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Effects of Learning a Second Language on English Academic and Low-frequency Vocabulary Acquisition and Metalinguistic Knowledge

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by

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DEDICATION

To those who stood by me

all through my belated journey

and

extended a strong grip at a time I otherwise

would have sunk further into the gloom of grief

after losing Can, my life partner of half a century.

*

To Can:

I could not finish it sooner

for you to see, but

I feel it –

you are proud of me.

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ABSTRACT

This study compared the possible effects of learning a language from the Italic branch of the Indo-European language family as a second language (L2), namely Latin and Spanish, on English academic and low-frequency vocabulary acquisition and metalinguistic knowledge of native English speaker (NES) undergraduates in their first language (L1), English.

The study sought to attain two objectives: first, it aimed to discover the effects of learning Latin and Spanish as L2s with respect to the vocabulary acquisition of NES undergraduates; second, it aimed to detect the effects these L2s in terms of metalinguistic awareness. In both cases, the focus was on the acquisition of the NES undergraduates' L1 academic and low-frequency vocabulary.

A 36-item matching definition pre/post-test (P/PT) was compiled and piloted specifically for the purpose. It was administered twice, once at the beginning and once at the end of the semester. The pre- and post-test results were compared for each L2 group to discover the progress the learners made, and their progress was compared to explore whether the groups differed in their achievements.

A metalinguistic awareness test (MAT) was compiled explicitly for this study and was administered at the end of the semester following the post-test. Responses were analyzed to detect whether either L2 group used their morphological knowledge in deciphering the meanings of the post-test items. Thereafter, the results were compared to explore whether there was a difference between the two L2 groups. Moreover, interviews were performed with volunteering

L2 learners from both language groups prior to the post-test and MAT administration to substantiate the quantitative (P/PT) and qualitative (MAT) findings.

The outcome of the quantitative data analyses indicated that learning Spanish slightly, but not significantly, improved the academic and low-frequency vocabulary levels of the undergraduate native English speakers, whereas the effect of learning Latin was significant. Comparison of the two language groups' performances showed that learning Latin is more beneficial than learning Spanish with respect to improving NES L2 learners' academic and low-frequency English vocabulary.

The outcome of the qualitative data suggested that learning Latin as an L2 helped more than learning Spanish did with regards to the acquisition of academic and low-frequency English vocabulary. The learners' opinions conveyed through both their statements in the MAT and their responses during the interviews supported this finding.

Furthermore, this study filled a gap in the second language acquisition field in that it explored the effects of learning an L2 on L1 academic and low-frequency vocabulary acquisition of the undergraduates by comparing the effects of two L2s from the same language family.

CHAPTER ONE:

INTRODUCTION

Purpose of the this study, *The Effects of Learning a Second Language on English Academic and Low-frequency Vocabulary Acquisition and Metalinguistic Knowledge,* is to compare the possible effects of learning a language from the Italic branch of the Indo-European language family (Appendix A) as a second language, namely Latin and Spanish, on English academic and low-frequency vocabulary acquisition and metalinguistic knowledge of native English speaker undergraduate students on their first language.

The rationale for including Latin and Spanish in this study is that over 60 percent of English language vocabulary is composed of Latin and Greek word parts and that Spanish is the most widely learned second language in the United States (Appendix B). The definitions of the term used in the title of the present study, *vocabulary,* and the terms related to it, namely, *word*, *word part*, *word family*, and *word frequency,* are given below as to clarify the way they are employed by the researchers.

1.1. Vocabulary: Definition of the Related Terms

Meaning basically the stock of words in a language, *vocabulary* is the English equivalent of the Latin word, *vocabularium*, which means the place (receptacle) of *vocabula*, names. It ultimately comes from the verb *vocare*, to call, name. Each word in the 'stock' has a depth, the profundity of its meaning, and the stock itself has a size, its breadth.

1.1.1. Word

Word, which entered English through Germanic line of the Indo-European language family (Appendix A), shares the common etymology with *verb* and is the doublet of it. Latin *verbum*, giving base to English *verb*, means *word*. Three terms related to the individual words need to be defined: word part, word family, and word frequency.

1.1.1.1. Word part. Also called a morpheme or word building block, a word part is the smallest meaningful part forming a word, whether it is the root or the affix. A word part, which occurs in a complex, multi-part (multi-morphemic) word, may be a word itself.

1.1.1.2. Word family. A word with its inflectional and common derivational forms that are clearly and closely related with respect to the meaning of the elementary member, also called the headword, constitutes a word family. Coxhead (2000) defines the headword as a free stem which can stand alone, and the family will contain all of its affixed forms. What is indicated by affix in this respect is "all inflections and the most frequent, productive, and regular prefixes and suffixes" (p.218). She gives *specify* as an example of a headword. Its family includes specifiable, specified, specifies, specifying, and unspecified but not *special* since the Latinate stem, *spec*, is not a free standing stem in English.

A word family should be differentiated from a lemma. Lemmas also contain words with common stems, but those words are related only by their inflectional forms; thus, they come from the same grammatical part of speech, that is, word forms such as nouns, adjectives, and verbs. Word families, however, do not take parts of speech into account.

1.1.1.3. Word frequency. Word frequency is the number of times a word and its inflectional, derivational, and combinatory forms occur in a corpus of written or spoken

discourse. If the word occurs frequently, then it is considered a high-frequency word; if the occurrence is infrequent, then the word is considered in the low-frequency group.

1.1.2. Depth of Word Knowledge

Milton and Fitzpatrick (2014) state that it is hard to give a simple description to cover all the aspects of knowing a word since it is an elusive as well as a difficult and complex concept. They detail the previous reflections of word knowledge starting from Aristotle and explain the three approaches to defining word knowledge, namely, componential, developmental, and metaphorical. Nagy and Scott (2000) also emphasize the complexity of word knowledge and offer a chronology of research on the five aspects of word knowledge: *incrementality*, knowing a word in degrees; *multidimentionality*, knowing qualitatively different aspects of a word; *polysemy*, knowing multiple meanings of a word; *interrelatedness*, knowing a word in relation to the knowledge of other words; and *heterogeneity*, knowing a word depending on the kind of the word. Following the explanation of these aspects of knowledge, the researchers state that "knowing a word cannot be identified with knowing a definition" (p. 236).

Schmitt and Meara (1997) underline the fact that "there is much more to knowing a word than just learning its meaning and form" (p. 18), and they present a word knowledge framework based on word associations and grammatical suffix knowledge for vocabulary research. Nation (2001) expands on the assumptions made by Richards (1976) about the knowledge of vocabulary and divides word knowledge into three areas, each of which are further divided into three subareas and expressed from the points of receptive (passive) and productive (active) word knowledge. The word knowledge framework table compiled by (Nation, 2001, p. 27), namely, 'What is involved in knowing a word?' (Table 1.1), is widely accepted and referred to by

researchers (e.g., Daller, Milton, & Treffers-Daller, 2007; Milton, 2009; Milton & Fitzpatrick, 2014). This systematic summary table outlines the following divisions: *form* (spoken, written, and word parts), *meaning* (form and meaning, concepts and referents, and associations), and *use* (grammatical functions, collocations, and constraints on use).

Table 1.1. What is involved in knowing a word?

Form	spoken	R	What does the word sound like?
		P	How is the word pronounced?
	written	R	What does the word look like?
		P	How is the word written and spelled?
	word parts	R	What parts are recognizable in this word?
		P	What word parts are needed to express this meaning?
Meaning	form & meaning	R	What meaning does this word form signal?
		P	What word form can be used to express this meaning?
	concept & referents	R	What is included in the concept?
		P	What items can the concept refer to?
	associations	R	What other words does this make us think of?
		P	What other words can we use instead of this one?
Use	grammatical functions	R	In what patterns does this word occur?
		P	In what patterns must we use this word?
	collocations	R	What words or types of words occur with this one?
		P	What words or types of words must we use with this one?
	constraints on use (register, frequency…)	R	Where, when and how often would we expect to meet this word?
		P	Where, when and how often can we use this word?

Note. R= receptive knowledge, P= productive knowledge (Nation, 2001, p. 27)

1.1.3. Breadth of Vocabulary

The size of vocabulary is not expressed simply as the total number of the words in a language. The words therein are classified in increments of thousands, each forming a level in

frequency of use. The greater the number of a level, the lower the level of frequency is. Corpus linguistics is the field that deals with the vocabulary issues such as frequency lists.

1.1.3.1. Corpora. Corpora are large bodies of "machine-readable" texts compiled to analyze linguistics data using computer tools, which, otherwise, would be "extremely difficult to search … by hand in a way which guarantees no error" (McEnery & Hardie, 2012, p. 2). With the advent of personal computers and especially the Internet, such large-scale corpora became available for general use.

However, historically, linguistic databases were first held in paper form, and word-frequency lists were produced as far back as the first decades of the 20th century. Meara (2002) refers to the work of H. E. Palmer and comments that "the results of modern counts are not greatly different from the frequency lists that Palmer developed in the 1920s" (p. 401). West (1930, p. 514) points to the importance of vocabulary and proposes 'word frequency as a solution' to the varied "collection of words … cut out by the scissors of [textbook] authors," stating that "the primary thing in learning a language is the acquisition of vocabulary, and practice in using it (which is the same thing as 'acquiring'). The problem is what vocabulary." He publishes his General Service List (GSL) in 1953, which is considered the most-referred and widely used list by researchers (e.g., Meara, 2002; Nation, 2001).

Corpora are not solely the bases of frequency lists; they also provide patterns of language use by means of tools such as concordances, which make the data possible to be utilized not only by researchers, but also by teachers and learners. There are various corpora available online, such as the American National Corpus (ANC), British National Corpus (BNC), and Corpus of Contemporary American English (COCA), the last of which contained over 520 million words from texts covering 1990-2015 period. With the most recent addition of the texts from the last

four years (2016-2019), the number of word coverage increased to one billion as indicated on the COCA website. The number of texts as of the end of December 2019 is over 500,000 (n.d.).

The present study utilized COCA in compiling the items of the Pre/Post-test that were administered during the study semester (Appendix C). A smaller, tailor-made corpus of Latin words was compiled by the researcher as a preparatory work for the present study to select the low-frequency English words derived from the words in the textbooks used in the related Latin and Spanish courses.

1.1.3.2. Frequency lists. Nation (2006, p. 60) states that "well-educated native speakers know around 20,000 word-families (excluding proper names and transparently derived forms)," and Nation and Beglar (2007, p. 12) indicate that "the most frequent 14,000 words of English along with proper nouns account for over 99 percent of the running words in written and spoken text" and that "although adult native speakers' vocabularies are much larger than 14,000 words, these 14,000 words include all the most important words." To gauge the vocabulary level of a speaker, vocabulary levels tests have been compiled (Laufer & Nation, 1999; Nation, 2001; Schmitt 2000). Nation (2012) gives the details of the available versions and the construct of the recent tests offered at the Victoria University for use without permission in research.

> There are two kinds of proficiency tests on this web site – those that measure total vocabulary size (How many words someone knows), and those that measure knowledge of particular frequency levels of words (for example, the first 1000 and second 1000 words). The Vocabulary Size Test which covers 20,000 word families can be used with native speakers and non-native speakers. The 14,000 version is best used with only non-native speakers. (n.d.)

1.2. Vocabulary: Teaching and Learning

Random House dictionary defines the adjective *incidental* as "happening or likely to happen in an unplanned or subordinate in conjunction with something else." The word takes its base from Latin *incidere*, to fall in, befall, and in connection with abstract things, it means to happen, also connoting a phenomenon occurring by chance (Ayto, 1990). With regard to language acquisition, the likelihood of *the chance to fall in*, that is, the possibility of incidental learning to take place has been of concern in applied linguistics, and specifically in vocabulary acquisition (Huckin & Coady, 1999; Hulstijn, 2003; Laufer, 2017; Laufer & Rozovski-Roitblat, 2011; Nagy & Scott, 2000; Nation, 2001; Nation & Meara, 2010; Rieder, 2003; Shaffer, 2005).

Historically, the shifts in the relative importance given to language skills reflect a tendency of recurring prominence given particularly to grammar and reading; nevertheless, teaching and learning of vocabulary have long been an issue in linguistics as well as in pedagogy and cognitive psychology. Nagy, Herman, and Anderson (1985) state that "[i]ncidental learning from context has traditionally been assumed to be one cause, if not the major cause, of vocabulary growth" (p. 234). Referring to Boettcher's (1980) dissertation, the researchers mention that the quotes supporting vocabulary acquisition through reading date as far back to St. Augustine's time. Indeed, Boettcher (1980, p. 20) states as follows:

> The first theorist mentioned here, while not usually classified as an authority on vocabulary, provides a very early introspective report of reading vocabulary acquisition, mentioning both the requirements of multiple exposures and time. "And thus, by constantly seeing words as they occurred in various sentences, I collected gradually for what they stood" (St. Augustine, 386).

The cited words of St. Augustine, however, indicate noticing and focused attention as well as 'constant' exposure rather than merely incidental acquisition. Over a millennium and a half later and after numerous studies conducted on vocabulary acquisition, Nation and Meara (2010) underline that incidental learning is less sure than deliberate study and that, although it is a great opportunity for native speakers, three conditions must be met for it to occur in the case of non-native speakers:

> First, the unknown vocabulary should make up only a very small proportion of the tokens [the number of individual words in a text], preferably around 2 per cent, which would mean one unknown word in fifty. Second, there needs to be a very large quantity of input, preferably one million tokens or more per year. Third, learning will be increased if there is more deliberate attention to the unknown vocabulary through the occurrence of the same vocabulary in the deliberate learning strand of the course. (p. 38)

Schmitt (2008) also supports the benefits of explicitly focusing on the unknown words with a specific goal of learning them. He emphasizes that "intentional vocabulary learning … almost always leads to greater and faster gains, with a better chance of retention and of reaching productive levels of mastery" although research findings show that acquisition can occur through incidental exposure to the unknown vocabulary items (p. 341).

Bellomo (2009) states that explicit vocabulary teaching is essential even for native speakers to become more knowledgeable users of the morphological elements and to attain the skills necessary to employ these elements in vocabulary acquisition and retention. Nation (2001) mentions two steps in word-part strategy: "breaking the unknown word into parts" which entails word-part awareness, and "relating the meaning of the parts to the meaning of the word" which requires the knowledge of the meanings of common word parts (p. 278).

The breadth of English vocabulary, although a daunting challenge, is also a richness that offers speakers of English an advantage of versatility in word choice and refined distinction in meaning. Denning, Kessler, & Leben (2007) express this quality as follows:

> English is extraordinarily well endowed with words. … One significant result of the size of the English vocabulary is the degree of precision and range of choices it allows. We have a wealth of words that are nearly synonymous yet embody subtle differences in meaning. (p. 5)

Should one surrender in the face of the challenging task of learning English vocabulary to which, as the researchers qualify, "[n]o other language comes close" (p. 3) in breadth? The answer is no. The ancestor of this unequaled language bestowed not only the language itself, but also the strategy to conquer it: *Divide et impera!* In essence, this is what morphological approach to vocabulary acquisition is: parse the word into its constituents and use your knowledge of the parts to decipher the compound meaning.

