only achieved by the most advanced learners. Thus, a partial awareness of morphology precedes a more complete awareness. Moreover, the number of derivational suffixes that these L2 learners manipulated was limited.

Study 2 also surveys morphological awareness by making the participants of Study 1 infer the meaning and structure of unknown words. The findings suggest that though all learners

rely on derivational morphology but advanced learners deploy morphological awareness the most.

Study 3 examines the implicit knowledge of derivational morphology, specifically distributional and semantic knowledge, from the participants of Study 1 and 2. In a timed Lexical Decision Task, learners accurately distinguished violations from non-violations, i.e., learners were aware of distributional and semantic constraints. Learners' reactions were also dependent on the suffix of the word, which suggests that every suffix can be independently learned and stored. These learners, however, did not show RTs that decreased with proficiency, which suggests they have yet to automatize derivational knowledge.

Study 4 uses Borg's framework (2003) to investigate classroom practices and teachers' beliefs about derivational morphology for five Spanish instructors at a large university. The classroom observations reveal that derivational teaching is mostly unplanned, incidental, scarce, and, on occasion, ambiguous. Neither textbooks nor teaching training emphasize the teaching of derivational morphology.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PREFACE

During the process of this dissertation, I have received help from many people, and I just want to use this page to acknowledge them.

First, I want to thank my parents who are, by now, well versed in the instruction and learning of derivational morphology. Even across the distance, they have listened to all of the tiny details of this dissertation and have always supported me.

My committee members, Keiko Koda, David Mortensen, and Marta Ortega-Llebaria have been supportive of my research and have always given me sound advice. I especially want to thank my advisor, Alan Juffs, who always had time for me and pushed me to do the best work that I could do.

My current and former fellow students have also played an important role in this dissertation. I especially want to thank Carrie Bonilla, Ben Friedline, Meghan Dabkowski, Katherine I. Martin, Laura Lenardón, Mike Olsen, Kimmy Rehak, Adrienne R. Washington, and Mary Lou Vercelloti.

I also want to thank Mari Felix Cubas-Mora, Arlette De Jesús, Wenhao Diao, Na-Rae Han, Yan Liu, LaShanda Lemmon, Brian Leventhal, Ryan Miller, Anisa Mughal, Kayla Paulk, Elaine Rubinstein, Évelyn Solórzano Barranca, Trudy Tuwalda, Gina Villamizar and Feifei Ye. You all have helped me with different parts of the dissertation process. Thank you!

Finally, my most sincere thanks to all the participants and also to the instructors who encouraged their students to participate in this study. I am especially thankful to those instructors who volunteered as participants. And, of course, for all of those who helped me with the piloting of the instruments and listened to my moaning about this dissertation: muchas gracias.

1.0 INTRODUCTION

Vocabulary is an essential part of learning and teaching foreign languages. However, it is still unclear how vocabulary size develops and increases across proficiency levels of second language (L2) learners (Nation & Webb, 2011; Schmitt, 2010). Moreover, learning a word does not simply mean mapping the form of a word with a meaning. Rather, it comprises a deeper knowledge of the word, which includes the knowledge of word structure, i.e., morphological knowledge (Nation, 2001). This morphological knowledge refers mainly to derivational morphology, i.e., to those elements in the word that provide semantic and syntactic meaning, such as the root, e.g. *travel*, and derivational affixes, e.g. *-er* in 'traveler.'

This dissertation discusses the relationship between vocabulary and derivational morphology in the foreign language classroom by analyzing English-speaking foreign language learners of Spanish and their instructors. The development in learners with diverse proficiency levels was measured and compared with a cross-sectional design. Since derivational knowledge is not just a monolithic construct, different aspects, such as syntactic, distributional and semantic knowledge, were explored. Finally, teacher cognition of derivational morphology was studied.

The purpose of this dissertation is to pay attention to the main factors, such as development and instruction, contributing to the acquisition of derivational morphology in the L2 classroom. The ultimate goal is to suggest a better model that encompasses the development of vocabulary and derivational morphology in order to benefit L2 instruction, given that there is

neither a current model for development nor much research on language practitioners' cognition of their linguistic and instructional mediation in learning. To sum up, three studies—i.e., Study 1, 2 and 3—will focus on the development of L2 derivational morphology, and another study—i.e., Study 4—will delve into L2 instruction of derivational morphology.

In the literature review, the main research points relating to the development of derivational morphology and vocabulary in the foreign language classroom are presented. First, information about derivational knowledge and awareness with regard to first and second language is discussed. Second, the development of derivational morphology and vocabulary in the foreign language classroom is introduced. Some specific models of vocabulary knowledge will be examined, namely Nation (2001), Jiang (2000) and Lowie (1998, 2005). Third, what is known about the relationship between vocabulary and derivational knowledge as established in the current literature is summarized. Fourth, testing methodologies on vocabulary size and derivational knowledge and awareness are reviewed. Fifth, the topic of teacher cognition about L2 vocabulary and derivational morphology is deepened by presenting three recent studies. Once the main areas of the dissertation have been pinpointed, the significance and contribution of this dissertation is highlighted by identifying the gaps in current research.

2.0 LITERATURE REVIEW

In instructed second language acquisition, a theory of the target and the process of acquisition are needed (Gregg, 1996). From section 2.1 to 2.4, the nature of derivational morphology, as well as its acquisition process, are reviewed. Testing mechanisms for both the target and the process of acquisition are examined in 2.5. Finally, in 2.6, teachers' practices and points of view are considered as an additional factor that influences the process of acquisition. In 2.7 and 3, there is a summary of the research questions and goals of this dissertation.

2.1 DERIVATIONAL MORPHOLOGY IN FIRST LANGUAGE (L1) ACQUISITION

Morphemes are the smallest meaningful units in a word. L1 speakers have to acquire both roots—i.e., the part of a word carrying lexical meaning—and affixes. Whereas acquisition of free roots is the same as vocabulary acquisition, the acquisition of affixes is not necessarily equivalent. Therefore, a theory of morphemes smaller than the free root is needed.

Derivational morphemes provide lexical meaning, such as the Spanish agentive suffix *–ero* in *molinero*, 'miller,' whereas inflectional morphemes supply grammatical information, such as the plural marker *–s* in *molineros*, 'millers.' Sometimes, the division between derivational and inflectional morphemes is not very sharp, as in the case of appreciative suffixes,

e.g., the derivational suffix *–ito*, '-let.' Prototypical derivational suffixes, however, are those that can coin new words as well as potentially change the syntactic category of the root.

Derivational suffixes are acquired later than inflectional suffixes since they are not as *vital* for communication nor are they as productive as inflectional suffixes. For example, children learning their L1 develop inflectional morphology before schooling whereas the acquisition of derivational morphology flourishes during schooling (Koda, 2008). While a child develops reading skills, an augmentation of a child's vocabulary size as well as an increase in knowledge of derivational morphemes is recorded (e.g., Anglin, 1993; Carlisle, 2000; Carlisle & Fleming, 2003; Kuo & Anderson, 2006; Tyler & Nagy, 1989). Therefore, there is an increase of derivational knowledge with age.

Specifically, in French, a Romance language, there are eighteen different derivational suffixes in the speech of children between the ages four and five that can be actively used to build new words (Clark, 1993). The mastered suffixes can be classified in three groups: agentive and instrumental (e.g., *–eur*, '-er'), object (e.g., *-age*, '-age'), and activity (e.g., *-ment*, '-ment') (examples from French suffixes and their English equivalents, p. 162). In Spanish, another Romance language, Auza (2008) establishes a relationship between vocabulary size and the production of agentive nouns in three- to four-year-old L1 Spanish children: larger vocabulary sizes correspond with an active knowledge of derivational suffixes, i.e., children were able to overgeneralize the usage of agentive suffixes such as *–dor* and *–ero*, '-er,' and those overgeneralizations proportionally corresponded with the frequency of the morpheme in their own output.

Contrary to the expected order of learning given that inflectional suffixes are supposedly learnt first (see Pérez-Pereira & Singer, 1984 for a study on the order of acquisition of Spanish

affixes), Marrero, Aguirre, and Albalá (2007) emphasize that diminutives are the first derivational suffixes to be acquired in Spanish, that they facilitate the acquisition of other morphological forms, and that the learning of verbal paradigms is far slower. Therefore, derivational morphology can be as productive and as frequent as inflectional morphology in L1 learners.

In sum, knowing derivational suffixes rather than just knowing inflectional suffixes implies a deeper knowledge of the language system because a speaker is able to find relationships between words belonging to the same word family—i.e., relational knowledge; the syntactic category marked by a suffix—i.e., syntactic knowledge; or the subcategorization required by a given suffix—i.e., distributional knowledge (see Tyler & Nagy, 1989). The question of how to define *morphological knowledge* remains. In the next section, the implications of metalinguistic and linguistic knowledge will be discussed for L1 and L2 learning.

2.2 METALINGUISTIC KNOWLEDGE, MORPHOLOGICAL AWARENESS AND GRAMMATICAL KNOWLEDGE

When dealing with derivational morphology, three different aspects of *knowledge* are expected from an L1 and an L2 learner. For the first aspect, a learner needs to have *abstract knowledge* about how morphology works without reference to any specific grammar rule, e.g., derivational morphemes can mark word category. This construct is called *metalinguistic knowledge* by Bialystok (2001). For the second aspect, the learner needs to be familiar with some of the derivational affixes in the inventory of a language and be able to manipulate them. This construct

is called *morphological awareness* (Kuo & Anderson, 2006). This concept is crucial to learning since it allows learners to identify grammatical categories, such as nouns or adjectives, infer the meaning of unfamiliar words, and access stored lexical *information* (Koda, 2008). For example, if an English reader comes across the word *toleration* in a text but does not know its meaning, that reader can still recognize its word category because the suffix *-ion* is found at the end of countless other English nouns. For the third aspect, a learner needs to have independently stored each derivational affix with its syntactic and distributional information in the mental lexicon. This knowledge can be considered the *grammatical knowledge* of each affix. Although this knowledge does not necessarily presuppose a rule-governed system, such a system might be helpful to understand the relationship between affixes and roots.

Mentioning the storage of affixes presupposes that derivational affixes exist independently of words. Evidence for the independence of derivational affixes comes from priming experiments (e.g., Longtin & Meunier, 2005; McCormick, Rastle, & Davis, 2008, 2009; Rastle, Davis, & New, 2004; Silva & Clahsen, 2008). However, other studies do not show affixes as independent units (e.g., Duñabeitia, Kinoshita, Carreiras & Norris, 2011; Rueckl & Rimzhim, 2011). Moreover, it is under discussion whether the syntactic features are available before the word semantics are activated (see Bertram, Hyönä, & Laine, 2011; see Farrell & Abrams, in press). Nevertheless, as Melinger and Koenig (2007) have demonstrated, word category can prime target words, which indicates that syntactic information is very much present in the representation of an individual word.

The psychological reality of affixes does not pose any threat to the construct of awareness and metalinguistic knowledge since these are explicit and conscious kinds of knowledge. As conscious knowledge, affixes are clearly independent of words as can be seen in multiple

neologisms created by L1 and L2 learners and in the ability of learners to recognize an unknown word by its parts. A larger vocabulary size facilitates developing a learner's recognition of affixes as independent units (e.g., Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997), but classroom instruction can also accomplish this goal by raising the learner's morphological awareness (e.g., Marcos Miguel, 2011; Morin 2003, 2006).

The three above-mentioned aspects—metalinguistic knowledge, morphological awareness, and grammatical knowledge—are expected to develop simultaneously or very closely in L1 learners. For an adult L2 learner, the metalinguistic knowledge—the abstract knowledge about language—has already been developed in his L1. At the same time, this learner still needs to develop a fine-grained knowledge of the inventory of suffixes in the new language, which implies extending their morphological awareness and grammatical knowledge. In the next section, the influence of the L2 language classroom on morphological development is discussed.

2.3 MORPHOLOGICAL DEVELOPMENT IN INSTRUCTED FOREIGN LANGUAGE LEARNERS

Both inflectional and derivational morphology are part of the foreign language classroom. Training on inflectional morphology is a must, although this training does not immediately lead to mastery in production. For example, studies on development of verbal morphology have shown that learning the morphological expression of tense and aspect evolves slowly and gradually (see Bardovi-Harlig, 2000, for a review). In fact, there is often a mismatch between form knowledge—e.g., using a default inflected verb—versus usage knowledge—e.g., using the necessary markers of tense and aspect. Moreover, learners tend to show a greater knowledge of

irregular verbal forms than of regular forms. In spite of these tendencies, L2 learners are almost always able to explain the rules behind an inflectional paradigm (e.g., Marcos Miguel, 2012a). Even though each L1 influences the level of L2 morphological awareness differently—i.e., there is always a different *dual language involvement* (Koda, 2008)—it can be assumed that inflectional paradigms are easily learned by all L2 learners due to its regularities.

With derivational knowledge, it is much harder to describe a mismatch, or lack thereof, between production/reception and explicit knowledge, given that derivational morphology is scarcely addressed in the classroom. For instance, Brown's analysis of English textbooks highlights that instruction of "word parts receives no attention at all in the beginner-level textbooks and a very small amount of attention at the other levels" (2010, p. 91).

More specifically, in a Spanish intermediate textbook such as *Enfoques* (Blanco & Colbert, 2010), where all verbal paradigms are presented and revisited, there is almost no presence of derivational instruction except for the highly productive adverbial suffix *–mente*, '-ly,' and some appreciative suffixes such as the diminutives *–ito* and *–illo*, '-let.' No work with word families is introduced. It seems that derivational morphology does not concern language educators. Conversely, word-formation rules are introduced at advanced levels as *Repase y Escriba* (Canteli Dominicis & Reynolds, 2007), a Spanish advanced grammar book, attests.[1] Thus, derivational morphology is mostly incidentally pointed out—i.e., focus-on-form—but it is not systematically taught. This approach is sensible given that it is not expected that learners use this derivational as productively as they use the inflectional knowledge one due to the many blocking forms and idiosyncrasies of any language: e.g., although *bosquero*, 'forest + -er,' could be a word denoting

[1] In http://cvc.cervantes.es/ensenanza/biblioteca_ele/antologia_didactica/default.htm, a compilation of articles dealing with derivational morphology seeks raising awareness of the usefulness of derivational morphology among L2 teachers.

a person who takes care of a forest since the suffix *–ero*, '-er,' can be attached to nouns and create nouns with such a meaning, there is blocking because the compound word *guardabosques*, 'keeps + forests, forester,' already exists. In spite of this, developing receptive knowledge of derivational morphology can be projected towards better memorization and recognition of new lexical items.

Advanced L2 learners do, in fact, coin new words based on their knowledge of L2 derivational morphology. For example, Whitley (2004) analyzed written samples of English-speaking, advanced learners of Spanish. These L2 learners created neologisms based on their L1 knowledge, but also on the developing knowledge of word formation in the L2. In spite of examples of successful coinages, morpho-syntactic errors—i.e., using a member of a word family instead of another without the necessary changes in syntactic marking, such as *feliz*, 'happy,' for *felicidad*, 'happiness'—amounted to "41% of the total 600 errors" in Whitley's study (p. 169). Furthermore, with another production task named the *Test of English Derivatives*, Schmitt and Zimmermann (2002) showed that learners of L2 English often only know two members of a word family, namely a noun and a verb, rather than any adjectives or adverbs. Thus, knowing a word does not automatically provide knowledge of a whole word family. For instance, knowing the noun *significance* does not imply knowing the adjective *significant*.

Along the same lines of research, using a forced choice task, Zyzik and Azevedo (2009) explored whether Spanish L2 learners were able to see the relationships between derivational suffixes and the word category they marked. Learners were not very successful in this task. In their conclusions, the authors also noted a prevalence of morpho-syntactic errors. Utilizing different methodology, think-aloud protocols, Zyzik (2009) showed how L2 learners approached word analysis in context by using different kinds of knowledge among them: derivational

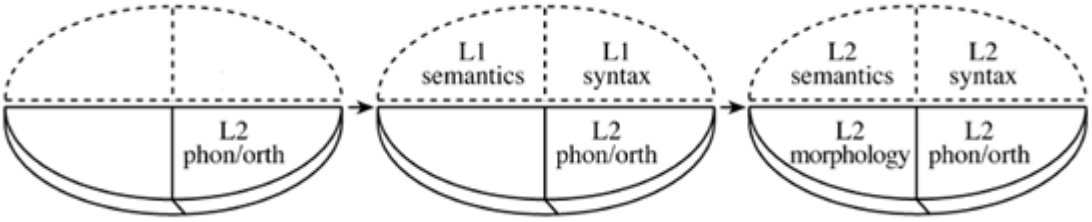
knowledge and word class knowledge. Nonetheless, derivational knowledge was not a major resource for these L2 learners, and the author had to separate word knowledge from derivational knowledge. Another study with English-speaking intermediate learners of Spanish (Marcos Miguel, 2012a) also confirms these trends: morphological knowledge is present and used when reading. Crucial to this study was the verification that intermediate learners of Spanish have only a minimal inventory of Spanish derivational suffixes at their disposal, whereas they have already mastered inflectional suffixes and have a clear knowledge of inflectional rules in Spanish—the focus of classroom instruction.

Studies on L2 vocabulary inferencing strategies, which vary depending on the learner's proficiency level (e.g., Haastrup, 1991; Schmitt, 1997), also can provide insight into how derivational awareness works for instructed foreign language learners. According to that research, morphological awareness contributes to word retention, although it does not always help with inferring a word's right meaning (Hu & Nassaji, 2012). In fact, Haastrup's study (1991), with two levels (high-low) of Danish-speaking learners of English L2, found that learners at lower levels used less intralingual cues—i.e., cues originated in a stem or an affix—than higher proficiency learners—i.e., they rely less on morphological awareness. Moreover, complex lexical items increased the probability that learners deployed morphological awareness.

From a theoretical perspective, Jiang (2000) proposes a developmental model of lexical representation and development in L2 based on Levelt's (1989) model of lexical representation. Jiang takes into account that L2 lexical development in the classroom is characterized by limited input and that a learner with a fully developed L1 lexical system only needs to memorize new forms, but not to understand new meanings. Jiang's model refers to the representation of each

independent word and not to the holistic process of vocabulary acquisition. In the following picture, the three stages of his model are depicted.

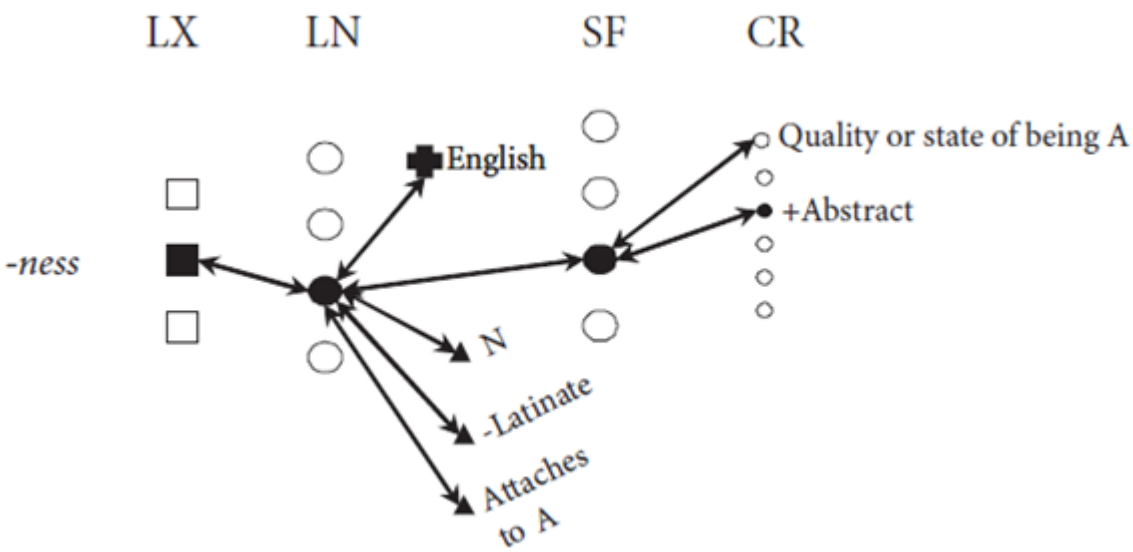
Figure 1. Lexical development in L2 (Jiang, 2000, p. 47)



The first stage involves knowledge of the L2 word form, i.e., phones and graphemes. The second stage presupposes that the learner will relate the L2 form with the meaning and the syntax of the word in the L1. Finally, this learner will be able to move from the L1 components into the L2 in semantic and syntactic knowledge. He or she will integrate these three aspects—form, meaning and syntactic information—with L2 morphology, namely inflectional morphology. Theoretically, all learners will be able to progress to the third stage. On the contrary, this is not necessarily always the case, and a word can be fossilized at stage 2 to never arrive at stage 3. Different patterns of words, such as cognates, might also go through different stages of development. It is open to question whether this model also suits the development of derivational morphology.

At the same time, Lowie (1998, 2005), based on Levelt (1989) and Schreuder and Baayen (1995), proposed a model for lexical representation that applies to both words and affixes. In the following figures, the Central Lemma Node (LN) appears with “interactive pointers” to other areas such as Syntactic Properties (SP), Semantic Form (SF), Lexeme (LX) and Conceptual Representations (CR).

Figure 2. Lowie's model of representation of the affix –*ness* (2005, p. 236)



What is important from this model is that suffixes can be learned in the same way as monomorphemic words thanks to input frequencies and degree of productivity. Affixes can be compared to the learning of abstract words due to their low levels of concreteness or imaginatively. For this reason, L2 learners will develop a deeper knowledge of the suffixes with time.

Furthermore, cognate suffixes could also be shared between bilingual lexicons. Given that cognate stems have been proposed to be communal elements in the bilingual lexicon (see Sánchez-Casas & García-Albea, 2005), the option of *shared* suffixes should be considered. Nevertheless, Danilović (2010) (quoted in Dimitrijević-Savić & Danilović, 2011) found that cognate suffixes were not better known than non-cognate suffixes for Serbian-speaking learners of English L2.

The above-discussed models of Jiang (2000, 2002) and Lowie (1998, 2005) focus on the relationship between morphology and vocabulary in L2 learners, which are the target areas of this dissertation. In this study, the characterization of derivational morphology under consideration assumes that the syntactic information of a word is stored not in the whole entry,

but in the derivational morpheme as in Lowie's Figure (see Figure 2). This statement is especially justifiable when the affix is biunique—i.e., when there is only one syntactic meaning for a morph. Table 1 depicts an inventory of some of the most frequent derivational morphemes in Spanish and their characteristics. Presumably, L2 learners should easily comprehend morphemes that are biunique and morphemes that are cognates—i.e., related in form and meaning between the two languages.

Table 1. Inventory of Frequent Spanish Derivational Suffixes

Nominal Suffixes				Adjectival Suffixes			
Biunique Suffixes		Non-biunique Suffixes		Biunique Suffixes		Non-biunique Suffixes	
Cognate (English)	Non-cognate (English)	Cognate (English)	Non-cognate (English)	Cognate (English)	Non-cognate (English)	Cognate (English)	Non-cognate (English)
–ión (*-ion*) –miento (*-ment*) –oso (*-ous*)	–ura (*-y,-ness*) –dad (*-ity*) –ez(a) *(-y,-ness*)	–al (*-al*) –ista (*-ist*) –nte (*-nte*, *-ant*) –ivo (*-ive*)	–ero (*-er*) –ón[2] –dor (*-er*)	–ble (*-ble*)	–ado (*-ed*)	–al (*-al*) –ista (*-ist*) –nte (*-ent*, *-ant*) –ivo (*-ive*)	–ón[2] –dor (*-er*) –eor (*-er*)

Apart from Lowie and Jiang's models, another popular model is Nation's pedagogical classification of kinds of word knowledge (2001, p. 27). His classification deals with the *forms* of the word (spoken, written and word parts), its *meanings* (form and meaning, concept and referents, and associations) and its *use* (grammatical functions, collocations and constraints of use). His scheme is not a model of vocabulary development since it mainly refers to explicit

[2] This is a polysemous suffix: providing an augmentative or intensive value; serving as a derogative suffix that indicates a frequent action; indicating lack of something; indicating a sudden or violent action and effect (DRAE).

knowledge that both L1 and L2 speakers have about every word. This model does not suggest chronological, and even less simultaneous, acquisition of the different kinds of knowledge. However, this model serves as a pedagogical base for language instruction.

To summarize previous findings, a learner's knowledge about derivational morphology develops with proficiency, thanks to metalinguistic knowledge and morphological awareness on the side of L2 learners, without depending on classroom instruction. The question remains whether more focused instruction might accelerate the learning of derivational morphology and what benefits this kind of instruction will bring L2 learners. These aspects will be discussed in the following section.

2.4 THE RELATIONSHIP BETWEEN VOCABULARY AND MORPHOLOGY IN FOREIGN LANGUAGE LEARNERS

Generally, highly-developed derivational awareness presents an advantage for vocabulary acquisition. In spite of this, few studies have focused on the acquisition of derivational morphology by L2 learners, especially with the regards to the relationship between morphological awareness and vocabulary size. Three studies (Hayashi & Murphy, 2011; Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997) have dealt with Japanese speakers learning English.

Schmitt and Meara (1997) found that, without any explicit instruction of derivational morphology, L2 learners expanded their vocabulary size at the same time that they increased their awareness of derivational morphology. These authors attended to the framework proposed by Nation (1990), where derivational morphology is subsumed under the category of

grammatical knowledge. Although this framework is purely descriptive—detailing the elements that can be learned about a word, but not those that must be learned or how those elements are learned, it encourages analysis of derivational morphology within word knowledge.

Mochizuki and Aizawa (2000) observed that higher levels of affixal awareness were influenced by vocabulary size. Overall, "affix knowledge increased in proportion to vocabulary size" (p. 300). These authors also suggested that the interaction of "instruction, frequency of suffixes, frequency of words that contain a suffix, and the polyfunctional nature of the suffix" (p. 301) might determine the order of acquisition of affixes. Although this may be true, the authors do not support their claim with data. In sum, derivational and vocabulary knowledge are not treated as separate entities in their study.

Hayashi and Murphy (2011) found high positive correlations between morphological awareness productively measured and vocabulary size in Japanese-speaking learners of English L2. These learners showed, however, no correlations between morphological awareness when measured in a word segmentation task—i.e., receptively measured—and vocabulary size. These authors concluded that morphological awareness is related to vocabulary size. A caveat of this study is that real words, instead of nonwords, were used for the morphological tests.

The relationship between morphological awareness and vocabulary size has also been examined in L2 English speakers of other L1s, namely Serbian and Spanish. With L1 Serbian speakers, Danilović, Dimitrijević Savić, and Dimitrijević (2013) replicated Mochizuki and Aizawa's (2000) study. These authors found no correlations between receptive mesurements of suffixal awareness and vocabulary knowledge. The participants did show moderate correlations between prefixal awareness and vocabulary knowledge. For L1 Spanish speakers, Medellín Gómez and Auza Benávides (2008) replicated Mochizuki and Aizawa's study. These scholars

found an increase in morphological awareness when receptively measured congruent with vocabulary size.

Furthermore, the question of what characteristics of derivational morphemes might propel learners into acquisition—i.e., active use and recognition of a morpheme—arises. For grammatical morphemes, several factors have been taken into account. In their meta-study, Goldschneider and DeKeyser (2001) propose five factors—perceptual salience, semantic complexity, morpho-phonological regularity, syntactic category and frequency. Notwithstanding these five factors, Luk and Shirai (2009) emphasize the role of L1 in the learning of grammatical morphemes. In L1 research, acoustic salience is a main factor in acquisition of inflectional morphology, and in the first developmental stages, acoustic salience—"a rough estimation of the degree to which a marker is perceptually detectable by a listener, in other words, its acoustic prominence" (Köpcke, 1998, p. 300)—appears to matter more than frequency of the input (Dressler, Korecky-Kröll & Dabašinskienė, 2012). This might also be propelled by the fact that L1 speakers first learn words holistically: acoustic salience will help them to parse words and find common patterns more easily.

The factors discussed for grammatical morphemes might also be prevalent in acquisition of derivational morphemes. Given the separation of derivational and grammatical morphemes, semantic complexity and frequency might be more decisive in the acquisition of the former. Frequency might not be necessarily measured as corpus frequency. For instance, Auza (2000) found consistency among the derivational suffixes used in overgeneralizations by L1 Spanish children and those more frequently used in the children output. Productivity might also be another factor, as Lowie (2005) illustrates. For example, in a production task where participants had to provide as many words of the verb family as possible from a verb (Marcos Miguel, 2011),

English-speaking learners of Spanish used mostly productive and transparent suffixes, such as *–dor* or *–ado*.[3]

In addition to this, L1 also plays a major role in acquisition of derivational morphology. For instance, Rehak and Juffs (2011) showed how L1—Spanish as opposed to Chinese—influenced processing of both grammatical and derivational affixes in an English masked-priming lexical decision task. Additionally, L1 readers of an opaque orthography, such as English, are expected to pay more attention to derivational morphemes when encountering new words in written form than readers of a transparent orthography, such as Spanish (see Perfetti & Dunlap, 2008). Therefore, L2 morphological awareness could depend on the L1 orthography. In brief, the role of L1 in acquisition of L2 derivational morphology is a factor that must be considered. Furthermore, gaining a deeper understanding of L2 learners awareness and knowledge is necessary to effectively teach suffixation. Thus, it is important to separate what is language specific and what holds cross-linguistically in L2 development of derivational morphology.

The discussed literature so far has concentrated on the development of derivational morphology without explicit instruction. In terms of its explicit instruction in alphabetic languages, four studies deserve attention: Morin (2003, 2006), Marcos Miguel (2011), and Friedline (2011). Morin performed two classroom studies with first- to fourth-semester English speakers' learners of Spanish to determine how instruction on derivational knowledge could enhance vocabulary learning. She focused on the training of word families by using metalanguage and by explicitly dividing the root and the suffixes during classroom instruction. Although higher derivational knowledge was present in the participants after the treatment,

[3] This is a participial ending that can be both considered: participle and adjectival suffix.

vocabulary size did not increase. As would be expected in a model of progressive development of morphology, the more advanced groups benefited more from instruction since their morphological awareness was greater, i.e., the Matthew effect. This finding is consistent with Jiang's account of lexical representation.

A caution about the methodology used by Morin (2003, 2006) is that morphological awareness was measured in terms of the learner being able to provide the part of speech of a word, but the word was not productively used within a syntactic frame. Additionally, a labeling task—i.e., writing down if it is a noun or an adjective—is a metalingual burden on the learner. In a replication study (Marcos Miguel, 2011) where production was given with and within a sentence-frame, the same results were found: despite evidence of a correlation between vocabulary size and derivational knowledge in the pre-test, this relationship disappeared in the post-test after training. These findings are important because of their contradictory nature with previous research that states how morphological awareness relates to vocabulary size (e.g., Hayashi & Murphy, 2011; Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997).

The replication study (Marcos Miguel, 2011) also sought to confirm how instruction influenced each subcomponent of derivational knowledge: relational, syntactic, distributional, and receptive (Tyler & Nagy, 1989; Roy & Labelle 2007).[4] Results showed that relational knowledge, i.e., root recognition in a word family, was well known—in accordance with Jiang's (2000) model; whereas syntactic knowledge, i.e. knowledge of word categories marked by suffixes, as well as receptive knowledge of the inventory of the suffix in a language, were still lacking. Therefore, from these five subcomponents of derivational knowledge, the syntactic and

[4] Relational—i.e., words of the same family; syntactic—i.e., word category marked by a suffix; distributional knowledge—i.e., morphemic ordering constraints; and receptive knowledge—i.e., the inventory of suffixes in a language (Tyler & Nagy, 1989).

the receptive components might require and/or benefit from explicit instruction, and it might be also expected that these components are the most closely connected to vocabulary acquisition since they provide a deeper awareness of the word.

In another classroom study about acquisition of derivational morphology (Friedline, 2011), L2 learners of English with different L1s showed improvement in recognition of morphological structures regardless of method of instruction (pushed output versus input-processing). L2 learners positively reported on how their morphological awareness improved through instruction and how at the end of the treatment they could see the benefits of this instruction for subsequent learning.

All in all, classroom instruction—with and without explicit focus on derivational morphology—should provide enough input for developing morphological awareness and knowledge as well as increasing vocabulary size. Another issue to discuss is what appropriate measurements of derivational morphology and vocabulary size are available for researching L2 Spanish learners. This topic is explored in the next section.

2.5 TESTING OF VOCABULARY SIZE AND DERIVATIONAL MORPHOLOGY

In vocabulary research, there has been a long debate about how to measure vocabulary size. To date, there are several popular measurements. Nation's original Vocabulary Levels Tests and Vocabulary Size Test are widely used in EFL with and without modifications (e.g., Schmitt, 2010). In these tests, a learner has to choose the best option from a multiple-choice format. These tests relied on the assumption that the frequency of the vocabulary item determine the speed at which it is acquired, that is, more frequent items are acquired first, whereas less frequent are

acquired at higher levels of proficiency. These frequencies are taken from the General Service List (GSL) or the Academic Word List (AWL), i.e., these lists supposedly show the words that need to be known by L2 English learners to function in an English-speaking country. The AWL is especially necessary for those who want to study at a higher education institution. Meara's *lognostics* website is also a useful resource for vocabulary researchers (Schmitt, 2010).

All these tools are nonexistent for L2 Spanish. Nonetheless, there are frequency dictionaries such as Davies (2006) or Almela, Cantos, Sánchez, Sarmiento, and Almela (2005) that can help create vocabulary tests based on frequencies for L2 Spanish learners. Another advisable way of testing vocabulary size could be by utilizing word frequencies found in the learners' input such as those offered in L2 textbooks. With this in mind, Davies and Face (2006) analyzed the frequencies found in the glossaries offered in six textbooks (three first-year and three second-year) and found correlations with the frequencies found in *A Frequency Dictionary of Spanish* (Davies, 2006). However, much more than half of the words used were above the first 1000 frequency words. Godev (2009) found similar results. This disparity implies that classroom frequencies do not correspond with *real world* frequencies. Therefore, classroom frequencies seem more suitable for L2 learners rather than other frequency measurements such as of *A Frequency Dictionary of Spanish* (Davies, 2006) or *Diccionario de Frequencias* (Almela et. al, 2005).

Measurements of vocabulary, however, do not supply any independent information about the learners' awareness of derivational morphology. There are a few tests that have been used for testing derivational awareness productively. Schmitt and Zimmerman (2002) proposed the *Test of English Derivatives*. An item of this test is presented below.

1. Philosophy

Noun	She explained her _____ of life to me.
Verb	She was known to _____ about her life.
Adjective	She was known as a _____ person.
Adverb	She discussed her life _____.

(Schmitt, 2010, p. 228).

Morin (2003, 2006) presented Spanish L2 learners with a verb and a table where every cell was labeled with a word category—noun, verb, adjective, and adverb. Learners were required to write down the correct derived form for the given verb. This way of testing has some limitations since metalanguage is needed to answer correctly. A method to avoid this setback consists of dividing this test in two: one where learners can produce as many derived forms as they know without classifying them, and another where learners are required to produce it à la Schmitt and Zimmerman, but without metalanguage. Another way to test awareness of suffixes is by giving a list of suffixes and verbs and asking learners to provide a form where the suffix is meaningful as in Schmitt and Meara (1997).

Receptive awareness of derivational suffixes can also be tested with a forced choice test where only one word is needed for a syntactic gap (e.g., Zyzik and Azevedo, 2009); with a multiple-choice format where a phrase with a gap is given followed by a selection of derived forms to choose from (e.g., Morin, 2003, 2006); and with a lexical inferencing test, where the multiple choice options are L1 translations (e.g., Zhang & Koda, 2012). Furthermore, behavioral tasks, such as lexical decision tasks, can also be used to test implicit knowledge of derivational morphology (e.g., Longtin & Meunier, 2005; Rehak & Juffs, 2011; Silva & Clahsen, 2008).

Although generally assumed that vocabulary size and derivational morphology are very tight constructs, measurements of vocabulary size and of derivational awareness do not always

correlate (e.g., Marcos Miguel, 2011; Morin, 2003, 2006). Instruction (see 2.4) might facilitate the separation of these constructs. However, apart from the classroom experiments discussed, it is not clear what kind of instruction of derivational morphology is promoted in the foreign language classroom. The next section delves into research on practices and beliefs about instruction of vocabulary and derivational morphology.

2.6 TEACHER COGNITION ABOUT DERIVATIONAL MORPHOLOGY

As shown in this literature review, the main agent in vocabulary acquisition is, of course, the learner. Moreover, instructed second language learning can benefit from a range of mediation interventions, including materials, the teacher, and other learners. Alongside a learners' effort, the classroom and the teacher determine vocabulary growth. However, the role of the teacher is still a neglected area in vocabulary research (Borg, 2009), and since the teaching of derivational morphology can be subsumed under vocabulary instruction, the same applies for teaching of derivational morphology, the focus of this dissertation.

Establishing a causal relationship between teaching and learning is not an easy task and might even turn into an impossible one given the many factors influencing learning. Nevertheless, knowing more about teacher cognition about vocabulary and derivational morphology might be very fruitful for researchers as well as for teacher trainers.

Previous studies about the teaching of vocabulary have focused mostly on observations of classroom practices, without necessarily addressing teachers' views (e.g., Sanaoui, 1996; Swain & Carroll, 1987). Their views, however, cannot be ignored in classroom research. For example, Borg (2003) proposes a comprehensive framework of *teacher cognition* in order to understand

teaching and teachers. Borg defines teacher cognition as "what teachers think, know, and believe and the relationships of these mental constructs to what teachers do in the language teaching classroom." (p. 81). His framework approaches research on teacher cognition, taking into account several factors that influenced the teacher, namely: schooling, professional coursework, classroom practices and contextual factors. The need for balance between teachers' analysis in and outside the classroom is exemplified in Niu and Andrews' (2012) study. These researchers showed how inconsistencies related to vocabulary instruction arise in Chinese-speaking teachers of L2 English when they were observed in the classroom and interviewed outside of it.

Although teaching of derivational morphology is addressed to a certain degree in the classroom, there is a prevalence of teaching meaning rather than of teaching form (e.g., Sanaoui, 1996; Swain & Carroll, 1987) and of teaching "lexical items or expressions rather than generalizable features of the lexis of the target language" (Sanaoui, 1996, p. 187). Instructors' main reasons for not discussing derivational morphology are the fallible nature of word formation rules as well as the presumably high proficiency level required in order to benefit from the instruction (Marcos Miguel, 2012b; Zhang, 2008). Therefore, formal instruction of derivational rules does not seem to be of interest for teachers; analysis of word formation is preferred as an exploratory strategy for further vocabulary acquisition (Zhang, 2008).

Although teachers' lexical input can be ambiguous (e.g., Chaudron, 1982) and some discussion remains as whether L2 teachers can create a "stimulating lexical environment" (Donzelli, 2007, p. 122; Meara, Lightbown, & Halter, 1997) or not (Horst, 2010; Tang, 2011), teachers' input is a source for vocabulary acquisition (e.g., Milton, 2009). Therefore, it can also be hypothesized that teachers' input is beneficial for developing awareness of derivational morphology. This development can be fostered in different ways. First, teachers might introduce

derivational morphology in the classroom when incidentally presenting words of the same word family in their lesson. Second, explicit elaborations of words can promote vocabulary acquisition by sharpening the focus of the form of the word (e.g., Vidal, 2003). Third, corrections of lexical errors, the most frequent type of error corrected, can also provide a suitable environment for drawing learners' attention to derivational morphology (e.g., Lyster, 1998; Simard & Jean, 2011).