1.3. Research Gap

Decomposing multisyllabic complex words into their parts to acquire their meanings requires morphological awareness which, as Carlisle and Goodwin (2013) define, "refers to students' familiarity with meaning units within words, as well as their reflections on or conscious application of that knowledge to problems of reading and writing" (p. 265). The researchers also indicate that "morphemes serve as orthographic units that help students spell words accurately" (p. 271). Research studies conducted on morphological knowledge and literacy acquisition generally cover children and adolescents, especially those with reading disabilities or those minority students learning English as a second language (e.g., Carlisle, 2010; Nagy, Carlisle, &

Goodwin, 2013; Reder, Marec-Breton, Gombert, & Demont, 2013). Additionally, metalinguistic awareness studies related to Spanish focus more on phonology of the second language learned rather than its morphology (e.g., Pollard-Drodola & Simmons, 2009), which is reasonable since Spanish is a widely spoken and the most learned second language in the States (Appendix B). However, in academic reading and writing in English, orthographic aspect of the metalinguistic awareness becomes predominant. As Carlisle and Goodwin (2013) underline, "[m]orphological knowledge and vocabulary knowledge are so closely related that the two terms are actually mapping onto one construct" (p. 273). Some studies (e.g., Urdaniz & Skoufaki, 2019) cover Spanish L1 students learning English as a second language. As discussed in Chapter Two (Subheading 2.6), there are also studies that explore the effects of learning Latin and/or Latinate word parts on the L1 vocabulary.

Examples of similar studies could be listed further; however, to the best knowledge of the researcher of the present study, none of these studies compare the effects of two languages from the Italic branch of the Indo-European language family on English L1 academic and low-frequency vocabulary. Thus, this study specifically aims to fill the gap in this respect. Its findings may also help expand future second language acquisition (SLA) research in relation to academic as well as low-frequency English vocabulary.

1.4. Purpose of the Study

The purpose of the present study is to explore the possible effects of learning a second language (L2) on the academic and low-frequency English vocabulary acquisition and metalinguistic knowledge of undergraduate native English speakers. The languages under scrutiny are Latin and Spanish. The participants are adult L2 learners, that is, undergraduates

who attend Beginning Level Spanish or Latin language course to fulfill the institutional and/or major requirement. In this respect, neither the age of the participants nor the motivation factors is the focus of the study, particularly since the purpose is not to gauge the participants' level of L2 acquisition but to explore the effect of the second language acquisition on their native language (L1), in this case, English.

1.5. Research Questions

The purpose of the present study dictated the six research questions, first three of which inquire the vocabulary knowledge, and the remaining three inquire the metalinguistic knowledge of the participants. Each group of three questions, in essence, are parallel in that the first two seek the L2 group performances individually, and the third compares the two.

Research Questions One and Two: Does learning Latin (RQ-1) / Spanish (RQ-2) as a second language help to improve the academic and low-frequency English vocabulary knowledge of undergraduate students who are native speakers of English?

Research Question Three: Is there a difference between learning Latin and learning Spanish as a second language in improving the academic and low-frequency English vocabulary?

Research Questions Four and Five: Does learning Latin (RQ-4) / Spanish (RQ-5) as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?

Research Question Six: Is there a difference between learning Latin and learning Spanish as a second langue in improving metalinguistic knowledge of English language?

1.6. Implications of the Study

Briefly, the present research study may prove significant especially in four ways:

1) Based on the findings of the present study, future L2 research may be expanded as to cover a wider population of students for longer learning periods (possibly two semesters as to cover a larger vocabulary).
2) The findings may promote the idea of including other languages from the Italic branch of the Indo-European language family, such as Italian and French.
3) The findings may encourage language textbook writers and material builders to include more of the morphological aspects of vocabulary to promote metalinguistic awareness.
4) The findings may also encourage instructors/teachers and curriculum developers to promote morphological and metalinguistic awareness in students attending L2 language courses.

Implications are discussed in Chapter Five in details.

1.7. Limitations of the Study

Concisely, the present research study bears the following limitations:

1) Conclusions reached based on the results obtained from the assessments of the student performances are limited to the described participants and setting.
2) Results presented are prescribed also by the limited length of instruction provided during the semester the present study was conducted.
3) Student performances assessed are limited to the English derivatives based on the second language vocabularies covered in the Latin and Spanish textbooks utilized.

Limitations of the study are further discussed in Chapter Five.

CHAPTER TWO:

LITERATURE REVIEW

Review of the literature in relation to the present study focuses first on the aspects of language learning and teaching in general and vocabulary acquisition in particular. Literature related to the research done on the topic to date is then reviewed to complete the theoretical and practical foundations of the study.

2.1. Incidental Learning

According to Hulstijn (2003), "incidental learning has often been rather loosely interpreted in common terms, not firmly rooted in a particular theory. It could therefore be said to have several theoretical meanings, in the weak sense" (p. 357). The terms such as unconscious processes, peripheral attention, implicit learning (processing without intention, not involving awareness), and automaticity (processing without control, not involving consciousness), all of which "are common in everyday usage and surface in some way in technical terminology … in the study of learning" (Schmidt, 1994, p. 1). Proposing to standardize the concepts relevant to conscious and unconscious processes and to define the corresponding terminology used in applied linguistics, Schmidt offers the following conditions that lead to incidental learning:

> (a) when the primary task requires that attention be allocated to language form, for example, when syntactic form must be processed to derive message meaning; (b) when the primary task does not deplete attentional resources and something about the relevant structure attracts a learner's attention, for example when one

> notices the odd spelling of a new vocabulary word; or (c) when the primary task does deplete all attentional resources, but unattended form enters long-term memory nevertheless. (p. 7)

Hulstijn (2003) derives three definitions from the above proposal, for the third of which he gives the example of incidental learning of grammar while having the primary objective of communicating:

> (i) The most general meaning is couched in negative terms as learning without the intent to learn; … (ii) Another interpretation is that it refers to the learning of one stimulus aspect while paying attention to another stimulus aspect; … (iii) A slightly more specific interpretation … is that it refers to the learning of formal features through a focus of attention on semantic features. (p. 358)

Ellis (2012, p. 444) capsulizes the three definitions and states that incidental learning "is characterized by an absence of intentionality to learn but may involve ad hoc conscious attention to some features" of the second language. Most recently, Boers (2017, p. 2) defines it as the acquisition that "occurs as a by-product of communicative activities in which language learners pick up features of the target language while they are primarily engaged with the content or the message of utterances."

As the above quoted definitions indicate, the search for a generally agreed terminology and definition of incidental learning has been continuing since the early 1990s. Hulstijn (2003) indicates that the term has actually been in use for more than five decades to refer to differing constructs across and within disciplines. An example of the latter set of constructs would be the acquisition of a grammar form during communication and the acquisition of a vocabulary item during reading.

The counter term, *intentional* learning, refers to a conscious effort to acquire knowledge, and thus, to a focused attention and awareness as well as to control over the learning processes. Huckin and Coady (1999, p. 190) list nine key points that mark the characteristics of incidental and intentional learning. Firstly, the researchers point out that incidental learning is not "entirely 'incidental'" since, depending on the context or the task to be accomplished, at least partial attention has to be paid to the unknown words. Secondly, they draw attention to the basic sight-recognition vocabulary requirement of minimum 3,000 word families for the incidental learning to take place. This number rises up to 10,000 for university level texts. Thirdly, they underline the lack of agreement on the number and type of exposures needed for the incidental acquisition to be achieved successfully. The fourth key point they mention is guessing meaning from context, which requires an effective application of processing strategies. As the fifth point, they emphasize the need for the teaching of some strategies which do not arise naturally. Sixth key point is that explicit vocabulary instruction accompanied with extensive reading benefits students in general. Their seventh point underscores the positive effect of the learner's interest in the topic of the context, and the eighth point emphasizes the effectiveness of modified input, such as glossing, which brings about the interactive involvement of the learner. The last key point is related to educated guesswork which may cause imprecise inference and misrecognition, as well as interference with the reading process. The researchers state that educated guessing requires not only a well-developed core vocabulary, but also a good knowledge of reading strategies and subject familiarity. The fourth and ninth key points the researchers indicate bring to mind the 'lexical plight' second language learners face in reading.

Laufer (1997, 2003) states two basic facts that underlie the plight. The first is that the clues to guide guessing are not available in every context, and the second is that, even if

available, they may be unknown to, and thus, are unusable by the learner. Moreover, she draws attention to the prerequisite of knowing 95-98 percent of the words in a context to be able to successfully guess the meanings of the unknown vocabulary items. In other words, a reader must know or at least be familiar with 3,000 to 5,000 word families to utilize this background in guessing.

Also, Huckin & Coady (1999) enumerate the serious limitations of guessing word meanings from context such as imprecision, inaccuracy, and deceptiveness unless the context is well understood and the surrounding words in the text are well known. They state that guessing from context "requires a great deal of prior training in basic vocabulary, word recognition, metacognition, and subject matter" (p. 190).

Giving the details of prior studies conducted, Folse (2004) shows how research falsifies the assumption that guessing the meanings of unfamiliar words from context is an excellent way to learn second language vocabulary (Myth 5). He states that a vast vocabulary and a good knowledge of practical skills must already be acquired for effective use of context clues.

2.2. Incidental vs. Implicit

The debate on incidental vs. intentional learning has brought about many research studies with differing findings. Before discussing these studies, presenting the definitions of the two sets of contrasting terms, namely, implicit vs. explicit learning and implicit vs. explicit knowledge, is deemed worthwhile.

2.2.1. Implicit Learning

Hulstijn (2005, p. 131) defines explicit learning as the processing of input with a conscious intention to learn and implicit learning as the process taking place unconsciously. He

recommends that the distinction between intentional and explicit learning should be maintained and verbalizes the distinction as follows: “Whereas explicit learning involves awareness at the point of learning … intentional learning involves a deliberate attempt to commit new information to memory” (p. 360).

DeKeyser (2005) states that the “[s]ubjects in experiments on implicit learning usually have the intention of learning something, even though they may learn something different from what they intended to learn,” and thus, defines implicit learning as “learning without awareness of what is being learned” (p. 314).

At this point, the question of difference between implicit learning and incidental learning comes to mind. Rieder (2003) differentiates the two sets of terms by pointing out that implicit and explicit learning emanate from the field of psychology, whereas incidental and intentional learning are utilized in second language pedagogy. In the case of the former the focus is “on the absence or presence of conscious operations as a crucial distinguishing factor,” whereas in the latter, focus is on intention. However, she also notes that “the distinctions and definitions frequently remain notoriously vague” (p. 26). VanPatten and Williams (2015) comment on the issue by pointing out the absence of instruction in the definitions of implicit and explicit learning and state that the perspective is “what the learner thinks and does,” and not “what the environment is doing to the learner” (p. 12).

2.2.2. Implicit Knowledge

The second set of implicit / explicit distinction relates to knowledge. Ellis (2012) defines implicit knowledge as unconscious and procedural and explicit knowledge as conscious and declarative. He also states that “the relationship between these two types of knowledge remains a

matter of controversy" (p. 433). Hulstijn (2015), within the frame of Basic Language Cognition (BLC) theory, differentiates unconscious and conscious knowledge as follows:

> BLC pertains to (1) the largely implicit, unconscious knowledge in the domains of phonetics, prosody, phonology, morphology and syntax, (2) the largely explicit, conscious knowledge in the lexical domain (form-meaning mappings), *in combination with* [italics his] (3) the automaticity with which these types of knowledge can be processed. BLC is restricted to frequent lexical items and frequent grammatical structures, that is, to lexical items and morpho-syntactic structures that may occur in any communicative situation, common to all adult L1-ers, regardless of age, literacy, or educational level. (p. 22)

VanPatten and Williams (2015) emphasize the fact that a consensus on the definitions of the implicit and explicit knowledge or "the nature of any interface between them" has not been reached because of the evidence on their roles in the implicit and explicit learning is conflicting. Therefore, "what each theory or framework … claim[s] about the two types of learning and the development of the two types of knowledge" still remains a matter of debate (p. 13). For example, DeKeyser (2015) comments on the claim the Skill Acquisition Theory makes by stating that the theory "does not reject the possibility of usefulness of implicit learning, but focuses on how explicit learning … can, via proceduralization and automatization of explicitly learned knowledge, lead to knowledge that is functionally equivalent to implicit knowledge" (p. 106).

2.3. Incidental Vocabulary Acquisition

In connection with the research conducted on incidental vocabulary acquisition, three research review articles discussed below cover three consecutive decades starting from 1990s, the first of which is analyzed by Huckin and Coady (1999). The researchers specify the period as

the decade of intensive research on incidental vocabulary learning and state that, in spite of this fact, it was still not understood well and that there remained many unsettled questions at that time. Their review is focused on numerous studies on the issues classified under the following subheadings and the related points discussed:

- How does incidental acquisition occur?
  - Depth of processing, comprehensible input, long-term storage and recall, comprehension and acquisition of meaning from context, coordination of form and meaning, degree of conscious attention, task type and demand, extensive reading, and learner engagement.
- How much and what kind of vocabulary knowledge does the learner need in order to guess effectively?
  - Sight vocabulary and recognition, word frequency, range and frequency-level of words known in a text, vocabulary threshold, prior word and topic knowledge, contextual guessing, knowledge of core lexemes, and cognates.
- How many and what kinds of exposures to a word does the learner need for successful acquisition?
  - Probability of learning a word from context, word salience and recognizability, morphology, availability and richness of clues, learner interest, and the continuum from partial recognition to precise knowledge and productive use.
- What word-guessing strategies and knowledge sources are most effective?
  - Processing strategies, graphemic identification, contextual meaning, structural and semantic information, thematic content, extratextual knowledge, metacognitive strategies, selective attention, learner motivation, diversity of strategy use.

- Do students need to be taught explicit strategies for guessing, or do they pick them up on their own?
  - Native language proximity, natural cognate recognition, false cognates, global and local context clues, topic knowledge, target language proficiency, guessing vs. translation strategy, metacognition.
- Do students benefit from explicit vocabulary instruction in the context of a reading program?
  - Extensive reading, self-selected reading, reading plus vocabulary instruction, interactive vocabulary instruction, decontextualized vocabulary learning, lexical processing.
- Are some kinds of reading texts more conducive to incidental learning than others?
  - Textual elaboration, text difficulty, personal interest, motivation.
- How effective are input modifications such as glossing?
  - Marginal glosses, computer aided instruction, annotated texts with still pictures or videos, controlled input, proficiency level, involvement, interaction.
- What are the limitations of incidental learning?
  - Imprecision, inaccuracy, deceptive lexical items, misunderstanding, slowed-down processing, textual clues, prior vocabulary knowledge, reading strategies, multiword lexical items, metacognition, and subject matter familiarity.

As a result of their analysis of the reviewed articles, Huckin and Coady (1999) offer the aforementioned nine key points that underscore the main arguments investigated. They underline that, beyond the first few thousand words, incidental learning remains the primary means for vocabulary acquisition for the second language learners, and they emphasize the importance of overcoming the problems, for the solution of which they propose that research ‘pass the baton’ to pedagogy.

Incidental learning enjoyed being the object of attention for the researchers also in the decade following the 1990s. In their review of research article, Choo, Lin, and Pandian (2012) selectively focus on four studies conducted in the second half of first decade of the 21st century on vocabulary acquisition in general, and second language attainment, mainstream vocabulary teaching and learning strategies, explicit / implicit vocabulary acquisition issues, and student performance in particular. The researchers conclude that evidence from empirical research indicates the need for the utilization of both implicit and explicit vocabulary teaching and learning, and they summarize the result of their review as follows:

> Learning, whether incidental or intentional, is mainly a matter of selective attention and elaborated processing. The absence or presence of a learning intention does not play a decisive role as vocabulary acquisition is first and foremost determined by the nature and frequency of the processing of new words. Incidental vocabulary learning is not necessarily more effective than intentional learning, nor is intentional vocabulary learning necessarily more effective than incidental learning. (p. 857)

Restrepo Ramos (2015), also analyzing the previous studies, reviews the research conducted in the first half of the third decade in focus, bringing the issue up-to-date. The studies covered in his review article are issues such as the comparison of incidental and intentional vocabulary learning, acquisition of receptive and productive vocabulary, effects of extensive reading, listening, goal-directed activities and task types, and effects of hypertext glosses and video captioning. He concludes that research provides evidence of incidental vocabulary acquisition through meaning comprehension and that, by being exposed to informative contexts, learners build their vocabularies through incidental means. However, he suggests that further

research be done on the rates of lexical retention through listening, conditions of multiword vocabulary acquisition, and use of technology-based methods that facilitate incidental learning.

Certainly, the interest the researchers show in the issues of both incidental and intentional vocabulary acquisition will continue in the decades to come until a viable means of gauging the rate of that *chance to fall in* becomes available.

2.4. Form Focused Instruction

Incidental vs. intentional learning issue is also related to form focused instruction (FFI), which is, basically, a direct intervention to facilitate learning by specifying the scope and the sequence of language forms and functions to be taught. Two terms identify the two types of FFI, namely, Focus-on-Form (FonF) and Focus-on-Forms (FonFs). Ellis (2012, p. 871) proposes the following points to be considered in differentiating the two types:

- Input-based instruction (whether attention is directed to the target form or not)
- Explicit instruction (whether direct explicit instruction –or indirect instruction through consciousness-raising tasks—is provided or not)
- Output-based instruction (whether text manipulation and error-avoiding / inducing are utilized or not)
- Corrective feedback (whether it is explicitly or implicitly provided)

His definition of the two terms is based on "whether learners attend to form while they are primarily oriented towards message-comprehension / production in order to achieve the outcome of some 'task' as opposed to whether they attend to form in activities whose principal goal is accurate language use" (p. 870) –FonF and FonFs, respectively. In other words, in the

case of FonF, learners' attention is drawn to linguistic forms while they are performing a task, whereas in FonFs, linguistic forms are taught to learners explicitly and directly. The former is, therefore, task-based and the latter, structure-based teaching.

In his critical paper, Ellis (2016) states that the term focus on form is misleading because the purpose of the task-based instruction (FonF) is to attract learners' attention not just to form, but to form-meaning mapping, with the primary focus being on meaning. In the case of structure-based teaching (FonFs), although instruction is explicit, it may also include communicative activities that aim to attract attention to form implicitly; thus, the two terms are not direct opposites. He clarifies the difference as follows:

> [F]ocus on form entails various techniques designed to attract learners' attention to form while they are using the L2 as a tool for communicating. In contrast, focus on forms entails various devices (such as 'exercises') designed to direct learners' attention to specific forms that are to be studied and learned as objects. (p. 409)

Ellis (2016) draws attention to the lack of global comparative method studies inquiring the relative effectiveness of FonF and FonFs and adds that only a few local comparative studies investigating the effectiveness of specific target language features are available. He emphasizes the urgent need for studies which "compare focus on form treatments that include and exclude explicit instruction, with care taken to measure the effects on the acquisition of both explicit and implicit knowledge" (p. 422).

Laufer (2006), in her study conducted with 158 high school students learning English as a second language, compares the effects of FonF and FonFs instruction the learners receive. Findings from the first phase of the study reveal that the scores of FonFs group are significantly

higher. In the second phase of the study, both groups receive FonFs instruction, and the score difference disappears. Based on her findings as well as results of the previous empirical research that support her findings, she concludes that "form-focused instruction –and particularly FonFs– is claimed to be indispensable for L2 vocabulary learning" since it is not realistic to expect learners to study all the vocabulary items for tests (p. 149).

In a later study, Laufer & Rozovski-Roitblat (2011) investigate the long term retention of words learned through FonF and FonFs instruction under six conditions of word occurrence and task type combinations. The study covered 20 university students taking English courses, and the instruction aimed to teach the participants 60 target words during a 13-week study. Research findings indicate that, in each word-occurrence condition, reading text accompanied with FonFs yields higher scores compared to reading text with FonF. Responses to the introspective questionnaire also indicate that the learners value the word-focused activities.

Boers (2015) discusses the merits of form focused instruction in his editorial article in a special issue of the Language Teaching Research journal devoted to form-focused intervention studies. He comments that research reported therein "demonstrate that interventions that direct learners' attention to selected target forms or discourse features can make a difference" (p. 252). However, he offers five caveats to be acknowledged with respect to the evidence provided by the studies. The points he cautions against are:

- variation among learners with respect to the benefits gained from the intervention
- differences of impact among the target features
- possible awareness-raising effect of the pre-test on the control group
- likelihood of post-test's not predicting successful performance in natural language use

- varied amounts of time invested in interventions that may influence effect sizes

Drawing attention to the need for the comparison of the usefulness of interventions and the time allotted to the learning goals, he calls for further research to evaluate the 'trade-offs' to "help language teaching practitioners weigh the merits of proposed form-focused interventions" (p. 253).

2.5. Mental Lexicon

The aforementioned issues of vocabulary acquisition and the research done on these issues bring about the question of similarities and differences between the mental lexicon of the learners' native language (L1) and that of the second language (L2) they learn.

Wolter (2001) compares the L1 and L2 mental lexicon and, challenging the notion supported by previous research that there are fundamental differences between the two, proposes a model for the processes that take place in the integration of the words into the mental lexicon.

Referring to the previous research done on word associations and the conclusions drawn by the researchers based on word connections, phonology, and semantic links, Wolter (2001) draws attention to the frequency of the prompt words used in the association tests. He states that, in the case of low-frequency words, native speaker responses were childlike, resembling those of non-native speakers, and that the patterns of developmental shift demonstrated by non-native speakers were similar to those of native speaker children. Based on these facts, he proposes that L1 and L2 mental lexicons are similar and that the depth of word knowledge is the key factor in integrating the words into mental lexicon.

2.5.1. Developmental Shift

Developmental shift refers to the higher proportion of paradigmatic responses older native speaker children demonstrate as compared to that of the younger ones. Paradigmatic response is one of the three main response types researchers take into consideration in the analysis of words association tests. It refers to the group of words that belong to the same word class and that have the same syntactic function. *Paradigmatic responses* encompass coordinates, superordinates, subordinates, and synonyms of the prompt words, whereas *syntagmatic responses* refer to the words that have sequential or collocational relation to the prompts but not necessarily are from the same word class, and *phonological* –or clang– *responses* resemble the prompts in sound only, with no overt semantic connection. Wolter (2001, p. 43) gives the following examples of response words to the prompt word *dog* to illuminate the three terms signifying response types:

- Paradigmatic responses
    - Coordinate: dog → cat
    - Superordinate: dog → animal
    - Subordinate: dog → terrier
    - Synonym: dog → canine
- Syntagmatic response: dog → bite, or bark
- Phonological (clang) response: dog → bog

The researcher notes that unclassifiable clang responses are analyzed separately and that the number of such responses reduces by age. This fact also supports the developmental shift. Another fact that indicate developmental shift is that younger native speaker children tend to produce a lower proportion of paradigmatic responses in nouns as compared to the proportions of verbs and adjectives, and research done with the beginner and advanced level English language

learners show that the ratio of paradigmatic noun responses given by the former group is lower as it is with the younger children.

The increase in the ratio of paradigmatic responses as well as the decrease in the clang responses relate to language proficiency. The aforementioned reference that Wolter (2001) makes to the frequency of prompt words in the word association tests also relates to the proficiency level of the responders. In this connection, he draws attention to the fact that the response results obtained in L2 research are compared with those that come from L1 word association tests which are based on high-frequency prompt words that are possibly widely known. He states that, although this may seem a limitation and may suggest a need to add other words to the association tests, "extrapolating such results to include the thousands and thousands of words that make up the mental lexicon of a normal native speaker is tenuous at best" (p. 44). Nevertheless, he suggests that L2 research similar to those carried out in the early 1970s be done with low-frequency words and that non-native speaker (NNS) responses be compared with those of native speakers (NS).

2.5.2. Structural Similarity

Taking into consideration the findings from previous research conducted with both high- and low-frequency words, Wolter (2001, p. 45) lists three patterns in the data that provide evidence to the structural similarity of the L1 and L2 mental lexicons.

1. Both native speakers of English and L2 learners demonstrate syntagmatic-paradigmatic shifts in responses.

2. Both native speakers of English (when presented with low-frequency prompt words) and learners of various levels of proficiency produce clang responses, mediated responses, and responses that seem completely unrelated to the prompt word.
3. A large diversity of responses can be found in the data of word association tests collected for L2 learners, NS adults (again when presented with low-frequency prompt words), and NS children.

With respect to word-frequency and learner proficiency, Wolter (2001) states that neither can be the underlying factor accounting for the structure of mental lexicon. The rationale behind his argument is that word frequency ratings "have a limited value in helping us to predict which words are or are not known by a particular individual (be they a native or a nonnative speaker)" and that proficiency "cannot account for the fact that NS adults commonly produce nonnative-like responses to certain prompt words" (p. 46). In search of evidence for the similarity between L1 and L2 lexicons, he proposes depth of individual word knowledge (DIWK) model.

2.5.3. The Proposed Mental Lexicon Model

Wolter (2001) defines DIWK Model as a model that "views the connections in both the L1 and the L2 mental lexicon as conditioned not by language proficiency or word frequency per se, but by how well particular words are known to a given speaker" (p. 46) and clarifies three aspects regarding the model that he deems important:

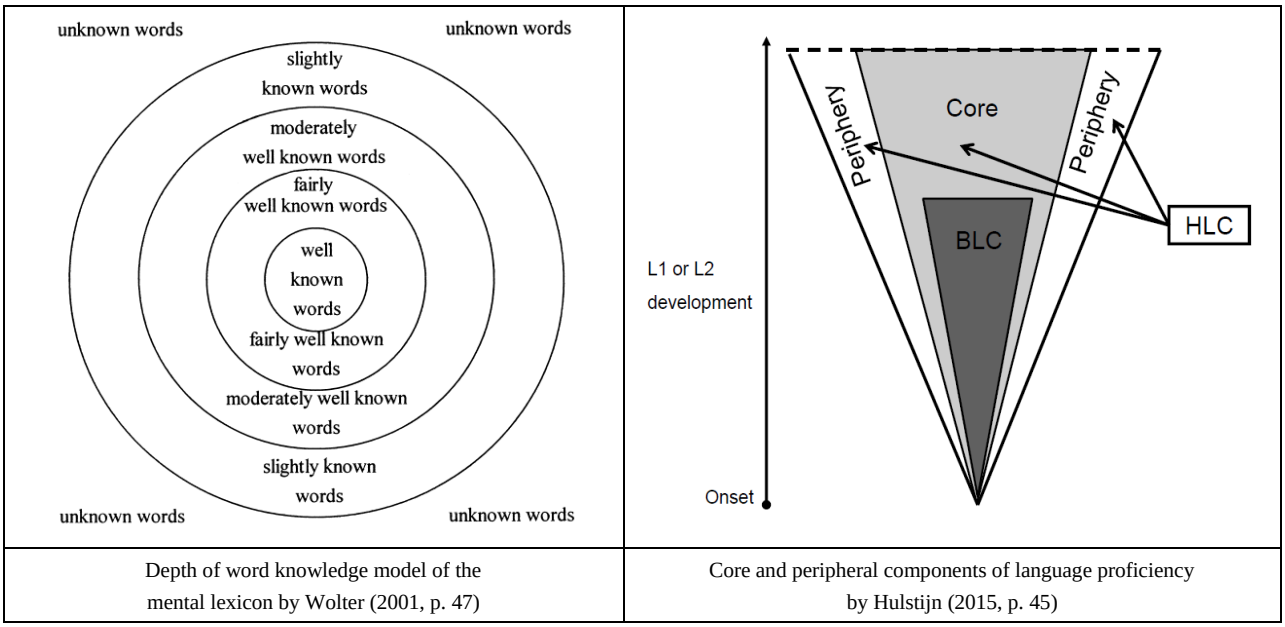
1. A learner's mental lexicon has a smaller stock of words as compared to that of NS; additionally, the stock is unstable since, at any point in time, speakers, whether native or non-native, both acquire new words and lose some previously learned ones.

2. A mental lexicon is neither more nor less than the sum of the words in the mind, and thus, dealing with the mental lexicon is dealing with the connection of the words rather than a pre-existing overall structure.
3. The words in a mental lexicon do not have the same status, in that, some of them are known well (core vocabulary), some are known in varying degrees (peripheral vocabulary), and some are not known at all. This distinction affects the connections between the words in the lexicon.

The model is based on the proposition that "the words in the mental lexicon are acquired individually and … undergo developmental shifts separately from other words" (p. 47). Another proposition is that the strength of the connections between the words in the mental lexicon depends on whether they are within the core or peripheral vocabulary. This concept is made visual through the encompassing circles expanding from the center (well-known words) to the periphery (fairly, moderately, and slightly-known words), beyond of the last of which lie the unknown words. This concept is named 'depth of word knowledge model' of the mental lexicon.

The DIWK graph presented in the article has similarities in concept with the graph presented by Hulstijn (2015) in connection with the aforementioned Basic Language Cognition (BLC) theory. As can be seen from the juxtaposed graphs in Figure 2.1, the latter details the core vocabulary content and, with the nested isosceles triangles turned upside down, the onset of vocabulary acquisition is represented by the former apex as a starting point and the capacity to expand is manifested with dashes on the former base line. Core vocabulary items, which include BLC words, represent "linguistic cognition (knowledge and speed) in the phonetic-phonological, morpho-phonological, morpho-syntactic, and lexical / pragmatic domains," whereas the items in the periphery (HLC, Higher Language Cognition –low-frequency items and uncommon morpho-

syntactic structures) represent interactional ability, strategic competences, metalinguistic knowledge, and the knowledge of various types of oral and written discourse (p. 42).



Depth of word knowledge model of the mental lexicon by Wolter (2001, p. 47)

Core and peripheral components of language proficiency by Hulstijn (2015, p. 45)

Figure 2.1. Core and peripheral words situated in the lexicon: Two graphs compared

Based on his DIWK Model, Wolter (2001) conducted a study with 13 Japanese speakers of L2 English and 9 NSs of English. He used two prompt-word lists (PWLs) compiled with the words from different frequency levels and included in the word association tests (VAT) administered. Also, a five-scale VKS (Vocabulary Knowledge Scale) test was utilized to support the demonstrated knowledge of the VAT scores with the self-reported data of the VKS.

The analysis of responses, categorized as paradigmatic, syntagmatic, and clang-other, shows that native speakers (NSs) produce more paradigmatic and less clang-other responses than the non-native speakers (NNSs), and the latter group produces more syntagmatic responses than the former. Also, NSs tend to produce more clang-other responses as the frequency level of the

prompt words increases. Wolter (2001) explains that “the L1 and L2 mental lexicon, though sharing many similarities, are fundamentally different for words that are well known” and “as a syntagmatically dominated structure, the L2 mental lexicon is in some ways a deviant or underdeveloped form of the L1 mental lexicon” (p. 61). With regards to the size of the mental lexicon, evidence suggests a real difference between the two groups in favor of the NSs. However, since the NNSs can successfully use their productive vocabulary when speaking English, their mental lexicon is not necessarily inferior to that of the NSs’ in spite of the structural difference; neither is it randomly and loosely structured.