As Schmitt says, "virtually anything that leads to more exposure, attention, manipulation, or time spent on lexical items adds to their learning" (2008, p. 339). Nonetheless, it is not clear how and whether the input of teachers *leads to more exposure, attention, manipulation or time spent on* derivational morphology. Further exploring teachers' practices and beliefs will help clarify how the learner is influenced in their learning of morphology, what teachers' concerns about teaching derivational morphology are, and what recommendations can be made so that teachers feel comfortable implementing suitable, morphological instruction for their students.

2.7 SUMMARY

In this literature review, the background for this research project has been laid out. It has been discussed what derivational knowledge and awareness is; how derivational awareness and knowledge develop in a formal setting with and without instruction; how derivational awareness and vocabulary size relate to one another; what the usual measurements of vocabulary size and derivational awareness and knowledge are; and what is known about teacher cognition about derivational morphology. In the next section, the research questions that were addressed in the four studies envisioned for this dissertation are introduced.

All in all, this dissertation offers a) a quantitative look at morphological awareness and vocabulary size (Study 1 and Study 2); b) and at implicit derivational knowledge, such as semantic and distributional (Study 3); and c) a qualitative analysis on teacher cognition about derivational morphology (Study 4). These four studies contribute to the literature by elucidating the relationship of vocabulary and derivational morphology and by helping in developing further models of vocabulary acquisition and optimizing classroom instruction. Furthermore, suggestions for further teaching of derivational morphology cannot be proposed without analyzing the current classroom situation. The significance of this dissertation will target both SLA research and classroom practices for mediating acquisition of derivational morphology.

In summation, this dissertation focuses on the following: 1) the relationship between derivational awareness and vocabulary size in Spanish L2 learners; 2) learners awareness and implicit knowledge of derivational morphology; and 3) teachers' understanding of instruction of derivational morphology in the Spanish L2 classroom.

3.0 RESEARCH QUESTIONS

Study 1 (a developmental study) addresses the following questions:

1) How do derivational awareness and vocabulary knowledge develop across different levels of English-speaking L2 Spanish learners who receive unsystematic instruction?
2) What model of vocabulary and morphology acquisition do these data suggest?
    a. Are vocabulary size and derivational awareness independent?
    b. If so, at what point during learning does morphological awareness diverge from vocabulary size?

Study 2 (a learner's awareness study) examines the following questions:

1) What can learners say about their use of derivational morphology when inferencing the meaning of an unknown word?
2) To what extent do they recognize a suffix and a stem in unknown words?

Study 3 (a study on distributional knowledge) analyzes learners' distributional and semantic knowledge of derivational morphology.

1. Do learners distinguish violations from possible word formations?
2. Do learners distinguish semantic violations from syntactic violations?

3. How does this implicit knowledge relate to morphological awareness (Study 1 and 2)?
    a. Is there an effect on proficiency for implicit knowledge?
    b. Is there an effect due to the specific suffix?

Study 4 (a teacher cognition study) deals with teacher cognition about instruction of derivational morphology.

1. How do Spanish instructors teach derivational morphology in the classroom?

4.0 STUDY 1: DEVELOPMENTAL STUDY OF VOCABULARY AND MORPHOLOGICAL AWARENESS

This first study analyzes the relationship between morphological awareness and vocabulary size. Although it has been proposed that there is a relationship between these variables in first language development (e.g., Kuo & Anderson, 2006), it is here hypothesized that vocabulary size—i.e., knowledge of monomorphemic words—is independent of morphological awareness, which pertains to knowledge and manipulation of affixes, in L2 adult learners. While it is possible that learners with large vocabulary sizes might also know more about affixes, this awareness might be explained through proficiency, as more about vocabulary is learned while language proficiency increases (e.g., Schmitt, 2010).

To test this hypothesis, production and reception scores from Spanish L2 learners at different proficiency levels were analyzed, searching for a point in the developmental path where morphological awareness, more specifically derivational awareness since inflectional awareness is not analyzed in this dissertation,[5] might grow apart from vocabulary size. It was hypothesized that after learners crossed a certain threshold in vocabulary size and proficiency, their vocabulary knowledge would differ from their derivational awareness. Then, the learner would be able to

[5] The term "morphological awareness" is more often used in the literature as a term that includes both awareness of inflectional and derivational morphology. The term "morphological awareness" will be also used in the studies of this dissertation interchangeably with "derivational awareness." However, only awareness of derivational morphology is analyzed in this dissertation.

manipulate derivational morphology with ease. In order to evaluate this hypothesis, learners at different proficiency levels were tested on syntactic, semantic and distributional awareness of Spanish morphology, both receptively and productively, as well as on vocabulary knowledge.

As a guide, Table 2 illustrates the constructs addressed in this study, which tests measured them, and what analyses were carried out. For organizational purposes, each test is labeled with a number. These numbers pertain to the order they will be explored in the results section (4.3), but not to the order they will be introduced in the materials description (4.2).

Table 2. Summary Table of Study 1

Research Questions	**Construct(s)**	**Tests**	**Analyses**
RQ1. How do derivational morphology and vocabulary knowledge develop across different levels of English-speaking L2 Spanish learners who receive unsystematic instruction?	Proficiency. Vocabulary Size. Morphological Awareness.	(1) Proficiency Test *Using a cloze test.* (2) Vocabulary Test *Testing monomorphemic words.* (4) Lexical Inferencing Test *Testing receptively syntactic awareness of biunique suffixes.* (5) Test of Productive Awareness *Testing productively syntactic, semantic and distributional awareness.*	*Three One-Way ANOVAs*. *Dependent variables*: Scores of (2), (4) and (5). *Independent variable*: 4th quartiles based on the Proficiency Test.
RQ2. What model of vocabulary and morphology acquisition do	*All of the constructs of RQ1 plus:* Knowledge of real word	*All of the test of RQ1 plus:* (3) Test of Knowledge of	*1. Correlations between tests.* *2. Hierarchical Regressions* for

these data suggest? a) Are vocabulary size and derivational awareness independent? b) If so, at what point during learning does morphological awareness diverge from vocabulary size?	families (depth of vocabulary knowledge)	Real Word Families *Testing learners' productive knowledge of word families.* Time on task measured for: (6) Vocabulary Test (7) Test of Productive Awareness (8) Lexical Inferencing Test.	predicting (5) morphological awareness **productively** measured. *3. Hierarchical Regressions* for predicting (4) morphological awareness **receptively** measured.

4.1 PARTICIPANTS

Participants of study 1 were English-speaking learners of Spanish L2 who were taking classes between the second and the seventh semester at a large university. The researcher visited twenty-one classes in order to explain the research project to potential participants. A total of 225 students volunteered. The volunteers were exempt from completing one classroom assignment if they participated in the study.

The final sample size was limited to L1 English-speakers (n=209); bilingual speakers of English and one of the following languages: Czech, German, Chinese, Korean, Bulgarian, Telugu, Russian, Polish, French, Hindi and Spanish were not included in the analysis.

4.2 MATERIALS, DESIGN AND PROCEDURE

In addition to a language profile questionnaire (see Appendix A.5), students completed four tests: (1) a Proficiency Test (a cloze test), (2) a Vocabulary Test, (3) a Test of Knowledge of Real Word Families, (4) a Lexical Inferencing Test, and (5) a Test of Productive Awareness (see Appendix A). These tests were administered through a computer-based survey system, except the cloze test, which was paper-based. The students also completed a questionnaire on their understanding of derivational morphology (see Study 2) and a Lexical Decision Task (see Study 3). The order of the tests was randomized for each student. The testing session lasted approximately ninety minutes. Next, all tests will be described. In the headings a number appears before the name of the test to indicate the test in question.

(1) Proficiency Test (a Cloze Test)

The learners' proficiency levels could have been determined by the course they were taking. Nevertheless, there is not a clear-cut profile of a learner who simply enrolls in a fourth-semester course. For instance, a study abroad semester can change the development of the learner by improving fluency, but not morphosyntactic accuracy (see Collentine & Freed, 2004). In addition to this, learners who are placed in a course through a placement test may be more advanced than those learners who are coming from the previous required course. Since individual learners' proficiency level can vary in the same course, a cloze test was used to establish learners' proficiency.

In order to create the cloze test, four different texts from materials that corresponded to a lower-level, i.e., to a first- and second-semester textbook, and an upper-level, i.e., a newspaper

article, were selected. The three texts for the beginning levels were taken from a textbook not used by the university (Blanco & Donely, 2012), whereas the upper-level text came from a newspaper article used previously in an upper-level class at the university. One of every ten or eleven words was deleted in a 600-word long test creating 40 gaps in the cloze test.

Each participant received a point for each semantically, syntactically and morphologically correct word, even though it might not have been the precise word used in the original source. The maximum possible score was forty points. Two Spanish native speakers rated the answers, and a third speaker was consulted for cases where there was disagreement among the judges. In that case, the judgment of the majority was the option accepted.

(2 and 6) Vocabulary Test

In L2 English research, there are several-widely known tests based on word frequencies (Nation, 2001; Milton, 2009; Read, 2000), yet research on L2 Spanish vocabulary cannot utilize such well-developed tools. Given that instructed L2 learners are exposed to frequencies as determined by their classroom input, a (2) Vocabulary Test with only monomorphemic words[6] was designed, taken the specific words these learners are exposed to through their textbooks into account. Additional words were chosen using corpus frequencies (Davies, 2006). This yes/no vocabulary test was designed as a measure of the learners' vocabulary size.

The on-line glossary offered by *Mosaicos* (Castells, et. al., 2012), the first- and second-semester textbook used at this university, was used as a baseline from which to select the words. The other books that provided material for this vocabulary measure were *Enfoques* (Blanco &

[6] The suffixes *–o* and *–a* were used, mainly because they are the most prevalent endings in Spanish, as well as the infinitival endings, *-ar*, *-er* and *–ir*. Contrary to English, a Spanish word rarely has the same form as its stem.

Colbert, 2010), which is used in the third- and fourth-semester courses, *Revista* (Blanco, 2010) and *Repase y escriba* (Canteli Dominicis & Reynolds, 2007), wich are both used in either a fifth- or sixth-semester course. For *Enfoques* and *Revista*, the vocabulary lists compiled at the end of each chapter were taken as a sample of the most frequent words for the learners since these are active vocabulary items that need to be learned for classroom purposes and, more specifically, for quizzes or exams. Since *Repase y escriba* does not provide the learners with such a list, the words used in the key of the workbook from chapters one to six were taken as a representative sample of frequent words for learners at that level.

In brief, there were 80 words taken from the learners' textbooks—i.e., twenty from each textbook. To ensure that the words were incrementally frequent across levels, the twenty words had to appear at least in one other advanced textbook, but were not permitted to appear in a lower level textbook. For example, each of the twenty words selected from *Mosaicos*, the first-semester textbook, also appeared in at least one or two of the more advanced books, whereas the twenty words selected from *Repase y escriba*, the fifth semester textbook, did not occur in any other lower book. Additionally, another twenty words ranging from each band of the 1 to the 5000 most frequent words were selected from a frequency dictionary (Davies, 2006). Since corpus frequencies tend to present a different array of frequencies than textbooks (Face & Davies, 2006), the dictionary material was thought to complement the textbooks. In total, there were 180 target words.

Although yes/no vocabulary test are sometimes controversial (Shillaw, 2009), this testing methodology was preferred due to its ease of administration and scoring. Participants had to indicate whether they knew the meaning of the word they saw on the screen by choosing between the *yes* and the *no* option. Participants were asked not to guess. If they had any doubt

about the meaning of the word, they should check the *no* option. Moreover, participants were told that there were also nonwords in the test. If they guessed, this would be obvious when calculating their final score since a percentage of the twenty nonwords that were considered "known words" by the L2 learners was deducted from the percentage of correct answers. Thus, students could obtain any score between 0% and 100%.

Moreover, the order of the items was randomized for each participant. (6) The time spent on this task was also recorded. The computer-based survey system calculated from the moment the participant submitted her demographic information until the moment she submitted the last item in the test.

(4 and 8) Lexical Inferencing Test

Based on Zhang and Koda (2012), a (4) Lexical Inferencing Test was designed to test derivational awareness in a receptive mode. The goal of this task was to ensure that learners recognize the syntactic meaning—the word category, such as noun or verb—marked by a suffix. For example, if a learner sees an unknown word with the nominal suffix *–ión*, '-ion,' she should know that the unknown word is a noun.

Nonwords were used for this test, instead of low frequency words, as in Zhang and Koda (2012). Making inferences from nonwords as opposed to low frequency words means that prior vocabulary knowledge could not contribute to the learners' answers. Thus, only previous awareness of the suffixes could be utilized for guessing a word's category.

In the test, non-real stems were combined with biunique suffixes —i.e., those having only one possible syntactic interpretation. The chosen biunique suffixes were: the nominal suffixes *–miento*, '-ment,' *-dad*, '-ity,' *-eza*, '-ness,' *–ura*, '-ness,' and *–ión*, '–ion,' and the adjectival

suffixes *–ble*, '-ble,' and *–oso*, '-ous.' The nominal suffixes appeared in two words each, whereas the adjectival suffixes were used in three words each. A total of sixteen items were on the test.

Participants had to decide the syntactic category of the word by picking one of three choices. Each choice was a noun, an adjective or a verb in the infinitive in their L1. For example, the nonword *picalión* was followed by: 'to pick,' 'the pick,' and 'picked.' A learner syntactically aware of the suffix *–ión* should be able to choose 'the pick' and not be confused with the adjective or the verbal option. As distractors, fourteen nonce words with non-biunique suffixes were added. Participants were not told the purpose of the test, but instead they were encouraged to guess what the meaning of the nonwords could be.

Participants could reach a maximum score of sixteen points, that is, one point for each correct selection in the multiple choice items. The items in the test as well as the order of the multiple-choice answers were randomized for each participant. (8) Time spend on this task was also recorded.

(5 and 7) Test of Productive Awareness and (3) Test of Knowledge of Real Word Families

To test derivational awareness in a productive way, a test based on Schmitt and Zimmerman (2002) and Morin (2003, 2006) was created. In the same test format, morphological awareness was measured with nonwords—i.e., (5) *Test of Productive Awareness*—and vocabulary knowledge—i.e., (3) *Test of Knowledge of Real Word Families*.

Participants were asked to coin the word family of six nonwords and six real words in the (4000-5000) frequency range for Spanish words (Davies, 2006). For both nonwords and real-words, there were two verbs, two nouns and two adjectives.

Learners were told which words were nonwords and encouraged to be creative in the task. Thus, for each given word, participants translated it or invented a meaning. After this, participants had to use a word of the word family in a syntactic frame. For example, participants would fill in a gap such as "It is _____" or "A _____ is." In this way, metalingual[7] knowledge was not required to complete the task, and vocabulary use was reduced to a minimum to ensure it did not hinder syntactic production of nouns and adjectives.

On the one hand, a cumulative score of 2 points for the nonwords was based on a composite score showing distributional awareness—e.g., *-dor* is only added to verbal bases—syntactic awareness—e.g., *-dor* can only be used in the syntactic frame "A_____is"—and semantic awareness—e.g., *-dor* needs to be translated by the suffix *–er* or an agentive word. A partial score (1 point) was given when the word was not given a meaning, but the participant showed distributional and syntactic awareness. In cases where the distributional knowledge was incorrect, a point was given if the participant showed syntactic and semantic awareness. Therefore, participants could obtain a maximum score of thirty-two points since there were two gaps for the two verbs, and three gaps for each noun and adjective. While knowledge of real word could be confounded with vocabulary knowledge, this should not be the case for nonwords. This was the scoring of (5) the *Test of Productive Awareness*.

[7] *Metalingual* is the adjective of *metalanguage,* i.e., using terms such as adjective, noun, etc. It should not be confounded with the adjective *metalinguistic*, which refers to explicit knowledge about the language without necessarily entailing metalanguage.

On the other hand, the real words were strictly scored. That is, vocabulary knowledge of word families rather than derivational awareness was tested here: words given in the correct syntactic frame and with an appropriate translation received a point. A maximum score of sixteen points could be reached. Only words compiled in the *DRAE* (*Dictionary of the Real Academy of the Spanish Language*) were accepted. This score was later used to see whether having a better knowledge of word families predicted more accurate creation of word families for nonwords, and this was called (3) *Test of Knowledge of Real Word Families*. (7) Time spend on this task was also measured to elucidate whether it influenced word production.

4.3 RESULTS

Participants

Table 3 shows the number of participants by the semester in which they were tested.

Table 3. Number of Participants Organized by Semester

Semester	Number of Participants (*n=209*)
2nd semester	17
3rd semester	41
4th semester	51
5th semester	62
Above 5th semester	38

Learners' Proficiency Effects on Vocabulary and Derivational Awareness

Table 4 summarizes the mean, standard deviation, and range of scores for the different tests measuring proficiency (1), vocabulary (2, 3) and morphological awareness (4-5), as well as the time spent on the tests (6-8). In the following pages, every time there is a reference to a variable or a test, the name of the tests as well as their number will be given as a guide to the reader.

Table 4. Descriptive Statistics of Measurements of Study 1

	N	Minimum	Maximum	Mean	Std. Deviation
1. Proficiency Test	209	3	35	16.54	5.77
2. Vocabulary Test (%)	209	13.66	90.50	50.36	14.64
3. Test of Knowledge of Real Word Families	209	.00	9	2.02	2.03
4. Lexical Inferencing Test	209	3	16	10.90	2.56
5. Test of Productive Awareness	191	3	32	18.50	7.54
6. Time_Vocabulary	209	314	4213	953.48	617.63
7. Time_Productive	209	246	4034	1579.06	648.91
8. Time_Lexical Inferencing	209	162	2393	766.59	416.183

Awareness of derivational morphology was tested productively through the use of nonwords in (5) the Test of Productive Awareness, and receptively through (4) the Lexical Inferencing Test. The cumulative score in the (5) Test of Productive Awareness included distributional, syntactic and semantic awareness of derivational morphology. The number of participants for (5) the Test of Productive Awareness was reduced to 191 because eighteen participants did not understand the directions. For example, they would give a semantic family instead of a morphological family for their response. The score for (3) the Test of Knowledge of Real Word Families was calculated by tallying the number of real-words correctly derived and translated into English keeping the same format as (5) the Test of Productive Awareness except

using real words instead of nonwords. This was a measurement of vocabulary depth rather than of derivational awareness.

To explore the first research question, "How do derivational morphology and vocabulary knowledge develop across different levels of English-speaking L2 Spanish learners who receive unsystematic instruction?," the effects that a learners' proficiency had on both derivational awareness and vocabulary size were analyzed.

The (1) Proficiency Test was found to be a reliable measurement (40 items; α=.83). Although semester placement does not equate proficiency, for educators, it might be helpful to know in which semester students start showing differences in their awareness of derivational morphology. A Pearson correlation between the proficiency scores of (1) the Cloze Test and participants' semester found a large effect size, $r=.608$, $n=209$, $p<.001$, $r^2=.37$. Table 5 depicts how many participants of each semester were located in each quartile of (1) the Proficiency Test.

Table 5. Proficiency Quartiles and Students' Semester

		Semesters					
		2nd semester	3rd semester	4th semester	5th semester	Over 5th semester	Total
Proficiency	1st quartile	14	16	17	9	2	58
	2nd quartile	2	15	17	10	2	46
	3rd quartile	1	8	10	23	11	53
	4th quartile	0	2	7	20	23	52
Total		17	41	51	62	38	209

There was also a large effect size in the correlation between semester and quartile, $r=.571$, $n=209$, $p<.001$, $r^2=.32$. For example, students in the fourth quartile were mostly in or above their fifth semester of study.

One-way ANOVAs and Kruskal-Wallis tests were run to understand how vocabulary size and derivational awareness develop with proficiency. The proficiency quartiles obtained from the (1) Proficiency Test were used as the independent variable in these analyses.

4.3.1.1 Learners' Proficiency Effects on Vocabulary Size

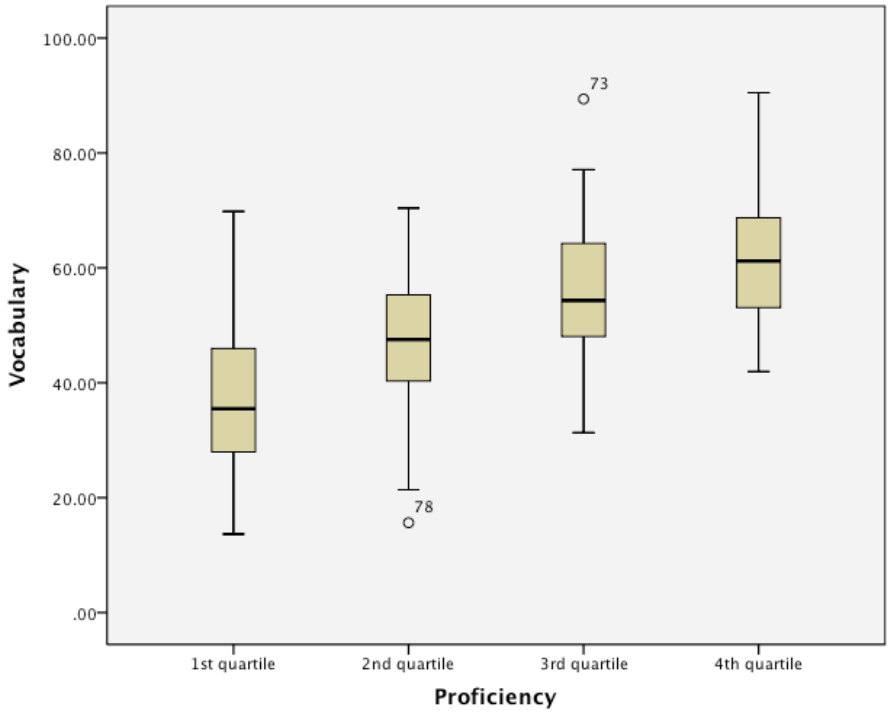
A one-way ANOVA was run to see whether there was an increase of vocabulary size by proficiency quartile. This statistical test was chosen because the assumptions of normality and of homogeneity of variance were met, *Levene F(2, 205)=.596, p=.619.* The sample sizes, means, standard deviations, confidence intervals, and range in the (2) Vocabulary Test by proficiency quartile are shown in Table 6.

Table 6. Descriptive Statistics of Vocabulary Test by Quartiles

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
1st quartile	58	37.92	12.68	34.59	41.26	13.66	69.83
2nd quartile	46	47.55	11.54	44.12	50.97	15.64	70.39
3rd quartile	53	55.91	11.13	52.84	58.97	31.31	89.39
4th quartile	52	61.09	10.86	58.06	64.11	41.96	90.50
Total	209	50.36	14.64	48.37	52.36	13.66	90.50

The range of the vocabulary scores was quite wide for every quartile. Nonetheless, the means were quite differentiated. The boxplot (Figure 3) illustrates the scores for each quartile and points out that the minimum score for the second quartile and the maximum score for the third quartile are actually outliers.

Figure 3. Boxplots of the Percentage Scores of (2) the Vocabulary Test by Proficiency Quartile



For post-hoc analysis, Games-Howell tests were used. This test is appropriate for unequal sample sizes, as was the case here. All quartiles differed from each other, *p<.002*, except for the third and fourth quartiles, which did not show statistically significant differences, *p=.081* (see Table 7). After removing the outlier of the third quartile, who turned out to be a learner above the fifth semester, the *p-value* became significant, *p=.029*.

Table 7. Post-Hoc Comparisons of the Scores in the Vocabulary Test among the Proficiency Quartiles

Vocabulary	1st quartile	2nd quartile	3rd quartile
1st quartile			
2nd quartile	*		
3rd quartile	*	*	
4th quartile	*	*	NS

**P<.01; **p<.001.*

4.3.1.2 Learners' Proficiency Effects on Derivational Awareness (Productively Measured)

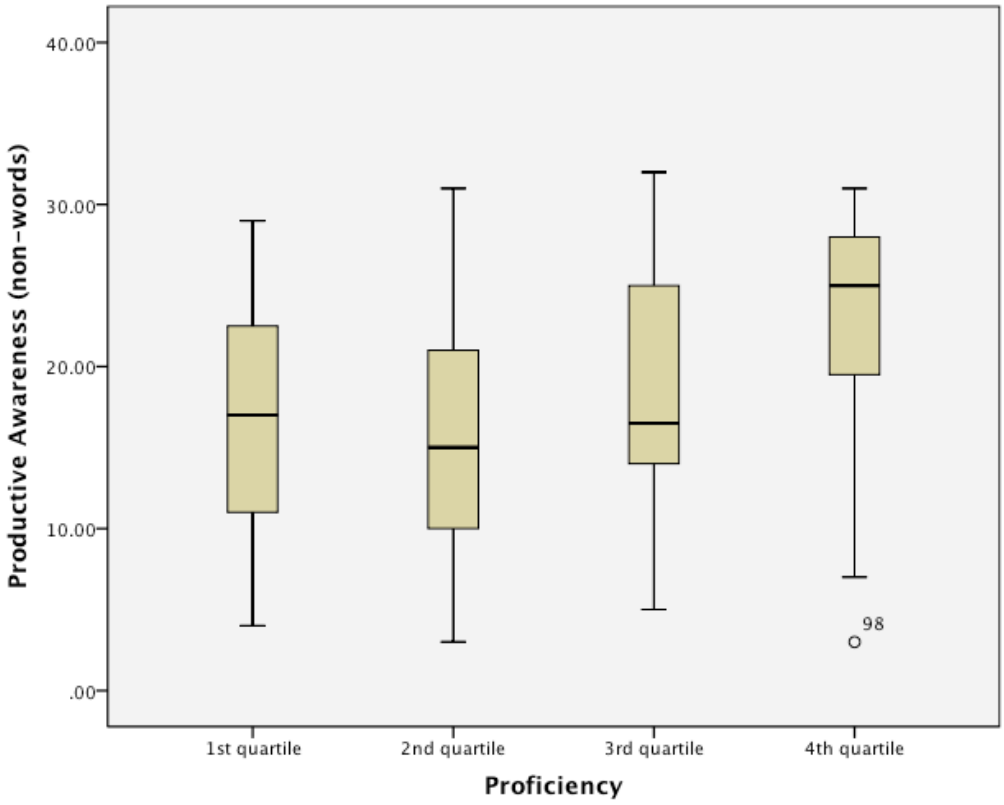
A Kruskal-Wallis was run with the proficiency quartiles as the independent variable and derivational awareness, productively measured, as the dependent variable. As hypothesized, there was a significant effect due to proficiency quartile, $\chi^2(3)=24.22$, $p<.001$. Descriptive statistics are provided in Table 8.

Table 8. Descriptive Statistics of (5) the Test of Productive Awareness by Proficiency Quartiles

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
1st quartile	48	16.27	6.94	14.26	18.29	4.00	29.00
2nd quartile	42	16.05	7.43	13.73	18.36	3.00	31.00
3rd quartile	50	18.56	7.26	16.50	20.62	5.00	32.00
4th quartile	51	22.57	6.88	20.63	24.50	3.00	31.00
Total	191	18.50	7.543	17.43	19.58	3.00	32.00

The boxplot (Figure 4) helps visualize participants' performance. The range of scores per quartile was very wide showing an overlapping between proficiency quartiles.

Figure 4. Boxplot of the Raw Scores of (5) the Test of Productive Awareness by Proficiency Quartiles



Moreover, the scores for derivational awareness, productively measured, were not normally distributed in the fourth quartile. That is why the Kruskal-Wallis test was chosen instead of the one-way ANOVA. Mann-Whitney tests were used to compare the differences between quartiles. The Mann-Whitney tests showed significant differences between the first and fourth quartiles, *(p<.001),* between the second and fourth quartiles, *(p<.001),* and the third and fourth quartiles, *(p=.006).* There was no significant difference between the first and second quartiles, *(p=.792);* the first and third quartiles, *(p=.152)*; and the second and third quartiles, *(p=.073).* That is, all quartiles differed from the fourth one, and the effect size tended to be moderate, whereas the first, second and third quartiles did not differ from one another. The following summary table illustrates the differences by quartiles for derivational awareness productively measured.

Table 9. Mann-Whitney Comparisons of the Scores in (5) the Test of Productive Awareness among the Proficiency Quartiles

Productive Awareness	1st quartile	2nd quartile	3rd quartile
1st quartile			
2nd quartile	NS		
3rd quartile	NS	NS	
4th quartile	*	*	*

**P<.01; **p<.001.*

To attain mastery of productive awareness of derivational morphology, participants needed to be around their fifth semester.

4.3.1.3 Learners' Proficiency Effects on Derivational Awareness (Receptively Measured)

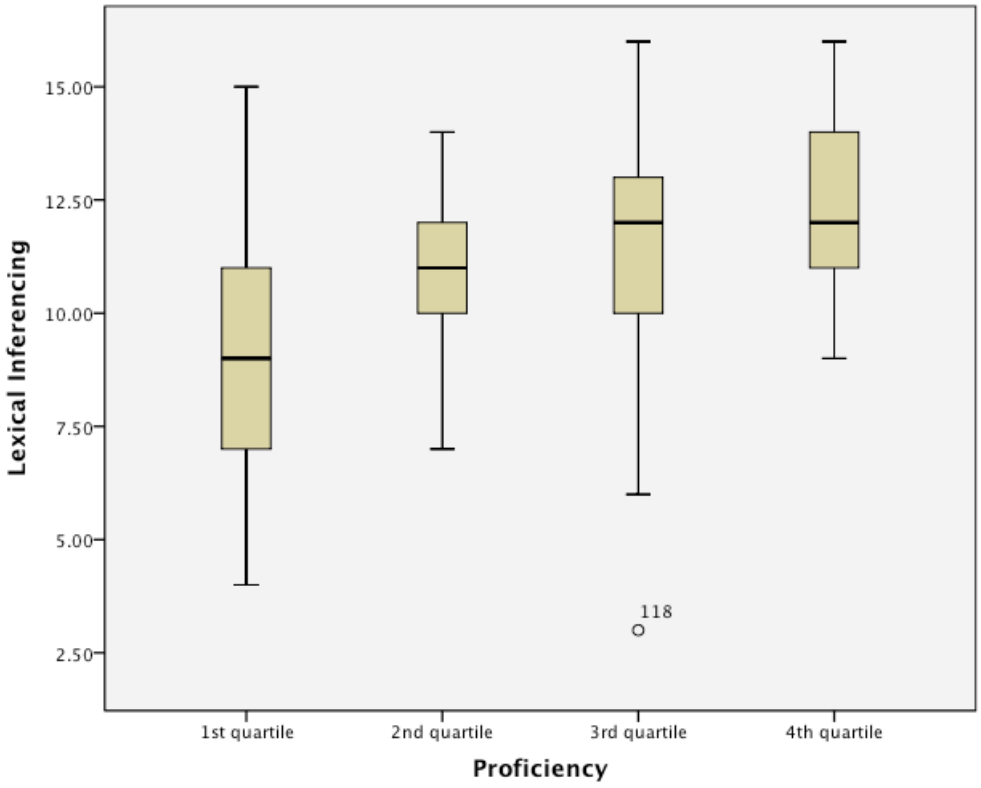
Similarly, to understand the effects of proficiency on receptive awareness, a Kruskal-Wallis test was run. Table 10 illustrates the descriptive statistics for (4) the Lexical Inferencing Test, where derivational awareness was receptively measured by quartile.

Table 10. Descriptive Statistics for (4) the Lexical Inferencing Test by Proficiency Quartiles

				95% Confidence Interval for Mean			
	N	Mean	Std. Deviation			Minimum	Maximum
1st quartile	58	9.17	2.68	8.47	9.88	4.00	15.00
2nd quartile	46	10.82	1.84	10.28	11.37	7.00	14.00
3rd quartile	53	11.55	2.52	10.85	12.24	3.00	16.00
4th quartile	52	12.25	1.91	11.72	12.78	9.00	16.00
Total	209	10.90	2.56	10.55	11.25	3.00	16.00

On the (4) Lexical Inferencing Test, all groups scored close to the maximum score (16 points). Participants were showing ceiling effects on this test, which was not the case for (5) the Test of Productive Awareness and (2) the Vocabulary Test.

Figure 5. Boxplot of the Raw Scores of the (4) Lexical Inferencing Test by Quartile



Again, the reason the Kruskal-Wallis test, a non-parametric test, was chosen was because the proficiency scores were not normally distributed. This time, the normality assumption was violated in the first and second quartile, ($p<.01$).

The Kruskal-Wallis test showed that there were differences among the quartiles, $\chi^2(3)=42.47$, $p<.001$. Mann-Whitney U tests were used to compare the differences between quartiles. The first quartile differed from all other quartiles: the first and the second quartile, *($p=.001$);* the first and the third, *($p<.001$)*; as well as the first and the fourth quartile, ($p<.001$). The second and the fourth quartile also showed significant differences, *($p=.001$).* However, the second and the third quartile, *($p=.039$),* as well as the third and the fourth, did not show significant differences, *($p=.303$).* Table 11 summarizes the differences in the results of (4) the

Lexical Inferencing Test by proficiency quartiles. This relationship for the quartiles remained even after the outlier in the third quartile was removed.

Table 11. Mann-Whitney Comparisons of the Scores in (4) the Lexical Inferencing Test among the Proficiency Quartiles

Receptive Awareness	1st quartile	2nd quartile	3rd quartile
1st quartile			
2nd quartile	*		
3rd quartile	*	NS	
4th quartile	*	*	NS

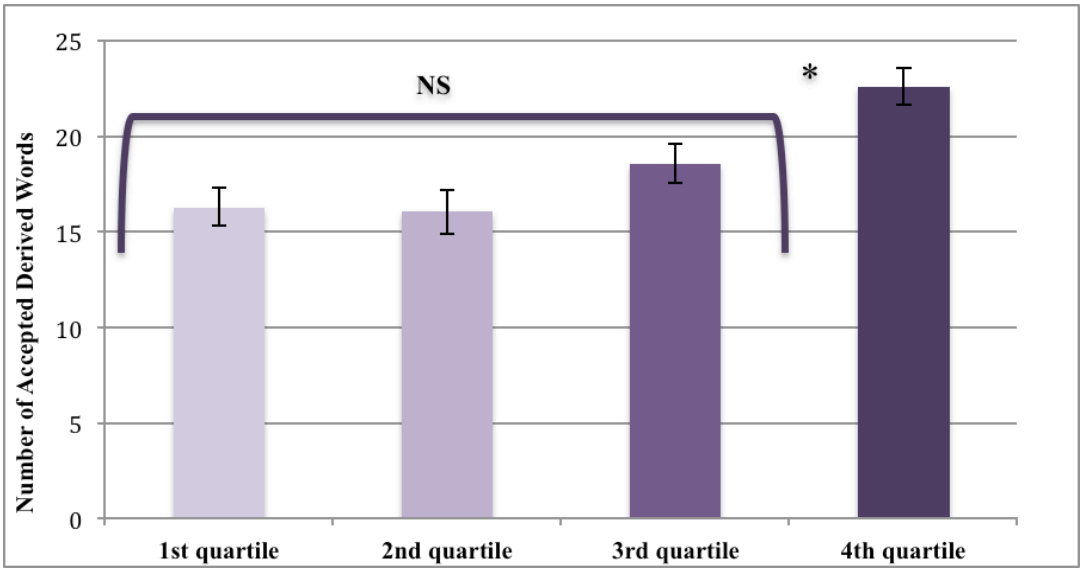
**P<.01; **p<.001*

4.3.1.4 Summary of Proficiency Effects

The following graphs (Figures 6 to 8) illustrate how the development of the two variables, vocabulary and derivational awareness, is influenced differently according to proficiency. Derivational awareness was measured as: (4) receptively in the Lexical Inferencing Test and (5) productively in the Test of Productive Awareness.

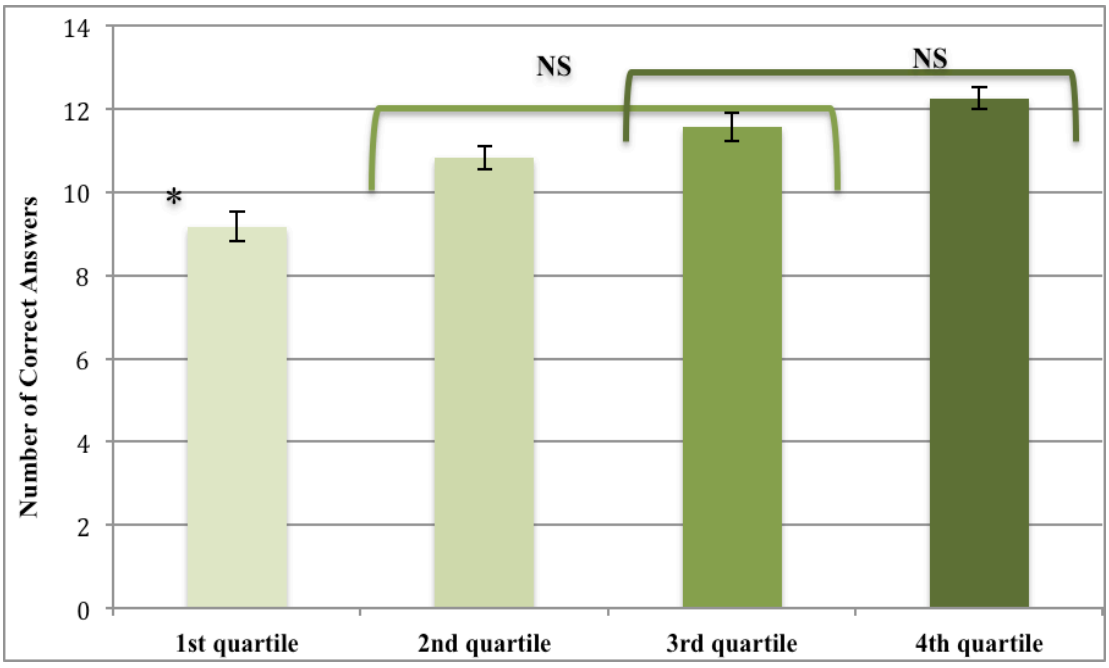
In terms of derivational awareness, the pattern of development is not as continuous as the one for vocabulary. For the scores on the (5) Test of Productive Awareness, there were no significant differences between the first, second and third quartiles (see Figure 6).

Figure 6. Scores of (5) the Test of Productive Awareness by Proficiency Quartile



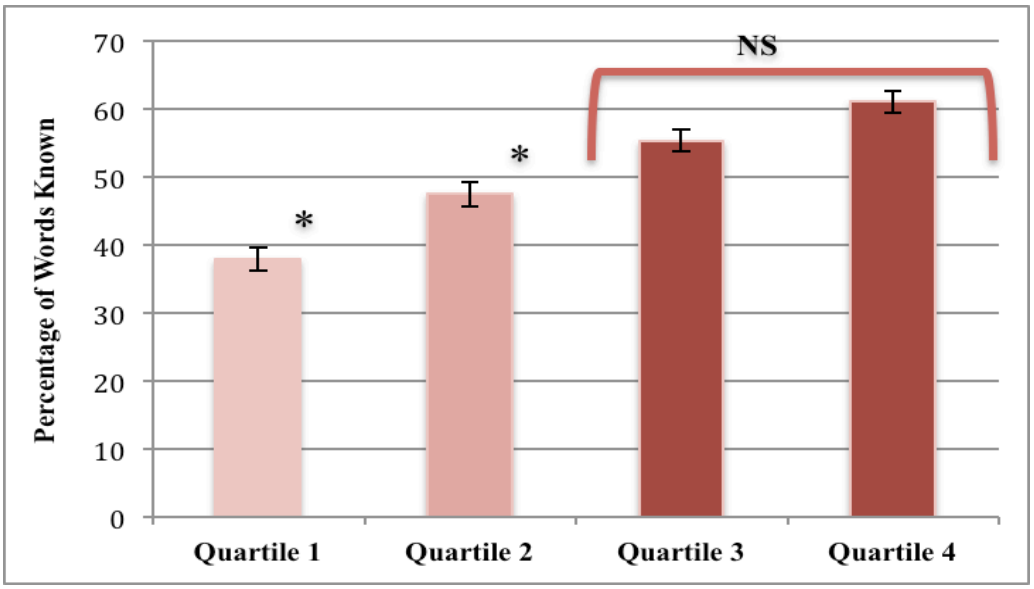
In the scores of (4) the Lexical Inferencing Test, the pattern of development was different: only the first quartile was significantly different from the others (see Figure 7).

Figure 7. Scores of (4) the Lexical Inferencing Test by Proficiency Quartile



In Figure 8, the developmental pattern of vocabulary, measured in (2) the Vocabulary Tests, does not resemble the derivational patterns in Figure 6 and Figure 7. Still, the third and fourth quartile were significantly different after an outlier from the third quartile was removed (see Table 7).

Figure 8. Scores of (2) the Vocabulary Test by Proficiency Quartile



All in all, high scores were more easily reached on (4) the Lexical Inferencing Test (see Figure 7) than on (5) the Test of Productive Awareness (see Figure 6). This situation means that partial awareness of a suffix can be acquired from beginning levels, but a deeper knowledge of the suffix does not occur until the advanced levels. Contrary to this process, vocabulary size (see Figure 8) increased gradually.

In the (5) Test of Productive Awareness, there was a clear-cut effect among the students around the fifth semester. All of a sudden, learners manipulate derivational morphology with

ease, i.e., they moved from a partial to a complete awareness of the suffixes. The learners in the fifth quartile were able to correctly complete over 50% of the gaps in the (1) Cloze Test. Therefore, certain mastery of grammar and vocabulary, as measured in the (1) Proficiency Test, is needed for the ability to manipulate derivational suffixes. In spite of this, the number of suffixes mastered by the participants in the fourth quartile was not very high, mostly *–dor*, *–ado*, and *–ar*. The following table depicts raw data of the most frequent suffixes used by each quartile.

Table 12. Number of Tokens of each Suffixes Used in all of the six Words by Quartile

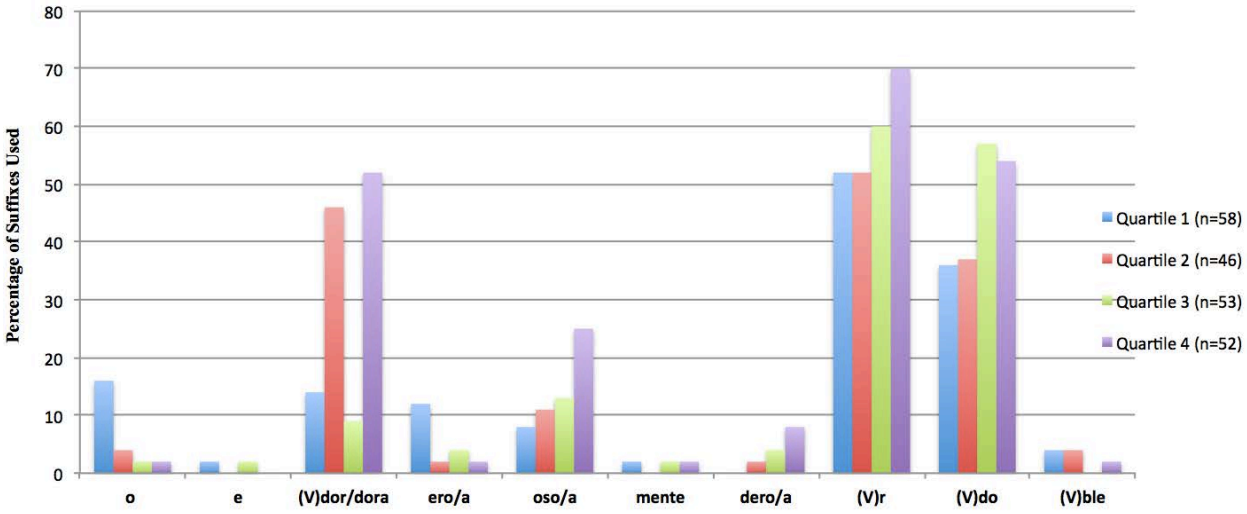
	–a[1]	*–o*[1]	*–e*[1]	*–dor/a*[2]	*–ero/a*[2]	*–oso/a*[3]	*–ble*[3]	*–mente*[4]	*–dero/a*[5]	*–(v)r*[6]	*–(v)do*[7]
1st Quartile *(n=58)*	47	23	22	65	44	29	16	6	19	119	121
2nd Quartile *(n=46)*	35	8	9	121	11	42	7	3	10	132	121
3rd Quartile *(n=53)*	53	9	15	136	17	44	8	6	18	115	155
4th Quartile *(n=52)*	55	12	9	147	17	69	8	3	19	123	155

[1] *Nominal, adjectival and verbal suffix; only recorded as nominal and adjectival suffix;*
[2] *Nominal and adjectival suffix with agentive meaning, similar to English -er;*
[3] *Biunique adjectival suffix; respectively, -ous and -ble;*
[4] *Biunique adverbial suffix, similar to -ly;*
[5] *Nominal and adjectival suffix; indicating place and instrument in nouns, and possibility in adjectives;*
[6] *Instructed infinitival suffix, not as frequent as nominal suffix;*
[7] *Instructed participial and adjectival suffix, similar to -ed.*

Table 12 suggests some patterns in learners' usage of suffixes. Basically, learners' productive use of morphology is reduced to a couple of suffixes, especially to those that are instructed and closely related to inflectional morphology, such as *–ar*, the infinitive marker, and *–ado*, '-ed.' The biuniqueness of the suffix does not seem to be motivation for mastery at a faster rate. For instance, the biunique and cognate suffix *–ble* was not as widely used as it might have been expected.

To zoom in, Figure 9 shows the percentages for suffixes used to derive the nonword *lenca* by quartile. Participants were told this was to be thought of as a noun. As reported in Table 12, the most widely used suffixes are *–ar*, *–dor*, and *–ado*. *–Oso* seems to be also known by the most advanced participants, but it is not even close to the percentage reported for the other three suffixes. All in all, learners have at their disposal a very limited inventory of suffixes.

Figure 9. Suffixes Used to Derive the Nonword *Lenca*



After having examined, how derivational awareness and vocabulary evolved through proficiency, the next section will explore the second research question, "What kind of model of development of derivational morphology and vocabulary do these data suggest?" (see Table 2).

The proficiency analyses have already suggested some answers to RQ2: vocabulary size and derivational awareness are independent because their development pattern is different. When derivational awareness is receptively measured—focused on identification and analysis of a suffix—is acquired sooner than when it is productively measured—looking at identification,

analysis, and manipulation of a suffix. To show awareness of a suffix productively, a learners' vocabulary must be in the fourth proficiency quartile: that is, he should have around a 60% in (2) the Vocabulary Test; whereas, to demonstrate awareness receptively, a learner should have scored around 40% on (2) the Vocabulary Test (see Table 6). Nevertheless, productive awareness was limited to a few suffixes (see Table 12) while receptive awareness comprised awareness of the most frequent biunique suffixes.[8] Therefore, even though L2 learners are aware of derivational morphology and can identify and analyze suffixes from the start of their learning process, they are not able to manipulate them until they reach more advanced levels. Even then, the number of suffixes that can be manipulated is lower than the number of suffixes than can be identified, there is a move from a partial awareness to a more complete level of awareness, i.e., from receptive to productive awareness. Analyzing the data with correlations and regression analyses will help to portray a model of development of derivational awareness by showing what factors are more important for its shaping.

Correlations

First, to investigate the level of association between awareness of derivational morphology and vocabulary size, correlations were computed. Pearson correlations among the different measurements are depicted in Table 13.

[8] These are the nominal suffixes: *–miento*, '-ment,' *–dad*, '-ity,' *–eza*, '-ness,' *–ura*, '-ness,' and *–ión*, '-ion;' and the adjectival suffixes: *–ble*, '-ble,' and *–oso*, '-oso.'

Table 13. Correlations between Tests

	1	2	3	4	5	6	7
1. Proficiency Test							
2. Vocabulary Test	.671**						
3. Test of Knowledge of Real Word Families	.522**	.494**					
4. Lexical Inferencing Test	.493**	.468**	.329*				
5. Test of Productive Awareness	.331**	.203*	.406*	.135			
6. Time_Vocabulary	.016	-.054	.025	.041	-.006		
7. Time_Productive	-.009	-.035	.077	-.046	.304**	.141*	
8. Time_Lexical Inferencing	.048	.021	.049	.042	.080	.182*	.362**

**P<.01; **p<. 001.*

The Pearson correlation coefficient between (5) the Test of Productive Awareness and (2) the Test of Vocabulary was significantly different from zero. It had a small effect size, *r=.203, n=191, p=.005, r^2=.04*. The Pearson correlation between (4) the Lexical Inferencing Test and (2) the Test of Vocabulary had a medium effect size, *r=.468, n=209, p<.001, r^2=.22.* The direction of the correlations was positive, which means that participants who had a larger vocabulary size tended to be more aware of derivational morphology. However, (4) the Lexical Inferencing Test did not correlate with (5) the Productive Test, *r=.135, n=191, p=.063, r^2=.02*.

(5) The Test of Productive Awareness showed correlation with: (3) the Test of Knowledge of Real Word Families *r=.406, n=191, p<.001, r^2=.16,* (1) the Proficiency Test, *r=.331, n=191, p<.001, r^2=.11,* and for (7) time on the Productive Test, *r=.304, n=191, p<.001, r^2=.092*.

Similarly, the variables that correlated with (4) the Lexical Inferencing Test were also: (3) the Test of Knowledge of Real Word Families, $r=.329$, $n=209$, $p<.001$, $r^2=.11$, and (1) the Proficiency Test, $r=.493$, $n=209$, $p<.001$, $r^2=.24$, $n=209$. (8) Time spent on the Lexical Inferencing Test and on (7) the Test of Productive Awareness did not correlate with (4) the Lexical Inferencing Test. Thus, learners spending more time on the tests did not obtain better or worse scores than those spending less time.

The measurements of derivational awareness—receptive and productive—did not correlate, although both measurements are considered integral parts of morphological awareness. This situation could be explained because (4) the Lexical Inferencing Test only measured receptively syntactic awareness and (5) the Test of Productive Awareness measured a compounded score of syntactic, distributional and semantic awareness. Therefore, a correlation was run between the scores of only productive syntactic awareness—i.e., producing the right suffix for a given gap in the Productive Test—and (4) the Lexical Inferencing Test. The results pointed out to a low effect size, $r=.204$, $n=191$, $p=.004$, $r^2=.042$, which means that the variance in (4) the Lexical Inferencing Test did not account for much according to the productive syntactic scores. Nevertheless, a correlation exists.

The time measurements correlated with each other, which means that learners who spent longer on one test also spent longer on the other tests. (7) Time spent on the Test of Productive Awareness also correlated with the results of (5) that test, $r=.304$, $n=191$, $p<.001$, $r^2=.092$. This means that learners who spent more time on the test obtained higher scores than those who spent less time. Nevertheless, the results of the other tests (2, 3, and 4) did not significantly correlate with how much time was spent on them.

On the one hand, these correlations suggest that derivational awareness, when

productively measured, is independent of vocabulary knowledge since the correlation and the effect size between (5) the Test of Productive Awareness and (2) the Vocabulary Test were low, i.e., knowing more monomorphemic words does not imply knowing how to manipulate suffixes productively. On the other hand, a partial morphological awareness of a suffix might be determined by vocabulary size. The question remains how each of the two other variables—proficiency and vocabulary—contribute to derivational awareness.

In general, vocabulary did not seem to be the main predictor of derivational awareness taking into consideration that other variables, such as proficiency, showed higher correlations with the different morphological measurements. This suggests that derivational awareness and vocabulary size are independent in L2 adult learners. All in all, the correlations pointed to some of the relationships between the variables, but still the correlations could not indicate what either the main predictors of derivational awareness or the specific contribution of vocabulary were. That is, no model of vocabulary and derivational awareness could be drawn. Therefore, two hierarchical regressions were carried out to see how the different variables, especially vocabulary, could predict derivational awareness as measured in (4) the Lexical Inferencing Test and (5) the Test of Productive Awareness.

Basically, the advantage of the regressions over the correlations is that a regression can determine which are the most important factors predicting derivational awareness, and not just which variables are related to derivational awareness. The values of the correlations will be taken into account when entering the different factors in the hierarchical regressions. For example, factors showing lower correlations are entered first so that the factors with higher correlation coefficients cannot conceal their influence.

Hierarchical Regressions

4.3.1.5 Derivational Awareness (Productively Measured)

To analyze how well vocabulary size could predict derivational awareness, when productively measured and when controlling for time of task, proficiency, and knowledge of real word families, a hierarchical regression was computed.

Assumptions for multiple regressions were checked. The normality assumption was satisfied by examining a Shapiro-Wilk test, *Shapiro-Wilk(191)=.989, p=.160*. The Q-Q plot generated also indicates approximately normal distribution. White's test of homoscedasticity shows that the error terms are homoscedastic, $\chi^2(8)=12.38$, $p=.135$. Multicollinearity was not an issue since all the Variance Inflation Factors (VIFs) were less than 5. The assumption of linearity was also satisfied. Outliers were also not of concern with these data since the range for Cook's distance was between .00 and .42.

Given that this test required more time than the other tests, the results of (7) time on task were entered first in the hierarchical regression in order to control for a time effect. (7) Time on task significantly predicted the scores in (5) the Test of Productive Awareness, $F(1,189)=19.252$, $p<.001$, *adjusted* $R^2=.09$. When the scores of (2) the Vocabulary Test were added, the model improved, $F(2,188)=16.017$, $p<.001$, *adjusted* $R^2=.136$. When (1) the scores of the Proficiency Test were subsequently entered into the model, vocabulary was no longer significant since it overlapped with the explanatory power of proficiency, $F(3,187)=16.972$, $p<.001$, *adjusted* $R^2=.201$. After adding the scores of (3) the Test of Knowledge of Real Word Families, the model significantly improved, $F(4,186)=17.889$, $p<.001$, *adjusted* $R^2=.262$. This is a large effect size according to Cohen (1988). The contribution of (7) time on task slightly changed in the fourth

model because this variable overlapped with the scores of (3) the Test of Knowledge of Real Word Families. From the squared semi-partial correlation, time-on-task contributes most to predicting derivational awareness (9%). That is, those learners who spent more time on the task obtained better scores. This might be due to the complexity of the task. The scores of (3) the Test of Knowledge of Real Word Families was the next variable in terms of contribution (6%). The scores of (2) Vocabulary Test, measuring knowledge of monomorphemic words, were not a significant predictor (.03%).

Total R^2 for the model, change in R^2, standardized and unstandardized regression coefficients, and 95% CI for unstandardized regression coefficients are displayed in Table 14.

Table 14. Hierarchical Multiple Regressions Analysis Summary for Vocabulary Size, Controlling for Proficiency, Knowledge of Other Word Families, and Time On-Task; Predicting Derivational Awareness, Productively Measured (n=191)

Variable	B	SEB	B	CI for B	sr^2	R^2	ΔR^2
Model 1						.092**	
(7) Time	.004**	.001	.304**	(.002, .005)	.09**		
Model 2						.146**	.053**
(7) Time	.004**	.001	.324**	(.002, .005)	.10**		
(2) Vocabulary Test	.123**	.036	.231**	(.052, .193)	.05**		
Model 3						.214**	.068**
(7) Time	.004**	.001	.324**	(.002, .005)	.10**		
(2) Vocabulary Test	.004	.045	.007	(-.086, .093)	.00003		
(1) Proficiency Test	.460**	.114	.345**	(.235, .686)	.07**		
Model 4						.278**	.064**
(7) Time	.003**	.001	.294**	(.002, .005)	.085**		

(2) Vocabulary Test	-.039	.045	-.073	(-.127, .050)	.003
(1) Proficiency Test	.325*	.115	.243*	(.099, .551)	.03*
(3) Test of Knowledge of Real Word Families	1.144**	.282	.302**	(.587, 1.7)	.06**

**P<.01; **p<.001.*

From this hierarchical regression, it can be concluded that vocabulary size is by no means the main predictor, or even a good predictor, of derivational awareness.

4.3.1.6 Derivational Awareness (Receptively Measured)

As the correlations illustrated in Table 13, the ability to recognize derivational morphology differs from the ability to manipulate it. In fact, the two measurements of morphological awareness did not correlate. Notwithstanding this lack of relationship, both measurements belong to the same construct: the former shows a partial awareness of derivational morphology, whereas the latter provides a more of a full level of awareness.

Similarly to the analysis of 4.3.1.5, another hierarchical regression was computed to examine how well vocabulary size could predict derivational awareness, receptively measured, when controlling for proficiency and knowledge of other words families.

Assumptions for multiple regressions were checked. The normality assumption was met, *Shapiro-Wilk test(209)=.991, p=.191*. Cook's distance was not over 1.00. The Q-Q plot generated also indicates approximately normal distribution. White's test of homoscedasticity shows that the error terms are homoscedastic, $\chi^2(6)=6.93$, $p=.33$. Multicollinearity was not an issue since all the VIFs were less than 5, both before and after removing the outlier. The assumption of linearity was also satisfied. Outliers were also not of concern with these data since the range for Cook's distance was between .00 and .068.

In the hierarchical regression, the scores of (3) the Test of Knowledge of Real Word Families were entered first, *F(1,207)=25.075, p<.001, adjusted* R^2*=.104*. Improvement in the model was reached when the scores of (2) the Vocabulary Test were added, *F(3,206)=31.039, p<.001, adjusted* R^2*=.224*. Knowledge of real word families was not any more significant since it overlapped with the explanatory power of vocabulary, i.e., both were measurements of vocabulary knowledge. Finally, proficiency was the last factor added to the model. Again, the model significantly improved, *F(4,205)=26.463, p<.001, adjusted* R^2*=.269*, showing a large effect size. By looking at the squared semi-partial correlation, sr^2*=.048*, proficiency contributes most to predicting receptive derivational awareness uniquely. Total R^2 for the model, change in R^2, standardized and unstandardized regression coefficients, and 95% CI for unstandardized regression coefficients are displayed in Table 15.

Table 15. Hierarchical Multiple Regressions Analysis Summary for Vocabulary Size, Controlling for Proficiency, Knowledge of Other Word Families, and Time On-Task; Predicting Derivational Awareness, Receptively Measured (n=191)

Variable	B	SEB	B	CI for B	sr^2	R^2	ΔR^2
Model 1						.108**	
(3) Test of Knowledge of Real Word Families	.416**	.083	.329**	(.252, .58)	.108**		
Model 2						.232**	.124**
(3) Test of Knowledge of Real Word Families	.163	.089	.129	(-.012, .338)	.013		
(2) Vocabulary Test	.071**	.012	.404**	(.047, .095)	.123**		
Model 3						.279**	.048**
(3) Test of Knowledge of Real Word Families	.065	.09	.051	(-.113,.243)	.002		
(2) Vocabulary Test	.041*	.014	.236*	(.013, .070)	.029*		

(1) Proficiency Test	.137**	.037	.308**	(.064, .210)	.048**

**P<.01; **p<.001.*

The last model, which includes the two measurements of vocabulary—(3) the Test of Knowledge of Real Word Families and (2) the Test of Vocabulary—and (1) the Proficiency Test, explains 28% of the variance. In fact, a regression with only proficiency as the main variable could explain 24% of the variance, *F(1,207)=66.535*, *p<.001*, *adjusted* R^2*=.24*, whereas knowledge of monomorphemic words could explain 22% of the variance, *F(1,207)=58.044*, *p<.001*, *adjusted* R^2*=.22*. In this regression model, proficiency is the main predictor. Furthermore, vocabulary knowledge of monomorphemic words can better explain a receptive measurement of derivational awareness than a productive one.

4.3.1.7 Summary of the hierarchical models for predicting derivational awareness

The orders of the hierarchical models were based on the correlations analysis (see Table 13), i.e., the variables that could explain some variance were entered starting with the variable that showed the lowest, albeit significant, correlation with derivational awareness. The differences between the two measurements used for derivational awareness are reflected in the two different models. Vocabulary plays a greater role in receptive awareness than in productive awareness. Nevertheless, proficiency is the main predictor for the two models.

All in all, identifying a suffix is not the same as productively using it. Still, it might be difficult to comprehend why the two measurements do not correlate. The higher involvement of metalinguistic awareness can be the cause of the divergences, i.e., the (4) Lexical Inferencing Test measures only syntactic awareness of biunique suffixes whereas the (5) Test of Productive

Awareness measures syntactic, distributional and semantic awareness, and forces the learner to actively manipulate the suffixes and stems. For example, several of the biunique suffixes, such as *–dad*, '-ity,' *–ura*, '-ness,' *–eza*, '-ness,' and *–miento*, '-ment,' recognized in the (4) Lexical Inferencing Test were not used in (5) the Test of Productive Awareness. This suggests that some suffixes might require a long time, if ever, to be actively learned. Moreover, there were some ceiling effects when measuring receptively derivational awareness, whereas none were found in the productive measurement (see Table 4). This implies that (4) the Lexical Inferencing Test was very easy for most of the participants.

4.4 DISCUSSION

From the results section, vocabulary size does not play a role in determining or predicting derivational awareness, but proficiency does.

To return to the study's first research question: "How do derivational awareness and vocabulary develop across different levels of English-speaking learners who receive unsystematic instruction?," vocabulary and derivational awareness do not follow the same course. Vocabulary develops incrementally, which is not the case with derivational awareness. A partial awareness of derivational morphology is quickly reached, whereas a complete awareness does not seem to be mastered unless a certain proficiency level is acquired. For example, in this study, those learners who obtained 30% correct scores in (1) the Proficiency Test were already identifying and analyzing biunique suffixes, but they were still not able to manipulate the same suffixes in a productive test. Learners with 60% of accuracy showed a deeper awareness than the other participants, but still were very limited in the number of suffixes they were able to control.

An important methodological issue is that the two tests that measured derivational awareness did not correlate. First, when productively measured, a conglomerate score of semantic, syntactic and distributional awareness was used; whereas when receptively measured, the scores focused on syntactic awareness of biunique suffixes. The higher metalinguistic involvement of the productive measure draws a developmental division between that and the receptive measure. This divergence implies that a partial awareness of a suffix precedes a deeper awareness. As suggested in 4.3.1.7, the simplicity of (4) the Lexical Inferencing Test does not allow for differentiation among proficiency levels as the productive measure does. In fact, a low correlation between receptive awareness and syntactic awareness of nonwords was found.

Answering the second research question, "What model of vocabulary and morphology acquisition do these data suggest?" On the whole, knowledge of monomorphemic words is not associated with ability to manipulate derivational suffixes. This also suggests that suffixes are not learned in the same way as words or stems. In fact, the suffixes mastered by Spanish L2 learners in uninstructed university level classes are mostly three: *–ar*, 'to…,' *–ado*, '–ed,' and *–dor*, '–er.' On the other hand, a stronger relationship between vocabulary and a partial awareness of suffixes exists. One reason for this divergence can be that manipulating suffixes requires a deeper knowledge of the language system, whereas identifying suffixes does not necessarily require this knowledge, just vocabulary knowledge. Receptive awareness, a partial awareness of derivational morphology, seems also to precede the development of productive awareness.

Furthermore, knowing more about real word families helped participants when creating new word families of nonwords. This suggests that learners might use their knowledge of other word families as their base for manipulation of affixes. Thus, an analogical understanding of word formation seems reasonable: from one word family, learners infer how the derived forms in

other word families should look like. Nevertheless, the low number of suffixes that the learners can manipulate better indicates an item-and-arrangement understanding of morphology, i.e., learners assume that some suffixes can be freely manipulated and attached to stems. This might also be influenced by the way inflectional morphology is taught in the classroom. For example, teachers and textbooks tend to introduce inflectional suffixes as something different from the verbal stem that can be manipulated. For example, in a first-semester college textbook, learners read about infinitive and verb endings (Castells et al., 2012, p. 33). Next, a verb is conjugated in a table-like manner with all the verbal *endings* bolded. These *endings* just need to be used for other verbs. The same model of instruction is repeated in the third- and fourth-semester textbook (Blanco & Colbert, 2010, p. 14-15).

Going back to the vocabulary models presented in the literature review, Lowie's model for lexical representation of affixes (1998, 2005) is supported by these results since Lowie talked about a gradual learning of suffixes and indicated that only those productive suffixes could be stored in a learner's lexicon. Even though this author discusses implicit knowledge instead of awareness, suffixes can be differentiated from one another by how much learners' are aware of them. Furthermore, assuming that inflectional and derivational morphology are similarly learned, Jiang's (2000) word's learning model is also supported. As in his model, L2 derivational morphology seems to be the last *piece* mastered, and the specific suffix does make a difference in the process of learning a word.

According to Nation's framework of what it means to know a word (2001), if a word is fully learned, a learner should be able to recognize each part and its derivatives. From the results, it can be extrapolated that learners do not fully know most morphologically complex words given the low number of suffixes that were actively manipulated. All in all, learners seem to

focus on certain suffixes as individual items. Nation and Bauer's (1993) pedagogical criteria for suffixes complexity degree could be used to analyze learners' choices. These scholars suggest different categories that could influence the learning of a suffix: 1) frequency, 2) productivity, 3) predictability (meaning), 4) regularity of the written/spoken form of the base, 5) regularity of the spelling/spoken form of the affix,[9] and 6) regularity of function (word category). From the results, 3) predictability (meaning) seems to be more important than 6) regularity of form. But still, most of these criteria fit the suffixes utilized by the learners in this study.

To summarize, the vocabulary and morphological awareness model that can be envisioned from these results is a model where derivational awareness differs from vocabulary knowledge; where proficiency, as measured in the (1) Cloze Test, is the main factor determining both constructs, namely vocabulary size and morphological awareness; and where knowledge of whole word families can be even more relevant than vocabulary size for developing morphological awareness. The hierarchical regressions of the result sections (see Tables 14 and 15), as well as the consistency of the correlations with previous studies, uphold this model.

For example, the correlations found in this study between derivational awareness and vocabulary—i.e., higher when productively measured than when receptively done—are consistent with previous results (e.g., Chen, Ramírez, Luo, Geva & Ku, 2011, who found the same tendency for productive and receptive awareness for Spanish-speaking and Chinese-speaking children learning English L2). Similarly, a lack of correlation between derivational awareness measured both productively and receptively was also found in Hayashi and Murphy's (2011) study with Japanese speaking learners of English L2.

[9] Although "regularity of the written form of the base" and "regularity of the spoken form of the base" are two different criteria for determining affix recognition in English, due to the transparent orthography of Spanish, these two can only be considered as one criterion. The same apply for Spanish affixes.

The next studies will further elaborate on learners' derivational awareness and on learners' perceptions of the Spanish morphological system (Study 2); and on learners' implicit knowledge of distributional and semantic morphological constraints (Study 3). The results of these three studies will redefine a model of understanding of derivational morphology. So far, Table 16 summarizes the results of this study.

Table 16. Summary Table of Results of Study 1

Research Questions	Construct(s)	Tests/Analyses	Results
RQ1. How do derivational morphology and vocabulary knowledge develop across different levels of English-speaking L2 Spanish learners who receive unsystematic instruction?	Morphological Awareness.	(5) Test of Productive Awareness. Kruskal-Wallis and Post-Hoc Mann Whitney.	4th quartile different from the others.
		(4) Lexical Inferencing Test. Kruskal-Wallis and Post-Hoc Mann Whitney.	Only the first quartile clearly differs from the others.
	Vocabulary.	(2) Vocabulary Test. One-Way ANOVA Games-Howell Post-Hoc tests.	Almost all quartiles differ from each other, but 3rd and 4th do not differ.
RQ2. What model of vocabulary and morphology acquisition do these	Proficiency, Vocabulary, and Morphological awareness.	*Correlations.* (1) Proficiency Test; (2) Vocabulary Test; (3) Test of Knowledge of	**Main Results:** Medium correlations between (1) the Proficiency Test and (4-5)

data suggest? (*Different variables that explain suffixal acquisition*)		Real Word Families; (4) Lexical Inferencing Test; and (5) Test of Productive Awareness.	the measurements of awareness. Low correlations between the (2) Vocabulary Test and (5) the Test of Productive Awareness. No correlations between the two measurements of derivational awareness (5 and 4).
	Morphological Awareness.	*Measured productively (5).* *Hierarchical Regression Independent variables*: (7) Time on task, (2) Vocabulary Test, (1) Proficiency Test and (3) Test of Knowledge of Real Word Families.	Final model 28%, (2) Vocabulary Test was not significant.
	Morphological Awareness.	*Measured receptively (4).* *Hierarchical regression* Independent variables: (3) Test of Knowledge of word families, (2) Vocabulary Test, and (1) Proficiency Test.	Final model 28% (3) Test of Knowledge of real word families was not significant, (2) Vocabulary Test was significant.
a) Are vocabulary size and derivational awareness independent?	Vocabulary and Morphological Awareness.	See *correlations* and *Hierarchical regressions.*	Yes.

b) If so, at what point during learning does morphological awareness diverge from vocabulary size?	Vocabulary and Morphological Awareness.	See *One-Way ANOVA* and *Kruskal Wallis tests*.	Early for a partial awareness (*around 30% of* ***receptive*** *monomorphemic knowledge*). Later for full awareness (*around 60% of* ***productive*** *monomorphemic knowledge*).
Conclusions: **Vocabulary size different from morphological awareness**; **proficiency** main factor determining derivational awareness; higher metalinguistic load for manipulation of suffixes, more fine-grained, complete awareness. **Very low number of suffixes actively manipulated by the learners**.			

5.0 STUDY 2: WHAT CAN LEARNERS SAY ABOUT DERIVATIONAL MORPHOLOGY?

To better understand the learners' awareness of derivational morphology, learners' inferencing strategies and development were analyzed by means of two metalinguistic tasks, which receptively measured derivational awareness. These tasks complement the quantitative results of Study 1.

According to the literature on vocabulary strategies (see Schmitt, 1997) and lexical inferencing (see Wesche & Paribakth, 2010), learners use derivational information in order to infer the meaning of unknown words. In most studies, analyses of inflectional and derivational affixes, stems and, in some cases, other intraword cues are subsumed under the same strategy (e.g., Haastrup, 1991; Haastrup, 2008; Schmitt, 1997; Wesche & Paribakht, 2010). Although these procedures are appropriate for studies on inferencing strategies, a more detailed classification of intraword inferencing strategies for morphologically complex words is necessary to comprehend the development of L2 derivational awareness.

Additionally, it is hypothesized that a more complex use of metalinguistic strategies should be found in advanced learners if usage of strategies develops with proficiency in adult L2 learners given that, in general, strategies evolved with proficiency (e.g., Schmitt, 1997; Welsch & Paribakth, 2010). Nevertheless, it is also hypothesized that the degree of familiarity with each

suffix might influence the learners, i.e., familiar suffixes might prompt intraword inferencing strategies, whereas unknown suffixes might cause learners to prioritize other inferencing strategies.

Furthermore, Study 2 approaches how learners develop their ability to explicitly decompose words. If the decoding ability improves with proficiency, a mastery of decoding should occur with higher proficiency. If suffixes affect recognition of word parts, then each word will have a different, explicit decomposition process. The complexity of this task should avoid the ceiling effects found in the Lexical Inferencing Test of Study 1. In fact, the pattern of the results should resemble the Test of Productive Awareness Study 1, given that these two new tasks are hypothesized to generate a similar metalinguistic challenge to the Test of Productive Awareness.

All in all, an overview of how learners identify and analyze suffixes is provided in this chapter. The findings will also be revisited after Study 4, the study on teacher practices and beliefs on derivational morphology, because both learners' and teachers' views factor into effective instruction of derivational morphology.

To summarize, Table 17 illustrates the research question of this study as well as the constructs tested and analyzed.

Table 17. Summary Table of Study 2

Research Questions	**Constructs**	**Test**	**Analyses**
RQ1. What can learners say about their use of derivational morphology when inferencing the meaning of an unknown word?	Morphological awareness *Identify and analyze suffixes.*	Survey of Receptive Awareness. *a. Words with different suffix and stem combinations.* *b. Measuring inferencing strategies.*	A. One-way ANOVAs. B. Descriptive analysis.

		c. Strategies emerged from the data.	
	Proficiency.	Proficiency Test of Study 1.	Four quartiles.
RQ2. To what extent are learners able to recognize a suffix and a stem in unknown words?	Morphological awareness. *Identify and analyze suffixes.*	Decomposition Test.	Kruskal-Wallis and Mann-Whitney Tests.
	Proficiency.	Proficiency Test of Study 1.	Four quartiles.

5.1 PARTICIPANTS

Participants of this study were the same participants as in Study 1: English-speaking learners of Spanish L2 taking Spanish from a second to a seventh semester (n=209).

5.2 MATERIALS, DESIGN AND PROCEDURE

Survey of Receptive Awareness

Learners were presented with eight words that appeared in the tests of Study 1. The words were chosen because of their potential to motivate varied inferencing strategies. For example, they

carried different suffixes and stems. Participants were asked: 'If you did not have a dictionary and you found the following word in a text, how would you know its meaning?' By testing complex words without providing context, learners' understanding of word structure and derivational morphology should be elicited. The survey was proctored in the same session of Study 1 and was taken on a computer. Participants were instructed that they could answer in English.

Due to the nature of the test, it was intended that learners not know the meanings of the words so that they could elaborate on the strategies they needed. The words selected were:

1) Two nonwords carrying the biunique, high-frequency suffixes *–oso*, '-ous,' and *–miento*, '-ment;'
2) Two real words with the biunique, high-frequency suffixes, *–idad*, '-ity,' and *–able*, '-ble;'
3) Two real words with instructed suffixes, *–ado*, '-ed,' and *–ar*, 'to…;'
4) Two possible words ending in *–ero*, '-er,' and *–dor*, '-er,' whose stems are English cognates.

All eight suffixes should be easily recognizable by learners of L2 Spanish. However, in terms of production, L2 learners only extensively use *–dor*, '-er,' *–ado*, '-ed,' and *–ar*, 'to…' (see Study 1); the other suffixes are barely utilized (see Table 12). Notwithstanding this, recognition of suffixes should be easier than their manipulation (see Study 1). The goal of this test was to tackle learners' derivational awareness, i.e., their understanding of derivational morphology, by analyzing: 1) the morphology-related strategies they used, 2) whether word structure or 3) learners' proficiency made any difference in choice of inferencing strategy.

Decomposition Test

Within the Survey of Receptive Awareness, learners had to answer the following question: 'How many elements do you find inside the following word?' for the eight target words. Thus, these data showed the analytical capacity of the learners to analyze and identify word parts, i.e., morphological awareness, receptively measured.

The effects of proficiency, as well as word structure, on accuracy while decoding were analyzed. Participants were scored with a 0, 1 or 2 for each one of the eight words. A score of 0 implied that the learner was not able to see any internal structure in the word, i.e., the learner considered the word as a whole entity without any separate parts. A score of 1 indicated that the learner was able to distinguish a word part, but was uncertain about the other part, i.e., a learner showed difficulties in understanding what the stem and suffix were. Finally, a score of 2 pointed to awareness of the root and the suffix.

5.3 RESULTS

Survey of Receptive Awareness

The inferencing strategies that emerged from the Survey of Receptive Awareness will be qualitatively and quantitatively approached. First, the strategies will be described. After that, the effect of proficiency and word structure on the usage of strategies will be analyzed.

Some learners were general in their strategies—i.e., they would apply the same strategies to every word—whereas other students would elaborate on each specific word. In sum, after

reading the participants' answers to the question: 'If you did not have a dictionary and you found the following word in a text, how would you know its meaning?,' a coding system (see Table 18) was developed.

Table 18. Coding for Learners' Comments in the Survey of Receptive Awareness

Main Groups		Strategies	Example
A) About the word structure	(1)	Affixal Awareness (e.g., recognizing the suffix).	(About the nonword **tanoso,** '*non-stem + -ous*') *"look at the beginning of the word Tan and then think of what the suffix "oso" does to spanish word." (Participant 238, 1st quartile)*
	(2)	Root Awareness (e.g., recognizing a root).	(About the low-frequency word **borrosidad,** '*erase + -ous + -ity*, blurriness') *"Consider the meaning of the root word borro." (Participant 250, 3rd quartile)*
	(3)	Word Family Awareness (e.g., mentioning the root as a whole word or other words of the family).	(About the low-frequency word **aprovechable**, '*take_advantage + -able*, advantageous') *"I know the meaning of apporvechar. I would use this knowledge and then make the definition a adjective because of the -able ending." (Participant 292, 2nd quartile)*
	(4)	Analogy (e.g., illustrating the suffix characteristics by using another word with that suffix).	(About the nonword **eslamiento,** *'non-stem + -ment'*) *"Context clues, and -miento ending is usually a noun, like 'alojamiento.'" (Participant 225, 1st quartile)*

	(5)	Cognate[10] (e.g., referring to an English word).	(About the low-frequency word **aprovechable**, '*take_advantage* + *-able*, advantageous') *"this is a cognate, meaning approvable." (Participant 260, 2nd quartile)*
B) About the Text	(6)	Context (e.g., looking at the context).	(About the nonword **eslamiento,** '*non-stem* + *-ment*') *"Guess from the context." (Participant 274, 3rd quartile)*
	(7)	Syntactic context (e.g., looking at the word that modifies it).	(About the nonword **tanoso**, '*non-stem* + *-ous*') *"If it was placed after a noun I know it would be describing the noun it followed. I would know the noun is masculine and singular because of the word's ending." (Participant 241, 3rd quartile)*
C) Problematic comments on morphology	(8)	Morphological awareness (?) (e.g., showing inaccurate morphological awareness or metalingual[11] knowledge).	(About the nonword **eslamiento,** '*non-stem* + *-ment*') *"miento is the suffix "ly" in english I would also use context clues to determine meaning." (Participant 260, 2nd quartile)*

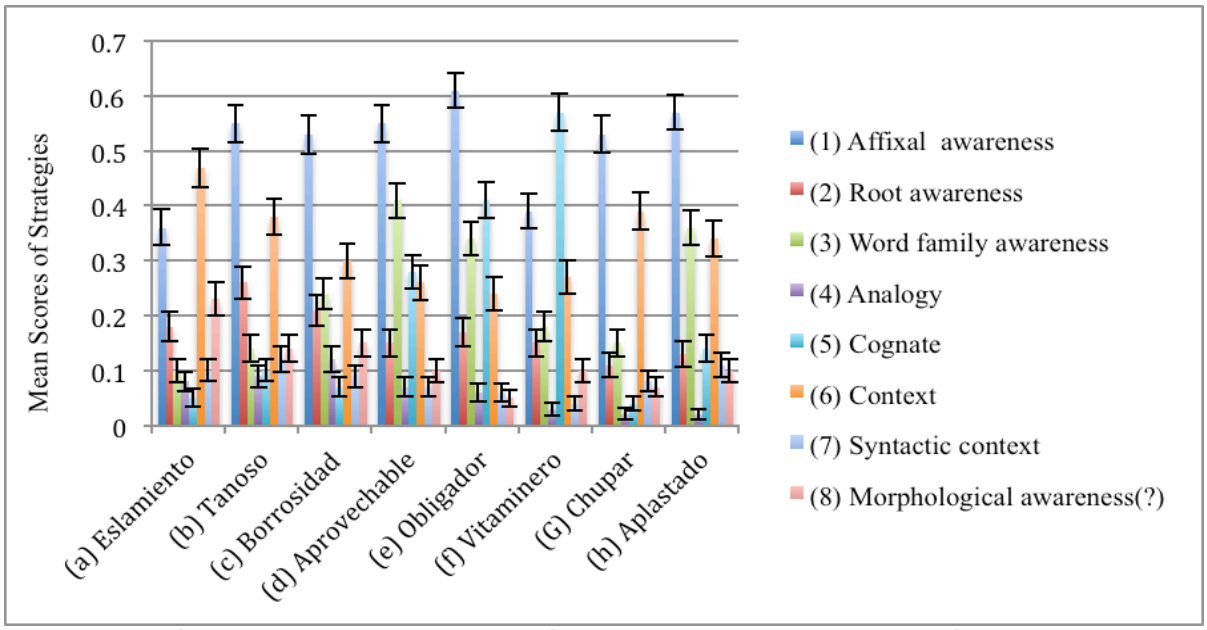
In Table 18, the different strategies were organized under three main groups: a) about the word structure, b) about the text, and c) problematic comments on morphology. All in all,

[10] The category (5) 'cognate' has been included in the main group "a) about the word structure" because "a cognate relation between words is considered a special case of morphological relation that may exist between words within the same language and that is reflected in the joint storage of morphologically related words in memory. According to this view, bilingual memory, just as monolingual memory, is organized by morphology, not by language" (de Groot & van Hell, 2005, p. 18).