2.5.4. Later Publications

Two books published more recently cover the core issues of the mental lexicon. In the opening chapter of the first book edited by Jarema and Libben (2007) introduce the matters related to definition and core perspectives. They state that there is a tendency among the authors and editors to refrain from defining mental lexicon knowing that “any attempt at a definition will likely be wrong or, at the very least, incomplete” (p. 2). The reason behind this tendency emanates from the awareness of two conflicting facts: the mental lexicon’s not really being a thing and the words’ ostensibly being storable and countable entities which people possess, acquire, use, and lose. Another reason underlying the reluctance to define the mental lexicon is that it defies ascribing boundaries because of its relation to linguistic concepts in phonology, morphology, syntax, and semantics, as well as to psychological processes. Nevertheless, the two authors offer a definition: *"The mental lexicon is the cognitive system that constitutes the capacity for conscious and unconscious lexical activity.”* (Italics theirs)

Jarema and Libben (2007) claim that their definition is ‘very unrestrictive’ since it does not aim to answer core questions but frames them, and the frame includes three main points: the mental lexicon is a cognitive system; this system constitutes a capacity; and that capacity includes both conscious and unconscious lexical activity. The idea behind the definition takes its base from the fact that “the goal of mental lexicon research is indeed to understand the human capacity for conscious and unconscious lexical activity.” The preference for ‘lexical activity’ opts out the terms such as word access or word production since it “highlights the covert processes of word composition and decomposition, of lexical priming, and, generally, of the activities in the first few hundred milliseconds of activation” (p. 3).

In connection with the core questions, Jarema and Libben (2007) present those under three headings to provide a structure that may lead to generating core perspectives as to help to advance understanding of the mental lexicon and to set the principles and possibilities as to answer core questions:

i. Can we have a common architecture for all languages?
ii. Gaining insight from the non-obvious
iii. What is the right approach to modeling the mental lexicon?

As the editors of the book, Jarema and Libben (2007) invite the researchers contributing to the book to present their core perspectives on the mental lexicon. The scope of the book is beyond the purpose of the present response paper, and thus, the details are not covered herewith. However, it is worth mentioning another book by Doczi and Kormos (2016) wherein the definition offered by the editors of the previous book resounds. The authors state that they prefer to adopt the definition for the following reasons:

> This characterization of the lexicon as a system accounts for both the storage in and retrieval from, and organized nature of, the lexicon. Furthermore, this definition incorporates a capacity view of the lexicon, which allows us to explain that, among all the aspects of language, it is lexis that is prone to the greatest change and development during one's life; therefore, the mental lexicon is in constant flux. This view of the mental lexicon as a system with capacity allows us to account for the possession, acquisition, conceptualization, use, and loss of lexical knowledge, thus drawing our attention to all the processes that can actually be achieved with the help of the mental lexicon. (p. 12)

2.5.5. Comments on Mental Lexicon

As the above analysis of papers shows, the mental lexicon is a topic of interest to researchers and has been debated on for many decades now. Being a concept hard to define and to find concrete evidence of its workings, the mental lexicon issue is likely to continue to be in focus for years to come. Similarly, incidental learning is a concept that eludes researchers' attempts to understand it and to find undebatable evidence of its workings.

The findings of the papers covered in this analysis indicate that there may not be a fundamental difference in the way the new words are acquired in L1 and L2, especially with respect to adult non-native English language learners and native speakers. On the contrary, noticeable similarities are observed through word association tests in the case of low-frequency vocabulary items.

2.6. Research Done to Date

The following research papers on the instruction of Latinate word parts and the effects of learning Latin are presented under four sub-headings in the order of the level of education, namely, elementary school, middle and high school, university preparation, and university. A

qualitative study with post-school adults is also added under the fifth sub-heading. The sequence of the papers under each sub-heading is arranged according to the dates of publication, starting from the most recent. If more studies appear in the same year, the alphabetical order of the author names is followed.

2.6.1. Research Done with Elementary School Students

Deacon, Kieffer, and Laroche (2014) studied hundred grade 3 and 4 English-speaking children to examine the role of the awareness and ability to employ morphemes in their reading. The researchers' key questions were whether morphological awareness facilitated word reading skills and whether the awareness supported reading comprehension. The findings indicated that "morphological awareness helps children understand texts both through a direct relationship with reading comprehension and through a more indirect relationship by helping them to read individual words, which in turn supports reading comprehension" (p. 445) and that children's ability in drawing on their morphological awareness plays a role on their gains in reading comprehension.

Smith [Jennifer] (2007) conducted a research with 84 first and second grade elementary school students to find out to the impact of teaching Latin and Greek roots on their word knowledge. Students were divided into experiment (45) and control (39) groups. Experimental-group students received instruction on the Latin and Greek roots as to teach them a transferable, that is, a life-long learning skill to enhance their word knowledge. Students in both groups were administered a pre/post-test composed of three sections: 20 multiple choice, 15 sentence completion, and 8 matching definition questions with distractors to gauge receptive and production word knowledge. The significant difference between the two test scores of the

experimental group students indicated that, even in the primary grades, students can learn and enhance their word knowledge through morphemes.

Baumann, Edwards, Boland, Olejnik, and Kame'enui (2003) studied 157 fifth-grade students, comparing the effects of morphemic and contextual (MC) analysis instruction with those of textbook vocabulary (TV) instruction. While the experimental group students were taught how to analyze the meaningful word parts and how to infer meanings from the surrounding text, the control group students were directly taught the same words covered also by the first group. Two pretests (word meaning and context) and nine posttests (textbook vocabulary, word part, immediate vocabulary in context, comprehension, chapter, delayed vocabulary in context) were administered. Also, descriptive post-assessments (teacher written questionnaire, student group interviews, and teach group interviews) were carried out to evaluate the effectiveness of the instruction program. With respect to inferring the meanings of novel affixed words and morphologically and contextually decipherable words, the findings indicated that MC students were more successful than TV students who were more successful at learning textbook vocabulary. The researchers conclude that "instruction in morphemic and contextual analysis can positively influence independent vocabulary learning, that combined instruction is just as effective as separate instruction, and that such instruction does not necessarily enhance text comprehension" (p. 455).

2.6.2. Research Done with Middle and High School Students

Crosson and Moore (2017) conducted a study with 82 English learners in three grade bands: 6-8, 9-10, and 11-12. The participants were ESL students from over 20 different first language backgrounds, and their knowledge of English was at intermediate or advanced level.

The researchers hypothesized that instruction on bound Latin roots would have positive effects on students' learning academic words and that Latin roots would provide students the analytic processing skills in inferring the meanings of unfamiliar words through Latin roots. Intervention with and without morphology focused instruction was employed, and the students in each grade band received both instructions in two consecutive sessions in the reverse order. Research findings indicated that positive effects of instruction on bound Latin roots were present at all grade levels and that the treatment effects were the largest in the case of oldest students.

Keiffer and DiFelice Box (2013) studied 82 Spanish first language minority sixth graders and their 55 native English speaker peers to inquire the direct and indirect contribution of morphological awareness in reading comprehension and to compare the two groups. Participants' academic vocabulary, derivational morphological awareness, reading comprehension, and word-reading fluency were assessed and compared. The findings indicate that the indirect effect of morphological awareness on reading comprehension through academic vocabulary is weaker in the minority students than their English native-speaker classmates. Since morphology interacts with orthography and phonology, this finding also explains the difficulties underdeveloped minority students face in reading comprehension and fluency.

Keiffer and Lesaux (2012) conducted a study with 952 sixth-grader students from English (323), Spanish (499), Filipino (82), and Vietnamese (48) first-language backgrounds. The students were from 16 urban-district middle schools in California, and they were administered tests to measure their reading comprehension, morphological awareness, reading vocabulary, and silent-reading fluency as to find out whether morphological awareness had contributions to English reading comprehension. Results indicated a significant direct contribution of

morphological awareness on reading comprehension and indirect contribution via reading vocabulary, and the effects were similar across all four language groups.

Diaz (2009), to find out the effects of learning Latin and Greek word roots on their vocabulary acquisition in particular, and reading and spelling performance in general, conducted a study with 140 eleventh grade English language learners (ELLs) whose first-language was Spanish. The Greek, Latin, and Old English roots of hundred low-frequency words and their morphological construct were taught to the experimental group, and both the experimental and control groups were administered the pre/post-test. The researcher compared the results of morphology instruction (MI) received by the experimental group with those of traditional (reading, vocabulary and spelling) instruction received by the control group. His findings show that MI has a significant effect on the improvement in reading, vocabulary, and spelling skills of the ELLs.

Nelson (2006) carried out a study on the effects of morphology instruction with the aim of determining the effectiveness of the root-word teaching method utilized as to advance students' vocabulary and comprehension skills. His participants were 107 eight graders who received intensive instruction on morphology. The intervention included word definitions, root-word meanings, and contextual information. Students' attention was drawn also on the English words that contain the same root-words with the ones being taught as a part of the instruction. The data were collected through field notes, student surveys, and student work which also included their test scores. Based on both the qualitative and quantitative findings, he concluded that "Greek and Latin root word instruction can improve student learning in their ongoing education and in the real world" (p. 36).

Kennedy (2006) evaluated the differences in English and overall academic achievements of 227 high school students. He compared those students who studied Latin (89) with those who studied modern foreign languages, namely French (75) and Spanish (63). The research he conducted aimed to inquire the performance of students with respect to their achievement in English (cumulative grades in English and in foreign languages, in critical reading, and writing), as well as their overall high school grades and PSAT scores. There was no intervention since the archived student records were used as the source of research data. Data analyses showed a statistically significant difference between the achievement of the students who studied Latin and the achievements of those who studied French or Spanish. The researcher concluded that his findings verify the benefits of learning Latin language on students' English vocabulary and linguistic competencies. He also mentioned that the College Board data show that SAT verbal scores of those students who took LAT II test are higher.

2.6.3. Research Done with Students Attending University Preparation Programs

Akbulut (2017) carried out a study with 52 intermediate English learners attending a university preparatory course. The research questioned whether morphological awareness contributes to vocabulary teaching and learning process in the classroom and whether teaching vocabulary with morphological awareness strategy helps learners to enlarge their vocabulary knowledge. The participants were divided into treatment and control groups, and the former group received instruction on prefixes, suffixes, and root knowledge as well as morphological analysis of the words, whereas the latter group received traditional instruction, namely note-taking, memorizing, and dictionary use. Both groups were administered a pre/post-test which contained words from 2,000 to 5,000 frequency level words. The results indicated that

experimental group learners were significantly better than those in the control group and that there was a significant relationship between morphological awareness and vocabulary size.

Bellomo (2005) conducted a study at a community college in central Florida with 88 non-native speakers of English from various first language backgrounds, such as Spanish (30), French (4), and Portuguese (3) from the Latin-based (LB) language group, and Russian (12), Japanese (11), Korean (9), Arabic (5), and eleven others from non-Latin based (NLB) languages. These students were attending the advanced level reading course in preparation for their major field course work. They received semester-long word-part instruction covering 65 roots that accounted for 315 words, as well as 42 prefixes and 24 suffixes. Their performance, measured through a pre/post-test, was compared with that of 44 English native speaker students (NES) who were attending a developmental reading course and received the same word-part instruction. The LB group scored the highest in both the pretest and the posttest, followed by NES and NLB groups. All groups recorded increased performance in the post test. The findings indicate that "teaching morphologically complex vocabulary at the college preparatory level along with providing a working knowledge of morphemes can assist students toward college readiness" (p. 103).

2.6.4. Research Done with University Students

Paiman, Thai, and Yuit (2015) conducted a study with 60 Malaysian undergraduate students majoring in health sciences. The participants were attending three separate classes of 20 students, and each group received one of the three different instructions on vocabulary learning strategies that focused on 1- general morphemic analysis, 2- Graeco-Latin morphemic analysis, and 3- use of contextual clues. The research questions inquired the effect of morphemic awareness on vocabulary acquisition of the health science students with respect to general and

major specific word knowledge as opposed to lack of it. Three vocabulary tests were administered both as the pretest and the posttest to gauge the students' morphemic knowledge of general English words, Graeco-Latin word parts, and overall vocabulary size. The results showed that the group that received Graeco-Latin morphemic analysis treatment scored highest in all three tests.

Zolfagharkhani and Ghorbani Moghadam (2011) studied 60 undergraduate English major students at an Iranian university to find out the effects of etymology study on vocabulary acquisition and to compare the performances of males and females. The participants were upper intermediate level English language learners divided into two groups, both of which were comprised of 9 males and 21 females. Randomly assigned experimental group students were provided with a list of affixes and roots, received instruction on etymology strategy, and practiced identifying the meaning of the words through the word parts. The results indicated that the experimental group members significantly outperformed those of the control group, and males scored higher than the females.

Karliova (2009) conducted an experimental study at a public university in Turkey. The participants were 245 undergraduate students, 122 freshmen and 123 seniors, all prospective English language teachers whose first language was Turkish. The freshmen students were equally divided into treatment and control groups, and the seniors functioned as the second control group. Only the treatment group students received Latinate word part instruction which covered 10 prefixes, 14 suffixes, and 10 Latin roots. A total of 150 Latinate English words that were composed of these affixes and roots formed the basis of the instruction. The words compiling the pre/post-test also contained the same affixes and roots; however, none of the instructed words appeared in the test. Treatment group students' performance was compared

with those of the students in both control groups. Findings indicate that the treatment group performed better than their control group counterparts, and the effect of the word-part instruction was statistically significant. Results also showed that the treatment group students, despite the three years' disadvantage in the length of academic study, performed slightly lower than those of the senior control group students, but the difference was not statistically significant.

Maag (2007) carried out a research with 106 undergraduates attending psychology courses at a university in northern Florida. The researcher assessed participants' morphological knowledge of 50 multi-morphemic, that is, complex words by means of a three-sectioned test. In the first section, participants were asked to mark the words they know out of the 50 presented in the test. In the following section of the test, they were asked to identify the simpler word that is morphologically related to each complex word as to find out their knowledge of derivational word-formation process. In the last section of the test, the participants were asked to select the definition of the target word from the three options presented. Participants were also administered a standardized reading test the correlation of their reading and vocabulary scores with that of their morphological knowledge. The hypotheses that the participants with higher reading comprehension and vocabulary scores would have a better knowledge of morphology, would gain better morphological awareness scores, and would detect word meanings more accurately were all supported by the results obtained.

2.6.5. Research Done with Post-school Adults

Smith [Jeffry] (2007) interviewed 16 adults who studied Latin and/or Greek at college level and were teaching or previously had taught both or either of these languages. Interview questions aimed to collect data on the classical language/s studied / taught, level and length of

study / teaching, the effect of the classical study on learning other subjects, and which and in what ways the effect is perceived / verified. The researcher analyzed both the interview data obtained from the participants and data from his reflective journals. The findings indicate that the "participants were generally very persuaded that the impact [on understanding and using English and acquiring other subjects and languages] was of a positive nature" (p. 99).

2.7. Reflection on the Research Studies

The aforementioned research studies are not all inclusive. There are others done prior to the earliest study included above from year 2003. The main criterion in the selection of the research covered is that they are the most recent studies focusing on the effect of morphological awareness of the language acquired, herein primarily English and its vocabulary, although other Indo-European languages, namely, French, Spanish, and Classics, are also included in some of the papers.