[11] *Metalingual* is the adjective form of *metalanguage*.

learners commented extensively on morphology. When a participant talked about a strategy, he received one point for using that strategy for that specific word. If he did not comment on that strategy, he received zero points. That is, if 109 participants used the strategy (1) 'affixal awareness' in the nonword (a) *eslamiento*, the mean score would be 0.5 for that strategy in that word (see Appendix B for the descriptive statistics of the strategies used for each word across the four proficiency quartiles). As an introductory graph, Figure 10 illustrates the strategies that were used in each word.

Figure 10. Strategies Used in each Word



(a) eslamiento → non-stem + -ment; (b) tanoso → non-stem + -ous; (c) borrosidad → erase + -ous + -ity, blurriness; (d) aprovechable → take_advantage + -ble, advantageous; (e) Obligador → oblig- + -er (possible word); (f) Vitaminero → vitamin + -er (possible word); (g) chupar → verb + infinitival suffix, to suck; (h) Aplastado → crash + -ed, crashed.

After having descriptively revisited learners' comments on derivational morphology, a quantitative analysis of the results follows. For the purposes of this study, it was especially relevant to compare how the strategies evolved throughout the proficiency quartiles. To calculate a score for each strategy, a participant received one point each time he used a strategy. The range

of scores was from 0 to 8: 0 if he did not use a strategy for any word, and 8 if the used the strategy in each one of the 8 words. Means and standard deviations are depicted on Table 19.

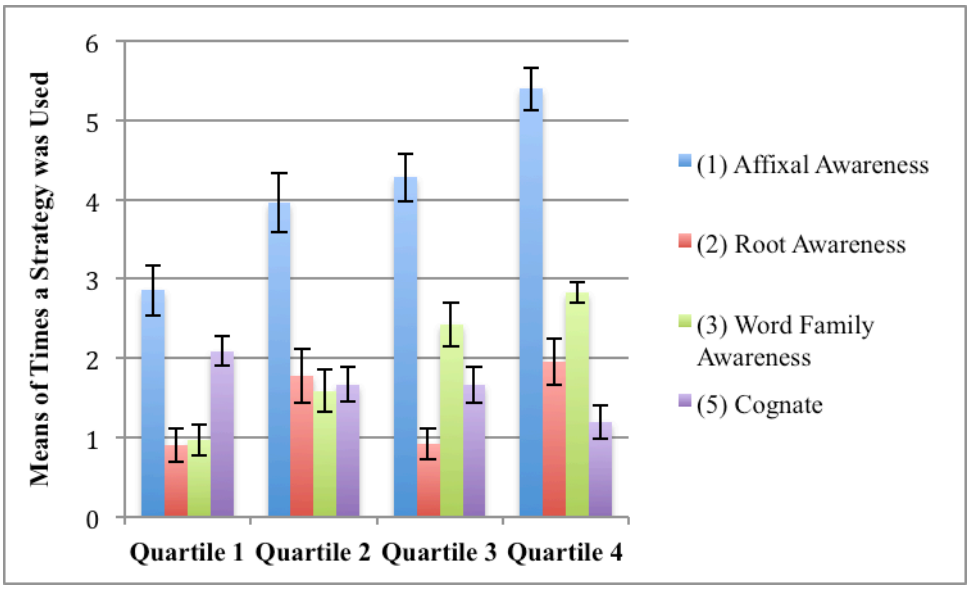
Table 19. Descriptive Statistics of Inferencing Strategies Used by Proficiency Quartile

	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	2.86	2.41	3.96	2.53	4.28	2.23	5.4	1.93
(2) Root Awareness	.91	1.63	1.78	2.28	.92	1.41	1.96	2.12
(3) Word Family Awareness	.97	1.52	1.59	1.79	2.42	1.91	2.83	1.99
(4) Analogy	.47	1.08	.30	.63	.58	1.12	.62	1.48
(5) Cognate	2.09	1.44	1.67	1.49	1.66	1.66	1.19	1.53
(6) Context	2.38	2.96	2.46	3.08	2.47	2.67	3.29	3.12
(7) Syntactic Context	.57	1.62	.61	1.68	.68	1.38	.81	1.62
(8) Morphological Awareness (?)	.93	1.51	1.94	1.12	.96	1.12	.83	.92

One-Way ANOVAs were conducted to compare the effect of proficiency on each one of the six main inferencing strategies—(1) 'affixal awareness,' (2) 'root awareness,' (3) 'word family awareness,' (5) 'cognate,' (6) 'context' and (8) 'morphological awareness (?).' The (7) 'syntactic context' strategy and the (4) 'analogy' strategy were intentionally left out of the analyses because these two strategies were rarely used (see Table 19).

On the one hand, there was not a significant effect of proficiency for (8) 'morphological awareness?', $F(3, 205)=.27$, $p=.85$, $\eta^2=.004$, and (6) 'context', $F(3,205)=1.1$, $p=.350$, $\eta^2=.02$. On the other hand, there was a significant effect of proficiency for (1) 'affixal awareness', $F(3,205)=11.516$, $p<.001$, $\eta^2=.14$, (3) 'word family awareness,' $F(3,205)=11.604$, $p<.001$, $\eta^2=.15$, (2) 'root awareness', $F(3,205)=4.63$, $p=.004$, $\eta^2=.06$, and (5) 'cognate', $F(3,205)=3.1$, $p=.028$, $\eta^2=.04$. That is, all morphologically-related strategies changed for each proficiency quartile. Figure 11 depicts these four strategies by quartile.

Figure 11. Morphologically-Related Strategies by Proficiency Quartile



Post-hoc results confirmed that the usage of morphologically-related strategies, except for the (5) 'cognate' strategy, increased with proficiency. (1) 'Affixal awareness' was statistically used more by the third quartile *(p=.007)* and by the fourth quartile *(p<.001)* than by the first quartile. Learners in the fourth quartile also discussed (1) 'affixal awareness' more than learners in the second quartile *(p=.01)*. For (8) 'root awareness,' the fourth quartile also mentioned this strategy more than the first and third quartiles (*p<.03*). Finally, for (3) 'word family awareness', the fourth quartile was significantly different from the first and the second *(p<.005)*. There was, however, no difference between either the third and fourth quartile *(p=.65)* or the second and third quartile *(p=.11)*. For (5) 'cognate,' there was only a significant difference between the first and the fourth quartile (*p=.014*). Table 20 summarizes the post-hoc comparisons.

Table 20. Post-Hoc Comparisons for Morphologically Related Strategies

(1) Affixal Awareness	1st Quartile	2nd Quartile	3rd Quartile
1st Quartile			
2nd Quartile	NS		
3rd Quartile	*	NS	
4th Quartile	***	**	NS
(2) Root Awareness	1st Quartile	2nd Quartile	3rd Quartile
1st Quartile			
2nd Quartile	NS		
3rd Quartile	NS	NS	
4th Quartile	*	NS	*
(3) Word Family Awareness	1st Quartile	2nd Quartile	3rd Quartile
1st Quartile			
2nd Quartile	NS		
3rd Quartile	***	NS	
4th Quartile	***	**	NS
(5) Cognate	1st Quartile	2nd Quartile	3rd Quartile
1st Quartile			
2nd Quartile	NS		
3rd Quartile	NS	NS	
4th Quartile	**	NS	NS

**p<.05, **p<.01, ***p<.001, NS=Non Significant*

In contrast to (4) the Lexical Inferencing Task of Study 1 (see Figure 7), more information about morphological awareness, receptively measured, could be obtained in this task. On the one hand, similar to (4) the Lexical Inferencing Task, in which there were only significant differences between the first quartile and the other quartiles, the biggest differences were still between the first quartile and the other quartiles. On the other hand, the fourth quartile tended to stand out in terms of (1) 'affixal awareness' (see Figure 11). Therefore, there was not such homogeneity of scores between the second, third and fourth quartile as in (4) the Lexical Inferencing Test. In brief, morphological awareness improved with proficiency.

This improvement, however, was mediated by the morphological characteristics of each word as it can be seen from Figure 12 to Figure 19, which means that the structure of the word encouraged certain strategies. The strategies under scrutiny were: (1) 'affixal awareness,' (2)

'root awareness,' (3) 'word family awareness,' (5) 'cognate,' (6) 'context,' and (8) 'morphological awareness (?),' which are labeled using their numbers on the horizontal axis.

The pattern of the nonwords (Figures 12 and 13) differs from the other words because (2) 'root awareness' and (3) 'word family awareness' show very low means. These results are motivated by the characteristics of these words, i.e., learners could not rely on the stem to infer the meaning of the unknown words. Using the stem was not an option for the nonwords. Nevertheless, the suffix *–miento*, '-ment,' seems to be known less than the suffix *–oso*, '-ous,' since the means of (1) 'affixal awareness' tend to be lower for the former.

Figure 12. Inferencing Strategies in (a) *Eslamiento*, 'non-stem + -ment'

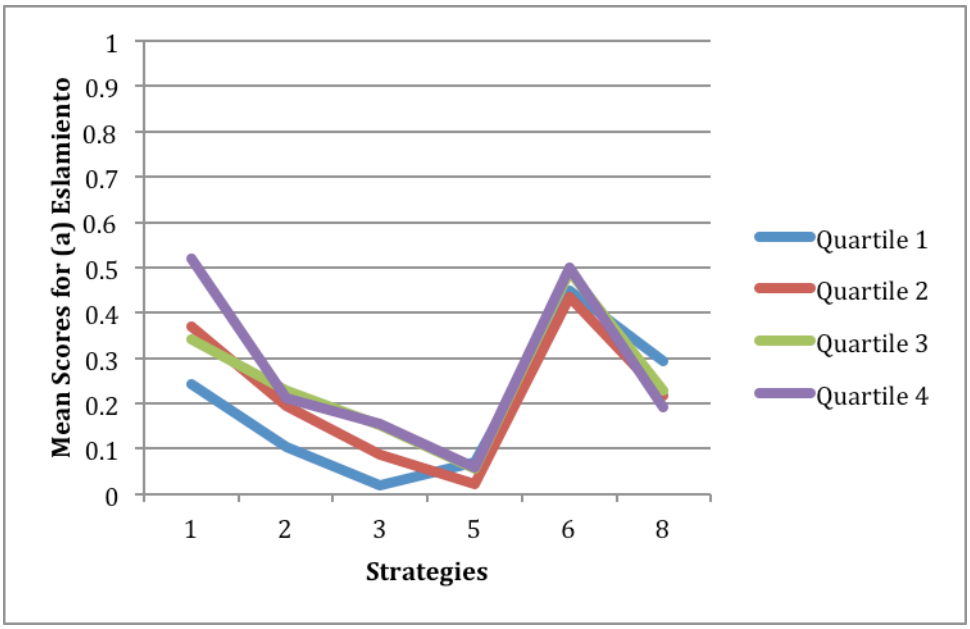
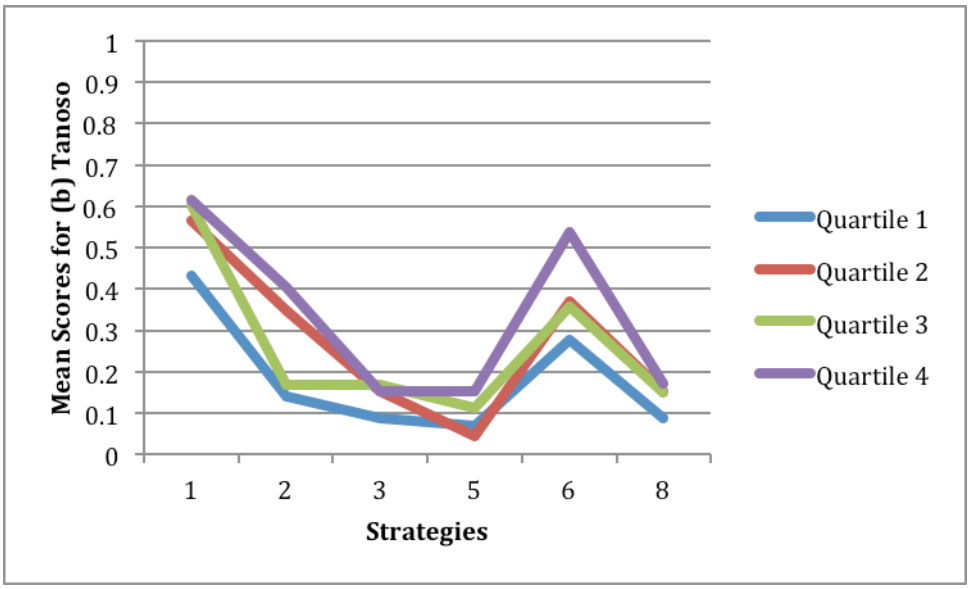


Figure 13. Inferencing Strategies in (b) *Tanoso*, 'non-stem + -ous'



The two low-frequency words (Figure 14 and 15) show differences in their pattern. (C) *Borrosidad*, 'blurriness,' seems to be a challenging word for the learners. The means for most of the inferencing strategies, except for (1) 'affixal awareness,' tend to be at .3 or below. The stem of the word is, in fact, more difficult to recognize than in the other words since two consecutive suffixes formed the word, [[borr$_{v}$]os$_{adj}$]idad$_{n}$]. Few learners could disentangle that structure. Several learners could, however, connect it to the word *borrador*, 'draft,' a high frequency word in the classroom, and even to *borrar*, 'to erase.' In spite of its biuniqueness, the suffix *–dad*, '-ity,' does not reach the same amount of recognition as the biunique suffix *–ble*, '-ble,' an English cognate. Interestingly, the word (d) *Aprovechable*, 'advantageous,' had a high number of participants in the first and second quartile to use the (5) 'cognate' strategy and/or the (3) 'word family awareness' strategy due to confusion with other words, such as *probar*, 'to prove,' and *aprobar*, 'approve.'

Figure 14. Inferencing Strategies in (c) *Borrosidad*, 'erase + -ous + -ity, blurriness'

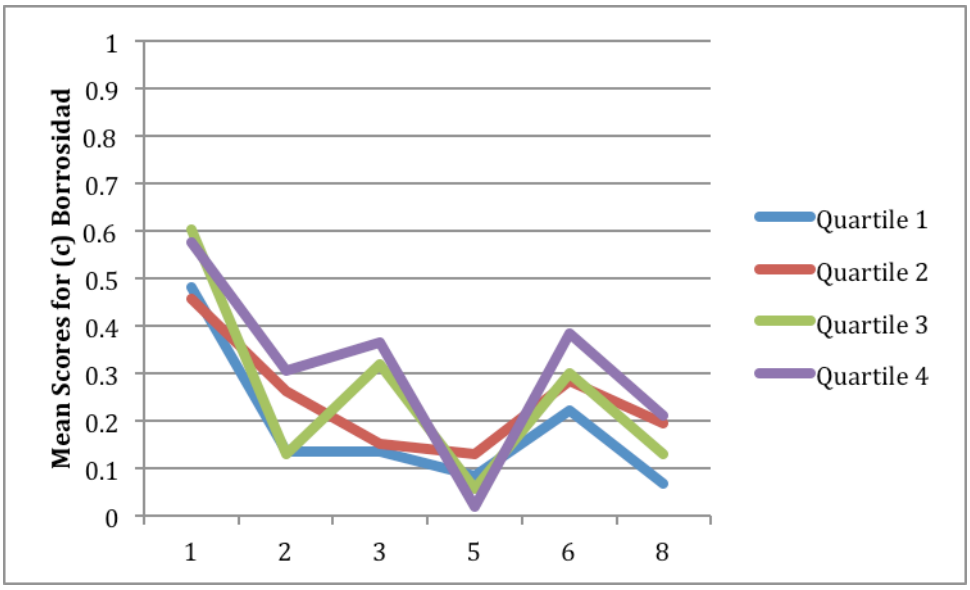
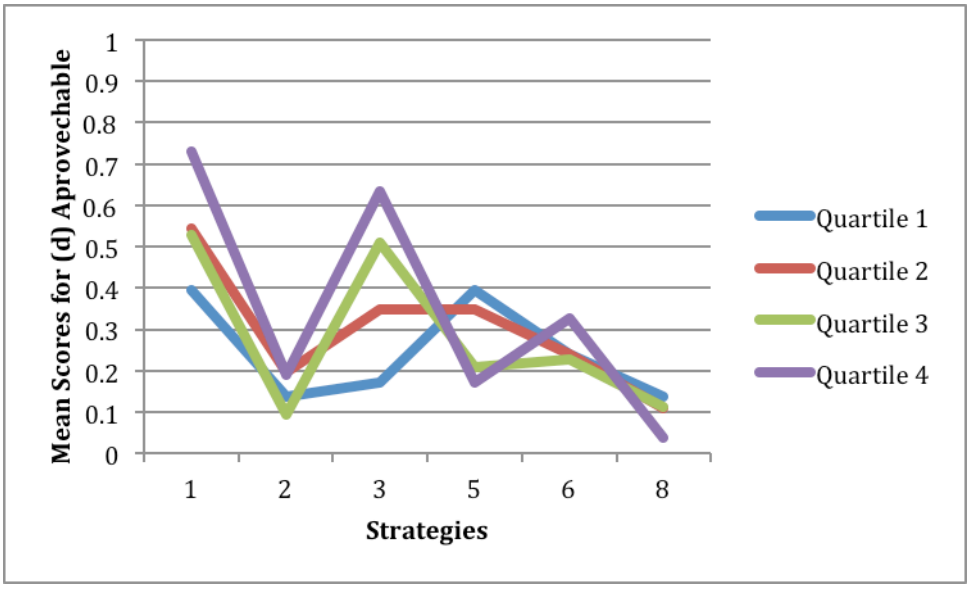


Figure 15. Inferencing Strategies in (d) *Aprovechable*, 'take_advantage + -ble, advantageous'



Similarly, the two possible words (Figure 16 and 17) also differ from one another. Whereas (e) *Obligador*, 'oblig- + -er,' shows an elevated amount of participants from all quartiles using (1) 'affixal awareness' and (3) 'word family awareness;' for (f) *Vitaminero*, 'vitamin + -er,' the (5) 'cognate' strategy stands out. (5) 'Cognate' is also widely used in (e)

Obligador, 'oblig- + -er.' Nevertheless, its use is not as prevalent as in (f) *Vitaminero*, 'vitamin + -er.' This divergence might be due to the fact that even though both stems are cognates, *–dor*, '-er,' is a well-known suffix while *–ero*, '-er,' is not. This is also in accord with the results of the Test of Productive Awareness of Study 1. In Figure 9, *–dor* was included more often in derived forms than *–ero*. Nevertheless, learners in the first quartile kept a similar use of *–dor* and *–ero*, contrary to the behavior of the other quartiles. In the Survey of Receptive Awareness, the fourth and the first quartile show a similar behavior towards both suffixes, whereas the second and third quartile seemed to recognize *–dor* more clearly than *–ero*. Nevertheless, learners in the second and third quartile infer the suffix better than learners in the first quartile. In brief, even though the possible words are very similar in structure, each suffix motivates a different inferencing behavior.

Figure 16. Inferencing Strategies in (e) *Obligador*, 'oblig- + -er (possible word)'

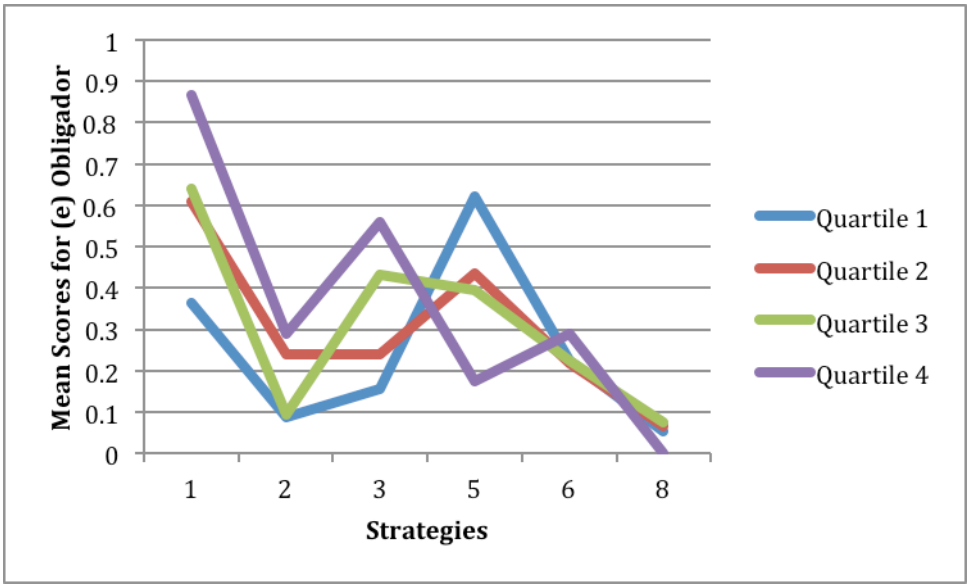
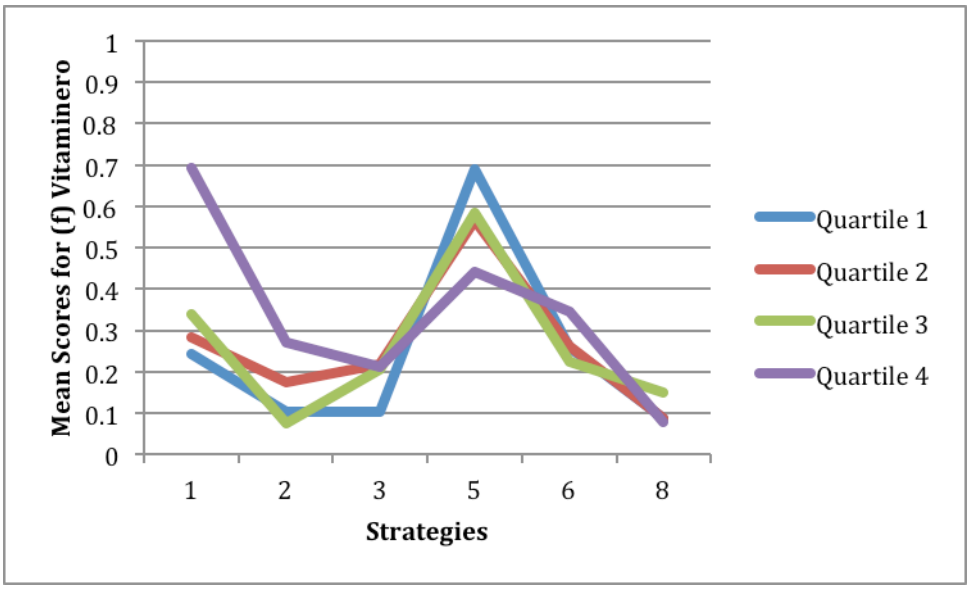


Figure 17. Inferencing Strategies in (f) *Vitaminero*, 'vitamin + -er (possible word)'



For the two words with instructed suffixes (Figure 18 and 19) learners show a high reliance on (6) 'context,' comparable to the nonwords (Figure 12 and 13), especially in the case of the infinitival suffix *–ar* of (g) *Chupar*, 'suck.' This might be motivated by the low level of semantic information provided by the stem *chup-*,' which is an onomatopoeic verb according to the DRAE. For both instructed suffixes, all quartiles showed a very close pattern of inferencing strategies. Nevertheless, the first quartile is not as familiar with the suffix *–ado* as the other quartiles.

Figure 18. Inferencing Strategies in (g) *Chupar*, 'verb + infinitival suffix, to suck'

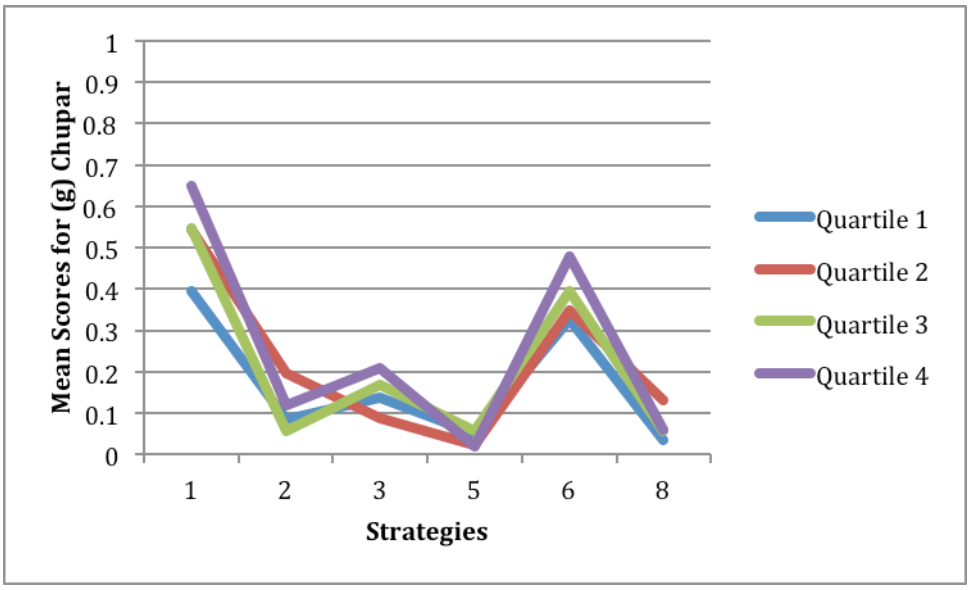
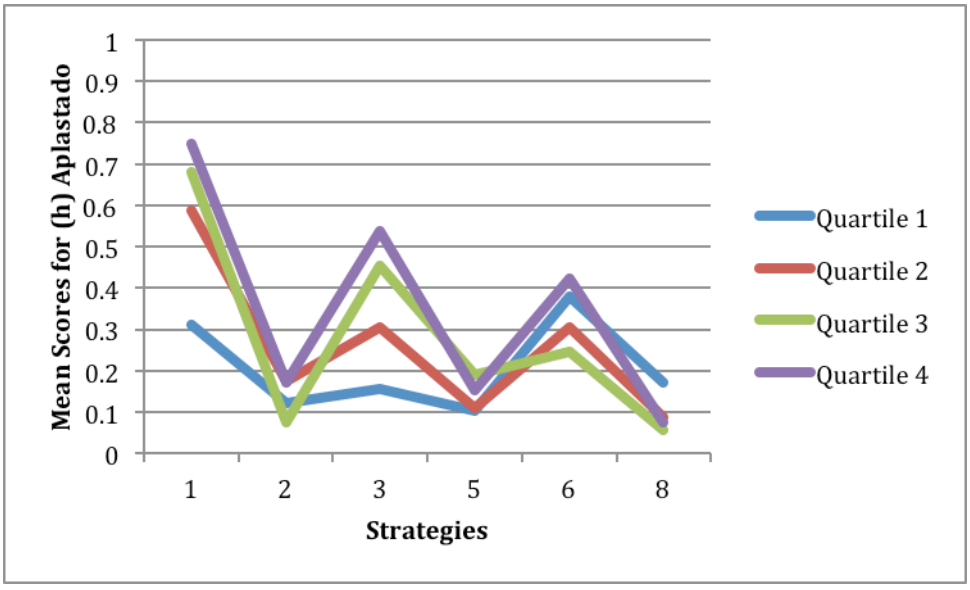


Figure 19. Inferencing Strategies in (h) *Aplastado*, 'crash + -ed, crashed'



All in all, from Figure 12 to Figure 19, it is striking how (1) 'affixal awareness' is the most prevalent strategy since it shows the highest peak in each graph. *–Miento*, '-ment,' and *–ero*, '-er' are the lowest-rated suffixes when compared with the others. Moreover, the meaning of the stem is then decisive for drawing learners' attention to a word's form. In summary, when

analyzing learners' inferencing strategies, they displayed a solid morphological awareness, i.e., they could discuss a word's morphological structure without much trouble. In spite of this, when dealing with unknown words, it is fundamental to understand the characteristics of each complex word because every word promotes a different behavior (e.g., Haastrup, 1991).

The next section will study to what extent participants could separate the root from the stem for each word. If the results are consistent with the inferencing analyses, learners will be good at this task and they will be influenced by the kind of word and by their proficiency level.

Decomposition Test

In the Decomposition Test, learners had to indicate how many intraword elements they could recognize for the eight words already discussed in the Survey of Receptive Awareness. By completing this task, learners displayed their extent of their morphological awareness. Participants received 0 points if they did not recognize any word part; 1 point if they showed a partial awareness of the word; and 2 points if they showed full awareness of both the stem and the suffix. Table 21 depicts the means and standard deviations for each word across the four quartiles as well as a cumulative score, where the scores of the eight words are summed.

Table 21. Descriptive Statistics for the Decomposition Test

Word	1st Quartile (n=58) M	SD	2nd Quartile (n=46) M	SD	3rd Quartile (n=53) M	SD	4th Quartile (n=52) M	SD
(a) Eslamiento (*non-stem + -ment*)	1.19	.760	1.65	.640	1.68	.644	1.71	.572
(b) Tanoso (*non-stem +-ous*)	1.53	.821	1.83	.486	1.91	.295	1.92	.269
(c) Borrosidad (*erase + -ous + -ity*, 'blurriness')	1.50	.863	1.85	.515	1.91	.405	1.96	.277
(d) Aprovechable (*take_advantage + -able*, 'advantageous')	1.40	.793	1.76	.480	1,74	.524	1.94	.235
(e) Obligador (*oblig- + -er*, possible word)	1.40	.897	1.85	.470	1.91	.405	1.96	.277
(f) Vitaminero (*vitamin + -er*, possible word)	1.53	.799	1.57	.720	1.81	.441	1.87	.444
(g) Chupar (*verb + infinitival suffix*, 'to suck')	1.07	.971	1.15	.965	1.26	.812	1.31	.875
(h) Aplastado (*crash + -ed*, 'crashed')	1.29	.899	1.63	.741	1.98	.137	1.90	.409
Cumulative Score	10.91	4.93	13.28	2.83	14.19	1.59	14.58	1.41

Since the assumption of normality and homogeneitiy of variance were not met, a Kruskal-Wallis was run to explore whether there were differences among the four proficiency quartiles, which was the case $\chi^2(3)=27.62$, $p<.001$. Mann-Whitney tests revealed that the first quartile was significantly different from the second quartile ($p=.011$), from the third quartile ($p<.001$), and from the fourth quartile, ($p<.001$). The second quartile was also different from the fourth quartile ($p=.024$). The other quartiles did not differ from one another. That is, learners in the first quartile showed the lowest ability to decompose words. This was the same pattern as the

one found in (4) the Lexical Inferencing Test of Study 1. Table 22 summarizes the results of the Mann-Whitney tests.

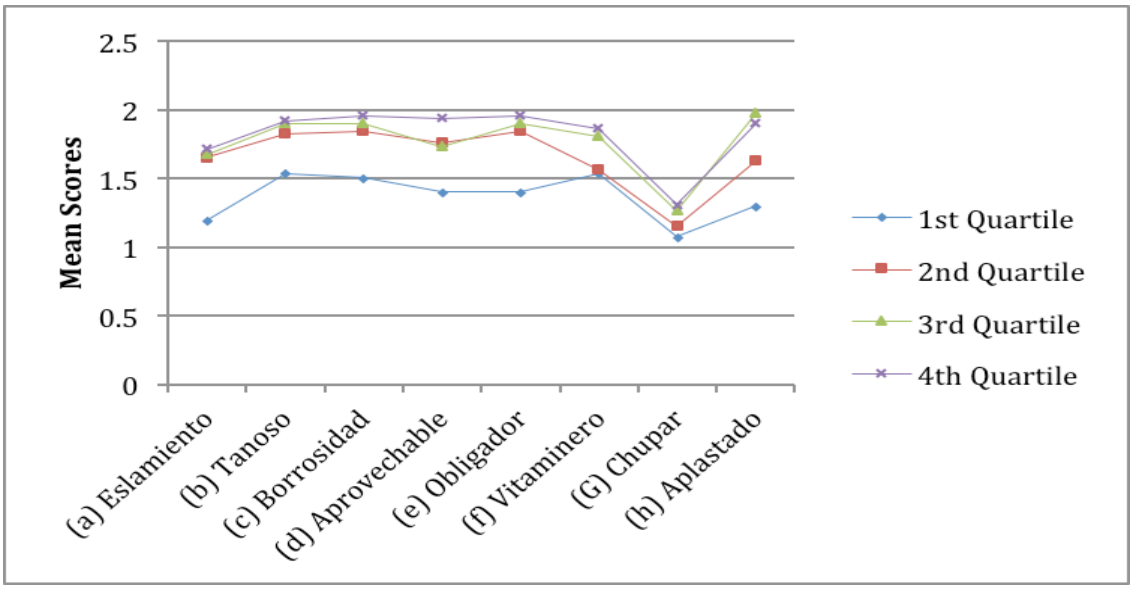
Table 22. Mann-Whitney Comparisons of the Scores in the Decomposition Test among the Proficiency Quartiles

Decomposition Test	1st Quartile	2nd Quartile	3rd Quartile
1st Quartile			
2nd Quartile	*		
3rd Quartile	***	NS	
4th Quartile	***	*	NS

**p<.05, **p<.01, ***p<.001, NS=Non Significant*

Given that each word could prompt a different behavior, as seen in the Survey of Receptive Awareness, the mean scores of each independent word by quartile were examined (see Table 21). Figure 20 illustrates how all participants showed a similar pattern when decomposing each word, between and within quartiles, albeit from the difference between the first quartile with the other quartiles (see Table 22).

Figure 20. Mean Scores of each Word in the Decomposition Test



(a) eslamiento → non-stem + -ment; (b) tanoso → non-stem +-ous; (c) borrosidad → erase + -ous + -ity, blurriness; (d) aprovechable → take_advantage + -able, advantageous; (e) Obligador → oblig- + -er (possible word); (f) Vitaminero → vitamin + -er (possible word); (g) chupar → verb + infinitival suffix, to suck; (h) Aplastado → crash + -ed, crashed.

In spite of the similar scores among the decomposed words, two words seem to distance themselves from the others: the instructed word (g) *chupar*, 'to suck,' as well as the nonword (a) *eslamiento*, 'non-stem + -ment.' The learners' answers to the Survey of Receptive Awareness clarify the effect of the infinitive suffix *–ar* for the results of (g) *chupar*. Because learners were familiar with the suffix and the verbal category of the word, they had problems *saying* that there were two elements in the word, i.e., the suffix was understood as part of the whole word, but not as a different element. In the case of *–miento* in (a) *eslamiento*, as presented in the results of the Survey of Receptive Awareness, this turned to be the least known suffix of all. Therefore, the fact that the suffix was least known causes the low peak for (a) *eslamiento*.

To sum up, there was a main effect of proficiency while decoding: the first quartile was significantly lower than the others. Regarding the suffixes, the infinitive suffix *–ar*, 'to…,' and

the biunique, nominal suffix *–miento,* '-ment,' presented some challenges for learners. These results will be further discussed in the next section.

5.4 SUMMARY AND DISCUSSION

Study 2 approached two main questions:

1) What can learners say about their use of derivational morphology when inferencing the meaning of an unknown word?
2) To what extent are learners able to recognize a suffix and a stem in unknown words?

The Survey of Receptive Awareness investigated the first question. By inquiring about ways to infer the meaning of an unknown word without a context, learners were propelled into using morphological awareness in this metalinguistic test. Participants did comment on the seven strategies reported below. The eighth one, (8) 'morphological awareness (?),' was not a strategy, but served as a code for those comments were learners showed metalingual confusion and/or difficulties when analyzing the unknown word. The eight so-called *strategies* were:

1. Affixal awareness (e.g., recognizing an affix)
2. Root awareness (e.g., recognizing a root)
3. Word family awareness (e.g., root as whole word, or other words of the family)
4. Analogy (e.g., words with similar structure because of the affix)
5. Cognate (e.g., recurring to an English word)
6. Context (e.g., looking at the context)
7. Syntactic context (e.g., looking at the word that modify it)

8. Morphological awareness (?) (e.g., showing inaccurate morphological awareness or metalingual knowledge)

Participants at all levels reported the usage of these strategies. Quantitative analyses revealed that (1) 'affixal awareness,' (2) 'root awareness,' and (3) 'word family awareness' increased with proficiency, whereas the (5) 'cognate' strategy decreased (see Table 19 and Figure 11). There was not a gradual increase by proficiency level: the first quartile tended to show the lowest means whereas the fourth quartile stood out in (1) 'affixal awareness' and (3) 'word family awareness.'

For the other inferencing strategies, there were no proficiency differences, i.e., no quartile was statistically different from the others. Thus, morphologically-related strategies seem to be more dependent on the proficiency level of the L2 learners than the other strategies related to the text (see Table 18). More specifically, the level of knowledge of derivational suffixes mediates the usage of morphological strategies. That is, the morphological characteristics of each word were relevant when the learners decided what inferencing strategies to apply. Intraword characteristics were not decisive for the other inferencing strategies. For this reason, the words' suffixes are examined next.

On the one hand, the advanced group of learners was able to base their inferencing analyses equally well on each one of the eight suffixes. On the other hand, the learners from the first to the third quartiles exhibited some divergences depending on the suffix. From the eight suffixes, the suffixes *–oso*, '-ous,' *–dor*, '-er,' and *–ado*, '-ed,' were the most easily recognizable by those learners, i.e., they could anchor their morphologically analyses on them. The suffix *–miento*, '-ment,' turned out to be the least known one (see Table 21). This situation is indeed surprising if an analysis of the suffix is performed.

–*Miento* is among the ten most frequent Spanish suffixes (Almela et al., 2005) and a nominal, biunique suffix that indicates "action and effect" of the verbal stem, such as *pensamiento*, 'thought', *action and effect of thinking* (DRAE). Moreover, it is a cognate, *tratamiento*, 'treatment.' Its phonetic structure is very salient: it has two syllables and any word carrying it receives the stress on its first syllable. It is true that it appeared in a nonword for these purposes, but the other nonword, (b) *tanoso*, did not create that level of uncertainty. One possible reason for this situation is that learners at beginner and intermediate levels are less aware of the suffix because it is usually found in cognates, such as *tratamiento* and *entretenimiento*, 'entertainment.' In those cases, learners may prefer a 'cognate' strategy when analyzing the word and ignore the suffix. Thus, this is an example of how learners prefer roots over affixes.

Moreover, it has been proposed that bilingual speakers share cognate stems across their L1 and L2 lexicons (Sánchez-Casas & García Albea, 2005). Since in those words, in which –*miento* appears, the stem tend to be a cognate, the learners might rely on that cognate stem. So it could be hypothesized that more advanced L2 learners relied even more on cognate stems. This is contrary to the results of the Survey of Receptive Awareness: the fourth quartile did use the (5) 'cognate' strategy less than the first quartile, i.e., they focused less on cognate stems. This contradictory piece of evidence cannot exist if suffixes are learned separately. Thus, more proficient learners could rely on both stems and suffixes when inferring words' meanings.

Another interesting issue raised by the analyses of the learners' comments is found in the inappropriate use of metalanguage. Even though learners demonstrated a wide range of expressions related to the linguistic domain, there were several cases where the word parts were incorrectly labeled. This is a topic that will be revisited after Study 4, the study of teacher beliefs

and practices. Nevertheless, learners could extensively verbalize their awareness of derivational morphology.[12]

To answer the second question of this study, "To what extent are learners able to recognize a suffix and a stem in unknown words?," the Decomposition Test showed how learners of all proficiency levels tended to be familiar with the structure of these complex words. When differentiating the stem from the suffix, the first quartile was the weakest from the four quartiles, as in the (4) Lexical Inferencing Test. Moreover, the data revealed that the instructed suffix, *–ar*, 'to…,' as well as the suffix, *–miento*, '-ment, 'were the most problematic. *–Miento* has already been discussed since the situation was replicated in the Survey of Derivational Morphology.

It seems quite odd that learners were not able to decompose a word with the infinitive suffix *–ar*. After all, learners study this suffix in the classroom and learn to inflect verbs by *removing* this suffix from the stem. So learners should know that *–ar* is a *removable* element. A qualitative analysis of the learners' comments showed that indeed they recognized *–ar* as a suffix, but they still considered it as a main element of the verb. Without it, the verb was not a verb. Thus, verbal suffixes do not seem to be understood in the same way as nominal suffixes. Whereas a nominal suffix can be more *detachable* from the stem—i.e., be semantically understood without the stem—a verb cannot appear without a suffix, i.e., the suffix signifies the *verb*. This is, however, the learners' explicit verbalization of their understanding of derivational morphology. This does not mean that the learners did not recognize *–ar* as infinitival marker, just that they could not understand a verb without the infinitival marker attached to it. Future

[12] From learners' anecdotal reports after taking the tests, this metalinguistic task was considered less difficult than the Test of Productive Awareness.

analyses with other verbal stems could show whether this is a generalizable situation for other verbs or whether the semantic information provided by the stem can determine the learners' ability to recognize two autonomous elements in a verb.

In sum, learners were able to consciously decompose six of the eight words. Except for the issues with *–ar* and *–miento*, the mean scores (from a maximum of two points) were at 1.50 or above that for the second, third and fourth quartiles (see Figure 20 and Table 21). Only the first quartile was significantly different from the others. Thus, the pattern found with the Decomposition Test resembles the pattern of the Lexical Inferencing Test of Study 1 (see Figure 7). For the Survey of Morphological Awareness, mentioning *morphologically-related* strategies seem to be more habitual in the fourth quartile than in the others (see Figure 11 and Table 19). Again, the weakest quartile tended to be the first quartile, while the three other quartiles were not necessarily so different.

In brief, the Decomposition Test yielded analogous results to the Lexical Inferencing Test. After a minimum threshold of proficiency has been crossed, learners are already familiar with the most frequent Spanish suffixes. Nevertheless, the Survey of Receptive Awareness showed how more advanced learners were better versed in the suffixes. That is, the Survey of Receptive Awareness could better show the differences in morphological awareness among the proficiency quartiles. Thus, verbalization of *morphologically-related* strategies is more challenging than pointing out word elements. Therefore, verbalizations of strategies provide a more fine-grained analysis of morphological development.

All in all, in terms of learners' verbalization of derivational awareness, learners operate to a certain extent with a conscious item-and-arrangement scheme (see Hockett, 1954). They approach words with a stem, and with certain nominal and adjectival suffixes as two independent

units. The stem is, however, the most relevant element for the learners. This is understandable since most of the sematic information is stored within the stem. Moreover, relational awareness is the fastest element to be acquired of the three different levels of morphological awareness proposed by Tyler and Nagy (1989)[13] by adult English-speaking learners of Spanish (see also Marcos Miguel, 2011). This study supports these claims: for the participants, establishing a relationship between words with a common stem was more frequent than between those with a common suffix.

In these metalinguistic tests, only learners' morphological awareness of a handful of high-frequency suffixes has been analyzed. Classroom instruction could help to raise awareness of other *unknown* suffixes. That a suffix with the characteristics of *–miento* was so challenging for beginner learners was striking. Moreover, the word (c) *borrosidad* had two suffixes: *–oso* and *–idad*. Learners mostly reported about the suffix *–idad*, but did not manipulate it. This suggests that more complex suffixal combinations can go unnoticed by the learners.[14] Nevertheless, following the tendency of these data, it is hypothesized that learners with proficiency higher than the fourth quartile here examined would be able to verbalize their thoughts of derivational morphology more deeply, rely more on morphologically-related strategies and actively handle a larger amount of suffixes.

To sum up, Table 23 briefly describes the structure of Study 2, indicating the constructs analyzed, how they were tested, and a summary of the main results.

[13] Relational, syntactic, and distributional (Tyler & Nagy, 1989).
[14] Due to the coding system, (c) *borrosidad*, 'blurriness,' was equally scored with 2 points if the learner saw one suffix or two.

Table 23. Summary Table of Study 2

Research Questions	Construct(s)	Test/analysis	Result(s)
RQ1. What can learners say about their use of derivational morphology when inferencing the meaning of an unknown word?	Proficiency	Proficiency Test.	Established 4 different proficiency levels (see Study 1).
	Morphological awareness.	Survey of Receptive Awareness. *a. Measuring inferencing strategies* One-way ANOVAs. *b. Strategies emerged from the data.*	a. Inferencing strategies dependent on word characteristics and (to a certain extent) student proficiency. b. Several morphology related strategies. c. Difficulty with metalanguage. d. *–miento* considered a difficult suffix. e. Regarding morphologically-related strategies: the first quartile is the weakest group; the fourth quartile is the strongest group.
RQ2. To what extent are learners able to recognize a suffix and a stem in unknown words?	Morphological awareness.	Decomposition Test. *Measuring identification and analyses of suffixes and stems.* Kruskal-Wallis and Mann-Whitney Tests.	Decomposition of words dependent on word characteristics and student proficiency. First quartile weaker than the other groups.
Final conclusions: the Decomposition Test provides a pattern of results similar to the Lexical Inferencing Test; i.e., learners of the first proficiency quartile are *weaker* than the others. In the Survey of Derivational Morphology, when verbalizing derivational strategies, the first quartile is also the weakest, but the fourth quartile stands out as the most morphologically aware quartile. In general, a wide use of *morphologically-related* inferencing strategies by all participants was reported. Inferencing strategies are also dependent on word's characteristics.			

So far, morphological awareness has been examined in Study 1 and 2. The next study presents a developmental analysis of the learners' implicit knowledge of derivational morphology, more specifically of the distributional and semantic constraints imposed by the suffixes.

6.0 STUDY 3. EXPLORING L2 LEARNERS IMPLICIT KNOWLEDGE OF THE DISTRIBUTIONAL AND SEMANTIC CHARACTERISTICS OF DERIVATIONAL MORPHOLOGY

So far, studies 1 and 2 have tackled morphological awareness, i.e., explicit knowledge used to identify, analyze, and manipulate morphemes. Study 3 intends to delve into more implicit domains of derivational morphology, specifically on implicit knowledge of distributional and semantic constraints of suffixes.

In general, SLA grammar research has focused on the relationship between explicit knowledge—i.e., awareness—and implicit knowledge assuming that implicit knowledge shows what is really *acquired* (Ellis, 2011). Moreover, under the "Weak Interface Hypothesis," explicit knowledge has been understood as the basis for developing implicit knowledge (see Ellis, 2011, for a review). On the other hand, vocabulary research has approached this subject from an explicit angle.

Sonbul and Schmitt (2013) call for exploring the explicit-implicit dichotomy because vocabulary learning is more than just explicit *item learning*. Nevertheless, even if grammar acquisition were only *rule-based* and vocabulary learning were only *item-based*, the learning of complex words—i.e., of derivational morphology—would clearly still be something *in between.* Knowing derivational morphology combines *item-learning*, e.g., explicitly knowing suffixes as

independent units; and *rule-based learning*, i.e., implicitly knowing the requirements of each suffix to manipulate them.

To analyze implicit knowledge of derivational morphology, this chapter explores L2 learners' knowledge of derivational rules. Specifically, distributional knowledge—i.e., knowing the syntactic category of the base that the suffix requires—and semantic knowledge—i.e., knowing the semantic and syntactic characteristics that a base needs to have so that the suffix can attach to it—are investigated. To this end, a distributional and semantic timed Lexical Decision Test (LDT) was adapted from Burani, Dovetto, Spuntarelli, and Thornton (1999).

Burani et al. (1999) found differences in Reaction Times (RTs) and accuracy results between novel nonwords—i.e., words following distributional and semantic constraints—and nonwords violating these constraints for Italian L1 speakers. However, they did not find a difference between the results for the semantic and distributional violations. Along the research lines of this dissertation, these findings suggest automaticity in L1 speakers: both semantic and distributional constraints are equally integrated in the speakers' lexicon.

This chapter will analyze implicit derivational knowledge by measuring RTs and accuracy in English-speaking learners of Spanish L2 in a similar LDT. In terms of accuracy, if the L2 learners were able to recognize both the distributional and semantic organization of suffixes and stems, learners would reject words with these violations. Moreover, learners would accept novel words that follow appropriate semantic and distributional constraints.

Accuracy in rejecting nonwords with semantic violations might also differ from accuracy in rejecting nonwords with distributional violations because nonwords with distributional violations could be considered a *double* violation, i.e., those words simultaneously exhibit semantic and distributional violations. This is exemplified by the nonword **dañinodor*,

*‘harmful + -er,’ where the suffix *–dor*, ‘-er,’ was added to the adjectival stem *dañino*, ‘harmful’: the distributional violation creates a semantic violation as well. If learners are unable to decompose the stem from the suffix, no difference in nonwords with distributional violations, semantic violations and novel nonwords—i.e., without violations—should be observed.

In terms of RTs, the same hypothesis as Burani et al. (1999) can be proposed for novel nonwords: longer RTs should be seen when deciding whether or not novel nonwords are nonexistent words if learners are aware of distributional and semantic constraints. For distributional violations, these authors proposed that RTs should be the longest if “the grammatical compatibility of the suffix is checked first” (p. 335). Thus, nonwords with semantic violations should show RTs that fall between those for novel nonwords and nonwords with distributional violations. Nevertheless, if interpretability were the main issue for deciding a word’s meaning, nonwords with semantic and distributional violations would show similar results. Additionally, if there were similar RTs in nonwords with semantic and distributional violations, this would point to an automatization of rules.

Furthermore, if the implicit acquisition of semantic and distributional characteristics of suffixes is progressive, differences among proficiency quartiles (see Study 1) should be visible. In addition to this, if high-frequency suffixes are all learned in a similar fashion, there should not be any differences in accuracy and RTs results with regard to their interaction with learners’ proficiency and/or the nonwords characteristics. However, if each suffix presupposes different learning processes, differences between suffixes would be found. Automatization of suffixes should be reflected in shorter RTs.

To sum up, the goal of Study 3 is to point out whether learners are sensitive to the distributional and semantic characteristics of derivational morphology and whether the

development of implicit knowledge about derivational morphology is similar to the development of morphological awareness. Thus, these results relating to the development of implicit knowledge will allow for comparison with the development of awareness of Study 2 and Study 3. Table 24 depicts the research questions, constructs and analyses of Study 3.

Table 24. Summary Table for Study 3

Research Questions	**Construct(s)**	**Test/analysis**
1. Do learners distinguish semantic and distributional violations from possible word formations in accuracy and reaction times (RTs)?	Implicit knowledge of derivational morphology (distributional and semantic). *Possible vs. Violations.*	Repeated Measures ANOVA: Accuracy and RTs.
2. Are there differences in RTs and accuracy between semantic and distributional violations?	Implicit knowledge of derivational morphology (distributional and semantic). *Distributional Violations vs. Semantic Violations.*	Repeated Measures ANOVA: Accuracy and RTs.
3. How does this implicit knowledge relate to the results of the awareness studies (1 and 2)? a. Is there an effect on proficiency for implicit knowledge as well? b. Is there an effect due to the specific suffix?	Implicit knowledge of derivational morphology (distributional and semantic).	Repeated Measures ANOVA Accuracy and RTs. Proficiency Test of Study 1. *Compared to Development of awareness* (Study 1 and 2). Suffixes understood as independent lexical items.

6.1 PARTICIPANTS

The participants of this study were the same as for Study 1 and Study 2 (n=209). Due to a technical problem, data from two participants of the second proficiency quartile were missing. Data from 207 participants was, therefore, used in this analysis.

6.2 MATERIALS, DESIGN AND PROCEDURE

LEXICAL DECISION TASK

The Lexical Decision Task (LDT) measured distributional and semantic knowledge by recording L2 learners' behavior in terms of accuracy and RTs when reacting to nonwords. These nonwords were formed with biunique suffixes—i.e., those marking only one syntactic category, such as *–ble* only marking adjectives—and non-biunique suffixes—i.e., those marking more than one syntactic category, such as *–dor* marking both adjectives and nouns—that were added to:

(1) Distributionally appropriate bases, creating a semantically interpretable, novel nonword, e.g., *facturador*, 'invoicer, a person who invoices;'

(2) Distributionally inappropriate bases, e.g., **idealdor* *'idealer,' as *-dor* can only be added to verbal bases;

(3) Distributionally appropriate bases, creating a semantically uninterpretable nonword e.g., **nevador*, *'snower,'as *-dor* can only be used on agentive verbs.

That is, learners were tested on the following word categories:

(1) Novel Nonwords (NW),

(2) Nonwords with Distributional Violations (DV), and

(3) Nonwords with Semantic Violations (SV).

Each set consisted of sixteen nonwords, i.e., four with each suffix type. The stems for the forty-eight nonwords were taken from the glossary of *Mosaicos* (2006), a first-semester Spanish textbook. Similarly, the suffixes chosen were among high-frequency Spanish suffixes (Almela et al., 2005). By using familiar stems and high-frequency suffixes, participants could focus on the characteristics of the stem-and-suffix combination rather than on the meaning of the stem. The chosen suffixes are depicted in Table 25.

Table 25. Distributional and Semantic Characteristics of the Suffixes Used in the LDT

Biunique suffixes (adj.) Verbal *stem* +	Non-biunique suffixes *With an agentive meaning* Nominal *stem* +	Verbal *stem* +
–ble (-*ble*)	–ero (-*er*)	–dor (-*er*)
–oso (-*ous*)	–dor (-*er*)	

For example, the suffix *–ble*, which tends to be added to verbal stems that can be either transitive and intransitive but should have an active meaning (DRAE), was added to

a) An active verb creating a novel nonword (NW) such as *florecible*, 'flourishable;'

b) An inactive verb creating a nonword with a semantic violation (SV) such as **venible*, *'come + –ible,'

c) A nominal base creating a nonword with a distributional violation (DV) such as **camarable*, *'camera + –ble.'

E-prime 2.0 (Psychology Software Tools, Pittsburgh, PA) was used to measure learners' accuracy and RTs for the target words. First, participants read the instructions on the screen. They were told they should press '1' if they though the word on the screen was a Spanish word and '2' if they thought it was not a Spanish word. They had to answer as quickly as possible. After ten practice trials, the experiment began. Once the participants indicated whether the word was a Spanish word or not, an asterisk appeared on the screen. To start with a new word, the participant had to press the space bar so that the procedure could be repeated. The words were on the screen for 5000 milliseconds. Apart from the target words, sixty-two real words and twenty nonwords were added as distractors.

The results for native speakers of Burani et al. (1999) were considered as a baseline. The results for this study were coded in the same way as the original study. All non-rejected target words were considered errors, even NW—so that both groups could be compared. In Burani et al., however, there was no analysis of the independent suffixes used. For adult native speakers, all suffixes should have been equally acquired. Thus, no differences by suffixes should have been found. Since this does not need to be the case for L2 learners, differences for suffixes were analyzed in this study.

6.3 RESULTS

In order to analyze the results of the LDT, a 3X4X4 Repeated Measures (RM) ANOVA with nonword category—(1) Novel Nonwords (NW), (2) Nonwords with Distributional Violations (DV) and (3) Nonwords with Semantic Violations (SV)—and suffix—(1) the adjectival suffix –*ble,* '-ble,' (2) the non-biunique suffix –*dor,* '-er,' (3) the non-biunique suffix –*ero*, '-er,' and (4)

the adjectival suffix *–oso,* '-ous'—as within-subjects factors; and with proficiency—the four proficiency quartiles from the Proficiency Test of Study 1—as the between-subjects factor.

That is, proficiency effects were investigated to search for a developmental pattern. Suffixes effects were also analyzed as independent factors since it was hypothesized that the semantic and distributional knowledge of each suffix could be acquired in a different way.

Accuracy Results in the Lexical Decision Task

First, the accuracy results will be discussed. Scores were calculated by assigning one point if the answer was accurate and 0 if the answer was not, i.e., if the target word was rejected. Table 26 depicts the accuracy results by nonword category, suffixes and proficiency level.

Table 26. Accuracy Results in the LDT

Suffix	Proficiency level	Novel Nonwords (NW)		Distributional Violations (DV)		Semantic Violations (SV)	
		M	SD	M	SD	M	SD
–ble, '-ble'	1st Quartile *(n=58)*	.51	.33	.67	.34	.63	.31
	2nd Quartile *(n=44)*	.45	.29	.63	.28	.48	.30
	3rd Quartile *(n=62)*	.48	.29	.71	.32	.57	.28
	4th Quartile *(n=43)*	.48	.31	.74	.29	.57	.32
–dor, '-er'	1st Quartile *(n=58)*	.35	.25	.71	.29	.61	.30
	2nd Quartile *(n=44)*	.29	.26	.67	.24	.65	.29
	3rd Quartile	.41	.29	.82	.23	.75	.26

	(n=62)						
	4th Quartile (n=43)	.37	.24	.82	.29	.69	.28

Suffix	**Proficiency level**	**Novel Nonwords (NW)**		**Distributional Violations (DV)**		**Semantic Violations (SV)**	
		M	**SD**	**M**	**SD**	**M**	**SD**
–ero, '-er'	1st Quartile *(n=58)*	.78	.28	.56	.24	.57	.26
	2nd Quartile *(n=44)*	.79	.26	.59	.21	.48	.27
	3rd Quartile *(n=62)*	.77	.28	.63	.25	.66	.29
	4th Quartile *(n=43)*	.76	.28	.64	.25	.69	.26
–oso, '-ous'	1st Quartile *(n=58)*	.49	.31	.69	.28	.62	.30
	2nd Quartile *(n=44)*	.42	.30	.73	.26	.60	.22
	3rd Quartile *(n=62)*	54	.32	.78	.22	.63	.31
	4th Quartile *(n=43)*	.51	.32	.82	.26	.67	.30

A 3X4X4 RM ANOVA was run to explore the effects of nonword category and suffix, i.e., the within-subjects factors; and of proficiency, i.e., the between-subjects factor, on accuracy scores for the LDT. The assumption of sphericity was met for nonword category, $\chi^2(2)=2.613$, $p=.217$, for suffix, $\chi^2(5)=10.49$, $p=.062$, and for its interaction, $\chi^2(20)=27.016$, $p=.135$.

The main effect of nonword category was significant, $F(2, 406)=137.266$, $p<.001$, $\eta^2=.403$, as were the main effect of suffix, $F(3, 609)=15.761$, $p<.001$, $\eta^2=.072$. However, there

was not a main effect of proficiency, $F(3, 203)=2.019$, $p=.112$, $\eta^2=.029$. This indicates that learners were able to differentiate among the violations and non-violations, and that there was some variability in accuracy due to the characteristics of each suffix. However, the differences between proficiency quartiles were not significant.

Nevertheless, there were significant interactions a) between quartile and category, $F(6, 406)=2.170$, $p=.045$, $\eta^2=.035$, b) between quartile and suffix, $F(9, 609)=1.724$, $p=.080$, $\eta^2=.025$, and c) between category and suffix, $F(6, 1218)=82.057$, $p<.001$, $\eta^2=.288$. The three way interaction d) between category, suffix, and quartile was also significant, $F(18, 1218)=1.679$, $p=.037$, $\eta^2=.024$.

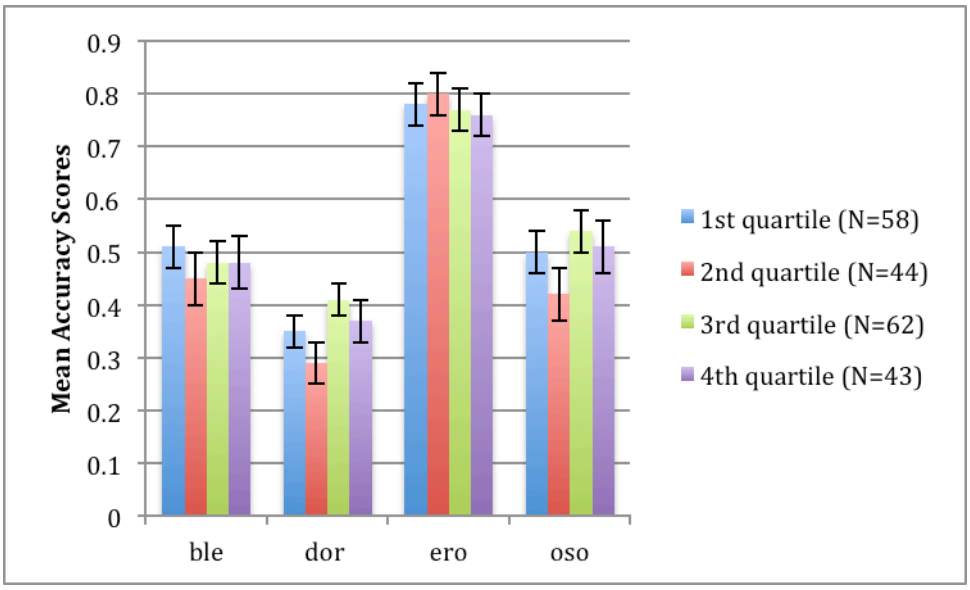
Given that the three-way interaction was significant, each nonword category[15]—Novel Nonwords (NW), Nonwords with Distributional Violations (DV) and Nonwords with Semantic Violations (SV)—is explored next, taking into account possible effects of suffix and proficiency through RM ANOVAs. That is, even though proficiency did not show main effects, there was a proficiency effect within the word categories, i.e., participants reacted differently depending on their proficiency level.

6.3.1.1 Accuracy Results in Novel Nonwords (NW)

For NW (see Figure 21), the assumption of sphericity was met, $\chi^2(5)=3.63$, $p=.603$. There was a main effect of suffix, $F(3,609)=128.33$, $p<.001$, $\eta^2=.39$. However, there was not a main effect of proficiency, $F(3, 203)=.709$, $p=.548$, $\eta^2=.010$. In the same vein, the interaction between suffix and proficiency was not significant, $F(9,609)=1.03$, $p=.418$, $\eta^2=.015$.

[15] Each word category was significantly different from the others ($p<.001$).

Figure 21. Accuracy Results by Proficiency and Suffix (Novel Nonwords)



Since there was only a main effect of suffix in NW, pairwise comparisons were carried out for that variable only. Table 27 illustrates the results.

Table 27. Pairwise Comparisons for Suffixes in Novel Nonwords (NW)

	–ble	*–dor*	*–ero*
–ble, '-ble'			
–dor, '-er'	**		
–ero, '-er'	**	**	
–oso, '-ous'	NS	**	**

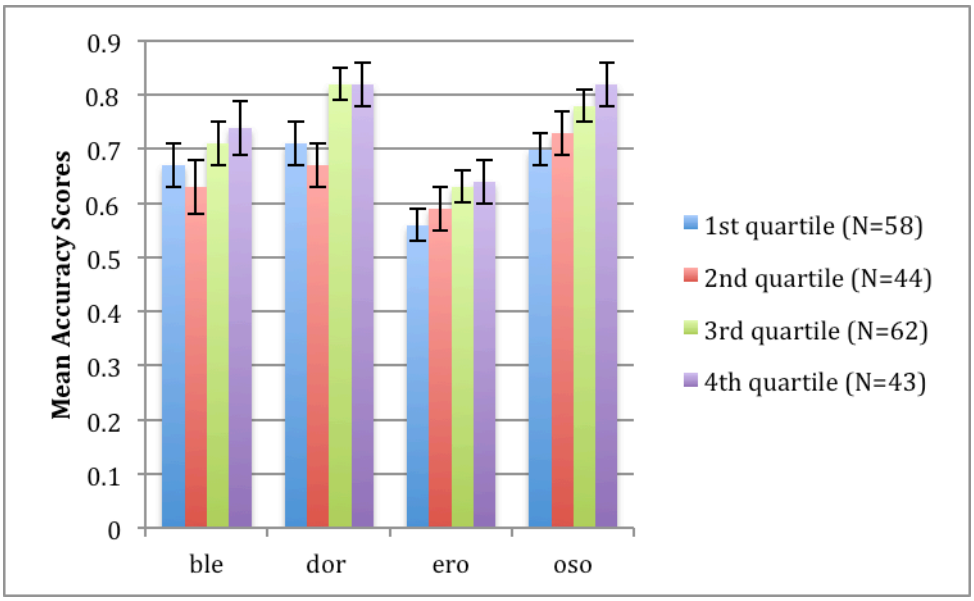
***p<.001, *p<.01, NS=Non-significant*

The pairwise comparisons indicated that learners were the least accurate with the suffix *–dor*: they accepted NW that met *-dor* semantic and distributional constraints, which shows that they knew the new words' constraints. Learners were significantly the most accurate with suffix *–ero*, i.e., they rejected NW carrying this suffix. They were equally accurate with *–ble* and *–oso*.

6.3.1.2 Accuracy Results in Nonwords with Distributional Violations (DV)

For DV (see Figure 22), the assumption of sphericity was not met, $\chi^2(5)=11.28$, $p=.043$. Therefore, Huynh-Feld corrections are reported. There was a main effect of suffix, $F(2.98, 587)=24.46$, $p<.001$, $\eta^2=.108$, and of proficiency, $F(3,203)=3.33$, $p=.021$, $\eta^2=.047$. Moreover, the interaction between suffix and proficiency was not significant either, $F(8.9, 587)=.735$, $p=.67$, $\eta^2=.011$.

Figure 22. Accuracy Results by Proficiency and Suffix (Nonwords with Distributional Violations)



Pairwise comparisons by quartile showed no differences. Nevertheless, the observed power per quartile in DV was below the recommended .50, which was not the case in any other comparison. This lack of power reduces the probability of finding any significant differences that might exist.

The pairwise comparisons for the suffix variable showed significant differences between all suffixes except *–dor* and *–oso* (Table 28).

Table 28. Pairwise Comparisons for Suffixes in Nonwords with Distributional Violations (DV)

	–ble	*–dor*	*–ero*
–ble, '-ble'			
–dor, '-er'	*		
–ero, '-er'	**	**	
–oso, '-er'	*	NS	**

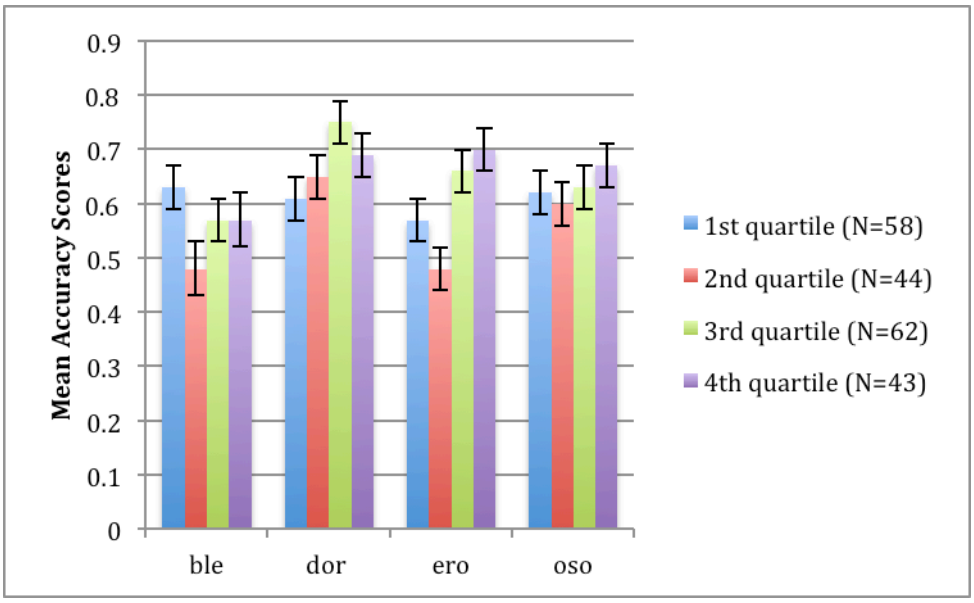
***p<.001, *p<.01, NS=Non-significant*

In DV, learners were better able to recognize distributional violations with the suffixes *–dor* and *–oso* than with *–ero* or *–ble*. Contrary to the NW, the suffix *–ero* was rejected the least.

6.3.1.3 Accuracy Results in Nonwords with Semantic Violations (SV)

For SV (see Figure 23), the assumption of sphericity was met, $\chi^2(5)=6.84$, $p=.233$. There was a main effect of suffix, $F(3, 609)=9.49$, $p<.001$, $\eta^2=.045$, whereas there was no main effect of proficiency, $F(3, 203)=2.28$, $p=.081$, $\eta^2=.33$. There was, however, a significant interaction between suffix and proficiency, $F(9, 609)=3.29$, $p=.001$, $\eta^2=.046$.

Figure 23. Accuracy Results by Proficiency and Suffix (Nonwords with Semantic Violations)



Given that there was an interaction effect between suffixes and quartiles for SV, a RM ANOVA was run within each proficiency quartile. The assumption of sphericity was met for all quartiles.

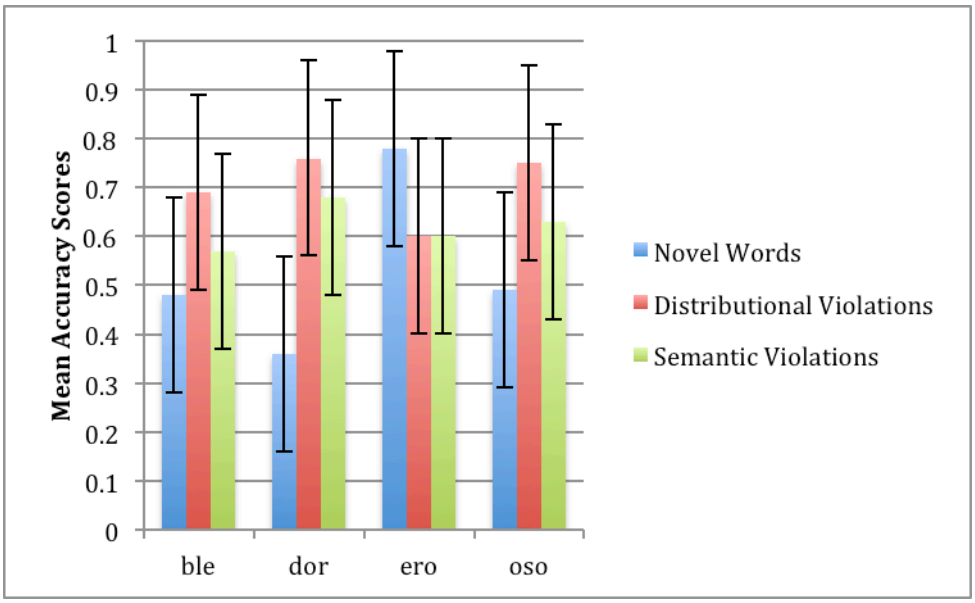
There was no difference between suffixes in the first quartile, $F(3, 171)=.933$, $p=.43$, $\eta^2=.016$. That is, participants rejected the four suffixes with the same level of accuracy. Nevertheless, there were significant differences in accuracy when rejecting the suffixes in the second, $F(3, 129)=6.06$, $p=.001$, $\eta^2=.123$, $\eta^2=.016$, the third, $F(3, 183)=8.75$, $p<.001$, $\eta^2=.125$, and the fourth quartiles, $F(3, 126)=3.26$, $p=.024$, $\eta^2=.072$.

Because of the different accuracy results for the suffixes, pairwise comparisons were conducted for these three quartiles. In the second quartile, *-dor* was more effectively rejected than *–ble* and *–ero* ($p<.01$). In the third quartile, *-dor* was more effectively rejected than *-ble* and *–oso* ($p<.01$). In the fourth quartile, *-ble* was more effectively rejected than *–ero* ($p=.037$).

6.3.1.4 Summary of Accuracy Results

In general, proficiency, the between-subjects factor, did not seem to make a difference for accuracy, except when a RM ANOVA was independently run for NW with suffix as the within-subject factor and proficiency as the between-subject factor. However, the within-subject factors—nonword category and suffix—influenced accuracy results. Figure 24 describes the different behavior of the suffixes in each nonword category.

Figure 24. Accuracy Results for Suffix by Nonword Category



All in all, the distributional and semantic characteristics of the suffix *–dor* were well-known by the learners since this suffix provided the most accurate results. Only with Novel Nonwords were learners making mistakes: they knew what possible words could look like and did not eagerly reject them. The suffix *–ero* showed just a dissimilar pattern to *–dor* suggesting that this suffix is not known by the learners.

Within SV, some proficiency effects were detected. The first quartile did not show any significant differences in accuracy for rejection of the four suffixes; whereas, there were some

differences for the other quartiles. This finding suggests that learning of semantic characteristics did, indeed, happen with proficiency.

For DV, there was no statistically significant difference between proficiency quartiles, but there was a visible improvement in rejecting the suffixes from the first quartile to the fourth quartile (see Figure 22). Learners in the third and four proficiency quartiles were more accurate with recognizing distributional violations than learners in the first quartile.

All in all, distributional violations seem to be more salient for learners than semantic violations since learners were the most accurate under this condition. This implies that learners are familiar with the grammatical category dictated by the base.

Reaction Times Results in the Lexical Decision Task

For analyzing RTs, only RTs of accurate responses were used. Therefore, sample sizes vary accordingly. RTs more than three Standard Deviations (SD) away from the mean were substituted by the means for the quartile. Table 29 summarizes RTs by suffixes, nonword categories, and proficiency quartiles.

Table 29. Descriptive Statistics for RTs by Suffix, Nonword Category, and Proficiency Quartile in the LDT

Suffix	Proficiency level	Novel Nonwords (NW)		Distributional Violations (DV)		Semantic Violations (SV)	
		M	SD	M	SD	M	SD
–ble, '-ble'	1st Quartile *(n=57)*	1054	328	1113	429	977	280
	2nd Quartile *(n=44)*	1121	402	1164	474	1047	482
	3rd Quartile *(n=62)*	1261	468	1332	479	1109	357

	4th Quartile *(n=43)*	1305	425	1381	410	1146	381
–dor, '-er'	1st Quartile *(n=57)*	1117	444	1111	428	1145	501
	2nd Quartile *(n=44)*	1220	486	1232	443	1120	502
	3rd Quartile *(n=62)*	1335	482	1260	383	1149	349
	4th Quartile *(n=43)*	1343	383	1399	477	1305	454

Suffix	**Proficiency level**	**Novel Nonwords (NW)**		**Distributional Violations (DV)**		**Semantic Violations (SV)**	
		M	**SD**	**M**	**SD**	**M**	**SD**
–ero, '-er'	1st Quartile *(n=57)*	1014	403	1133	476	1121	411
	2nd Quartile *(n=44)*	1009	391	1213	454	1269	467
	3rd Quartile *(n=62)*	1084	358	1274	401	1338	479
	4th Quartile *(n=43)*	1206	429	1434	550	1488	521
–oso, '-ous'	1st Quartile *(n=57)*	1114	477	1213	480	1209	481
	2nd Quartile *(n=44)*	1169	485	1226	425	1163	396
	3rd Quartile *(n=62)*	1257	350	1371	438	1279	367
	4th Quartile *(n=43)*	1340	502	1463	442	1365	384

In addition to the 3X4X4 RM ANOVA conducted to analyze the effects of nonword category and suffix (the within-subjects factors), as well as of proficiency (the between-subjects factor), on accuracy scores, another 3X4X4 RM ANOVA was run to explore the effects of these factors on RTs. The assumption of sphericity was not met for the interaction between category and suffix, $\chi^2(20)=41.92$, $p=.003$. Thus, Huynh-Feld corrections are reported.