Another criterion in selecting these works is that they cover four levels of education, namely, elementary school, middle and high school, university preparation, and university. One additional research done with post-school adults (Jeffry Smith, 2007) was also included because it relates not only to learning, but also to teaching classical languages, and thus, reflects the participants' personal experiences gained by learning Latin and/or Greek. The participants in this qualitative study affirmed that the knowledge of Classics had affected their ability to learn other subjects when they were students themselves and that now, as teachers, they observed how this knowledge improved not only the reading and writing skills, but also the reasoning faculties of their students.

Lastly, the statements made by the participants in this study in verified by other recent research. For example, Masrai and Milton (2017) report their findings which suggest that 56 percent of the variance in students' GPAs can be explained by the academic and general vocabulary knowledge, both in their first and second languages. Also, research conducted by Milton and Treffers-Daller (2013) and Townsend, Filipppini, Collins, and Biancarosa (2012) indicate that both general and academic vocabulary knowledge are good predictors of overall academic performance, the latter having a stronger correlation.

2.7.1. Summary of the Research Data

Table 2.1 and 2.2 present the summary of the aforementioned research data with respect to the education and grade levels, number of participants, native and second languages of the participants, and their language skills tested. The data are divided into two tables according to the levels of education before and after the tertiary study. University preparation programs are deemed in the latter group since these programs were offered at the universities. The data presented on both tables are in the order or the aforementioned studies; that is, the data are in the descending chronological order of the research conducted and, if more than one study is from the same year, alphabetical order of the last names is followed. The rationale for keeping the data in the table parallel with the studies covered in this paper is that neither the dates, nor the researcher names are included in the tables for the sake of conciseness.

Data in Table 2.1 show that the studies in this educational level group is done mostly with English native speaker students with the exception of one case wherein Spanish was the native language of one of the participant groups, and in one of Spanish, Filipino, and Vietnamese were the minority languages. As for the languages learned, all but two are English; in other

words, the effect of morphological awareness / instruction on the native language was studied. Latin, French, and Spanish were the languages learned in two cases only. In all the studies in the group inquired the effects mainly on word knowledge (general or academic vocabulary) and reading comprehension.

Table 2.1. Research Done with Elementary, Middle, and High School Students

Education Level	Grade Level	Number of Participants	Native Language	Languages Learned	English Language Skill Tested
Elementary	3 & 4	100	• English		• Reading comprehension
	1 & 2	84	• English		• Word knowledge
	5	157	• English		• Word knowledge
Middle & High School	6-8 9-12	82	• English	• English	• Academic vocabulary Meaning inference
	6	82 + 55	• Spanish + English	• English	• Reading comprehension Word-reading fluency Academic vocabulary
	6	952	• English, Spanish, Filipino, Vietnamese	• English	• Reading comprehension Reading vocabulary Silent reading fluency
	11	140	• Spanish	• English	• Vocabulary acquisition Reading comprehension Spelling
	8	107	• English	• Latin French Spanish	• Vocabulary acquisition Reading comprehension
	9-12	227	• English	• Latin French Spanish	• Academic success Critical reading Writing, PSAT

Note. For elementary school students, the native language, English, is also the language learned.

Table 2.2 summarizes the studies conducted both in the States and abroad. In the former case, the native language is English, with the exception of one study which also covers students taking a university preparatory course at a university in the States and learning English as a second language. As for the skill tested, in all cases studied it is the knowledge of vocabulary

although word frequencies may differ. Some specifically focus on academic vocabulary, some to low-frequency, and some to high-frequency words. In some studies, vocabulary knowledge is studied in combination with reading comprehension or guessing meaning from context. The choice of skills tested in these studies is in line with the research results obtained to date (e.g., Hu & Nation, 2000; Laufer, 2013; Nation, 2001, 2006; Schmitt, Jiang, & Grabe, 2011) which emphasize the importance of vocabulary in reading comprehension.

Table 2.2. Research Done with University Students and Post-school Adults

Education Level	Grade Level	Number of Participants	Native Language	Languages Learned	English Language Skill Tested
University Preparatory Programs	Prep.	52	• Turkish	• English	• 2,000-5,000 frequency level vocabulary
		88	• English Spanish French Portuguese Russian Japanese Korean Arabic & 11 others	• English	• Reading comprehension Academic and low-frequency vocabulary Morphological awareness
University	UG	60	• Malaysian	• English	• Morphological awareness Guessing word meaning
		60	• Persian	• English	• Vocabulary acquisition Morphological awareness
		245	• Turkish	• English	• Academic vocabulary Morphological awareness
		106	• English	• English	• Multi-morphemic words Reading vocabulary
Post-school	Adults	16	• English	• Latin Greek	• Word knowledge

Note. University preparatory program students are considered university level participants.

2.8. Research Approaches

The abovementioned studies are mostly experimental research comparing the treatment and control groups. Some groups were intact, and some were randomly assigned by the

researchers. Of the sixteen studies, only one is quasi-experimental, in that, it used archived data. One study is qualitative, and two studies employed mixed-method, that is, both qualitative and quantitative data were analyzed. Some of the experimental studies had more than one experimental group, and thus, both within- and between-group comparisons were made.

The common means employed by all the experimental studies was pre/post-test administration. In one study, multiple post-tests were used with intervals to reflect the progress made by the students after each section of the course material covered. One of the experimental studies stands out, in that, it also compared the performances of males and females besides the performance of the overall treatment group with that of the control group. No other study took gender into consideration with respect to student achievements. Some experimental studies also administered proficiency tests to compare the knowledge levels of the treatment and control group participants. Those studies that inquired the progress participants made in reading administered comprehension tests besides vocabulary tests to gauge the improvements in breadth and depth of word knowledge after the interference.

With respect to languages learned, the majority of the experimental studies inquired the progress made in English word knowledge following the instruction on morphology. The native languages of the majority of participants up the tertiary level was mainly English since those students considered Spanish or other minority language speakers, knew English but their native languages were the only ones spoken at home. Therefore, progress in English vocabulary knowledge itself and the effects of morphological awareness on English reading comprehension / word fluency were analyzed.

Other native languages were also covered in the studies carried out with tertiary level participants since either the research were conducted abroad or the school was in the United

States, but the participants were international students or first-generation immigrants. Thus, homogeneous first-language speaker groups, namely English-as-a-foreign-language speakers were also studied. Since the language proficiency and word-knowledge levels of these students are generally lower, the frequency levels of the vocabulary items studied were also lower compared with those of the studies conducted with English native speaker students in the States.

As for the languages learned, with the exception of post-school adult participants, Latin was the case only in two studies carried out with English native speaker high school students. Other languages besides English and Latin were French and Spanish, again, both only in two cases of study.

2.9. Research Gap Observed in the Studies Presented under 2.6

The number of studies carried out with the participants who learned or are learning Latin and Latinate languages is not commensurate with that of studies conducted with English learners. Of course, the total number of studies covered in this paper is only 16, and it is not all-inclusive. However, of the rest of the studies searched but not included here, none comparing the effects of learning Latin and a Latinate language on English vocabulary development was detected. This is the case at least about work available online and publication within the reach of the researcher. There may be more work done but not published and/or made available to university libraries.

2.10. Instructional Considerations

There are some difficulties generally faced with respect to morphology and English vocabulary teaching, Latin language instruction, and Latinate cognates.

2.10.1. Morphological Instruction and Vocabulary Teaching

In her commentary article, Carlisle (2003) discusses the current research done on morphological awareness and its effects on reading comprehension as well as reading instruction. She mentions that the instructors are aware of the need for children to learn strategies that will help them learn complex words through morphemes and become better readers; however, she also mentions "the assumption that many educators are relatively unfamiliar with morphology" (p. 291). Furthermore, she states that "few teachers know what an inflection is" (p. 312) and emphasizes the need for instructional programs to raise the morphological awareness in children starting even in elementary years as to help them acquire literacy early on. According to the results obtained from recent research, teachers should provide explicit instruction and also model the analytical process in class by using it themselves when an unfamiliar word is encountered by the students since "[m]orphological awareness really does matter in learning to read" (p. 318).

Jennifer Smith (2007) reported authentic statements she collected during the teacher interviews. One specific sentence by a teacher supports the above comment on teachers' not being familiar with morphology: "I'm learning a lot too. I find myself looking at words differently" (p. 65).

Teachers' statements about the facts related to vocabulary teaching in classrooms emanate from two sources: the first is their not having enough time to teach both vocabulary and the subject matters, and the second, their experiencing a change in thinking about vocabulary and its instruction with the effect of vocabulary programs available (Baumann et al., 2003). The researchers report two authentic statements by teachers: "We are kind of under the gun to get

everything done," and "I have always known [that] vocabulary is an important element to learning, but now I look at it from a much broader perspective" (p. 480).

Rasinski, Padak, and Newton (2017) refer to the 2015 assessment report released by the National Center for Education Statistics and point out the fact that 4th, 8th, and 12th graders did not demonstrate improvement in their vocabulary knowledge since 2009. The researchers also mention that very little vocabulary teaching occurs in many classrooms in the States. When this happens, students take learning vocabulary through word lists and quizzes as a painful and meaningless effort since what is memorized is soon forgotten. Awareness of Latin and Greek morphology helps students improve their vocabulary knowledge and retain the words; however, the researchers emphasize that "[m]any teachers recognize the importance of using Latin and Greek word patterns to build vocabulary, but are still developing their own understanding of morphemic patterns and how they can use these patterns to expand students' word knowledge" (p. 42).

2.10.2. Latin Instruction

Kennedy (2006) mentions the major decline in Latin instruction over a half century ago upon the authorization of the delivery of sermons in languages other than Latin and states that the language was 'left for dead' all through the 70s and 80s. However, a sign of revival started being seen in the 90s, and recently, its correlation with improved abilities in English language skills and in overall academic achievement has become evident with the support of research done since then, but especially in the last two decades.

Resurgence after decades of neglect necessitates larger investment to implement widespread Latin instruction programs. A quick search on the Internet produces 96 colleges and

universities which offer Latin Language and Literature degrees in the United States. Most of these degree programs require comparatively high SAT scores for acceptance. This means that the applicants need to have the basic knowledge of English vocabulary in advance. Thus, providing students instruction on morphology and low-frequency vocabulary is in the hands of the teachers in primary and secondary schools. This fact indicates a need for training teachers to become equipped instructors of Latinate word parts in complex English words.

This brings the issue to the main idea of the present study and its possible implications with regards to explicit morphological instruction in language teaching in general and Latin instruction in particular. The results suggest a need to conduct further research as to find out whether learning Latin as a second language would set a solid foundation for learning Latinate languages as the third.

2.10.3. Latinate Cognates

Solodow (2010) states that the "great bulk of the vocabulary in [the] three Romance languages [French, Italian, and Spanish] is inherited from Latin or based on Latin." He gives the following example in support of this fact:

> [W]hen studying the Romance lexicon with my classes, I have sometimes assigned them a tricky exercise. They were first to choose a passage in one of the Romance languages, about forty words in length and taken from any sort of writing (poem, advertisement, magazine article, novel, etc.); then, with the aid of an etymological dictionary, for every word in the passage to indicate from which language family (Latin, Greek, Germanic, Celtic, Arabic, other) it entered the modern language; and finally, to tabulate the results. … Regardless of the passage chosen, the results varied little: the Latin portion never dropped below 90 percent, and usually reached 95, sometimes 100 percent. (p. 127)

Moreover, Nagy, and Scott (2000, p. 236) emphasizes that "English and Spanish share many cognates … that are similar in pronunciation, spelling, and meaning," and that the ability to recognize the relationship between such cognates is similar to that "required to recognize morphological relationships in English." However, in the case of changes in spelling and pronunciation, the morphological relationship is obscured, and a metalinguistic sensitivity, that is, morphological knowledge and syntactic awareness, must be developed. The researchers also mention that "the vast majority of words composed of more than one morpheme are semantically transparent."

To summarize the instructional considerations mentioned above, it is indispensable to acquire the skills for analyzing English word formations even in early years of education. Since research results confirm the benefits of morphological awareness and since, as Gardner and Davies (2014) emphasize, many complex words bear abstract meanings and have multiple senses, putting every effort in it would be worth.

CHAPTER THREE:

METHODOLOGY

3.1. Purpose of the Study

The purpose of the present study is to compare the possible effects of learning a language from the Italic branch of Indo-European language family (Appendix A) as a second language (L2), namely Latin (LL2) and Spanish (SL2), on the English academic and low-frequency vocabulary acquisition and metalinguistic knowledge of the native English speaker (NES) undergraduate students in their first language (L1). The rationale for including Latin and Spanish in the present study is that over 60 percent of English language vocabulary contains the words composed of Latinate word parts (Nagy & Scott, 2000; Nation & Meara, 2010) and that Spanish is the most widely learned second language in the United States (Goldberg, Looney, & Lusin, 2019). Appendix B gives the percentage of total language enrollments from 1968 to 2016 in various intervals. As the figures indicate, Spanish supersedes all the languages by 50.2 percent in 2016, recording an increasing trend from 32.3 percent in 1968.

3.2. Research Questions

1. Does learning Latin as a second language help to improve the academic and low-frequency English vocabulary knowledge of first-semester undergraduate students who are native speakers of English?

2. Does learning Spanish as a second language help to improve the academic and low-frequency English vocabulary knowledge of first-semester undergraduate students who are native speakers of English?
3. Is there a difference between learning Latin and learning Spanish as a second langue in improving academic and low-frequency English vocabulary?
4. Does learning Latin as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?
5. Does learning Spanish as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?
6. Is there a difference between learning Latin and learning Spanish as a second langue in improving metalinguistic knowledge of English language?

3.3. Research Design

The participants were students attending Latin and Spanish second language courses, and the classrooms were intact. Since a random pre-selection could not be made, the present study is a quasi-experimental research. It focuses on the possible effects of learning a second language on the vocabulary development and metalinguistic awareness of the participants in their first language, which is English. Acquisition of the four language-skills and grammar is not within the scope of the present study. In this respect, the study evaluates the performances of two separate groups, none of which is a control group. Therefore, differences between the pre-test and post-

test performances of each group were compared to find out whether there is a difference between the two groups.

3.3.1. Setting

The study was conducted at the World Languages Department of a public university in the southeastern United States in regular classroom sessions for one fall semester.

3.3.2. Participants

The participants were native speakers of English pursuing their tertiary education in various fields of study, such as anthropology, biomedical sciences, health sciences, history, English, philosophy, physics, and psychology. They were undergraduate students attending Beginning Latin 1 and Beginning Spanish 1 courses offered by the department.

3.3.2.1. Number of the participants. The number of L2 learners participated in the study is 40, out of which 15 are from the Latin L2 and 25 from Spanish L2-learners group. The ratio of the language groups is three to five in favor of Spanish learners, which is expected since the demand for the latter language is much higher. The World Languages Department offers two sections of Latin lecture classes each spring and fall semesters and none in summer, whereas it generally offers ten or more sections of Spanish lecture classes in spring and fall and at least two sections in summer. This difference coincides with the latest enrollment data published by the Modern Language Association in June 2019 (Appendix B) . The report indicates that the number of Spanish learners enrolled in the introductory undergraduate courses throughout the United States in the year 2016 was 584,533 while that of Latin learners was 20,954 (ratio: 1/28). In the

semester the present study was conducted, the number of Latin lecture classes opened was two and Spanish was thirteen.