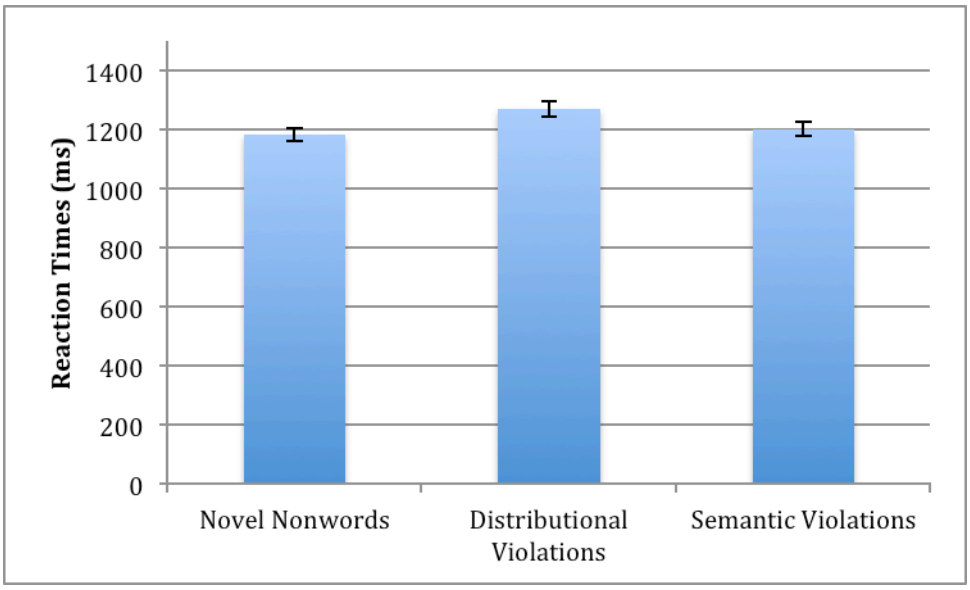
The RM found significant main effects of a) nonword category, $F(2, 404)=16.26$, $p<.001$, $\eta^2=.074$, b) suffix, $F(3, 606)=9.25$, $p<.001$, $\eta^2=.044$, c) proficiency, $F(3, 202)=5.42$, $p=.001$, $\eta^2=.074$, and of d) the interaction between nonword category and suffix, $F(5.89, 1189.43)=13.143$, $p<.001$, $\eta^2=.061$.

However, there were not any significant interactions a) between nonword category and proficiency, $F(6, 404)=.704$, $p=.647$, $\eta^2=.010$, b) between suffix and proficiency, $F(9, 606)=.801$, $p=.615$, $\eta^2=.012$, and c) between suffix, proficiency, and nonword category $F(18, 1189.43)=.908$, $p=.567$, $\eta^2=.013$. Nevertheless, the power observed for the interactions a) between nonword category and proficiency, and c) suffix and proficiency were under the recommended .50. Therefore, these effects need to be explored with caution.

To investigate differences in RTs, post-hoc analyses were only run for significant main effects—word noncategory, suffix and proficiency—as well as for the significant interaction between suffix and category.

Post-hoc analyses by nonword category showed that DV caused significant longer RTs than NW ($p<.001$) and SV ($p<.001$) across quartiles and proficiency levels. Figure 25 illustrates these results.

Figure 25. Reaction Times by Nonword Categories in the LDT

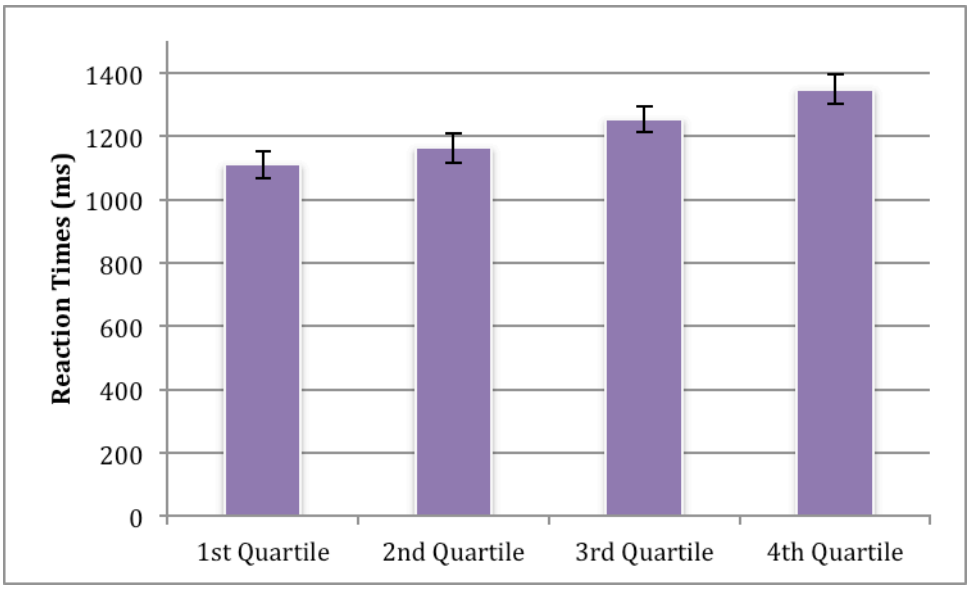


Additionally, post-hoc analyses of RTs for the suffixes revealed that across the four quartiles and categories, RTs were significantly faster for the cognate suffix *–ble* than for *–dor* (*p=.006*) and the cognate suffix *–oso* (*p<.01*). There were no other significant differences (see Figure 26).

Figure 26. Reaction Times by Suffixes in the LDT

Furthermore, post-hoc analyses by proficiency quartiles showed that the fourth quartile was significantly different from the first quartile *(p=.001)* and the second quartile *(p=.039)*. Figure 27 illustrates that the fourth quartile was the slowest group to reject the target words. Moreover, even though the interaction between suffix and category was not significant, RTs increased with proficiency across the three word categories as can be seen in Table 29.

Figure 27. Reaction Times by Proficiency Quartiles in the LDT



Post-hoc comparisons for the interaction between suffixes and categories are compiled on Table 30. All suffixes, with the exception of *–ero*, showed significant longer RTs for DV than for SV. RTs for NW and SV were only significantly different for *–ble* and *–ero*. For *–ble*, SV generated the shortest RTs; whereas for *–ero*, SV caused the longest RTs of the three conditions. Rejecting DV and NW took similar times for *–dor* and *–ble*; whereas for *–ero* and *–oso*, DV took longer time than NW ($p<.01$).

Table 30. Comparisons of Suffixes Across the three Word Categories: Novel Nonwords (NW), Distributional Violations (DV) and Semantic Violations (SV)

Suffix	Category	Significant
–ble, '-ble'	NW—SV	*
	DV—SV	**
	NW—DV	NS

–dor, '-er'	NW—SV	NS
	DV—SV	*
	NW—DV	NS
–ero, '-er'	NW—SV	*
	DV—SV	NS
	NW—DV	**
–oso, '-ous'	NW—SV	NS
	DV—SV	*
	NW—DV	*

**p<.01, **p<.001, NS=Non significant*

6.3.1.5 Summary of RTs Results

To sum up, there were significant main effects of nonword category and suffix (the within-subjects factor), and of proficiency quartile (the between-subjects factor), as well as of the interaction between nonword category and suffix for RTs.

With increasing proficiency, learners needed longer RTs to explore the new *suffix + stem* combination (see Table 29 and Figure 25). That is, learners were progressively more capable of deploying their knowledge of the characteristics of the suffixes. There was no interaction between quartile and the other factors (suffix and nonword category). However, the data showed low power for detecting significant differences. All in all, the longer RTs of more proficient learners suggest that those learners were more aware of the structure of the word than beginning learners.

In general, RTs for DV were significantly longer than for NW and SV. Thus, learners seem to reflect on the distributional constraints of each suffix when found in unknown words. Moreover, participants were not showing statistically significant differences in RTs between NW and SV, which invites the reinterpretation that learners might not be as aware of the semantic restrictions of each suffix as was previously hypothesized. A comparison of suffixes between NW and SV showed that RTs for *–ble* and *–ero* were different, ($p<.01$), whereas *–dor* and *–oso* were not. *–Ble* and *–ero* seem to be differently perceived than *–dor* and *–oso* for these L2 learners.

For example, although in terms of accuracy, *–ble* was not especially helpful—i.e., learners were not accurate when rejecting it—for RTs, *–ble* tended to be the fastest recognized suffix. This might be due to the cognate nature of the suffix. In English, it has the same meaning, form and constraints as in Spanish. Nevertheless, these characteristics did not help when manipulating the suffix in the Test of Productive Awareness of Study 1. Few instances of *–ble* were recorded (see Table 12). If the suffix *–ble* were to be shared between L1 and L2 lexicons, this could explain the reason why this suffix provided the fastest RTs.

The suffix *–ero* seems to be different from the other suffixes. In Table 29, it can be seen how *–ero* tends to show different RTs than the other suffixes for each nonword category. From the explicit knowledge of the learners compiled in Study 1 and Study 2, it is known that this suffix is less known. This could be an explanation for its erratic results, i.e., less known, less analyzed. Nonetheless, it showed lower RTs for SV than the other conditions. This is interesting because semantic constraints seem to be more salient for this suffix.

–Dor and *–oso* showed no significant differences in RTs between NW and SV, but there were differences with DV. Thus, distributional violations tended to raise learners' attention by

increasing RTs for these suffixes.

In brief, these data support the conclusions of Study 1 and Study 2. Nevertheless, these data do not suggest automatization, i.e., implicit knowledge, of the four suffixes analyzed. Therefore, it is hypothesized that the beginning learners from the first quartile might have been guessing, which sped up their RTs in the LDT, and contributed to the unreliability in the comparisons of this quartile with the other proficiency quartiles. In order to explore this hypothesis, the participants' results will be reexamined in the next section.

Reanalysis of Accuracy Results

In order to study whether participants were guessing during the LDT, the percentiles of the accuracy result were analyzed. A cumulative score for all right answers was calculated for the nonword categories: Novel Nonwords (NW), Nonwords with Distributional Violations (DV) and Nonwords with Semantic Violations (SV). The maximum score that could be reached was of sixteen points as there were sixteen words in each category. It was hypothesized that if most participants in one quartile obtained half of the maximum score, they would be guessing. Table 31 shows means, standard deviations, and percentiles for the three nonword categories.

Table 31. Percentiles of the Cumulative Accuracy Scores for the LDT

		NW		**DV**		**SV**	
1st Quartile		M	SD	M	SD	M	SD
(n=58)		8.51	3.74	10.53	3.55	9.71	3.65
	25 Percentile	5		8.75		7	
	50 Percentile	8.5		11		9	
	75 Percentile	11.25		13.25		13	
	Cumulative Percentage Below 8 Points	50%		24.1%		39.7%	
2nd Quartile		M	SD	M	SD	M	SD
(n=44)		7.82	3.19	10.45	2.79	8.86	2.90
	25 Percentile	6		9		7	
	50 Percentile	7.5		10.5		10	
	75 Percentile	10		12.75		11	
	Cumulative Percentage Below 8 Points	59.1%		22.7%		40.9%	
3rd Quartile		M	SD	M	SD	M	SD
(n=53)		8.70	3.59	11.72	3.01	10.28	3.66
	25 Percentile	6		10		7	
	50 Percentile	9		12		11	
	75 Percentile	11		14		13.5	
	Cumulative Percentage Below 8 Points	45%		15.1%		30.2%	
4th Quartile		M	SD	M	SD	M	SD
(n=52)		8.65	3.31	12.08	3.38	10.65	3.59
	25 Percentile	7		10		8	
	50 Percentile	9		13		11.5	
	75 Percentile	11		15		14	
	Cumulative Percentage Below 8 Points	59.1%		40.9%		22.7%	

Only for the accuracy scores of NW does there seem to be random guessing since around half of the learners obtained at least eight points for that nonword category. The problem, however, was not that the learners randomly chose their answers, but that they were more inclined to reject all target nonwords. Therefore, a correlation analysis was run to see whether there was a relationship between rejecting nonwords among the three categories. The results are displayed on Table 32.

Table 32. Correlations among the Three Nonword Categories: Novel Nonwords (NW), Nonwords with Distributional Violations (DV), and Nonwords with Semantic Violations (SV)

	NW	DV
NW		
DV	.714**	
SV	.761**	.777**

**p<.01, **p<.001, NS=Non significant*

The correlations were positive and high, which indicates that participants who rejected more nonwords in one category would also do the same in the other categories. This assertion is especially meaningful for the Novel Nonwords (NW). It was hypothesized that if learners were using their implicit knowledge, there should be a negative correlation between NW and DV as well as NW and SV. That is, participants would reject violations, but accept possible words. These results, however, point that participants tended to reject more than accept the target nonwords. In spite of this, learners perceived a visible difference between nonwords with violations and novel nonwords, i.e., learners recognized violations.

6.4 DISCUSSION

There were three main research questions Study 3 tried to answer:

1. Do learners distinguish semantic (SV) and distributional violations (DV) from possible nonword formations (NW) in accuracy and reaction times (RTs)?
2. Are there differences in RTs and accuracy between semantic (SV) and distributional violations (DV)?
3. How does this implicit knowledge relate to the results of the awareness studies (1 and 2)?
    a. Is there an effect for proficiency for implicit knowledge as well?
    b. Is there an effect due to the specific suffix?

To summarize the results of the RM ANOVA for accuracy, RTs, and their post-hoc analyses, the answers have been broken down in smaller sections in Table 33.

Table 33. Answers to Research Questions in Study 3

Research Question	(Summarized) Answer
RQ1. i) **Non-violations vs. Violations** and **accuracy**.	NW different from violations: committing more errors with NW because they are considered as possible words. (Similar to Burani et al., 1999)
RQ1. ii) **Non-violations vs. Violations** and **RTs**.	NW not different from all violations (*dependent on the suffix*). (Different from Burani et al., 1999)
RQ2. i) **Semantic Violations** (SV) and **Distributional Violations** (DV), and **accuracy**.	Semantic Violations (SV) different from Distributional Violations (DV). (Different from Burani et al., 1999)
RQ2. ii) **Semantic Violations** (SV) and **Distributional Violations** (DV), and **RT**s.	Semantic Violations (SV) *tended to be* different from Distributional Violations

	(DV). (Different from Burani et al., 1999)
RQ3. a.i) **Proficiency** effects on **accuracy**.	**NW**: **NO** main effect. **DV**: **YES**, main effect. Although not statistically significant: 4th quartile tended to be the most accurate, 1st quartile the least accurate **SV**: **NO** main effect.
RQ3. a.ii) **Proficiency** effects on **RTs**.	**YES**. Main effects, but no interaction between accuracy and word categories. RTs from the 4th quartile significantly longer than the 1st and 2nd quartile.
RQ3. b.i) **Suffix** effects on **accuracy**.	**YES**. Main effects and the interaction between suffix, nonword category, and accuracy. Analyses by nonword category followed: **NW**: **YES**. Learners accepted words with *–dor* the most. Learners rejected words with *–ero* the most. **DV**: **YES**. Learners rejected words with *–dor* and *–oso* the most. **SV**: **YES** and differences by **Proficiency**. 1st quartile, all suffixes equally rejected; not the case for the other quartiles.
RQ3. b.ii) **Suffix** effects on **RTs**.	**YES**. Main effects. ***–ble*** the fastest of all **Interaction** between **suffix** and non**word category**: *–ble*: the fastest in SV; *–dor*: the fastest in SV; *–ero*: the fastest in NV; *–oso*: faster in SV than DV; slower in SV than in NW.
RQ3. iii) Degree of similarity in **development** with **awareness**.	The suffixes best known in the Test of Productive Awareness (Study 1) are also best known here, such as *–dor*.

	Similar to the Lexical Inferencing Tests (Study 1) and the Survey of Morphological Awareness (Study 2), first quartile tended to be different from the others. Similar to the Test of Productive Awareness (Study 1), the fourth quartile tended to be different from the others.

This section will elaborate on what the results summarized on Table 33 mean for acquisition of derivational morphology and vocabulary. Moreover, the main aspect of the third research question, "How does this implicit knowledge relate to the results of the awareness studies?," will be discussed.

Burani et al., (1999), who analyzed the reading of nonwords in Italian L1, could only find differences in accuracy and RTs between NW and the two other word categories, namely DV and SV. Their findings diverged from the behavior of these Spanish L2 learners: there were differences among the three nonword categories in accuracy; and between DV and the other nonword categories in RTs. Moreover, these results were also dependent on suffixes, i.e., every suffix prompted slightly different patterns.

In general, DV was always the most salient nonword category, as reflected in a higher accuracy rate and longer RTs. The lack of differences between DV and SV in Burani et al. (1999) can be due to an automatization of the semantic and distributional constraints by the L1 speakers. The data of Spanish L2 learners suggest that automatization has yet to occur: Even the most proficient group in Study 3 did not have the pattern of the Italian L1 speakers. Although the results of the L2 learners in RTs do not point out towards implicit acquisition of derivational morphology, their accuracy results suggest that these learners can distinguish violations from non-violations, which coming from the Weak Interface Hypothesis (see Ellis, 2011) should

precede the automatization process. Thus, the learners are on the right track towards automatization. For future research, more advanced learners that the one of this study should be included in the analysis. It can be hypothesized that near-native learners can be the ones showing automatization of derivational knowledge.

On the other hand, the main effect of suffix, and the effect of the interaction between suffix and nonword category were not explored in Burani et al. (1999). From the data of the L2 learners, this seems to be an important element, especially when some suffixes turned out to be better *acquired* than others. In fact, each of the four analyzed suffixes varied the RTs and accuracy results. For example, learners tended to be more knowledgeable (or accurate) with the suffix *–dor*, less familiar (or less accurate) with the suffix *–ero*, and faster with the cognate suffix *–ble*. For future research, it would be necessary to include a control group of Spanish native speakers where the main effect of suffix can also be explored.

Furthermore, Burani et al. (1999) did not check for proficiency effects since the participants were all adult L1 speakers. In this study on L2 learners, proficiency was a factor influencing learners' decisions; even though, nonword category and suffix were the main factors affecting accuracy and RTs. In general, more proficient learners were more accurate when rejecting DV and SV, and less accurate when accepting NV. The advanced learners also provided longer RTs for all conditions. Given that the results were not statistically significant, it is difficult to consider a gradual learning of the suffixes. Nevertheless, both in terms of accuracy (see Table 26) and RTs (see Table 29), there is an increasing trend from the first to the fourth quartile.

In brief, the differences in RTs and accuracy scores of suffixes support the hypothesis that each suffix is stored in the L2 lexicon as Lowie's (2005) model depicted. The suffixes seem

to be independently learned. For example, while the suffix *–dor* was well acquired for most of the learners; this was not necessarily the case for the suffix *–ero*.

Furthermore, these results are consistent with Study 1 and Study 2. For example, the results of Study 1 showed that learners were very familiar with the agentive suffix *–dor*; the same seems to hold for their implicit knowledge. Learners had more troubles rejecting the suffix when it appeared in potentially possible words, NW. Moreover, since they were not so familiar with the constraints of the suffix *–ero*, which was almost never used for new coinages in Study 1, learners tended to reject it more frequently: they did not recognize the word as a *whole item*, thus they rejected it. In terms of RTs, the behavior of *–dor* and *–ero* was the opposite: whereas *–dor* showed longer times for DV than for SV, *–ero* did not showed any significant differences, but SV took longer than DV. This means that participants would care more about the semantic than the distributional characteristics of *–ero* and vice versa for *–dor*.

These differences between *–dor* and *–ero* are something really remarkable if it is taken into account that for L1 Spanish-speaking children, both suffixes are equally known (Auza, 2008), have the same agentive meaning, and marked nouns and adjectives. Perhaps the more transparent semantic nature of *–dor* can explain this divergence. *–Dor* denotes that somebody does the meaning of the verb, whereas *–ero* has a more *malleable* meaning (Maldonado, in press). For example, *trabajador* is somebody that works (from *trabajar*, 'to work') and *luchador* is somebody that fights (from *luchar*, 'to fight'). *Futbolero* is somebody that likes soccer (from *fútbol*, 'soccer') whereas *camionero* is somebody who drives a truck (from *camión*, 'truck').

Interestingly, the suffix *–ble* seems to be the most internalized of all the suffixes because it tended to produce faster RTs than the other suffixes. This cognate suffix could then be shared between the L1 and the L2 lexicons as has been suggested for shared cognate stems (e.g.,

Sánchez-Casas & García-Albea, 2005). Given that the data of this study merely recorded explicit knowledge, for further research, it would be important to discern if in implicit measurements *–ble* stands out from other suffixes.

All in all, these data supports that learners are aware of suffixes as independent units in their lexicon. Therefore, a dual learning of stems and suffixes needs to be taken into account for models of L2 vocabulary acquisition. Some derived words can be stored with its suffix as a non-decomposable element, but certain suffixes, as *–dor*, are stored independently. For teaching purposes, it seems relevant to include suffixes as part of regular vocabulary instruction. The goal would be to make productive and high-frequency suffixes as familiar as *–dor*.

7.0 STUDY 4: TEACHER COGNITION ABOUT DERIVATIONAL MORPHOLOGY

As stated in the introduction, Study 4 focuses on teachers rather than on learners. The goal of Study 4 is to demonstrate what kinds of instruction of derivational morphology teachers promote. Borg's (2003, 2006) framework of teacher cognition was taken into account to develop this study. This framework considers several factors that influenced teacher's behaviors and beliefs, such as schooling, professional coursework, classroom practices and contextual circumstances. The habitual, methodological approach of the framework—pre-interview, observations, post-interview—has been successfully implemented in studies of teacher cognition on grammar (e.g., Borg, 1998, 2003) and on vocabulary (e.g., Niu & Andrews, 2012; Zhang, 2008). Therefore, contextual factors, such as the influence from the class they are currently teaching as well as their and institutional expectations for that class, and previous schooling and professional coursework were explored in a pre-interview; whereas teaching practices were scrutinized by observing teachers in their classroom and interviewing them a second time.

Given that error sequences regarding derivational morphology are explored in this study, the literature on corrective feedback will be taken into account, especially teacher feedback. According to Lyster and Ranta (1997) teacher-student interactions tend to include the following elements: *Learner error → teacher feedback → learner uptake → topic continuation*. The five kinds of feedback reported—i) explicit corrections, ii) recasts, iii) clarification requests, iv)

metalinguistic feedback, v) elicitations, and vi) repetitions (Lyster & Ranta, 1997)—will be incorporated in the analyses of classroom practices.

Borg's framework is important because it not only shows what happens in the classroom, but also why it occurs in such a fashion. Considering the hierarchical nature of the relationship between teachers and learners in the classroom, teacher's practices might influence learner awareness. Based on that premise, the results of Study 4 will broaden the scope of derivational awareness by analyzing one motivating source of learner awareness. Essentially, Study 4 also explores awareness of derivational morphology; only instead of examining the learner, it analyzes the teachers. Morphologically aware teachers might care more about developing their students' awareness than ones who are less morphologically aware.

As an organizational guide, Table 34 depicts the methodology followed in the study that will be discussed in the following sections.

Table 34. Summary of Methodology of Study 4

Instrument	Coding/Results
Pre-interview	Teachers' profiles were elaborated with this information.
Classroom observations	A system of codes emerged for the vocabulary episodes (see Table 36). Different themes were observed (see Table 37) (Reported under *Vocabulary Episodes*).
Post-interview	To explore their thoughts/motivations on the vocabulary episode (reported under *Vocabulary Episodes*).

7.1 PARTICIPANTS

By email or in person, the researcher approached nine Spanish instructors, who were teaching language college-level courses from the second to fifth semesters, from her personal network. From those, five instructors, who worked with the language learners of Study 1, volunteered to be interviewed and observed. All of these teachers were pursuing a PhD in Spanish literature at the time of the study, which is typical of instructors in such programs. These participants did not know that the focus of the study was on derivational morphology. Table 35 summarizes the main characteristics of these teachers, namely the level they were teaching, their L1 and the number of years they had been teaching Spanish. All names are pseudonyms.

Table 35. Teachers' profiles

Teacher Name	Level Teaching	Teacher L1	Experience teaching Spanish
Juan	2nd semester	Spanish	First semester
Sally	3rd semester	English	Over four years
Fred	4th semester	English	Over four years
Rosa	5th semester	Spanish	Over four years
Pablo	5th semester	Spanish	Over four years

7.2 MATERIALS AND PROCEDURES

Semi-structured Interview (Pre-observations)

A semi-structured interview[16] was used to elicit a profile of each teacher's educational background, language education, teacher education and teaching experience and, specifically, their views on the teaching of vocabulary. The interview, which is included in Appendix D, was based on the model used by Borg (1998, 2003) and Zhang (2008). The order of the questions was modified depending on the teachers' answers, and new questions were added to further explore the teachers' comments. Participants were not specifically questioned about derivational morphology to avoid their being able to infer the main goal of the study and vary their teaching accordingly. Nevertheless, the participants could have ascertained from the interview that vocabulary teaching was the main aspect of this study.

This pre-interview was carried out in Spanish for L1 speakers and in English for L2. For Juan, Sally and Fred the pre-interview was carried out before the observations whereas, due to time constraints, Rosa and Pablo were interviewed in the same weeks that they were observed. All interviews were audiotaped and transcribed. A brief profile of each teacher is given in the results section (7.3).

[16] "Semi-structured interviews are interviews based on a plan or interview guide, which aim to cover key topics and questions, but which are allowed to develop as naturally as possible and not necessarily in the planned order." (Heigham & Croker, 2009, p. 321).

Classroom Observations

These teachers were observed during a minimum of five teaching sessions (between 50 to 75 minutes per session) or the equivalent of teaching a book chapter (around 300 minutes). Each session was audiotaped. During the observations, the researcher had an observational grid based on Niu and Andrews (2012) to take notes about each Vocabulary Instruction Episodes (VIEs). After the observations, all vocabulary episodes were transcribed.

At the start of the coding process, adjustments were made towards delimiting the definition of *a vocabulary episode*. A vocabulary episode was defined as a speech event where a word or several words were the focus of instruction. Within a vocabulary episode, there could be other episodes. For example, within an episode defining words, there could well be a morphology-related episode.

Morphology-related episodes were classified into two main categories: *incidental* and *intentional*. Incidental episodes were those where derivational morphology was introduced without using metalanguage or explicit comments on the affixes and/or the word family. Those more explicit episodes were called intentional episodes. Planned activities also formed part of intentional morphology episodes. These morphology-related episodes are discussed in the results section (7.3).

Semi-structured Interview (Post-observations)

After all observations had taken place, the teachers met with the researcher for a post-interview to discuss the vocabulary episodes. This was not a stimulated-recall interview since in some cases more than three weeks elapsed between the times of the observations. Participants were

shown the episodes' transcriptions and asked about their performance on those episodes. Because of the individual nature of each episode, there was variation between all interviews. The researcher also presented her interpretations of the episodes and asked the teachers whether those were accurate. This post-interview was carried out in Spanish for all participants.

7.3 RESULTS

Before explaining the vocabulary episodes and the morphology-related episodes, a brief profile of each teacher is presented. These profiles were elaborated with the information given in the pre-interview. Following Borg's framework, each profile addresses the teachers' education, professional experiences and contextual factors, such as institutional expectations or class behavior, well as their view on what is relevant in vocabulary instruction. The researcher read and summarized the following points of the semi-structured interview (see Appendix D) to create the teachers' profiles:

a) "Section 1: Education;"

b) Their report on formal teaching experiences, especially focusing on how they were trained to teach vocabulary (question 2 in "Section 2: Professional Development"); and

c) Their thoughts on vocabulary teaching in their classroom (question 7 in "Section 5: Vocabulary Teaching")

Additionally, the whole interview was analyzed to look for teachers' opinions on the teaching of derivational morphology. In sum, these profiles help understanding the background of the instructors.

Participants

7.3.1.1 Juan

Juan is a Spanish native speaker. He learned Russian, German, Latin, Portuguese and English during his schooling. Juan reported his learning of English vocabulary in school as something negative since everything was decontextualized. Juan preferred the Latin class where learners were required to guess words from context, or his study abroad stay in Germany where he had to use vocabulary in an everyday context.

Although he had previously taught English and Spanish composition in his home country, this was Juan's first year teaching at this university. Juan was taking the required methodology class offered by the language department while teaching a second semester Spanish class. He used plenty of metalanguage in his classes and spoke mostly in Spanish. Juan understood language teaching to be a matter of presenting structures to the learners.

Juan believed that learners had to study vocabulary on their own. Through reading, personal interest and exchanges with other interlocutors, learners would be exposed to new vocabulary and acquire it. In the classroom, he did not have any system for teaching vocabulary, apart from incorporating the chapter vocabulary in his speeches. Juan did not like using close-ended activities, such as fill-in-the-blanks or multiple-choice activities, in the classroom. That is why he employed open-ended activities for both vocabulary and grammar. For example, he would dictate words to the learners and then ask them to write a paragraph. During classroom activities, he emphasized the words that needed to be learned for exam purposes and made a clear distinction between the words that would be tested and the words he would introduce just for the sake of a new activity. In the post-interview, Juan elaborated a little bit on how using

derivational morphology was useful for systematically teaching professions, e.g., *zapato,* 'shoe,' versus *zapatero,* 'shoe + *-ero*$_{agentive\ suffix}$, shoemaker.' For him, that was the only vocabulary topic where he could actively use derivational morphology.

7.3.1.2 Sally

Sally is an L1 English speaker. She studied French and Spanish in high school. Her English classes in high school had a strong focus on grammar, i.e., she learned about parts of speech and syntactic trees. For her undergraduate studies, Sally studied Hispanic literature and linguistics. Later on, she completed a master's degree in literature with a strong focus on teaching Spanish as a foreign language. From her training, Sally extracted her approach to teaching: *"[…] what I got out of it, that was, I'm [for] the communicative approach, but not purely communicative because I thought grammar was important."*

Sally did not remember learning a specific way to introduce vocabulary in the classroom. In her teaching, she favored showing words in context and letting learners practice in a meaningful way. Sally was very morphologically aware. In the pre-interview when asked about specific vocabulary that needed to be taught in the classroom, she talked about how helpful it was to introduce word families to the learners since they tended to confuse parts of speech. Sally was the only teacher who talked about the importance of teaching word families in the pre-interview. This was a matter of interest for her because it had helped her in her own process of learning Spanish as a foreign language.

7.3.1.3 Fred

Fred is an L1 English speaker. He learned Spanish in school and attended an immersion program for religious reasons. During missionary work, he was in contact with Spanish-speakers. This

was the experience that mostly helped him with his development of Spanish. After that, he continued learning Spanish at graduate school and also had a study abroad experience. At the time of the study, Fred had taught Spanish for over six years at the university level.

In his teacher training, he learned about the importance of binding,[17] activating previous information, using language in a contextualized manner, and letting the learners know about the goals of each activity. Fred considered these characteristics the main aspects of the communicative approach. He was also very interested in not only teaching language in the classroom, but also in making students reflect on cultural and social issues. The vocabulary activity he preferred the most was asking learners to provide definitions as if they were writing a dictionary.

7.3.1.4 Rosa

Rosa is a Spanish native speaker. During her schooling, she studied French, English and Portuguese as foreign languages. She had had four years of experience teaching Spanish. As part of her initial training as a teaching assistant, she had to take three methodology courses that introduced her to the communicative method.

As a response to her English classes, Rosa aimed for interactive classes with little emphasis on mechanical activities. Rosa was very keen on utilizing PowerPoint and other digital media. During the semester she was observed, she could not integrate any media in her class

[17] Fred did not elaborate on the term of binding since he assumed this was shared knowledge among language teachers. This is the most habitual definition of the term: "Binding is the term I propose to describe the cognitive and affective mental process of linking a meaning to a form. The concept of binding is what language teachers refer to when they insist that a new word ultimately be associated directly with its meaning and not with a translation" (Terrel, 1986, p. 214).

because her classroom lacked media equipment. She apologized for that since she thought the observations would not be representative of her teaching approach. That semester, Rosa was teaching a conversation class where new vocabulary was introduced during each lesson.

In terms of vocabulary instruction, Rosa was trained not to translate, but to provide learners with a sentence where the word was contextualized so that they could infer its meaning. Rosa saw the goals of vocabulary learning as being able to use the new vocabulary item in a sentence, in a real life situation and in more than one context. Therefore, she preferred open-ended activities where learners could be more creative and use the new vocabulary motivated by a practical reason, i.e., to express themselves.

7.3.1.5 Pablo

Pablo is a Spanish native speaker. He had taken English classes since he was a child in his native country. For his graduate studies, he came to the US. During his first month, he had to take an intensive English course required for all L2 English-speaking teaching assistants at his institution. He considered that learning English for so many years in his home country did not bring him much, but that experience abroad vastly improved his language development. This experience influenced Pablo's teaching since he did not consider the language classroom the ultimate place for learning.

Pablo started teaching Spanish as an L2 in his home country. For his undergraduate studies, he focused on both Hispanic literature and linguistics. According to Pablo, his undergraduate studies did not prepare him for L2 teaching. But while teaching L2 Spanish, he worked with a very capable teacher, his boss, whom he liked to emulate. This teacher had clear and logical explanations for all grammar points. During his graduate studies, he took a teaching

methodology class and also Portuguese. Both experiences were beneficial for him in terms of professional development. In his methodological training, he was told to contextualize and visualize vocabulary in the classroom. Pablo believed that learners would be enriching their lexicon according to their practical needs, just as he did when he first moved abroad. For vocabulary teaching, he would follow the vocabulary activities proposed by the textbook.

At the time of the study, Pablo was teaching an advanced class with a high component of grammar and writing. Since Pablo was against the idea of a language instructor as a cheerleader—i.e., as an entertainer—he would just use the textbook. During class time, he covered the grammar with the learners by talking about it and following the textbook activities. From time to time, he would take a break from the textbook and use some time just to talk with the learners. In this class, Pablo considered the textbook as the main element shaping his teaching.

Vocabulary Episodes

Table 36 shows an overview of the number of vocabulary episodes and morphology-related episodes (incidental versus intentional) by teacher. Those episodes not related to morphology, which dealt mostly with words' meaning, are also tallied in the table. The number of episodes of all observed classes by teacher appears in the column: 'Total number of vocabulary episodes.'

Since only Pablo had planned activities related to derivational morphology—i.e., the textbook introduced the prefixes *des–*, 'de-' and *in–*, 'in-'—the morphology-related episodes were not further divided into planned versus unplanned. It is important to bear in mind that Pablo's intentional episodes were mostly planned episodes.

Table 36. Teachers and Vocabulary Episodes' Summary

Teacher's Name	Level	Number of classes observed	Incidental morphology episodes	Intentional morphology episodes	Episodes not related to morphology	Total number of vocabulary episodes (100%)
Juan	2nd semester	7 (350 min)	8 (17%)	3 (7%)	35 (76%)	46 (100%)
Sally	3rd semester	4 (300 min)	9 (15%)	14 (24%)	36 (61%)	59 (100%)
Fred	4th semester	4 (300 min)	8 (31%)	1 (4%)	17 (65%)	26 (100%)
Rosa	5th semester	4 (300 min)	18 (39%)	3 (7%)	25 (54%)	46 (100%)
Pablo	5th semester	5 (300 min)	2 (4%)	7 (13%)	44 (83%)	53 (100%)

All in all, the number of morphology-related episodes varied by teacher, and it did not seem to be dependent on the level of the class. The quantitative results of Table 36 are complemented by the description of the themes of the vocabulary episodes in Table 37.

Table 37. Themes in Morphology-related Vocabulary Episodes

Theme	*Kind of morphological episode*	*Teacher*
Gender Marking	*Incidental*	
	(e.g., giving the article with the noun, error correction)	Juan Sally Fred Rosa
	Intentional	
	(e.g., expanding on the gender marked by the suffix, error correction)	Fred (e.g., *−ma*) Sally (e.g., *−ma, −ista, −ción*)
Word Labeling	*Intentional*	
	(e.g., using metalanguage) 1. Content words 2. Lexicalized categories	Juan Sally Fred Rosa Pablo
Introducing Word-Families	*Incidental*	
	1. Meaning *and* form 2. Error correction (Form *over* meaning) 3. Meaning *over* form	Juan Sally *Rosa* Fred Pablo

	Intentional (e.g., root awareness, word category)	*Sally* Rosa Fred
Planned Activities	*Intentional*	Pablo

The following sections will elaborate on some representative examples of morphology-related episodes related to the themes of Table 37.[18]

7.3.1.6 Gender marking episodes

Incidental

Incidental-gender marking episodes had the potential to raise learners awareness of word endings, which might lead to awareness of word parts. This kind of episode could be just an elicitation or a recast as the following example from Juan's class.

[18] Every example is tagged with a time stamp that refers back to the time the classroom observation happened.

(1) 1 *Student*: […]sobre un$_{masc}$ *ladera*.

2 (‘on a$_{[wrong\ gender]}$ hillside)

3 *Juan*: *Ladera*, sobre un**a** $_{fem}$ …

4 (‘*Hillside*, on a$_{fem}$’)

5 *Student*: No sé.

6 (‘I don’t know.’)

7 *Teacher*: *Ladera*.

8 (‘*Hillside*.’)

9 *Student*: Sí.

10 (‘Yes.’)

11 *Juan*: Entonces…la casa de Cenicienta

12 (‘Cinderella’s house’)

13 *Student*: La casa de Cenicienta, una chica bonita, era grande y sobre *un$_{masc}$*

14 *ladera*.

15 (‘Cinderella’s house, a beautiful girl, was big and on *a$_{[wrong\ gender]}$ hillside’*)

16 *Juan*: *La $_{fem}$ ladera* [blackboard]

17 (‘The$_{fem}$ *hillside* [blackboard]’)

18 *Students*: [laughing]

19 *Juan*: *Ladera*

20 (‘*Hillside’*)

21 *Student*: A lo largo de la casa había muchos árboles […]

22 (‘Along the house there were many trees.’) (10/24/2012)

Juan tried to elicit the correct form, *una*$_{fem}$ *ladera*, 'a$_{fem}$ hillside,' (line 3). The learner acknowledged the correction, but he seemed to be unsure about what Juan was pointed out. Thus, the learner made the same mistake again (lines 13-14), to which Juan replied by recasting the noun with the correct feminine article (line 16). There was, however, no-repair of the sequence by the learner since he did just go on reporting on Cinderella's story without using *una ladera*. This did not seem to be a successful episode of raising the learner's awareness of word endings.

Intentional

Intentional-gender marking episodes could also be promoted by a learner error as the next example from Fred's class shows. The difference with (1) is that here Fred intentionally referred to the gender category of the word. That is, Fred did not recast the error, but provided metalinguistic feedback.

(2) 1 <u>*Fred*</u>: […] *Algún*$_{masc.sing}$, eh, *algún*$_{masc.sing}$ *problema*$_{masc.sing}$ [Blackboard].
2 *Algún*$_{masc.sing}$ *problema*$_{masc.sing}$ porque se acuerdan, *problema*$_{masc.sing}$ es
3 masculino, ok?
4 ('*Some*$_{masc.sing}$, eh, *some*$_{masc.sing}$ *problem*$_{masc.sing}$ [Blackboard]. *Some*$_{masc.sing}$
5 *problem*$_{masc.sing}$ because you remember, *problem* is masculine, ok?')
6 (11/6/2012)

Assigning the wrong category to *problema* is an error that tends to fossilize.[19] Thus, Fred's metalinguistic feedback was well justified. Similarly, Sally, the most morphologically-aware teacher, introduced a longer, impromptu explanation of the gender characteristics of a few

[19] Words that etymologically come from Greek and end in *–ma* are masculine in Spanish. This is against the general norm of Spanish grammar, which indicates that all words ending in *–a* are feminine.

high-frequency suffixes. Sally would revisit the gender category marked by *–dad* and *–ción* and would also expand on the suffix *–ma*.

7.3.1.7 Word Labeling (Intentional)

Content Words

All teachers showed a marked tendency to use metalanguage in their classes. For example, Sally employed metalanguage in her vocabulary episodes—e.g., *¿de qué verbo es?,* 'Which verb does it come from?' *¿Cuál es el infinitivo de este verbo?,* 'What is the infinitive of this verb?,' *Es una abreviatura para decir subterráneo,* 'it is an abbreviation for saying *subway*' (11/1/2012). When talking with her in the post-interview, she claimed that she emphasized to her students that metalanguage is useful to explain and better understand Spanish.

When presenting grammatical structures, teachers logically resorted to word category labeling. For instance, when Sally presented the structure *tan* and *tanto*, 'as…as,' Sally had to label *cómodo* as an adjective and *comodidad* as a noun.

(3) 1 *Sally*: Es un **adjetivo** en este caso, entonces usamos *tan* porque no
2 podemos contar descripciones, no podemos decir un *cómodo,* dos *cómodo,*
3 ¿no? No tiene sentido.
4 ('It is an **adjective** in this case, then we use *as* because we cannot count
5 descriptions. We cannot say a *comfortable,* two *comfortable,* right? It does
6 not make sense.') (11/6/2012)

In her explanation, she labeled *cómodo* as an adjective, but more than that, she expounded on what it means to say that a word is an adjective and not a noun. *Nouns can be*

countable, adjectives can never be. Sally provided negative evidence to the learners by exemplifying what an inappropriate syntactic frame for the word would look like. In the post-interview, Sally claimed that she did not target these differences between adjectives and nouns on purpose when she presented the grammar practice.

Furthermore, Sally's learners used metalingual[20] terms effectively in the classroom. For example, when asking for a clarification, instead of using the formulaic expression, *¿Qué significa x?*, 'What does x mean?,' or something similar, a learner said, *¿Qué es el* ***verbo*** *abrochar?*, 'What is the **verb** button up?' (11/1/2012). In another example, Sally asked why they needed a specific form, and a learner replied, *porque es un adjetivo*, 'because it is an adjective.' (11/13/2012). In other words, Sally's learners were well-versed in metalanguage.

In the most advanced class, Pablo's class, learners also used plenty of metalanguage. In fact, due to the curriculum's strong focus on grammar, Pablo extensively used metalanguage. For example, when introducing relative clauses, Pablo would talk about relative clauses acting as nouns, adjectives and adverbs. Nonetheless, he would also deemphasize the need to know the morphological category represented by the sentence (11/26/2012). Pablo, however, went back to this explanation of relative clauses functioning as words in other lessons (11/28/2012). In the post-interview, when talking about the learners' need to recognize word categories, Pablo highlighted the fact that if the goal of the class was to improve communication, there was actually no need for delving into linguistic terminology.

[20] *Metalingual* is the adjective of *metalanguage*, i.e., using terms such as adjective, noun, etc. It should not be confounded with the adjective *metalinguistic*, which refers to explicit knowledge about the language without entailing metalanguage.

Lexicalized words

Both Juan and Sally had to cover the usage of lexicalized words such as *algún, alguno,* 'some, any.' Although these areas are in-between grammar and vocabulary, these topics were indexed as grammar in the textbooks. When these teachers approached the subject as a matter of assigning word category, those episodes were coded as vocabulary episodes. If the teachers, however, dealt with the phrase structure of the lexicalized word, they were not coded as vocabulary episodes.

For example, in his second lesson, Juan used questions and answers to introduce these lexicalized words and talked about them in terms of word categories. Similarly to the textbook, Juan did not think of the instruction of these lexicalized words as vocabulary teaching. In spite of the teacher's opinion, this was coded as a vocabulary episode.

7.3.1.8 Introducing Word-families' Episodes

The most frequent way of introducing derivational morphology to the learners was the use of more than one word of the same word family in a vocabulary episode. This pattern did indeed appear for all teachers. That is, in the same sentence and/or turn, two members of a word family would be used. However, it was not always equally possible to comprehend the syntactic and semantic differences between the two members. For example, in some cases a learner could easily contrast the noun with the verb, such as *bloquear* (verb) with *bloqueador* (noun) (see example 5); whereas, in other occasions, there was almost no room for disentangling the syntactic and semantic differences (see example 9). Without enough evidence to contrast the forms and their meanings, using more than one word family member could be unhelpful or, worst-case scenario, detrimental for learning.

In brief, there were instances where the stem's meaning prevailed over the word form (example 9) and vice versa (example 6); and there were other examples where the teacher equally highlighted the meaning and form of the whole word (example 5).

Incidental (Form and Meaning)

Words of the same family were frequently introduced when paraphrasing the meaning of a word. For example, Juan remembered aiming for learners to find the form-relationship between words in the extract below.

(4) 1 *Juan*: Dar un *títul**o***$_{masc.nom}$. ¿Cómo *titul**aste***$_{past.imp.2ndperson.sing}$ tu composición?

2 ('To write *a title*. How did you *title* your composition?') (10/31/2012)

Thus, form and meaning were at the same level because there was no conflict in the way they were introduced, i.e., the syntactic patterns of the noun, *título*, and the verb, *titulaste*, were representative of these word categories.

In particular, this pattern reoccurred while constructing definitions with learners' collaborations. In (5), Sally used the verbal form, *bloquear*, 'to block,' not only to elicit the noun from the learners, but also to exemplify the meaning of the new word. Once the word was found, she would also use the two words of the word family together.

(5) 1 *Sally:* ¿Qué tiene que llevar para no quemarse, para no quemarse bajo el
2 sol? ¿Alguien sabe? [Silence] Como para, a ver, uy, para *bloquear* el sol,
3 ¿qué debe llevar?
4 ('What do you have to take with you not to burn yourself, not to burn
5 yourself under the sun? Somebody knows? [Silence]. So for, let's see, *to*
6 *block* the sun, what does one need?')
7 *Student*: [Incomprehensible]
8 *Sally*: Sí, *bloqueador solar*, ¿no? [Blackboard]. Bien, una crema que se
9 pone para no quemarse, para *bloquear* el sol.
10 ('Yes, *sun block*, right? [Blackboard] Good, a cream that one uses not to
11 get burned, to *block* the sun.') (11/1/2012)

Incidental: Error Correction (Form over Meaning)

There were instances where learners produced the inappropriate form from a word family. Because of the nature of the teacher feedback, the form rather than the meaning was the most highlighted aspect in the vocabulary episode. In (6), Fred elicited an unsuccessful correction of the form of the word (*paciencia* instead of *paciente*). When he provided the right answer, the learner was then able to process this formal change (see Line 11).

(6) 1 *Fred*: ¿Hay alguna cosa más?

2 ('Is there something else?')

3 *Student*: Preferimos una persona que haya tenido *paciente*$_{adj}$.

4 ('We prefer a person that has had *patient*$_{adj}$.')

5 *Fred*: Que haya tenido…

6 ('That has had…')

7 *Student*: *Paciente*$_{adj}$, "has patient"

8 ('*Patient*$_{adj}$*, has patient (in English in the original)*')

9 *Fred*: Ok […] una persona que haya tenido *paciencia*$_{noun}$.

10 ('Ok, somebody that has had patience$_{noun}$.')

11 *Student*: *Paciencia* $_{noun}$. [Talking to her group]

12 ('Patience. [Talking to her group]') (10/02/2012)

Generally, confusion within members of word families was motivated by the L1 of the learners. A favorite of Spanish teachers appeared in the following episode.

(7) 1 *Student*: Yo pienso que ahora yo necesito un equilibrio de trabajo y

2 *divertido*$_{adj}$.

3 ('I think that now I need a balance of work and *fun*$_{[adj.wrong\ word\ category].}$')

4 *Rosa*: *Diversión*$_{noun}$.

5 ('*Fun*$_{noun}$.')

6 *Student*: *Diversión* $_{noun}$.

7 ('*Fun* $_{noun}$.')

8 *Rosa*: Eso es importante también, el balance. No todo el tiempo trabajar

9 sino también *divertirse*$_{verb}$.

10 ('That is important, the balance. Not everything is going to be work, but

11 also *to have fun*$_{verb}$.') (9/19/2012)

The learner used the adjective *divertido*, 'fun$_{adj}$,' instead of the noun *diversión*, 'fun$_{noun}$,' (line 2). This mistake was likely made because of an L1 interference. *Fun* in English is both an adjective and a noun so English-speaking learners of Spanish L2 tend to translate 'to have fun' as **tener divertido* instead of using the verb form *divertirse* or the noun form **tener diversión*.[21] From their incorrect translation **tener divertido*, learners infer that *divertido* can be used for the noun 'fun,' which is incorrect. The noun form of 'fun' is *diversión*.

The learner in the episode was aware of Rosa's recast (see Line 6), and it seems possible to assume that the learner recognized the nature of her mistake. To increase the complexity of the vocabulary episode, in line 9, Rosa added the reflexive verbal form, *divertirse*, without any

[21] This is not grammatically incorrect, but it is semantically inappropriate. From anecdotal experience, learners do not tend to use **tener diversión*. Another issue to discuss is why learners would prefer to use the adjectival form, especially given that *diversión*, 'diversion,' is a cognate. A possible explanation is that the adjectival form *divertido* might be more frequent in the classroom, and that *diversión* and 'diversion' do not have the same meaning.

explicit comment. In sum, this could have been a good opportunity to discuss the biunique suffix *–ión* as well as the other members of the family because the noun *diversión*, the adjective *divertido*, and the verb *divertirse* appeared together in the same episode.

When talking with Rosa in the post-interview, she could see the benefits of providing the learners with more information about the word category. Nonetheless, this idea was triggered by the researcher's question, *¿crees que hubiera sido necesario hacerlo un poco más explícito? Decirle: "mira que has usado un adjetivo, necesitas un…,* 'Do you think you should have needed to make it more explicit? Saying "look, you have used an adjective, you need a…,' which might have biased the answer.

Incidental (Meaning over Form)

Meaning-focused activities might hinder the learning of a word's form if members of the same word family are successively presented without a syntactic frame to distinguish them. For example, the textbook of Rosa's conversation class fostered practice of antonyms and synonyms with no reference to word categories. As the example (9) illustrates, this kind of activities caused formal mismatches due to the prevalence of the stem's meaning.

(8) 1 *Rosa*: ¿Quién sabe un sinónimo de algo, de la palabra *estúpidez*? [Silence]
2 Sí, *Student*. ('Who knows a synonym of something, of the word *stupidity*?
3 Yes, *Student*.')
4 *Student*: *Tonto*.
5 ('*Silly*.')
6 *Rosa*: **Cerca**, sería *tontería*. [Blackboard]. *Tontería*…muy bien.
7 ('**Close**, it is *silliness*. [Blackboard] *Silliness*…very good.') (9/19/2012)

The learner produced an adjective of the correct word-family instead of a noun, i.e., *tonto* instead of *tontería*. Rosa acknowledged the word by saying *cerca*, 'close', and pointing out to the semantic relation of the two words. She then went on and provided the right word category by saying it aloud and writing it on the blackboard, but without indicating it was a noun, e.g., saying the article. Rosa, moreover, did not make any comment of the biunique nominal suffixes *–ería* or *–ez*. The word *tonto* is also problematic since the same form can be a noun and an adjective, only the syntactic frame allows for discriminating its function. It is questionable whether the learner was able to see the formal nature of his mistake.

Another interesting mismatch between form and meaning was found in a synonym activity. In fact, the teacher might have motivated this mismatch since she used a verb when exemplifying the meaning of the noun *descubrimiento*, 'discovery.' That is, Rosa also concentrated on the meaning of the stem *descubr-*, 'discover.'

(9) 1 Rosa: Número 4, sería, Ok, *descubrimiento*. ¿Cuál sería para la palabra
2 *descubrimiento*?
3 ('Number 4, it is, Ok, *discovery*. What is the word for *discovery*?')
4 Student1: [Incomprehensible]
5 Rosa: Eso es una consecuencia de un *descubrimiento*. Pero por ejemplo,
6 "yo tuve un *descubrimiento* muy grande, supe el secreto de la felicidad."
7 ¿Qué es un *descubrimiento*? O "yo *descubrí* un secreto"…¿no?
8 ('That is a consequence of *a discovery*. But for example, 'I had a great
9 discovery, I knew the secret of happiness' What is a discovery? Or 'I
10 *discovered* a secret'…no?')
11 Student2: ¿*Enterarse*?
12 ('*To find out*.')
13 Rosa: *Enterarse*, **ese es el significado**. La palabra es *revelación*
14 [Blackboard] *revelación*, la *revelación*. Mmm. La *revelación*.
15 ('*To find out*, that is the **meaning**. The word is *revelation* [Blackboard]
16 *revelation*, the *revelation*. Mmm. The *revelation*.') (9/19/2012)

Student 2 provided a verb, *enterarse*, 'to find out,' (line 11), as a synonym for the noun *descubrimiento*, 'discovery.' Rosa might have promoted the mistake since she exemplified the meaning of the stem *descubr-* using a verb, *yo descubrí un secreto*, 'I discovered a secret,' (line 7). Rosa told the student that he correctly understood the *stem* meaning, *ese es el significado*, 'that is the meaning,' (line 13). Next, Rosa gave the right answer, using the noun form

revelación, 'revelation.' However, she did not reflect on the sentence *ese es el significado* and what it entailed, i.e., that the nominal and the adjectival form share the same meaning because of their common stem (*descubr*-). By saying *ese es el significado* without any further explanation, she implies that a word can be defined by the meaning of its stem, disregarding its syntactic function. Therefore, mixing words of the same family when defining a word might potentially hinder the learning of the syntactic function that the suffix marks.

Intentional (form and meaning)

The main difference between incidental and intentional episodes introducing word families lies in the labeling of word categories. When labeling words, a greater balance between teaching of meaning and form was achieved: labeling helps with the noticing of the word category. Furthermore, this labeling is motivated by teachers' awareness of the complexity of learning word-families. For example, both Sally and Juan commented on students' difficulties with parts of speech during the interviews. This was also reflected in their teaching. Nevertheless, all teachers commented in the post-interview that they were relatively unaware of introducing word families throughout their discourse.

In the example below, Sally tagged the part of speech, *bastar*, 'to be enough,' as verb, and made an intentional connection between the words of the word family, *bastar* and *bastante*, 'enough.'

(10) 1 *Sally*: Ok, ¿qué quiere decir *basta*? […] Oh, muy bien. Viene de, o sea
2 es una palabra relacionada a *bastante*, ¿no? Como dijo S, *bastante*
3 quiere decir *enough*, ¿no? Entonces *bastar* es, perdón, es el **verbo** que
4 quiere decir como "ya vamos a ponerle fin. O hemos tenido *bastante*.
5 Me canso de esto." Sí, "estoy cansada de *tatata*."
6 ('Ok, what does it mean '*to be enough*'? […] Oh, very good. It comes
7 from, it is related to *enough*, right? As S said, enough means *bastante*,
8 right? Then, *to be enough* is, sorry, the **verb** that says: 'we are going
9 to end this. We have had *enough*. I am tired of this.' Yes. 'I am tired
10 of *tatata*.') (11/08/2012)

Sally, as the most morphologically-aware of the teachers, had several similar episodes. In one outstanding episode, she intentionally defined the stems of the verbs *aterrizar*, 'to land,' and *despegar*, 'to take off,' without using metalanguage, but instead drawing learners' attention to morphological complexity.

(11) 1 *Sally*: ¿Qué hizo el avión? ¿Sí?

2 (‘What did the plane do? Yes?’)

3 *Student1*: *Aterriza*.

4 (‘It *lands*.’)

5 *Sally*: Bien, *aterrizó* [Blackboard]. Ok, *aterrizó*, que es de *tierra*.

6 Cuando llega de nuevo a la *tierra*, ¿Ok? ¿Cuál es el opuesto de

7 *aterrizar*, *Student2*?

8 (‘Good, it landed [Blackboard]. Ok, it *landed*, that comes from *land*.

9 When it arrives again to the *land*, ok? What is the opposite of *to land*,

10 *Student2*?’)

11 *Student2*: *Despegar*.

14 (‘To take off.’)

15 *Sally*: *Despegar*. Ok [Blackboard]. *Despegar*. Es como…¿saben qué

16 quiere decir ‘pegar’? Como lo que hacen con cintas, o por ejemplo, es

17 *pegar*, ¿no? Entonces, *despegar* es como *uuffs* [Gesture separating her

18 hands]. The plane literally *unsticks* itself from the ground. Ok, muy

19 bien. Ok, ¿y número 6, qué hace? […]

20 (‘*To take off*. Ok. [Blackboard]. *To take off/unstick*. It is…do you know

21 what *to stick* means? Like what you do with tape, or for example, *to*

22 *stick*, right? Then, *unstick* is like *uffs* [Gesture separating her hands].

23 [In English in the original] The plane literally *unsticks* itself from the

24 ground. Ok, very good. Ok, and number 6, what is she doing?’)

(11/1/2012)

Sally explained that *aterrizar*, 'to land,' was related to the noun *tierra*, 'land.' She paraphrased the meaning of the verb using the word *tierra* too. It is even more interesting how she illustrated the meaning of *despegar*. Sally did not translate it as *to take off*, but elaborated her answer looking for one of the main meanings of the verb *pegar,* 'to stick.' This was a very clear example for the learners supported with her hands gesture. During the post-interview, Sally even commented that she was not sure whether *unstick* was a verb in English. This makes the event even more noteworthy since Sally was clearly paying attention to the Spanish prefix and verbal stem by matching them with an English prefix and verbal base.

In contrast, in Rosa's class, even when labeling words, there was still a prevalence of meaning over form. In fact, the examples in Rosa's class showed how difficult it could be to infer the right syntactic category from the input. When talking with Rosa about her vocabulary episodes, she was surprised about finding so many utterances where she provided several words of the same word family without making any distinctions among them. Rosa admitted not paying attention to the syntactic category of a word, rather to its meaning. When reading the transcripts, she stated the best way to produce words of the same word family was found in the next example; but mainly because she started by giving a general example and then relating the sentence to the learners' experiences, i.e., form was not the main issue here.

(12) 1 *Student1*: La felicidad concebida en la felicidad como *hedonismo*.

2 (‘Happiness understood as happiness as *hedonism*.’)

3 *Rosa*: Correcto. Esa palabra es importante. *Hedonismo* [Blackboard]

4 El *hedonismo*. *He-do-nismo*. ¿Qué es el *hedonismo*? ¿Quién me puede

5 definir qué es el *hedonismo*? Carpe diem por ejemplo es un…¿sí?

6 (‘Correct. That word is important. *Hedonism*. [Blackboard] The

7 *hedonism*. What is *hedonism*? Who can define *hedonism*? Carpe Diem

8 for example is an…yes?’)

9 *Student1*: Es la creencia que se debe hacer cosas que dar placer…que

10 (‘It is the belief that one should do things that to give pleasure …that’)

11 *Rosa*: Que dan.

12 (‘That they give.’)

13 Student1: Que dan placer, sí.

14 (‘That they give pleasure, yes.’)

15 *Rosa*: mm…correcto, S2.

16 (‘mm…correct, S2.’)

17 *Student2*: Tener placer en todo.

18 (‘To have pleasure in everything.’)

19 *Rosa*: Ok.

20 *Student3*: [incomprehensible]

21 *Rosa*: Correcto. Es una idea de no importa mañana, lo que importa es

22 hoy. Carpe diem, ¿no? Carpe diem. Esa es la mentalidad de los

23 *hedonistas*$_{\text{noun}}$. El **adjetivo** sería una persona que le gusta o practica

hedonismo. Es un *hedonista*$_{\text{noun}}$. *Hedo-nista*. [Blackboard] ¿Ustedes se consideran *hedonistas*$_{adj}$ o no? ¿Qué piensan? Alguno de ustedes dicen "yo soy un *hedonista*$_{noun}$." [Silence] ¿Nadie? ¿Por qué, Student 4?

('Right. That is the idea that we don't care about tomorrow, what is important is today. Carpe diem, no? Carpe diem. That is the mentality of the *hedonists*$_{\text{noun}}$. The adjective would be a person that likes or practices *hedonism*. He is a *hedonist*$_{\text{noun}}$. *Hedo-nist*. [Blackboard] Do you consider yourself *hedonist*$_{adj}$? What do you think? Any of you say "I am a *hedonist*$_{\text{noun}}$." [Silence] Anybody? Why, Student 4?) (9/21/2012)

Rosa considered that this example was less confusing as those presented under the epigraph *incidental* (see examples 8 and 9) because she explicitly indicated that the second form she was giving, *hedonista*, was an adjective. Nevertheless, she used the adjective in a nominal frame, *un hedonista*, since *–ista* is both a nominal and adjectival marker. Assuming that word labeling is indeed helpful for making learners aware of the word's form, instead of saying *el adjetivo sería una persona*, 'the adjective would be a person,' Rosa could have said something along the lines *el adjetivo describe a una persona*…, 'the adjective describes a … person.' This should reduce ambiguity of word category. *–Ista* is not a biunique suffix, and *hedonista* is used in two different syntactic frames: *¿ustedes se consideran* <u>*hedonistas*$_{adj}$</u>*?*, 'Do you consider yourself <u>hedonist</u>$_{adj}$?,' versus *Yo soy un hedonista*$_{\text{noun}}$,'I am a <u>hedonist</u>$_{\text{noun}}$.' In sum, a variety of unambiguous morphological and syntactic frames, which allow for contrast, are important in teaching derivational morphology.

7.3.1.9 Planned Activities: Intentional (Prefixes *in-* and *des-*)

Only in the advanced textbook of Pablo's class were morphology-related activities included for the observed lessons. Pablo and his learners had to talk about the prefixes *in–*, 'in-,' and *des–*, 'de-' (30.11.2012), neither of which changes word category. His learners were well aware of metalingual terms such as prefixes. Pablo went over the prefix *in–* by focusing on the semantic information given by the suffix:

(13) 1 *Pablo*: Normalmente estos prefijos dan la idea de opinión o contraste.
2 ¿Ok? También de privar, quitar o carecer de algo.
3 ('Usually these prefixes give the idea of opposition or contrast. Ok? And
4 also of depriving, removing or taking from something.') (11/30/2012)

When talking with Pablo in the post-interview, the researcher asked him why he did not comment on the characteristics of the different allomorphs of *in–*. Pablo considered that he probably should have added that information, but he did not think of that at the time of the activity. Once more, meaning was more prevalent than form.

The textbook activity was a matching activity where learners had to connect the definition with a vocabulary item carrying the prefix *in–*. That is, even though this was a morphology-related planned activity, this activity did not seem to raise learners awareness more than other incidental activities. This assertion is, however, merely speculative since the learners' opinions are unknown.

When introducing the prefix *des–*, Pablo indicated the distribution of *des–* by pointing out that all words in the example were verbs. Therefore, there was extra information of the distributional characteristics of this suffix. The practice activity consisted in filling the gaps with

the right derivative form. In most of the sentences, the textbook included a form without the suffix and a form with the suffix. This format had the potential to help learners to separate the semantic and distributional characteristics of the suffix.

In the following class (5.12.2012), there were again planned activities dealing with the suffix *in–*. The format was changed, though: it was now a fill-in-the-blank activity. The format was, however, not as enlightening as the fill-in-the-gap activity for *des–*. This activity was purely about filling the gap with a word carrying the prefix *in–*, and there were no morphologically-related words in the sentence to fill in.

7.3.1.10 Summary of Teachers' Degree of Morphological Awareness

Apart from labeling words, Juan and Pablo did not stand out as very morphologically-aware instructors. For Fred, morphological awareness was not a priority either. However, this does not mean that these teachers did not spend time on other linguistic elements, especially on inflectional morphology. For example, Fred discussed the present perfect subjunctive with its conjugation, relative pronouns and sentences, and the neuter *lo* (Chapter 9, Blanco & Colbert, 2010). Juan's class, a second semester class, had a greater stress on verbal forms: preterit and imperfect, subjunctive, and conditional (Chapter 12 and Chapter 13, Castells et. al, 2012). Pablo, in his fifth semester class, also discussed subjunctive and conditional forms (Chapter 6, Canteli Dominicis & Reynolds, 2011).

Rosa's class was remarkable for the amount of new vocabulary presented every day. The textbook, however, never focused on derivational morphology, and Rosa was not very intentional in raising the morphological awareness of her students. Even though there were many instances of incidental episodes where words of the same word family were introduced, there

were few instances of word labeling and frequent episodes of formally ambiguous presentations of word categories. Nonetheless, the past tenses preterit and imperfect were reviewed in that lesson, i.e., the book focused on other linguistic features. Due to the high level of the class, there was, however, more emphasis on reviewing when to use each aspect—perfect or imperfect—rather than on conjugating the verb.

Unlike these other instructors, Sally's classroom observations depicted a very morphologically-aware instructor, who included unplanned, intentional episodes in her classes. Those episodes were integrated into the teaching points of the lesson and, therefore, enhanced them. Moreover, the incidental episodes, especially those paraphrasing the meaning of a word, also promoted the learners' morphological awareness. This class should be a good environment for raising learners awareness. All in all, the learners of Sally's third-semester-class were those most exposed to derivational morphology in an intentional way. In the class, there was also exposure to inflectional morphology since the subjunctive was reviewed (Chapter 5, Blanco & Colbert, 2010).

When comparing Sally with Fred, it is clear that being a second language speaker of the target language is not a criterion for being a morphologically-aware teacher. According to the interviews, professional training does not seem to delve into vocabulary instruction. Their common belief about vocabulary instruction was that vocabulary should be always contextualized and be meaningful for the learners.

In reality, Sally's own experience as a morphologically aware second language learner is what triggered her way of raising learners awareness of morphology.[22] Therefore, given that all

[22] Sally: *Eso fue una forma que me ayudo a mí a aprender y a empezar a... a ver las relaciones, entonces como... a ver, si vemos... si sabemos el verbo mantener y luego vemos mantenimiento y luego... vemos, por ejemplo, no sé, mantenido... entonces, para que vean que no es... como... no es ningún misterio.* ('That was a way that helped me to

these teachers are successful second language learners, not all language learners equally consider the utility of derivational morphology.

7.4 DISCUSSION

The goal of this study was to describe the kind of instruction of derivational morphology that predominates in the Spanish L2 classroom. In essence, these data show that there is hardly any planned instruction of derivational morphology, and that derivational morphology is not a priority for teachers. In spite of these adverse circumstances, derivational morphology can always find a niche in the classroom, e.g., when teachers correct lexical errors or define new words (see Table 37). In those occasions, the focus on affixes and/or word families is significant.

For example, the data showed that morphological errors affecting word form were promptly corrected. The teachers then focused on gender marking (see examples 1 and 2) and word category (see examples 6 and 7). Since lexical errors are corrected around 80% of the time (Lyster, 1998),[23] this is a constant way of introducing derivational morphology in the classroom.

Additionally, although not all kinds of definitions include word families, there seems to be an abundance of definitions based on word families in the foreign language classroom. This is not so remote from the approach followed in lectures. Flowerdew's classification system for definitions (1992) suggests that word-families tend to be used when providing a definition. A problematic issue is, however, that the emphasis of the *definition* activities, e.g., those related to

---

learn and see the relationships between (words). For example, if we see the verb maintain, and then we see maintenance, and then, for example, maintained. So that (the learners) see this is not a mystery.')

[23] Although this percentage was extracted from observations of immersion classes, a similar percentage should be found in classes where language instruction is even more dominant.

synonyms and antonyms, was always on meaning, and never on forms (sees examples 8 and 9). Since it is known that teaching words with similar forms simultaneously hinders vocabulary learning (see Nation, 2001), a warning to book authors and teachers is justified.

To summarize the main findings of the classroom observations, it can be said that the morphology-related episodes were mostly unplanned. From those, their nature was mostly incidental since teachers tended not to be aware of derivational morphology as an instructional focus. Occasionally, those episodes generated mismatches between form and meaning when form was pushed into the background. Intentional episodes, on the other hand, sought a balance between form and meaning by labeling words or commenting on the affixes and stems. Although meaning is the basis for comprehension, a more refined approach to vocabulary instruction needs to regard the formal characteristics of a word.

Furthermore, the problematic nature of the episodes mismatching form and meaning can be better understood under the framework of Input Processing (IP) and its pedagogical counterpart, Processing Instruction (PI). IP is "concerned with how learners come to make form-meaning connections" (VanPatten, 2007, p. 127), whereas PI analyzes the question: "to what degree can we either manipulate leaner attention during input processing or manipulate input data so that more and better form-meaning connections are made?" (VanPatten, 2005, p. 272). Although IP and PI are discussed mostly at the sentence level, these ideas can also be applied at the lexical level. As seen in the observations, teachers do not always provide a proper syntactic frame for new words, which leaves the learners with no room to build a syntactic-meaning relationship. That is, just associating a stem's meaning and form does not help in processing the function of the whole word. For example, this was the case when *descubrimiento*, 'discovery,' and *descubrir*, 'to discover,' were analyzed only through their common stem (see example 9).

Therefore, it can be suggested that teachers present words in a proper syntactic frame so that learners have enough information to infer and/or process the word's meaning-form, not just the meaning-form of the stem. This is a mere confirmation of the well-known principle of "contextualize vocabulary!" that all teachers' in this study talked about. However, it might need to be reinforced that context is not just the thematic context, but also the phrasal context.

Previous observational studies (Carroll & Swain, 1987; Sanaoui, 1996) have already pointed out that meaning is prioritized over form during incidental and intentional vocabulary instruction. That is, derivational morphology was not a main issue in the classroom. Going back to Borg's framework (2003, 2006), some explanations can be offered about this situation, especially in regard to professional coursework, contextual circumstances and their own schooling.

First, according to Sally, Fred, Juan, Pablo and Rosa, their professional training did not approach much teaching of vocabulary, and what their training emphasized was that vocabulary is about *meaning*, that it should be contextualized, and that it should not be translated into the L1. In a word, there was no reflection on morphological awareness, at least that they remembered, in their training.

Second, the textbooks used can be included as a main factor contributing to the contextual circumstances influencing these teachers. The majority of the vocabulary activities in the textbooks dealt with meaning, not with form. The purpose of the study was not to review the textbooks used; but, of the chapters covered, only for Pablo's class there was any practice of Spanish prefixes. From the interviews, it is clear that the textbooks were the main source of vocabulary instruction, i.e., the vocabulary goals were the goals set by the book. It does not help that Carroll and Swain (1987) already pointed out that textbooks did not systematically deal with

derivational morphology, and that Brown (2010) found a minimal number of activities related to word parts in his exploration of English textbooks. Textbook authors should also reflect on the several aspects that can be considered when working with vocabulary in the classroom.

Third, in terms of their own schooling, the five teachers had similar experiences: all of them learned a foreign language and spent time abroad. Pablo and Juan stressed how their study abroad helped them in learning vocabulary. Not the classroom, but the study abroad *taught* them vocabulary. Sally, however, was the one who reflected on how derivational morphology helped her in learning her L2.

All in all, contrary to Zhang's interviewed teachers (2011), who considered teaching rules of derivational morphology as something not really reliable, Rosa, Pablo, Fred and Juan did not have any special motivation for not working more with derivational morphology. Basically, the influence of their own schooling, their teacher training and their own experience learning foreign languages seem to be the reasons why derivational morphology was not explicitly explored in their classrooms. After all, raising awareness of and systematic teaching of derivational morphology are not the only aspects to be aware of when working with vocabulary. Nevertheless, the emphasis on rejecting the L1 and on focusing on the stem's meaning militates against the successful instruction of derivational morphology. In general, a minimum stress on derivational morphology should help learners remember words more easily, reduce problems in word category assignment, and give learners a good tool to autonomously infer and learn new words in two languages so formally related as Spanish and English.

8.0 GENERAL CONCLUSIONS

In this section, a brief summary of the main results is presented followed by an analysis of the implications for vocabulary and morphology research as well as for instruction. Finally, some suggestions for future research are proposed.

8.1 SUMMARY

Study 1 has shown that morphological awareness and vocabulary knowledge are different, and that knowledge of monomorphemic words does not necessarily predict derivational awareness. However, these assertions need to be further clarified because derivational awareness varied according to the way it is measured, that is whether it was receptively or productively measured. Whereas derivational awareness, productively measured, is mostly influenced by proficiency; when receptively measured, it is influenced more by a learner's vocabulary size. On the tests, learners showed higher scores for receptive tasks than for productive tasks.

For the Lexical Inferencing Test of Study 1, i.e., the receptive test, a ceiling effect occurred. Learners could easily recognize the word category marked by the biunique suffixes used in the test: only the lowest proficiency learners showed some uncertainty in the tests. For the productive test, the learners at the highest proficiency level in the study outperformed the

other learners. To sum up, a partial awareness was obtained before a complete awareness could be reached. However, a very limited number of suffixes was known, even for the most advanced learners.

Study 2 complemented the results of Study 1. It analyzed learners' morphological awareness in more detail by exploring inferencing strategies and decoding ability through two metalinguistic tasks. That is, morphological awareness was receptively measured. In terms of strategies, learners at all levels reported using morphologically-related inferencing strategies. Interestingly, there was an increase in strategies related to affixal and word family awareness by proficiency: the first proficiency group was significantly weaker than the others while the fourth proficiency quartile tended to stand out. Moreover, the structure of the complex word influenced the choice of inferencing strategy. The developmental pattern of this test was very close to the Test of Productive Awareness of Study 1.

For decoding abilities, learners were able to explicitly decompose a complex word. Overall, the learners knew six of the eight suffixes tested. Only the learners in the first proficiency quartile were weaker than the other proficiency levels. The Decomposition Test showed the same developmental pattern as the multiple-choice test used in Study 1 and also revealed that instructed suffixes and low-frequency suffixes can challenge learners' inferencing processes.

Study 3 intended to analyze semantic and distributional, implicit knowledge of derivational morphology by measuring RTs and accuracy in a timed LDT. Differences were established between nonwords showing distributional violations, semantic violations and novel nonwords following the semantic and distributional constraints marked by the suffixes. That is, learners displayed knowledge of suffixes' constraints.

Furthermore, the characteristics of the suffix played a role in determining learners' reactions. For example, these data also showed that the suffix *–dor* was better known that the suffix *–ero* since learners could more easily accept words following its semantic and distributional constraints. Facilitating cognate effects in RTs could be found in the suffix *–ble*.

Additionally, proficiency tended to increase the RTs and accuracy of the participants, and semantic and distributional violations were processed differently. That is, learners did not show automatization of distributional and semantic knowledge. Given that the participants are on the right track to automatization according to the Weak Interface Hypothesis; it is, however, hypothesized that near-native speakers of Spanish L2 would show automatization.

Finally, Study 4 examined teachers' beliefs and practices about derivational morphology since teachers are assumed to influence L2 learners in instructed SLA. Borg's framework (2003) was used to better explore the reasons motivating teacher behaviors when dealing with derivational morphology. Although the teachers studied were not very morphologically aware, derivational morphology was incidentally taught in their classrooms. Moreover, teachers who were morphologically aware learners seem to include more intentional teaching of derivational morphology in their classes. Teacher training does not seem to confront teachers with the instruction of the different levels of word knowledge. For example, pedagogical frameworks of aspects included in word learning, such as Nation's (2001), are not common knowledge. In general, teachers' schooling seems to be the main factor determining a teacher's preference to include morphology in the classroom.

In general, teachers and textbooks tend to prioritize the meaning of the stem over its formal characteristics. This can be detrimental for learners when establishing a connection between the form of a suffix with its semantic and syntactic features. Overemphasis on a stem's

meaning might reduce room for learners to notice suffixes. More structured and syntactically rich instruction of derivational morphology could help learners to expand their arsenal of derivational suffixes. Further studies should explore these hypotheses.

8.2 EXPLICIT AND IMPLICIT KNOWLEDGE OF DERIVATIONAL MORPHOLOGY

This dissertation intended to be an overview of instructed derivational morphology. In terms of explicit knowledge, the results have illustrated that English-speaking learners of L2 Spanish are morphologically-aware. For example, learners can verbalize their thoughts on derivational morphology and recognize the characteristics of biunique suffixes. When awareness is measured productively, it can be seen that learners are limited to a handful of suffixes, but they can still deploy their knowledge of word formation rules and create new words.

Moreover, most of the learners' declarative knowledge about morphology, i.e., what they can verbalize, is *learned* without explicit teaching. That is, even though learners receive metalingual information in the classroom, they are not told the specific characteristics of each suffix. Learners are then able to *infer* all the explicit information from the suffix departing from their L1 knowledge of language systems—i.e., their metalinguistic ability—and using morphological awareness to identify, analyze, and manipulate this specific Spanish suffixes. The main issue here is the limited number of suffixes learners are aware of. Targeted instruction should facilitate identifying not only the most semantically salient and regular derivational suffixes, but also a wide array of high-frequency suffixes.

This dissertation has also included a measurement of learners' implicit knowledge of derivational morphology, a Lexical Decision Task (LDT). Although the learners in the study did not achieve automatization of derivational morphology, i.e., they did not show lower RTs increasing with proficiency, it is hypothesized that learners more advanced than the ones studied here could. As a matter of fact, learners were very accurate when rejecting nonwords showing derivational violations. Therefore, if derivational awareness can be later move into procedural knowledge, learners will then automatize implicit derivational knowledge (e.g., DeKeyser, 2007; Ellis, 2011).

8.3 MODELS OF ACQUISITION OF VOCABULARY AND DERIVATIONAL MORPHOLOGY

According to the findings, when establishing a model of acquisition of vocabulary and derivational morphology, it is necessary to specify that monomorphemic words are not necessarily learned in the same way as suffixes. This assertion can be extended to claim that complex words are not learned in the same way as monomorphemic words. Lowie's (2005) model works with the data here presented: distributional suffixes are stored with their semantic, distributional and syntactic characteristics. Moreover, Jiang's (2000) model can also be applicable to derivational morphology: L2 derivational morphology is acquired later than other word knowledge, i.e., the stem meaning. Words can be both stored as a whole and as the sum of its elements.

All in all, for a model of vocabulary acquisition, learning of stems needs to be differentiated from learning of suffixes. Each specific suffix presents different challenges for the learners. Moreover, in this study, participants were learning a very similar language to their L1: derivational morphology works similarly in both languages; and many suffixes, as well as stems, which shared a similar form, can be translated one-to-one. This might have enormously helped to facilitate the process of learning suffixes. In spite of this, learners did not know an extensive amount of suffixes.

Bauer and Nation's (1993) characterization of learnable suffixes can be used to understand learner behavior. Learners seem to rely on two of the characteristics these scholars mentioned: 2) *productivity* and 3) *predictability* (*meaning*). The other four factors, 1) *frequency*; 4) *regularity of the written/spoken form of the base*; 5) *regularity of the spelling/spoken form of the affix*; and 6) *regularity of function* (*word category*), are not very relevant because they are not salient in Spanish as in English (4 and 5), or because learners prioritize one syntactic function over other. That is, learners do not seem to have difficulties with the non-biunique nature of –*dor*. They seem to prioritize the nominal meaning over the adjectival meaning, thus, 6) *regularity of function* might not be as important for acquisition as was previously thought. All the suffixes examined here had similar frequencies, and yet, some were better known than others.

Along the same line, Goldschneider and DeKeyser's (2001) five factors—perceptual salience, semantic complexity, morpho-phonological regularity, syntactic category and frequency—favoring learning of inflectional suffixes can also be applied to derivational suffixes. From the suffixes examined, perceptual saliency is not necessarily the most important (e.g., -*miento*). Semantic complexity might be more decisive for acquisition of derivational suffixes,

such as *–dor*. Thus, a call for the devotion of more attention to high-frequency suffixes in the classroom is justified.