Moreover, the number of L2 learners who dropped out or withdrew from the two Latin sections was higher than that of the two Spanish sections included in the study. While this number was 12 for the Latin L2 group of learners, it was only 4 for the Spanish L2 group. Therefore, these students were not included in the study although they had consented to participate at the beginning of the course.

Additionally, there were eleven Latin learners who did not take the post-test and the MAT at the end of the semester, which lowered the number of participants in the Latin L2 group. In addition, two of the Latin learners submitted an incomplete pre-test and one Latin learner was excluded for personal reasons. Therefore, a total of fourteen Latin L2 participants were excluded from the study, negatively affecting the ratio of the Latin group. The number of Latin participants would otherwise be 29, providing an equal group to compare with the Spanish L2 group which had only four participants who did not take the post-test and/or did not complete the surveys, and thus, were excluded from the study. Table 3.1 summarizes the number of participants that were included in and excluded from the study.

Table 3.1. Number of the Participants

Language Group	Participants Included in the Study	Incomplete Data (P/PT, MAT, and/or Surveys)	Personal Reasons	The Would-Be-Total (with the excluded participants)
Latin	15	13	1	29
Spanish	25	4	-	29
Total	40	18	1	58

Note. The issue of comparing unequal number of participants are discussed under the Pre/Post-test heading.

The would-be-total for each language group would satisfy the widely accepted sample size of 30 (Field, 2013). However, even the actual sample size of the study (LL2 group, $N = 15$; SL2 group, $N = 25$) is generally accepted since, as Larson-Hall (2010) indicates, small sample sizes are common in the field of second language research. She states that "obtaining 15 participants per group may seem like a great accomplishment" and that "it can be hard to find enough people to fit in certain categories to obtain more participants" (p. 103).

3.3.2.2. Gender of the participants. The gender of the participants is not considered within the scope of this study since the aim is to explore the possible effects of learning a second language on the academic and low-frequency English vocabulary knowledge and metalinguistic awareness of the undergraduate native English speakers without regard to the learners' gender.

Ellis (2012) discusses gender studies in language use and learning and states that gender is a social distinction and relates to discursive practices. He indicates that "the relationship between gender and language learning is highly variable, reflecting the fact that 'gendering' in language learning varies from context to context" (p. 315). Analyzing the studies done on gender from early research on, he mentions that some findings suggest females' being better language learners than males, which is explained by the positive attitude of the former to learning a second language, whereas other findings indicate males' being better learners, which is explained by their being motivated by functional reasons. Yet, other findings suggest that there is no difference between the two genders in learning a language.

Gender differences were also explored from the points of learner strategies and motivation. Ellis (2012) states that, while some findings indicate a profound effect of gender on the choice of strategy, other findings indicate no effect. He underlines that "different populations

of learners employ strategies in different ways" (p. 719). Kissau (2006) used a mixed method which employed a questionnaire and interviews with students and teachers to explore the effect of gender differences on motivation in second language learning. He states that, while quantitative findings indicated "significant differences in several motivational factors [e.g., desire to learn, class anxiety, tolerance of ambiguity], … the qualitative data emphasized that at the root of these differences were societal influences" (p. 73). In her article on the role of gender in second language acquisition, Feery (2008) concludes that "SLA and gender are regarded as being fluid and very complex in their nature. In spite of this their complexity and their interrelatedness is very real and therefore cannot be simply disregarded" (p. 47).

The present study does not aim to 'disregard' gender differences; however, its purpose is to explore the possible effects of learning a Latinate language on the advanced vocabulary knowledge of native English speakers and their metalinguistic awareness. Nonetheless, the gender distribution is presented in Table 3.2 as a part of demographic data.

Table 3.2. Gender of the Participants

Language Group	Females	Males	Total
Latin	6	9	15
Spanish	16	9	25
Total	22	18	40

As Table 3.2 indicates, the number of male participants was higher than that of the females in the Latin L2 group, whereas the case was the opposite among the Spanish L2s. This balanced the gender distribution of the participants in total.

3.3.3. Course Programs

No change was made in the regular syllabus of either language course. Latin learners (LLs) received Classics education which is primarily based on vocabulary and grammar instruction (Focus on Forms). Thus, the LLs were expected to acquire morphological and metalinguistic knowledge of the language through explicit teaching.

The second participant group, Spanish learners (SLs), received content-based instruction employing communicative method, and thus, their acquisition of morphological and metalinguistic knowledge was implicit. Thus, both types of form focused instruction (Focus on Form and Focus on Forms) may take place.

3.4. Data Collection

Data were collected through two online questionnaires, the pre/post-test (P/PT), the metalinguistic awareness test (MAT), and interviews.

3.4.1. Online Questionnaires

Two online questionnaires are prepared to obtain demographic data, such as genders and language backgrounds (native or heritage languages and second or other languages learned) and to elicit language learning attitudes such as word study habits and the purpose of taking the language course. Both questionnaires are already piloted. Figures 3.1 and 3.2 present a partial view of questionnaires to be utilized in the study.

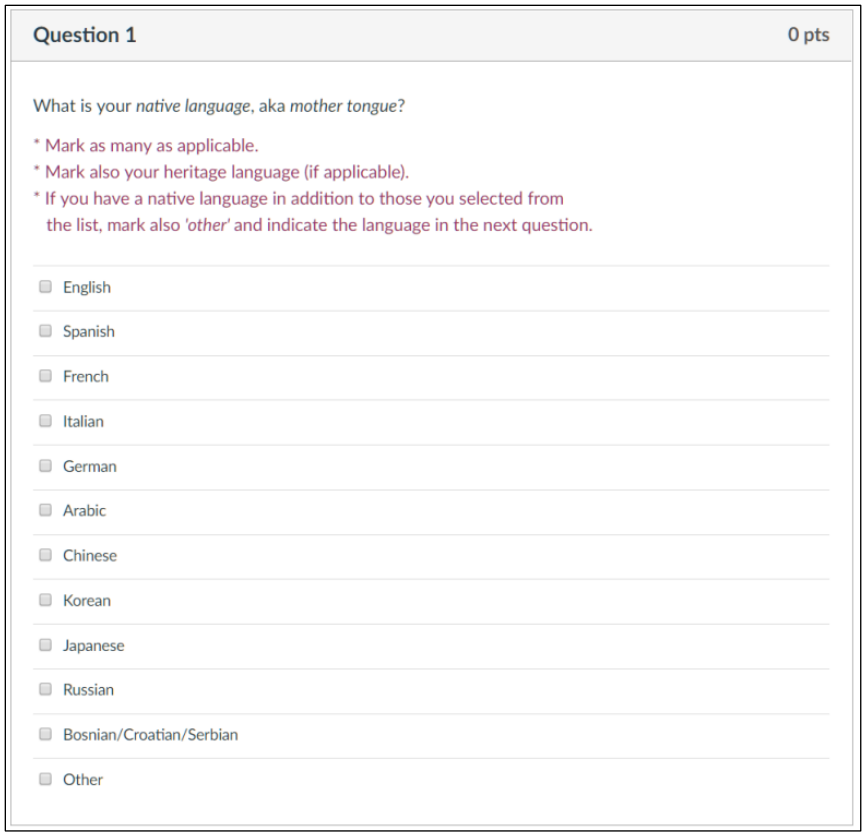


Figure 3.1. "Getting to Know You" Questionnaire – A Sample Question

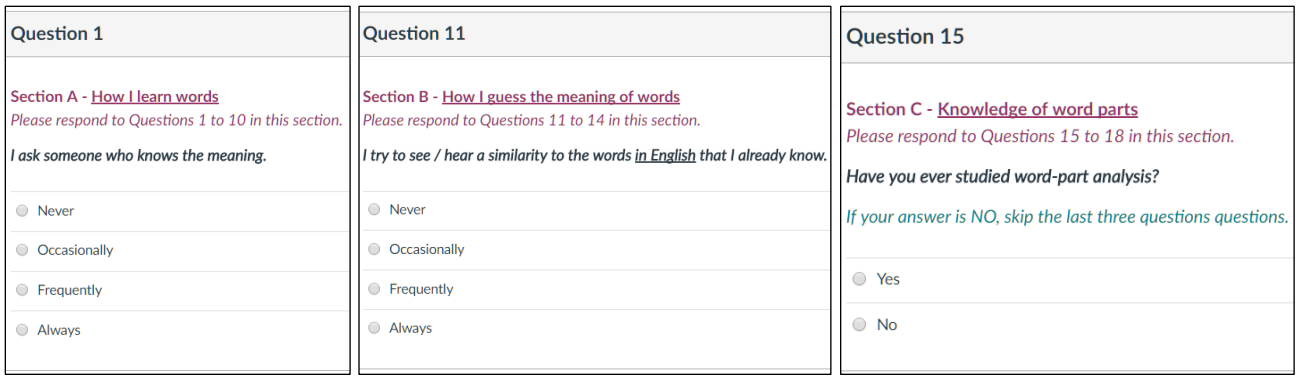


Figure 3.2. "Word Study Habits" Questionnaire - A Sample Question from Each Section

3.4.2. Pre/Post-test (P/PT)

The pre/post-test (Appendix C) contains 72 academic and low-frequency English vocabulary items (36 key words and 36 distractors) grouped to form 12 questions, each

composed of six matching-definition items. Definitions are provided for only three of the items, whereas the remaining three function as distractors. The test was administered once in the introductory week, that is, before the instruction starts, and once at the end of the semester. Spanish L2 participants took the test in class in the week before the final exams, and the Latin L2s took it on the Latin final exam day.

3.4.2.1. Pre/Post-test: Preparatory work. The principal investigator (PI) of this research study was also the Beginning Latin 1 instructor at the World Languages Department of the university where the research was conducted. The PI compiled and piloted the pre/post-test at the same department during the two semesters before the study was conducted.

3.4.2.2. The steps employed in compiling the test. The main textbook used in the Beginning Latin course offered by the department is the Wheelock's Latin seventh edition (Wheelock & LaFleur, 2011), and the first thirteen chapters of the book are covered during the first semester of the course. The vocabulary sections of the chapters provide a number of representative English derivatives of each word covered in Latin. Firstly, the PI created a database of all the Latin words and their English derivatives listed in the first thirteen chapters to obtain a set of vocabulary items as the basis of the pre/post-test. The compiled database file contained 320 Latin and 1158 English words.

Secondly, the vocabulary profile (VP) of the English derivatives was checked on the Compleat Lexical Tutor (n.d.) website through both the Classic and the BNC-COCA-25 profilers. The rationale for checking the words through both tools is to display also the classic frequency distribution of the words since the AWL, the Academic World List (Coxhead, 2000), is still referred to in many sources, such as vocabulary course textbooks (e.g., Schmitt & Schmitt, 2011; McCarthy & O'Dell, 2016) and research studies (e.g.. Coxhead, 2011; Keiffer &

DiFelice Box, 2013; Lubliner & Hiebert, 2011). Thus, obtaining the frequency distributions of the English derivatives database from both profilers provided a comparative weight of the low-frequency words in the present study.

Table 3.3. Breakdown of 1158 English Words Derived from 320 Latin Words in 13 Chapters

Profiler	Word List	Number of Words	Total	Percentage	Total %
Classic	Academic Word List (AWL)	107		9.24	
	K1-K2 Word Lists (i.e., GSL, General Service List)	170		14.68	
	Off-List Words (i.e., those not in AWL or GSL) ➢ *Of the 881 words, 96 are in COCA Off-List.*	881	1158	76.08	100
BNC-COCA	Academic Vocabulary List (AVL)	212		18.31	
BNC-COCA	K1-K25 Word Lists in COCA [K1-K2 Words 177 15.28%] [K3-K25 Words 885 76.43%]	1062		91.71	
	Off-List Words (i.e., those beyond K25 Word List)	96	1158	8.29	100

Note. AVL words may be in any of the Kth COCA word bands.

Table 3.3, which displays the profiler results obtained, indicates that there are twice as many Academic Vocabulary List (AVL) words (*n* = 212, 18.31%) as the AWL words (*n* = 107, 9.24%) among the 1158 English derivatives in the database. As for the comparison of the words in the most frequent 2,000 word bands, the COCA K1-K2 list covers slightly more words (177, 15.28%) than the Classic list does (170, 14.68%). Beyond K2, COCA shares only 96 of the 881

Off-List words (those not in the first 25,000) of the Classic frequency distribution, the remaining 785 being within the K3-K25 bands.

Since the breadth of an adult native English speaker's vocabulary is much larger than 14,000 words (Nation & Beglar, 2007) and since a well-educated native speaker knows around 20,000 words families (Nation, 2006), the words within the 15,000 and 25,000 bands represent a span of low-frequency words for the undergraduate students pursuing their higher education. Thus, of the English derivatives in the database, only those in the K15-K25 group were taken as the basis of the pre/post-test words.

Moreover, since the COCA K-level bands include also the academic vocabulary items that fall into the corresponding frequency levels, they would provide only the low-frequency academic words, a fact suitable for the purpose of the present the study. As Gardner and Davies (2014) state, 79 percent of the 570 AWL word families fall into the first 4,000 most frequent words (K1-K4 band) in COCA, which is another fact supporting the utilization of COCA in the analyses of English derivatives in the database and selecting the ones in the low-frequency vocabulary.

To compare the frequency levels of the low-frequency words, a further analysis of their distribution was made. In the English derivatives database, there are 118 K15-K25 words derived from 98 Latin words. Out of these 118 low-frequency words, 74 belong to the academic vocabulary occurring in one or more of the nine domain-specific areas: business and finance; education; history; humanities; law and political science; medicine and health; philosophy, religion, and psychology; science and technology; and social science. Table 3.4 demonstrates the distribution of AVL and non-AVL words according to their K-levels.

Table 3.4. Distribution of the Low-frequency English Derivatives

K-level	AVL Words (in 9 K-levels)	Running Total (in 9 K-levels)	Non-AVL words (in 11 K-levels)
K-15	24	24	4
K-16	10	34	6
K-17	15	49	1
K-18	12	61	8
K-19	8	69	4
K-20	1	70	5
K-21	-	70	2
K-22	1	71	7
K-23	-	71	4
K-24	1	72	1
K-25	2	74	2
Total	74		44

As Table 3.4 shows, 69 out of 74 academic vocabulary items are in levels K15-19 (93.24%), and the highest number is 24 in K-15 (32.45%), the number of words decreasing as the levels increase. For non-AVL items, the weight of distribution in K-levels varies, the highest being K-18 (18.18%). Therefore, it may be expected that the majority of AVL words are among the vocabulary items already known by the test takers.

In the process of preparing the pre/post-test, the parts of speech were also taken into consideration in order to group the matching definition words and the distractors from the same word forms. Table 3.5 shows the word-form distribution.

Table 3.5. Word-form Distribution of K15-K25 Words

Word Form	AVL Words (in 9 K-levels)	Non-AVL Words (in 11 K-levels)	Total
Noun	40	19	59
Noun or Adjective	4	5	9
Adjective	20	8	28
Adjective or Adverb	-	1	1
Adverb	2	1	3
Verb	8	6	14
Verb or Noun	-	3	3
Phrase	-	1	1
Total	74	44	118

As Table 3.5 indicates, some of the vocabulary items offered the flexibility of assigning them to one of the two word forms they function in. This was useful in excluding the words that share the same root as well as those whose definitions may cause confusion in eliminating the distractors. Table 3.6 shows the distribution of the word forms making up the twelve questions in the pre/post-test.