The results of the dissertation can also suggest a base for establishing differences among derivational suffixes. For future research, suffixes can be divided among: 1) instructed versus non-instructed suffixes; 2) low-frequency suffixes versus high-frequency suffixes, taking into account corpus frequencies and classroom frequencies based on teacher talk as well as learner talk; 3) semantically biunique suffixes versus semantically non-biunique suffixes, such as *–dor* and *–ero*. The reasons why learners can be aware of a suffix and store it in their lexicons are multiple.

8.4 RECOMMENDATIONS FOR TEACHING

Morphological awareness can help L2 learners in three ways: 1) to infer the meaning of unknown words, 2) to better memorize new forms, and 3) to use the appropriate word category in each syntactic frame.

Since not all suffixes are as salient as *–dor*, teachers might want to increase learner awareness of other frequent and productive suffixes. By teachers' being aware of derivational morphology and including intentional focus-on-form in the classroom, learner awareness could be raised. Moreover, teachers should provide every word in an appropriate syntactic frame and even label parts of speech.

Additionally, planned activities could be incorporated in the classroom, not only for the most advanced learners. These activities should allow for a contrast between words of the same word family and between suffixes. For example, in a brainstorming activity, known words

related to the lesson topic could be organized according to their suffixes. Since some vocabulary topics such as *professions*, e.g., 'teach, teacher,' can be used to illustrate derivational morphology, these opportunities should not be dismissed. Moreover, visual representations of word formation rules and word families' *paradigms* should be used as clarifying tools. Besides, introducing one productive suffix at a time, and using stems known to the learners can help learners' inferencing of the syntactic, distributional and semantic, morphological constraints. Both input processing activities and pushed-output activities are successful ways of increasing derivational knowledge (Friedline, 2011).

Nevertheless, learners should also be made aware of the limitations of derivational morphology. For example, not all words following appropriate morphological constraints are words in a language. Furthermore, when reading, context analysis should follow derivational analysis to corroborate a plausible morphological hypothesis.

Apart from these activities, some classroom time could be spent explaining metalanguage to learners. Even though metalanguage is not fundamental for learning, it can facilitate language learning (Hu, 2010). Moreover, the learners of this study showed familiarity with metalanguage but also misinterpreted some terms. These misinterpretations can add difficulties to the learning process.

8.5 LIMITATIONS OF THE STUDY AND FUTURE RESEARCH

This dissertation has comprehensively explored derivational awareness by instructed L2 learners. Some of the limitations of the study also come from the pool of participants. A more advanced

group of learners could have expanded the results. For example, do more advanced learners end up with a larger inventory of suffixes? Do they show automatization of derivational morphology? Additionally, having a baseline of Spanish native speakers could have shown whether L1 speakers also *know* some suffixes better than others and whether receptive tasks provide higher scores than productive ones. As anecdotal evidence, the native speakers and more advanced learners who piloted the tests did comment on the challenging nature of the metalinguistic tasks, i.e., the Test of Productive Awareness (Study 1) and the Survey of Derivational Morphology (Study 2). Moreover, as Sonbuld and Schmitt (2013) point out, vocabulary knowledge is not only explicit. Thus, further analyses of implicit knowledge of derivational morphology should be carried out.

For future research, it could be of interest to include a vocabulary size test of complex words, one of monomorphemic words, and a productive test of derivational morphology. By carrying out this study, it could be seen whether learners expand their knowledge of complex words at the same time that they expand their derivational awareness and whether they infer their knowledge of suffixes from these complex words. It is hypothesized that learners could only be productively aware of the suffixes they have noticed in complex words. Regarding models of vocabulary acquisition, an analysis of these characteristics could support/reject the idea of suffixes stored as lexical items. Additionally, the individual characteristics of each affix should be taken into account when developing morphological tests. In section 8.3., a proposal for further research is included.

Moreover, the suggestions for teaching should be contrasted in the classroom. Does a morphologically aware teacher who presents words in appropriate syntactic frames facilitate acquisition of word categories? Additionally, it would be of interest to explore how the learners

perceive the vocabulary episodes and whether they notice the differences between the morphologically-related episodes and those that are merely meaning based.

Furthermore, approaching a different set of L1-L2 learners will expand the knowledge on the development of derivational awareness as well as of implicit knowledge. L1 English-speaking learners of Spanish L2 are supposed to be facilitated in their development of derivational morphology by having the same writing system, the same morphological system, and even some one-to-one correspondences between suffixes. Moreover, moving from a deep into a shallow orthography should also facilitate the developmental process. From the results of this dissertation, it could be hypothesized that teachers of L2 learners of Spanish whose L1 does not share these commonalities with Spanish would need to promote teaching that is even more morphologically aware. Adult learners of other L1s might have more difficulties with developing derivational awareness and knowledge than the learners in this study.

APPENDIX A

A.1 VOCABULARY TEST

Table 38. Vocabulary Words from Frequency Ranges (Davies, 2006)

0-1000	1000-2000	2000-3000	3000-4000	4000-5000
Hacer	Hoja	Orgullo	Campana	Jaula
Ver	Cobrar	Rostro	Suscitar	Aburrir
Año	Luchar	Pata	Pelea	Manta
Llegar	Acudir	Pista	Domicilio	Plancha
Mismo	Pelo	Aceite	Ladrillo	Trepar
Cosa	Saltar	Varón	Cazar	Guapo
Bien	Alcance	Huella	Sed	Hígado
Vida	Dueño	Vidrio	Almuerzo	Trago
Menos	Casar	Tapar	Arroz	Ceja
Salir	Frío	Llave	Falda	Trapo
Mejor	Alimento	Onda	Volcar	Alambre
País	Rama	Brindar	Rodar	Niebla
Mano	Ajeno	Lunes	Alentar	Ramo

Empezar	Plazo	Tía	Carencia	Finca
Buscar	Viento	Paseo	Rozar	Asco
Pequeño	Dedo	Amenaza	Corbata	Conejo
Agua	Caja	Callar	Prisa	Cuerno
Pedir	Arrancar	Ala	Manga	Obrar
Sacar	Plata	Soltar	Alcalde	Mierda
Señor	Cama	Moreno	Lástima	Ocio

Table 39. Vocabulary Words Chosen From Classroom Textbooks

2nd Semester Textbook	3rd Semester Textbook	5th Semester Textbook (conversation)	5th Semester Textbook (advanced grammar)
Pantalla	Vaca	Derechos	Ajuar
Ganar	Guardar	Hembra	Atropellar
Perder	Cohete	Hierba	Bagatela
Odiar	Enterarse	Media	Bermejo
Dios	Relámpago	Garra	Boj
Estreno	Factura	Hito	Capaz
Duro	Olvido	Nave	Escombro
Engañar	Nuca	Bicho	Gaveta
Cocinar	Rechazar	Aplastar	Gorrión
Sonar	Muelle	Linterna	Gozo
Muñeca	Ataúd	Hueco	Leña

Clima	Vencer	Colmillo	Sitio
Miedo	Redonda	Flojo	Soto
Clave	Regresar	Mata	Involucrar
Meta	Tacaño	Extrañar	Congoja
Mono	Cinta	Multa	Fanfarrón
Sensate	Cancha	Bruja	Rancio
Tirar	Empatar	Velar	Modorra
Trabajo	Paella	Azotea	Viga
Llanto	Faro	Tregua	Vecino

A.2 LEXICAL INFERENCING TEST

Table 40. Words with Biunique Suffixes in the Lexical Inferencing Test

Target Word	Options	Target Word	Options
Culmiento	1.The culmination 2. Culminated 3. To culminate	Tanoso	1. The slow tan 2. Looking like tan 3. To tan slowly
Patura	1. The duckness 2. Ducky 3. To walk like a duck	Camiable	1. The part of the wheel that changes its movement 2. That can be lifted from a circular movement 3. To lift from a circular movement
Dueldad	1. The duel 2. Duelish 3. To duel	Ambroso	1. The amber 2. Looking like amber 3.To dig for amber
Claleza	1. The clap 2. Clapish 3. To clap	Logable	1. The lightly frying 2. That can be fried lightly 3. To fry something lightly
Eslamiento	1. A set of slats	Istoso	1. A lie

	2. Thin as a slat 3. To cut a serie of slats		2. Lying/liar 3. To lie
Iglura	1. A fresh and youthful appareance 2. Fresh and youthful 3. To feel fresh and youthful	Picalión	1. The pick 2. Picked 3. To play with a pick
Mondad	1. The intense laugh 2. Intensely laughing 3. To laugh intensely	Crisión	1. The crisp (desert) 2. Crisp 3. To make crispy
Senteza	1. The careful thinker 2. Thoughful 3. To think something carefully	Millable	1. The mile running 2. With the capacity of running a mille 3. To run a mile

A.3 TEST OF PRODUCTIVE AWARENESS OF AWARENESS

Table 41. Target Words in the the Test of Productive Awareness

Real Words	**Nonwords**
Chupar, 'to suck' (verb)	*Cofeter* (verb)
Ligar, 'to link' (verb)	*Ralar* (verb)
La estampa, 'picture card' (noun)	*El redo* (noun)
La espuma, 'foam' (noun)	*La lenca* (noun)
Aplastado, 'crashed' (adj.)	*Defo* (adj.)
Congelado, 'frozen' (adj.)	*Bopado* (adj.)

A.4 LANGUAGE PROFILE

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. Have you participated in another linguistic study at the University of Pittsburgh?

   Yes No (circle the right option)

7. If yes, indicate when it took place and what the study was about.

_____

_____

8. How many language courses have you taken at your university?

Language (e.g., Span 001)	Level	Year
1.		
2.		
3.		
4.		

5.		
6.		
7.		
8.		
9.		

9. Did you study Spanish before the university? For how long?

_____

_____

_____

_____

_____

_____

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

If so, fill in the table below:

Country	Date	Stay duration
1.		
2.		
3.		
4.		

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

11. Estimate your level in **all** foreign languages that you speak:

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.

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

_____

_____

_____

_____

13. How do you study vocabulary?

APPENDIX B

Table 42. Descriptive Statistics for (a) *Eslamiento* by Proficiency and by Inferencing Strategy

	(a) Eslamiento *(non-stem +-ment)*							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.24	.432	.37	.488	.34	.478	.52	.505
(2) Root Awareness	.10	.307	.20	.401	.23	.423	.21	.412
(3) Word Family Awareness	.02	.131	.09	.285	.15	.361	.15	.364
(4) Analogy	.03	.184	.04	.206	.11	.320	.12	.323
(5) Cognate	.07	.256	.02	.147	.06	.233	.06	.235
(6) Context	.45	.502	.43	.501	.49	.505	.50	.505
(7) Syntactic Context	.03	.184	.13	.341	.09	.295	.13	.345
(8) Morphological Awareness (?)	.29	.459	.22	.417	.23	.423	.19	.398

Table 43. Descriptive Statistics for (b) *Tanoso* by Proficiency and by Inferencing Strategy

	(b) Tanoso (*non-stem +-ous*)							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.43	.500	.57	.501	.60	.494	.62	.491
(2) Root Awareness	.14	.348	.35	.482	.17	.379	.40	.495
(3) Word Family Awareness	.09	.283	.15	.363	.17	.379	.15	.364
(4) Analogy	.07	.256	.07	.250	.09	.295	.13	.345
(5) Cognate	.07	.256	.04	.206	.11	.320	.15	.364
(6) Context	.28	.451	.37	.488	.36	.484	.54	.503
(7) Syntactic Context	.12	.329	.09	.285	.15	.361	.13	.345
(8) Morphological Awareness (?)	.09	.283	.15	.363	.15	.361	.17	.382

Table 44. Descriptive Statistics for (c) *Borrosidad* by Proficiency and by Inferencing Strategy

	(c) Borrosidad (*erase +-ous+-ity*, 'blurriness')							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.48	.504	.46	.504	.60	.494	.58	.499
(2) Root Awareness	.14	.348	.26	.444	.13	.342	.31	.466
(3) Word Family Awareness	.14	.348	.15	.363	.32	.471	.37	.486
(4) Analogy	.16	.365	.09	.285	.15	.361	.10	.298
(5) Cognate	.09	.283	.13	.341	.06	.233	.02	.139
(6) Context	.22	.421	.28	.455	.30	.463	.38	.491
(7) Syntactic Context	.09	.283	.07	.250	.08	.267	.12	.323
(8) Morphological Awareness (?)	.07	.256	.20	.401	.13	.342	.21	.412

Table 45. Descriptive Statistics for (d) *Aprovechable* by Proficiency and by Inferencing Strategy

	(d) Aprovechable (*take_advante* + *-able*, 'advantageous')							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.40	.493	.54	.504	.53	.504	.73	.448
(2) Root Awareness	.14	.348	.20	.401	.09	.295	.19	.398
(3) Word Family Awareness	.17	.381	.35	.482	.51	.505	.63	.486
(4) Analogy	.09	.283	.02	.147	.06	.233	.10	.298
(5) Cognate	.40	.493	.35	.482	.21	.409	.17	.382
(6) Context	.24	.432	.24	.431	.23	.423	.33	.474
(7) Syntactic Context	.07	.256	.07	.250	.09	.295	.06	.235
(8) Morphological Awareness (?)	.14	.348	.11	.315	.11	.320	.04	.194

Table 46. Descriptive Statistics for (e) *Obligador* by Proficiency and by Inferencing Strategy

	(e) Obligador (*oblig-* + *-er, possible word*)							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.36	.485	.61	.493	.64	.484	.87	.345
(2) Root Awareness	.09	.283	.24	.431	.09	.295	.29	.457
(3) Word Family Awareness	.16	.365	.24	.431	.43	.500	.56	.502
(4) Analogy	.02	.131	.07	.250	.09	.295	.08	.269
(5) Cognate	.62	.489	.43	.501	.40	.494	.17	.382
(6) Context	.22	.421	.22	.417	.23	.423	.29	.457
(7) Syntactic Context	.05	.223	.04	.206	.04	.192	.12	.323
(8) Morphological Awareness (?)	.05	.223	.07	.250	.08	.267	.00	.00

Table 47. Descriptive Statistics for (f) *Vitaminero* by Proficiency and by Inferencing Strategy

	(f) Vitaminero (*vitamin + -er, possible word*)							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.24	.432	.28	.455	.34	.478	.69	.466
(2) Root Awareness	.10	.307	.17	.383	.08	.267	.27	.448
(3) Word Family Awareness	.10	.307	.22	.417	.21	.409	.21	.412
(4) Analogy	.02	.131	.00	.00	.06	.233	.06	.235
(5) Cognate	.69	.467	.57	.501	.58	.497	.44	.502
(6) Context	.26	.442	.26	.444	.23	.423	.35	.480
(7) Syntactic Context	.05	.223	.04	.206	.04	.192	.02	.139
(8) Morphological Awareness (?)	.09	.283	.09	.285	.15	.361	.08	.269

Table 48. Descriptive Statistics for (g) *Chupar* by Proficiency and by Inferencing Strategy

	(g) Chupar (*verb + infinitival suffix,* 'to suck')							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.40	.493	.54	.504	.55	.503	.65	.480
(2) Root Awareness	.09	.283	.20	.401	.06	.233	.12	.323
(3) Word Family Awareness	.14	.348	.09	.285	.17	.379	.21	.412
(4) Analogy	.05	.223	.00	.000	.02	.137	.02	.139
(5) Cognate	.05	.223	.02	.147	.06	.233	.02	.139
(6) Context	.33	.473	.35	.482	.40	.494	.48	.505
(7) Syntactic Context	.07	.256	.07	.250	.09	.295	.08	.269
(8) Morphological Awareness (?)	.03	.184	.13	.341	.06	.233	.06	.235

Table 49. Descriptive Statistics for (h) *Aplastado* by Proficiency and by Inferencing Strategy

	(h) Aplastado (*crash* + *-ed*, 'crashed')							
	1st Quartile (*n=58*)		2nd Quartile (*n=46*)		3rd Quartile (*n=53*)		4th quartile (*n=52*)	
	M	SD	M	SD	M	SD	M	SD
(1) Affixal Awareness	.31	.467	.59	.498	.68	.471	.75	.437
(2) Root Awareness	.12	.329	.17	.383	.08	.267	.17	.382
(3) Word Family Awareness	.16	.365	.30	.465	.45	.503	.54	.503
(4) Analogy	.03	.184	.02	.147	.00	.000	.02	.139
(5) Cognate	.10	.307	.11	.315	.19	.395	.15	.364
(6) Context	.38	.489	.30	.465	.25	.434	.42	.499
(7) Syntactic Context	.09	.283	.11	.315	.09	.295	.15	.364
(8) Morphological Awareness (?)	.17	.381	.09	.285	.06	.233	.08	.269

APPENDIX C

Table 50. Target Words in the Lexical Decision Task (Study 3)

Nonword Category	Suffix	Target Word
Novel Nonwords (NW)	**–ble**	Aparecible
		Florecible
		Faltable
		Tenible
	–dor	Quedador
		Editador
		Obligador
		Facturador
	–ero	Bulliciero
		Burlero
		Locionero
		Butaquero
	–oso	Blancoso
		Raroso
		Esperanzoso
		Esquinoso
Nonwords with Distributional Violations (DV)	**–ble**	Ricable
		Beneficiosable
		Camarable
		Defensorable

	–dor	Idealdor
		Dañinodor
		Habildor
		Racionaldor
	–ero	Revindiquero
		Descendero
		Observero
		Descifrero
	–oso	Rapidamentoso
		Imborrabloso
		Ignoraroso
		Lavadosoero
Nonwords with Semantic Violations (SV)	**–ble**	Bastable
		Reaccionable
		Venible
		Gemible
	–dor	Llovedor
		Habedor
		Atardecedor
		Nevador
	–ero	Energiero
		Lluviero
		Inglesero
		Vencimientero
	–oso	Nativoso
		Farmacioso
		Futboloso
		Sagradoso

APPENDIX D

SEMI-STRUCTURED INTERVIEW FOR STUDY 4

Extracted from Borg (1998) and Zhang (2011).

Section 1: Education

1. What do you recall about your experience of learning your native language at school?
2. Did you learn other foreign languages at school?

    a) What do you recall about these lessons?

    b) What approaches were used?

    c) What kinds of methods were used?

    d) Do you recall whether you enjoyed such lessons or not?

    e) How was vocabulary taught?

    f) How did you learn vocabulary?

3. What about at the college level? Did the study of language play a role there (Portuguese, etc.)?
4. Do you feel that your own education as a student has had any influence on the way you teach today?
5. Have you ever been to other countries? If yes, how did this experience impact your teaching?

Section 2: Entry into the Profession and Development as a Teacher

1. How and why did you become a Spanish teacher?

    a) What recollections do you have about your earliest teaching experiences?

    b) Were these particularly positive or negative?

    c) What kinds of teaching methods and materials did you use?

2. Tell me about your formal teacher training experiences.

    a) Did they promote a particular way of teaching?

    b) Did they encourage participants to approach grammar in any particular way?

    c) Did they encourage participants to approach vocabulary in a particular way?

    d) Which aspect(s) of the course(s) did you find most memorable?

3. What has been the greatest influence on your development as a teacher?

4. What qualities do you think a qualified Spanish teacher should have?

5. What kind of Spanish teacher do you think students prefer to have?

Section 3: Reactions on Teaching

1. What is the most satisfying aspect of teaching Spanish, and what is the hardest part of the job?

2. What are your strengths as a Spanish teacher, and your weaknesses?

3. Can you describe one particularly good experience you have had as a Spanish teacher, and one particularly bad one? What is your idea of a "successful" lesson?

4. Do you have any preferences in terms of the types of students you like to teach?

5. What about the students? Do they generally have any preferences about the kind of work they like to do in the class?

Section 4: The School

1. Does the school you work for promote any particular style of teaching?

2. Are there any restrictions on the kinds of materials you use or on the content and organization of your lessons?

3. Do students come here expecting a particular type of language course?

a) What are students' expectations towards vocabulary?

Section 5: Vocabulary instruction

1. Which do you think is the most important in Spanish college teaching: reading, vocabulary, grammar, listening, speaking, or writing? Why?

a) What role do you think vocabulary plays in learning Spanish?

2. In general, what do you think vocabulary learning involves?
3. How do you evaluate that your students have commanded the vocabulary you require them to learn?
4. What do you think vocabulary teaching involves?
5. If your students asked you how to enlarge their vocabulary, what suggestions would you give them?
6. What type of vocabulary do you think you need to teach? What type of vocabulary don't you think you need to teach?
7. How do you teach Spanish vocabulary in your class?
8. What are the hardest and the easiest thing about teaching vocabulary?

BIBLIOGRAPHY

Abrams, L., & Farrell, M (in press). The role of priming in lexical access and speech production. In N. Hsu & Z. Schütt (Eds.), *Psychology of priming*.

Almela, R., Cantos, P., Sánchez, A., Sarmiento, R., & Almela, M. (2005). *Frecuencias del español: diccionario y estudios léxicos y morfológicos*. Madrid: Universitas.

Anglin, J. (1993). Vocabulary development: A morphological analysis. *Monographs of the Society for Research in Child Development, 58*(10), i-186.

Auza Benavides, A. (20008). Las sobregeneralizaciones morfológicas derivativas y su relación con el vocabulario infantil. *Lenguas en contexto, 5*, 32-41.

Bardovi-Harlig, K. (2000). *Tense and Aspect in Second Language Acquisition: Form, Meaning, and Use*. Malden, MA: Blackwell Publishers, Inc.

Bauer, L., & Nation, P. (1993). Word Families. *International Journal of Lexicography, 6*(4).

Bertram, R., Hyöna, J., & Laine, M. (2011). Morphology in language comprehension, production and acquisition. *Language and Cognitive Processes, 26*(4-6), 457-481.

Bialystok, E. (2001). *Bilingualism Development. Language, Literacy, & Cognition*. Cambridge: Cambridge University Press.

Blanco, J. A. (2010). *Revista. Conversación sin barreras* (3rd ed.): Vista Higher Learning.

Blanco, J., & Colbert, M. (2010). *Enfoques. Curso intermedio de lengua española*. Boston, Massachusetts: Vista Higher Learning.

Blanco, J. A. & Donley. (2012). *Vistas. Introducción a la lengua española*: Vista. Higher learning.

Borg, S. (1998). Teachers' Pedagogical Systems and Grammar Teaching: A Qualitative Study. *TESOL Quarterly, 32*(1), 9-38.

Borg, S. (2003). Teacher cognition in language teaching: A review of research on what language teachers think, know, believe and do. *Language Teaching, 36*, 81–109.

Borg, S. (2006a). The distinctive characteristics of foreign language teachers. *Language Teaching Research, 10*, 3-31.

Borg, S. (2006b). *Teacher cognition and language education: Research and practice*. London: Continuum.

Borg, S. (2009) Introducing language teacher cognition. In: JACET (Ed.) *36th JACET Summer Seminar Proceedings*. JACET.

Brown, D. (2010). What aspects of vocabulary knowledge do textbooks give attention to? *Language Teaching Research, 15*(83), 83-97.

Burani, C., Dovetto, F., Spuntarelli, A., & Thornton, A. (1999). Morpholexical Access and Naming: The semantic interpretability of new root-suffix combinations. *Brain and Language, 68*, 333-339.

Canteli Dominicis, M., & Reynolds, J. (2011). *Repase y escriba. Curso avanzado de gramática y composición.* Hoboken, NJ: John Wiley & Sons, INC.

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.

Carlisle, J. F., & Fleming, J. (2003). Lexical Processing of Morphologically Complex Words in the Elementary Years. *Scientific Studies of Reading, 7*(3), 239-253.

Castells, M., Guzmán, E., Lapuerta, P., & García, C. (2012). *Mosaicos. Spanish as a world language*. New Jersey: Pearson Education.

Chaudron, C. (1982). Vocabulary elaboration in teachers' speech to L2 learners. *Studies in Second Language Acquisition, 4*, 170-180.

Chen, X., Ramírez, G., Luo, Y., Geva, E., & Ku, Y.-M. (2011). Comparing vocabulary development in Spanish- and Chinese-speaking ELLs: the effects of metalinguistic and sociocultural factors. *Reading and Writing*.

Clark, E. V. (1993). *The lexicon in acquisition*. Cambridge: Cambridge University Press.

Coady, J. & Huckin, T. (1997). *Second language vocabulary acquisition: a rationale for pedagogy.* New York : Cambridge University Press.

Collentine, J. & B. Freed (eds.) (2004). Learning context and its effect on second language acquisition. *Studies in Second Language Acquisition* 26, 153–171.

Danilović, J., Dimitrijević Savi, J., & Dimitrijević, M. (2013). Affix Acquisition Order in Serbian EFL Learners. *Romanian Journal of English Studies, 10*(1), 77-88.

Davies, M., & Face, T. (2006). *Vocabulary coverage in Spanish textbooks: How representative is it?* Paper presented at the 9th Hispanic Linguistics Symposium.

Davies, M. (2006). *A frequency dictionary of Spanish. Core vocabulary for learners*. New York: Routledge.

de Groot, A. M. B., & van Hell, J. G. (2005). The Learning of Foreign Language Vocabulary. In J. F. Kroll & A. M. B. de Groot (Eds.), *Handbook of Bilingualism. Psycholinguistic Approaches.* New York: Oxford University Press.

DeKeyser, R. (2007). Skill Acquisition Theory. In B. VanPatten & J. Williams (Eds.), *Theories in Second Language Acquisition*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Diccionario de la lengua española (DRAE). (2001) (Online 22 ed.): Real Academia Española.

Donzelli, G. (2007). Foreign Language Learners: Words they Hear and Words they Learn: A Case Study. *Estudios de Lingüística Inglesa Aplicada, 7*, 103-125.

Dressler, W. U., Korecy-Kröll, K., & Dabasinskiene, I. (2012). *On the salience of number and case in the acquisition of German and Lithuanian in a typological perspective*. Paper presented at the 15th International Morphology Meeting, Vienna, Austria.

Duñabeitia, J.A., Kinoshita, S., Carreiras, M., & Norris, D. (2011). Is morpho-orthographic decomposition purely orthographic? Evidence from masked priming in the same-different task. *Language & Cognitive Processes, 26*, 509-529.

Ellis, N. (2011). Implicit and Explicit SLA and Their Interface. In C. Sanz & R. Leow (Eds.), *Implicit and Explicit Language Learning: Conditions, Processes, and Knowledge in SLA and Bilingualism.* United States: Georgetown University Press.

E-prime 2.0 (Psychology Software Tools, Pittsburgh, PA)

Flowerdew, J. (1992). Definitions in Science Lectures. *Applied Linguistics, 1992*(13), 201-221.

Friedline, B. (2011). *Challenges in the Second Language Acquisition of Derivational Morphology: From Theory to Practice.* PhD, University of Pittsburgh, Pittsburgh.

Gatbonton, E. (2008). Looking beyond teachers' classroom behaviour: Novice and experienced ESL teachers' pedagogical knowledge. *Language Teaching Research, 12*(2), 161-182.

Godev, C. B. (2009). Word-frequency and vocabulary acquisition: an analysis of elementary Spanish college textbooks in the USA. *Revista de Lingüística Teórica y Aplicada, 47*(2), 51-68.

Goldschneider, J., & DeKeyser, R. (2001). Explaining the "Natural Order of L2 Morpheme Acquisition" in English: A Meta-analysis of Multiple Determinants. *Language Learning, 5*(1), 1-50.

Gregg, K. (1996). The logical and developmental problems of second language acquisition. In W. C.Ritchie & T. K. Bhatia (Eds*.), Handbook of Second Language Acquisition (pp. 50-84)*. New York: Academic Press.

Haastrup, K. (1991). *Lexical Inferencing Procedures or Talking about Words. Receptive Procedures in Foreign Language Learning with Special Reference to English*. Tübingen: Gunter Narr Verlag.

Haastrup, K. (2008). Lexical Inferencing Procedures in Two Languages. In D. Albrechtsen, K. Haastrup & B. Henriksen (Eds.), *Vocabulary and Writing in a First and Second Language*. New York: Palgrave. Macmillan.

Hayashi, Y., & Murphy, V. (2011). An investigation of morphological awareness in Japanese learners of English. *Language Learning Journal, 39*(1), 105-120.

Heigham, J., & Croker, R. (2009). *Qualitative Research in Applied Linguistics. A Practical Introduction*. New York: Palgrave Macmillan.

Hockett, C. (1954). Two Models of Grammatical Description. *Word, 10*, 210-234.

Horst, M. (2010). How well does teacher talk support incidental vocabulary acquisition? *Reading in a Foreign Language, 22*(1), 161-180.

Hu, G. W. (2010). Revisiting the role of metalanguage in L2 teaching and learning. *English Australia Journal, 26(1), 61-70.*

Hu, H.-c. M., & Nassaji, H. (2012). Ease of Inferencing, Learner Inferential Strategies, and Their Relationship with the Retention of Word Meanings Inferred from Context. *The Canadian Modern Language Review/La Revue canadienne des langues vivante, 68*(1), 54-77.

Jiang, N. (2000). Lexical representation and development in a second language. *Applied Linguistics, 21*(1), 47-77.

Jiang, N. (2002). Form-meaning mapping in vocabulary acquisition in a second language. *Studies in Second Language Acquisition, 24*, 617-637.

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.

Köpcke, K-M. (1998). The acquisition of plural marking in English and German revisited: Schemata versus rules. *Journal of Child Language, 25*(2), 293–319.

Kuo, L.-J., & Anderson, R. C. (2006). Morphological Awareness and Learning to Read: A Cross-Language Perspective. *Educational Psychologist, 41*(3), 161-180.

Longtin, C.-M., & Meunier, F. (2005). Morphological decomposition in early visual word processing. *Journal of Memory and Language, 53*, 26-41.

Lowie, W. (1998). *AIM: The Acquisition of Interlanguage Morphology.* PhD Dissertation, Rijksuniversiteit Groningen.

Lowie, W. (2005). Exploring a second language. The discovery of morphological productivity. *EUROSLA Yearbook, 5*, 251-268.

Luk, Z. P.-s., & Shirai, Y. Is the Acquisition Order of Grammatical Morphemes Impervious to L1 Knowledge? Evidence from the Acquisition of Plural -s, Articles, and Possessive 's. *Language Learning, 59*(4), 721-754.

Lyster, R. (1998). Negotiation of Form, Recasts, and Explicit Correction in Relation to Error Types and Learner Repair In Immersion Classrooms. *Language Learning, 48*.

Lyster, R., & Ranta, L. (1997). Corrective Feedback and Learner Uptake. *Studies in Second Language Acquisition, 20*, 37-66.

Maldonado, R. (in press) “Sobre perfiles y bases en sufijos agentivos”. En Homenaje a Elizabeth Beniers. México: Instituto de Investigaciones Filológicas. Universidad Nacional Autónoma de México.

Marcos Miguel, N. (2011). *Working on L2 morphological awareness by building word families*. Paper presented at the New Dynamics of Language Learning: Spaces and Places-Intentions and Opportunities, University of Jyväskylä, Finland.

Marcos Miguel, N. (2012a). Grapho-morphological awareness in L2 Spanish: How do L2 learners use this metalinguistic skill? *Language Awareness, 21*(1-2), 195-211.

Marcos Miguel, N. (2012b). *Investigating teacher cognition about L2 vocabulary instruction and acquisition.* Poster presented at the ACTFL. Annual Convention & World Languages Expo. Many Languages: One United Voice, Philadelphia.

Marrero, V., Aguirre, C., & Albalá, M. J. (2007). The acquisition of diminutives in Spanish. In I. Savickiene & W. U. Dressler (Eds.), *The Acquisition of Diminutives: A cross-linguistic perspective*. Amsterdam: John Benjamins Publishing Company.

McCormick, S. F., Rastle, K., & Davis, M. H. (2008). Is there a ‘fete’ in ‘fetish’? Effects of orthographic opacity on morpho-orthographic segmentation in visual word recognition. *Journal of Memory and Language, 58*, 307-326.

McCormick, S. F., Rastle, K., & Davis, M. H. (2009). Adore-able not adorable? Orthographic underspecification studied with masked repetition priming. *European Journal of Cognitive Psychology, 6*, 813-836.

Meara, P., Lightbown, P. M., & Halter, R. H. (1997). Classrooms as Lexical Environments. *Language Teaching Research, 1*(1), 28-47.

Medellín Gómez, A., & Auza Benavides, A. (2008). Influencia del tamaño del vocabulario en el conocimiento morfológico de afijos. *Estudios de Lingüística Aplicada, 48*.

Melinger, A., & Koenig, J.-P. (2007). Part-of-speech persistence: The influence of part-of-speech information on lexical process. *Journal of Memory and Language, 56*, 472-489.

Milton, J. (2009). *Measuring Second Language Vocabulary Acquisition*. Bristol: Multilingual Matters.

Mochizuki, M., & Aizawa, K. (2000). An affix acquisition order for EFL learners: an exploratory study. *System, 28*, 291-304.

Morin, R. (2003). Derivational Morphological Analysis as a Strategy for Vocabulary Acquisition in Spanish. *The Modern Language Journal, 87*(2), 200-221.

Morin, R. (2006). Building Depth of Spanish L2 Vocabulary by Building and Using Word Families. *Hispania, 89*(1), 170-182.

Nation, P. (2001). *Learning vocabulary in another language*. Cambridge: Cambridge University Press.

Nation, I.S.P. & Webb, S. (2011) Researching and Analyzing Vocabulary. Boston: Heinle Cengage Learning.

Niu, R., & Andrews, S. (2012). Commonalities and Discrepancies in L2 Teachers' Beliefs and Practices about Vocabulary Pedagogy: A Small Culture Perspective. *TESOL Journal, 2006*(6), 134-154.

Pérez-Pereira, M., & Singer, D. (1984). Adquisición de morfemas del español. *Infancia y aprendizaje* (27/28), 205-221.

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.

Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Language Review*, 56, 282–307.

Rastle, K., Davis, M. H., & New, B. (2004). The broth in my brother's brothel: Morphoorthographic segmentation in visual word recognition. *Psychonomic Bulletin and Review*, 11, 1090-1098.

Read, J. (2000). *Assessing Vocabulary*. Cambridge: Cambridge University Press.

Rehak, K. M., & Juffs, A. (2011). *Native and Non-Native Processing of Morphologically Complex English Words: Testing the Influence of Derivational Prefixes.* In G. Granena, J.

Koeth, S. Lee-Ellis, A. Lukyanchenko, G. Prieto Botana, & E. Rhoades (Eds.), *Selected Proceedings of the 2010 Second Language Research Forum: Reconsidering SLA Research, Dimensions, and Directions* (pp. 125-142). Somerville, MA: Cascadilla Proceedings Project.

Roy, C., & Labelle, M. (2007). Connaissance de la Morphologie Dérivationnelle chez les Francophones et Non-francophones de 6 à 8 Ans. *Revue de l'Association Canadienne de Linguistique Appliquée, 10*(3), 263-292.

Rueckl, J., & Rimzhim, A. (2011). On the interaction of letter transpositions and morphemic boundaries. *Language and Cognitive Processes, 26*, 482_508.

Sanaoui, R. (1996). Processes of Vocabulary Instruction in 10 French as a second language classrooms. *The Canadian Modern Language Review, 52*(2), 179-199.

Sánchez-Casas, R., & García-Albea, J. E. (2005). The Representation of Cognate and Noncognate Words in Bilingual Memory: Can Cognate Status Be Characterized as a Special Kind of Morphological Relation? In J. F. Kroll & A. M. B. de Groot (Eds.), *Handbook of Bilingualism. Psycholinguistic Approaches.* New York: Oxford University Press.

Schmitt, N. (1997). Vocabulary learning strategies. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: description, acquisition and pedagogy*: Cambridge University Press.

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research, 12*(2), 329-363.

Schmitt, N. (2010). *Researching Vocabulary. A Vocabulary Research Manual.* New York: Palgrave Macmillan.

Schmitt, N., & Meara, P. (1997). Researching Vocabulary through a Word Knowledge Framework. *SSLA, 20*, 17-36.

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

Shillaw, J. (2009). Putting Yes/No Tests in Context. In: T. Fitzpatrick and A. Barnfield (Eds.) *Lexical Processing in Second Language Learners*. Bristol: Multilingual Matters.

Silva, R., & Clahsen, H. (2008). Morphologically complex words in L1 and L2 processing: Evidence from masked priming experiments in English. *Bilingualism: Language and Cognition, 11*(2), 245-260.

Simard, D., & Jean, G. (2011). An Exploration of L2 Teachers' Use of Pedagogical Interventions Devised to Draw L2 Learners' Attention to Form. *Language Learning, 61*(3), 759-785.

Sonbul, S., & Schmitt, N. (2013). Explicit and Implicit Lexical Knowledge: Acquisition of Collocations Under Different Input Conditions. *Language Learning, 63*(1), 121-159.

Swain, M. (2005). The Output Hypothesis: Theory and Research. In E. Hinkel (Ed.), *Handbook of Research in Second Language Teaching and Learning* (pp. 471-483). Mahwah, New Jersey.

Swain, M., & Carroll, S. (1987). The immersion observation study. In B. Harley, P. Allen, J. Cummins & M. Swain (Eds.), *The development of bilingual proficiency. Final report.* (Vol. II, pp. 192-222). Ontario: Ontario Institute for Studies in Education, Modern Language Centre.

Tang, E. (2011). Non-native Teacher Talk as Lexical Input in the Foreign Language Classroom. *Journal of Language Teaching and Research, 2*(1), 45-54.

Terrel, D. T. (1986). Acquisition in the Natural Approach: The Binding/Access Framework. *The Modern Language Journal, 70*(3), 213-227.

Tyler, A., & Nagy, W. (1989). The Acquisition of English Derivational Morphology. *Journal of Memory and Language, 28*, 649-667.

Van Hout, R., & Vermeer, A. (2007). Comparing measures of lexical richness. In H. Daller, J. Milton & J. Treffers-Daller (Eds.), *Modelling and assessing vocabulary knowledge*. Cambridge: University Press Cambridge.

VanPatten, B. (2005). Processing Instruction. In C. Sanz (Ed.), *Mind and Context in Adult Second Language Acquisition: Methods, Theory and Practices*. Washington: Georgetown University Press.

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.

Vidal, K. (2003). Academic Listening: A source of vocabulary acquisition? *Applied Linguistics, 24*(1), 56-89.

Wesche, M. B., & Paribakht, S. (2010). *Lexical Inferencing in a First and Second Language*. Toronto: Multilingual Matters.

Whitley, S. (2004). Lexical errors and the acquisition of derivational morphology in Spanish. *Hispania, 87*(163-172).

Zhang, W. (2008). *In Search of English as a Foreign Language (EFL) Teachers' Knowledge of Vocabulary Instruction.* PhD Dissertation, Georgia State University.

Zhang, D., & Koda, K. (2012). Contribution of morphological awareness and lexical inferencing ability to L2 vocabulary knowledge and reading comprehension among advanced EFL learners: testing direct and indirect effects. *Reading and Writing, 25*, 1195-1216.

Zyzik, E. (2009). Noun, verb, or adjective? L2 learners' sensitivity to cues to word class. *Language Awareness, 18*(2), 147-164.

Zyzik, E., & Azevedo, C. (2009). Word Class Distinctions in Second Language Acquisition. An Experimental Study of L2 Spanish. *Studies in Second Language Acquisition, 31*, 1-29.