Table 3.6. Distribution of the Word Forms in the Pre/Post-test

Word Form	Number of Questions	Total Words (6 words in each question)
Noun	6	36
Adjective	4	24
Verb	1	6
Phrase	1	6
Total	12	72

Figure 3.3 presents a sample question from the pre/post-test. Of the six words in the test questions, three are the key words, and three are distractors. The instruction at the beginning of the test asks the test takers to choose the correct words to match the definitions and write the number of the words next to their meanings.

II	1 provenience 2 cogitation 3 quiddity 4 certitude 5 senility 6 ratiocination	____ source of origin ____ methodological reasoning ____ the essential nature of a thing

Figure 3.3. Sample Pre/Post-test Question

One of the questions of the test contains six phrases in Latin that are also used in English, especially in academic contexts. The phrases are composed of three nouns, one adjective, six pronouns, and two prepositions in Latin. Three of the phrases are covered in the 13 chapters under study, and only one of them is among the key words. However, some of the word forms constituting the phrases are a part of the Latin vocabulary items on their own. Thus, test takers may benefit from their vocabulary knowledge either in their second language or in English.

3.4.2.3. The steps employed in piloting the test. The compiled pre/post-test was piloted twice at the same institution the present study was conducted. It was administered to 21 Beginning Latin-1 students attending the course in one summer and one fall term. The results obtained showed that both the pre- and post-test scores were normally distributed. Table 3.7 displays the pre/post-test descriptive data of the pilot test.

Table 3.7. Descriptive Data of the Piloted Pre/Post-test

Total Scores	*N*	Min	Max	$\bar{x}$	*s*	*Skewness*	*SE*	*Kurtosis*	*SE*
Pre-test	21	8	21	14.81	3.473	.066	.501	-.473	.972
Post-test	21	10	27	18.86	4.430	.021	.501	-.306	.972

Checking the skewness (pre-test .066, post-test .021, *SE* = .501) and the kurtosis (pre-test -.473, post-test -.306, *SE* = .972) values, it is assumed that the data obtained from both tests are approximately normally distributed. To demonstrate the distribution of the data also visually, normality statistics were performed. Figure 3.4 displays the P-P plots of the piloted test scores.

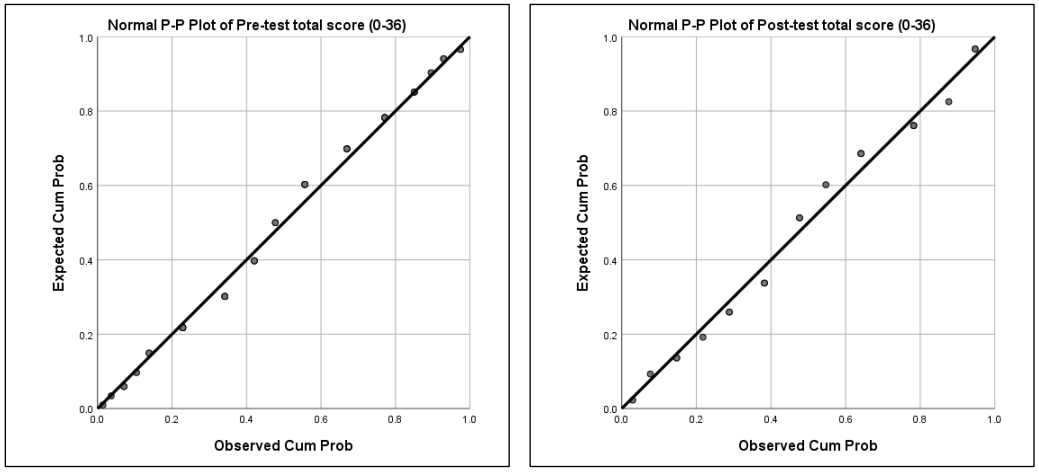


Figure 3.4. P-P Plots of the Pre- and Post-test Pilot Scores

Pre- and post-test pilot scores cluster quite closely around the diagonal line, which indicates that the distribution is approximately normal. The data from both tests are slightly skewed since the data points form an S-shape around the diagonal line. Figure 3.5 displays the histograms and normality curves of the pre/post-test pilot scores.

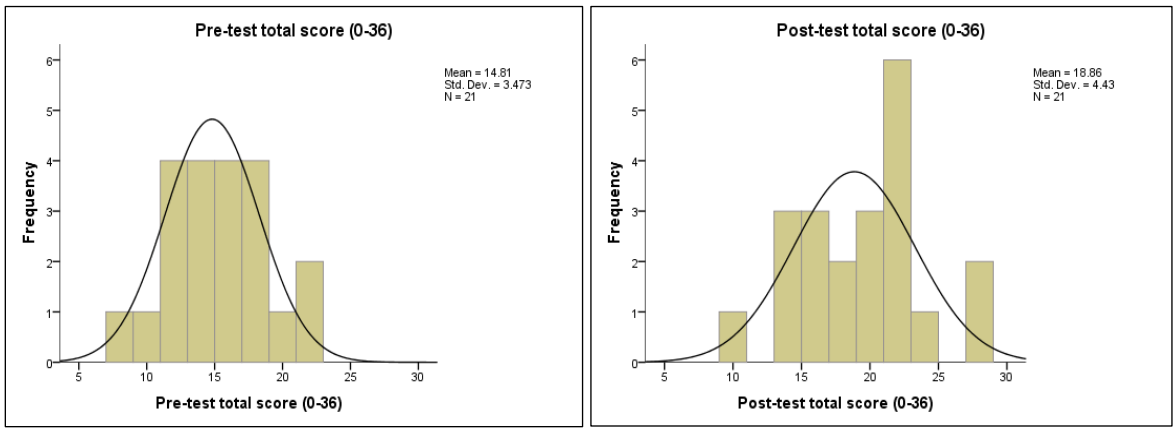


Figure 3.5. Histograms of the Piloted Pre- and Post-test Scores

The P-P plots and histograms demonstrate that both pilot P/PTs were normally distributed. Since the distribution of the data obtained was normal, the reliability statistics were run to check the difficulty levels and discrimination powers of the 36 test items. Pilot post-test was used in computation since the test-takers' performances after the intervention (i.e., Latin instruction) was in question. Table 3.8 shows the reliability statistics of the pilot post-test.

Table 3.8. Reliability Statistics of the Pilot Post-test

Cronbach's Alpha	*N* of Items	*N* of Cases
.636	36	21

Table 3.8 shows a Cronbach's value of .636 for the pilot post-test which is slightly below the acceptable level (α = .70–.80). In social sciences research, however, a coefficient slightly below the lower reliability level of 0.7 is expected (Field, 2013; Larson-Hall, 2010). Referring to Cortina (1993), Larson-Hall (2010, p. 173) mentions that "determining a general rule is impossible" since factors such as the number of items affect the Cronbach's alpha value, and that

"the higher the number of items, the higher alpha can be." Nevertheless, items with a *Cronbach's Alpha If Item Deleted* that is greater than the alpha of the reliability statistics need attention. In the pilot test reliability output, there were eleven items with alpha values between .637 and .659, all of which fell into this category (Appendix D).

Bachman (2004) underlines that "the decision on item selection should be based on multiple sources of information, both qualitative and quantitative" and that "item selection should be based primarily on content considerations, with item statistics used to supplement this" (p. 137). Content relates to the measured language ability. In the present study, it is the effect of learning an L2 on the English academic and low-frequency vocabulary. As explained under the *Steps employed in the process* subheading (3.4.2.2), items of the pre/post-test fall into the low-frequency band between 15,000 and 25,000 words, and such words are expected to be less known by the undergraduate native English speakers. To cross-check Cronbach's α values against the item difficulty levels and discrimination power values, a classical item analysis was made.

Table 3.9 lists those eleven items with an alpha greater than the reliability statistics value ($\alpha > .636$) in the order of difficulty levels. As indicated in the table, there are two items (*parvenu* and *ad hoc*) in the pilot post-test that are both difficult and do not discriminate well and two other items (*pusillanimous* and *parterre*) which are also difficult but do discriminate well. Since the present study focuses on low-frequency English words, low difficulty levels were not deemed an issue of concern.

Table 3.9. Analysis of the Items with Cronbach's $\alpha > .636$

Pilot Post-test Item	Cronbach's Alpha	Difficulty (*p*)	Discrimination (D)	% of Total Correct
parvenu	0.639	0.04	0.07	14.29
ad hoc	0.649	0.07	0.14	19.05
pusillanimous	0.637	0.18	0.36	33.33
parterre	0.652	0.21	0.43	38.10
sui generis	0.648	0.29	0.57	61.90
recuse	0.641	0.32	0.64	66.67
bona fide	0.639	0.32	0.64	71.43
venial	0.637	0.36	0.71	71.43
provenience	0.645	0.39	0.79	80.95
nomenclature	0.659	0.46	0.93	85.71
premonition	0.655	0.46	0.93	95.24

Note. *N* of items = 11; $p < .25$ (difficult); D > .30 (discriminates well)

Another small-scale piloting was done with nine graduate students to compare the perceived difficulty of the pre/post-test. Three native speakers of English and five non-native speakers from three other native language backgrounds (i.e., Croatian, German, and Turkish) took the test in one sitting. Table 3.10 displays their graduate levels, known L2s, and test results, listed according to their native languages.

As for the second languages they knew, of the nine, two knew none; two knew 1, three knew 2, one knew 3, and one knew 4 of the following languages as the L2: English, French, German, Polish, and Spanish. Although English is the second language for the non-native English speakers in the graduate group, they are at least advanced-level, if not near-native L2 speakers since they pursued their degrees in English. Therefore, they can be compared to the undergraduate native speakers of English who took the pilot test.

The graduate test takers were also asked to indicate their opinions about the content and format of the piloted pre/post-test. As for the content, they found the test difficult, hard, tough, very advanced, and beyond the vocabulary of even the native speakers; they tried to look at the

root words and attempted to recognize word parts using other languages they knew. Related to the test format, they found it straightforward and easy to follow, but some needed time to get used to the format.

Table 3.10. Pilot Test - Native and Non-native Speaker Graduates

Native Speaker of	Number of L2s Known	Correct Responses	
		out of 36	%
German *(Ph.D.)*	4	25	69.4
English *(2 MA, 1 Ph.D.)*	-	23	63.9
	-	21	58.3
	2	18	50.0
Croatian *(Ph.D.)*	2	10	27.8
Turkish *(2 MA, 2 Ph.D.)*	2	14	38.9
	1	9	25.0
	3	8	22.2
	1	8	22.2

In relation to the four difficult words ($p < .25$) emphasized in Table 3.9, the results obtained from the graduate group revealed that two of the key words were also among the less known ones: only one test taker matched *parvenu* correctly, and two matched *pusillanimous*. While *parterre* was marked by five test takers, *ad hoc* was detected by three, which was interesting to find out that the graduates were not successful in spotting the latter.

3.4.2.4. Preparatory work in incorporating Spanish L2 data. The other second language included in the present study is Spanish. In the institution where the study was conducted, Spanish courses use the tenth edition of Dicho y Hecho Beginning Spanish textbook (Potowski, Sobral, & Dowson, 2015), and Chapters 1-5 are covered during the first semester of the course. A total of 476 Spanish words in these chapters along with their English equivalents and Latin base words were also added to the database compiled for this study. The comparison of

the number of words covered in the 13 chapters of the Latin textbook with that of the words covered in the five chapters of Spanish textbook are shown in Table 3.11.

Table 3.11. Distribution of the Latin and Spanish Words Covered in the First Semester

Word Form	Number of Words in Wheelock's Chapters 1-13	Number of Words in Dicho y Hecho Chapters 1-5
Nouns	249	266
Adjectives	100	84
Verbs	129	86
Others (adverbs, conjunctions, prepositions, and pronouns)	104	40
Total	582	476

A comparison the Latin bases of the 476 Spanish words with those of Latin words covered in the Wheelock's Latin textbook indicated that 86 of them coincided (18.06%). Table 3.12 shows the distribution of the Spanish words and their forms.

Table 3.12. Distribution of the Spanish Words and Their Word Forms in the First Five Chapters

Word Form	Number of Words in Dicho y Hecho Chapters 1-5	Number of Words Coinciding with Those in Wheelock's Chapters 1-13	Ratio of Coincidence (%)
Nouns	266	45	16.9
Adjectives	84	9	10.7
Verbs	86	22	25.6
Others (adverbs, conjunctions, prepositions, and pronouns)	40	10	25.0
Total	476	86	18.1

A similar comparison was made between the Latin roots of the pre/post-test key words and distractors with those of the Spanish words included in the first five chapters. The results are shown in Table 3.13.

Table 3.13. Equivalents of Spanish Words in the Pre/Post-test

Word Group	Pre/Post-test Words	Number of Spanish Equivalents Coinciding	Ratio of Coincidence (%)
Key words	36	12	33.33
Distractors	36	15	41.67
Total	72	27	37.50

As seen in Table 3.13, only 37.50 percent of the Spanish words are covered although every word in the pre/post-test has an equivalent in Spanish. The reason for this relatively low coverage emanates from the difference in the teaching methods employed.

Table 3.14. First 13 Chapters of the *Wheelock's Latin* Textbook

Chapter	Topic
1	Verbs; First and Second Conjugations; Adverbs; Reading and Translating
2	First Declension Nouns and Adjectives; Prepositions, Conjunctions, Interjections
3	Second Declension Masculine Nouns and Adjectives; Apposition; Word Order
4	Second Declension Neuters; Adjectives, Present of *Sum*; Predicate Nominatives; Substantives
5	First and Second Conjugations: Future and Imperfect; Adjectives in *-er*
6	*Sum* and *Possum*; Complementary Infinitive
7	Third Declension Nouns
8	Third Conjugation: Present System
9	Demonstratives *Hic*, *Ille*, *Iste*; Special *-ius* Adjectives
10	Fourth Conjugation and *-io* Verbs of the Third
11	Personal Pronouns *Ego*, *Tu*, and *Is*; Demonstratives *Is* and *Idem*
12	The Perfect Active System; Synopsis
13	Reflexive Pronouns and Possessives; Intensive Pronouns

As seen in Table 3.14, Latin textbook focuses mainly on the grammatical aspects of the language and provides sentences and short passages for practicing translation. Teaching reading and writing skills are aimed at, but not listening and speaking, at least not in the sense of communication.

In the Spanish courses, however, communicative approach is followed. In other words, all four skills are aimed at, and grammatical aspects are taught as a part of all. Since the purpose is to communicate, words in daily use, such as cereal, or those which refer to more recent times, such as volleyball and electronics, are not in the Latin textbook vocabulary. Table 3.15 showing the chapter headings of the Spanish textbook reflects this fact.

Table 3.15. First Five Chapters of the *Dicho y Hecho* Spanish Textbook

Chapter	Topic	
1	Nuevos encuentros	New encounters
2	La vida universitaria	University life
3	Asi es mi familia	This is my family
4	¡A la mesa!	To the table!
5	Nuestro tiempo libre	Our free time

Since the aim of the present study is not to compare the teaching methods or outcome of the any of the four language-skills and since the focus is on morphological and metalinguistic awareness gained as a result of learning a second language from the same line of the language family, the topics covered are not taken into consideration. Tables 3.12 and 3.13 above are presented as additional information to clarify the difference in the ratio of pre/post-test key word and distractor equivalents in Spanish.

3.4.3. Metalinguistic Awareness Test (MAT)

The pre/post-test is the tool to gauge the vocabulary knowledge development of the second language learners in their native language. To also gauge their metalinguistic awareness, a second test was prepared (Appendix E) to accompany the post-test.

The first item in the metalinguistic awareness test covers the six words in Question II of the pre/post-test. The rationale for choosing Question II is that it contains the Spanish equivalents or the base words of the two of the question words and one of the distractors, the highest among the rest of the pre/post-test questions. Additionally, the remaining question word and two distractors contain word parts which form other words in English (i.e., ratio, certain, senile) and which may help participants decipher the meaning of the question words. The MAT item checks the following:

- Whether the participants already knew any of the key words and distractors.
- Whether the participants are aware of the word parts in them (metalinguistic knowledge).
- Whether the participants analyzed the word-parts while eliminating the distractors and matching the definitions.
- Whether word parts helped the participants in their decision.
- Whether a part of the definitions or definitions as a whole helped the participants in their decision.

The second item in the metalinguistic awareness test covers eight words, three of which are question words and five are distractors in the pre/post-test. The rationale for choosing these words is that their equivalents or base words are covered in Dicho y Hecho Chapters 1-5. In this

item, which aims to elicit the metalinguistic awareness of the participants by inquiring the word parts, the participants were asked:

- to mark the words that they already knew,
- to write the word parts and their meanings, and
- to indicate whether they detected the word part through their first language (English) or the language they learned in the course (Latin or Spanish). For example, *bellum* in antebellum is also present in bellicose, belligerent, rebellion, and rebellious. Participants' prior knowledge of any of these words was expected to guide them in guessing the meaning of *antebellum*.

The objective is to compare participant responses to the corresponding post-test questions to discover whether their post-test answers differ. The third item in the metalinguistic awareness test seeks to discover the participants' opinions. The purpose of the open-ended questions is to elicit what the participants think about the effect of learning a second language on their English vocabulary knowledge. That is,

- whether they find it helpful in becoming aware of the word parts (metalinguistic awareness), and
- whether they deem it beneficial in accessing the meanings of the unknown English words.

Responses to this item are also considered to be a supplement to the interviews conducted with two of the participants from both Latin and Spanish L2 groups.

3.4.4. Interviews

Firstly, the interviews were on voluntary basis, and this was made clear to the prospective participants in advance. The adult consent form, dated and signed by both the participants and the principal investigator, contained a reference to the interviews under subheading *Study Procedures*, informing both the Latin and the Spanish L2 learners before they gave consent to participate in the study. The related reference read as follows: "On a voluntary basis, you may be asked to have an interview with the Principal Investigator [the researcher of the present study] to express your hands-on experience in learning a second language with respect to its effects on your knowledge of native language." Participants were also informed in the consent form that there would be no compensation (*You will receive no payment or other compensation for taking part in this study.*) or cost (*It will not cost you anything to take part in the study.*) involved in participating the study. Additionally, under subheading *Privacy and Confidentiality* of the consent form, the participants were informed that their records would be kept private and confidential (*We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are.*), and the contact information of the Institutional Review Board (IRB) was presented in case the participants had any complaints, concerns or issues you want to discuss with someone outside the research.

Secondly, the open-ended interview questions were aligned with the research questions, in that, they were aimed to inquire whether learning the second language was found to improve the participants L1 vocabulary (RQ 1-3) and whether it provided a metalinguistic awareness (RQ 4-6). To probe the possible benefits during the semester as well as in the future from both the vocabulary acquisition and metalinguistic awareness aspects, interview questions were expanded by two additional interview questions.

1. Did you find learning a second language useful in improving your English vocabulary knowledge?
   [If yes] In what ways was it useful? [If prompt needed:] For example, does it help you in guessing the meanings of words you did not know?
2. Did learning a second language contribute to your work in other courses you took? How?
   [If prompt needed:] For example, did it make you more aware of the choice of words in your assignments?
3. Do you think your awareness of the subtleties in word meanings improved?
4. Would you consider benefiting from this awareness as a life-long tool in expanding your vocabulary?

Lastly, the interview questions were piloted by the researcher of the present study with graduate students attending a master's program in English Language Teaching and received feedback prior to utilizing it in a research conducted with 122 freshmen undergraduates divided equally into treatment and control groups. Of the 61 treatment group participants who received Latinate word part instruction, 16 volunteers took part in the interviews, responding to the same open-ended questions (Karliova, 2009).

3.5. Data Analysis

3.5.1. Variables

The present study does not focus on the differences in the treatment (language instruction received) on the post-test scores since both the second languages learned and the methods of instruction utilized are varied. Rather, it focuses on the achievements of participants in using morphological analysis skills in deciphering the academic and low-frequency English derivatives.

The dependent variables are the pre-test and post-test scores. Since the pre-test scores indicate the participants' prior knowledge of the English derivatives, they are the defining factor in the choice of the statistics tool employed, as explained in the 'analyses of the data' section.

3.5.2. Reliability and Validity

The discrimination powers (*p*-values) and the difficulty levels (D-values) of the items in the pre/post-test were calculated and Cronbach alpha values were checked for item validity and test reliability.

3.5.2.1. Internal validity. Internal validity issue may emanate from having two different models of instruction utilized, that is, the method with which the two languages are taught. Latin is a language taught with the traditional model (based on grammar and vocabulary teaching), and thus explicit morphology instruction is naturally a part of the program. The Wheelock's textbook used in the Latin L2 course also follows the traditional model. The communicative approach Spanish is taught focuses primarily on the productive use of language (speaking and writing) as well as receptive skills (listening and reading). Vocabulary is a component that is a part of each of the four language-skills, but morphology generally is not the primary focus; however, Dicho y Hecho textbook used in the Spanish L2 course places a special emphasis on vocabulary usage and word forms. Also, the instructor highlights the derivational aspects of the words to activate the background English knowledge of the learners to facilitate retention and recall, as Interviewee-3 stated (Appendix J) in response to Question 3 of the interview. Participants themselves may also make the connection implicitly.

This internal validity issue cannot be eliminated since the general trend in modern language teaching is communicative and the traditional method is the widely accepted means of

teaching classics. It is not the purpose of the present study to intervene with the teaching methods or materials employed in the two L2 courses. It focuses solely on the possible effects of learning a second language on the vocabulary and the metalinguistic knowledge of the learners in their first language.

3.5.2.2. External validity. External validity, that is, the generalizability of the intervention, were possible to test since there were data already available in the Latin section of the department through piloting of the pre/post-test. The same course textbook has been used for many years now, and the testing system has been on trial for three semesters.

3.5.3. Analysis of the Data

3.5.3.1. Demographic data. Demographic data obtained from the 'Getting to Know You' questionnaire, such as native language/s or languages learned other than the mother tongue or heritage language, as well as data obtained from the 'Word Study Habits' questionnaire, such as the participants' prior experience in morphological analysis at school or on their own, were included to present the background knowledge and vocabulary learning habits of the participants.

3.5.3.2. Answering research questions. The results obtained from both the pre- and the post-test were analyzed in relation to the research questions (RQ).

- Research Questions One and Two

  To find out whether learning a second language helped improve the participants' knowledge of the academic and low-frequency words in English, scores obtained from the pre- and post-tests were analyzed by conducting paired sample *t*-tests for both Latin and Spanish L2 learners.

- Research Question Three

  To find out whether there is a difference between academic and low-frequency English vocabulary knowledge of the two language groups after a semester-long second language learning, their post-test scores were compared. Since the pre-test performances of one of the language groups were statistically meaningful and since the number of participants in each group was not equal, an ANCOVA was run to compare the scores in order to eliminate the confounding factor (i.e., the pre-test).

- Research Questions Four and Five

  To find out whether learning a second language helped improve the participants' metalinguistic awareness of English, the data obtained from metalinguistic awareness test were analyzed for both Latin and Spanish L2 participants. For Item 1 and 2, participants' pre-test and post-test responses to the corresponding derivative English words were compared to check response consistency. For item 3, which is an open-ended question included to elicit participants' opinions, a qualitative analysis was made.

- Research Question Six

  To find out whether there is a difference between the two language groups with respect to their metalinguistic knowledge of English vocabulary, the results obtained in response to RQ-4 and RQ-5 were compared.

3.5.3.3. Statistical software. The 26th version of IBM SPSS Statistics Program was used for performing data analyses. The rationale for choosing SPSS is that it is the most widely employed program in the social sciences field, which is an important factor that facilitates reaching the target audience. Additionally, SPSS is an application provided by the university

where the study was conducted. This provided the benefit of having access to the program without further investment. A third factor is that the principal investigator of the study has employed SPSS in other studies she conducted previously and finds it relatively easier and considerably more user-friendly than the other programs such as the SAS software she experimented before.

3.5.3.4. Interviews. Participant responses obtained through interviews with two Latin and two Spanish L2 participants at the end of the semester in which the present study was conducted were analyzed qualitatively and compared with those written in response to Item 3 of the metalinguistic awareness test. Responses given by each language group were also compared.

3.5.4. Assumptions

It was assumed that both groups would benefit from the instruction they received in terms of the contribution of languages they learned since Latin is the parent language of Spanish and since over 60 percent of the words in English vocabulary is derived from Latin. It was also assumed that the students who learned Latin might benefit more since they would receive intensive and explicit (FonFs) instruction on the Latin vocabulary items which are the basis of English derivatives. However, it was deemed possible that there would be some students in both groups who might not equally benefit from either language as their peers would. As a consequence, the overall success of the groups in comparison might be balanced, and thus, might not indicate a statistically significant difference.

CHAPTER FOUR:

RESULTS

4.1. Introduction

This chapter includes information on the participants, study findings, and discussion of the results obtained. Data were collected by means of five tools, namely, Getting to Know You Survey (G2KY), Word Study Habits Survey (WSH), Vocabulary Pre/Post-test (P/PT), Metalinguistic Awareness Test (MAT), and Interviews. The surveys provide demographic data on the participants, P/PTs gauge the participants' academic and low-frequency English vocabulary knowledge before and after one-semester of beginning level second language course, MAT checks the participants' awareness of metalinguistic knowledge use, and the one-on-one interviews aim to compare the participant responses to the open-ended MAT question on metalinguistic awareness. Findings and their discussions are presented under headings allocated for each tool.

4.2. Getting to Know You Survey

As the study aims to detect the possible effects of learning a second language (L2) on the academic and low-frequency English vocabulary knowledge and metalinguistic awareness of the native English speakers (NESs), Getting to Know You survey contains a question to check the participants' declared first language (L1) as well as their heritage language as to detect whether they knew any other L1, which would draw attention to the self-declared NES status. The survey

also contains a question on the placement tests taken which aims to double-check the NES status. As the Test of English as a Foreign Language (TOEFL) is required for the non-native speakers of English, any participant who declares to have taken TOEFL would not be considered a NES and would be excluded from the study.

Participants' survey responses indicate that all the L2 learners of Latin (LL2s) were NESs. One case needed to be checked since the participant declared Spanish as the L1 and English as the L2 but had not taken the TOEFL. The researcher contacted this participant by e-mail to inquire the L1. Response received showed that the participant was a NES, who immigrated with the family at the age of four and attended schools wherein the instruction language was English. Therefore, this participant was included in the study.

Survey responses by three learners of Spanish (SL2s) also required checking their L1 status. Two participants who claimed to be a NES but had taken the TOEFL were excluded from the study. A third participant declared a second L1 in addition to English and had not taken the TOEFL. This participant was contacted by e-mail to check the NES status. Response received indicated that this participant was born in the United States to an immigrant family, learned the heritage language at home but attended schools wherein the instruction was in English. Thus, this participant was included in the study.

The G2KY survey also includes a question to detect whether there were any graduate level participants since the study aims to inspect the possible effects of learning an L2 on the academic and low-frequency English vocabulary knowledge and metalinguistic awareness of undergraduate students attending a beginning level L2 course. The responses show that all the participants included in the study were undergraduates.

4.2.1. Previously Known Second Languages

A question was included in the G2KY survey about the participants' prior knowledge of a language other than their L1(s). The question clarified that 'to know' meant that the participant studied/practiced the language(s) for any length of time and that the proficiency level was not of concern. The purpose of this question was to check whether any of the participants learned an Indo-European language before attending the L2 course they were enrolled. As was expected, Spanish was the mostly learned second language among the participants; six out of 15 Latin L2s (40%) and sixteen out of 25 Spanish L2s (64%) declared knowing Spanish. Three other languages from the Indo-European group were also known by the participants: Five participants knew French, two knew German, and one knew Italian. None of the participants indicated Latin as their second language. Table 4.1 shows the distribution of the previously known L2s.

Table 4.1. Previously Known Second Languages

Language Group	Spanish	French	German	Italian	Korean	Hebrew	None	Blank	Total
Latin L2s	6	2	1	1	-	1	3	3	17
Spanish L2s	16	3	1	-	1	1	8	-	30
Total	22	5	2	1	1	2	11	3	47

Note. Two LL2s declared knowing two L2s, and three SL2s declared knowing two L2s and one three L2s (Total: 7; $N = 40$).

The effects of previously known L2s by the participants is not considered within the scope of this study since the aim is to inspect the possible effects of learning an L2 on the native English speakers' academic and low-frequency English vocabulary and not on the progress of their L2 knowledge or level of L2 vocabulary. Otherwise, it would require taking such considerations into account as their prior L2 proficiency levels. Additionally, not all the

participants previously knew the same L2, and fourteen participants either declared not to know an L2 before or did not respond to the question. This fact would render the comparison unfeasible. Moreover, the L2 courses participants attended during the study semester were beginning level classes, and thus, it is deemed that the students did not consider themselves proficient in the declared L2 unless they took the course only to fulfill the institution's foreign language graduation requirement (http://ugs.usf.edu/pdf/cat1819/FINAL_CATALOG.pdf, p. 106-107).

4.2.2. Reasons for Attending the Second Language Course

Participants were asked to state their reasons for attending the second language course. The aim was to see whether there was a difference in the approaches of the two language groups. Individual statements (Appendix F) were analyzed, and similar reasons were combined to form four groups, namely, *those who wanted to attend the course, those who both wanted and was required to attend, those who were required to attend,* and *those who reported other reasons* (e.g., automatically added to the course). As the summary of the reasons given in Table 4.4 indicates, 80% of the Latin L2 participants wanted to attend the course, whereas the ratio was 20% for the Spanish L2 participants. The ratio of those participants who attended the course because they were required to do so was 13.3% for the Latin and 48% for the Spanish L2s.

Participants who both wanted to and were required to attend (6.7% for LL2s, 24% for SL2s) and participants who did not enroll willingly (8% for SLs) could be included either into the willing group or into the required group. When considered in the wanted-to-attend group, the ratio becomes 86.7% for the Latin L2s and 44% for the Spanish L2s, and when considered in the required-to-attend group, the ratio becomes 20% for the Latin L2s and 80% for the Spanish L2s.

In summary, the majority of the Latin L2s attended the course willingly, whereas the majority of the Spanish L2s attended the course because they were required to.

Table 4.2. Reasons for Attending the Second Language Course

Language Group	Number of Participants	Wanted to attend		Both wanted and was required to attend		Was required to attend		Other reasons for attending	
Latin	15	12	80%	1	6.66%	2	13.33%	-	-
Spanish	25	5	20%	6	24%	12	48%	2	8%
Total	40	17	42.50%	7	17.50%	14	35%	2	5%

Note. Wanted: interested in, like, desire; useful, most applicable; to enjoy, to learn.
Required: necessary, needed, was asked; Other: was automatically added, did not mean to click accept.

It may be argued that willingly attending the course could have a positive effect on learning the language from the point of motivation. Since the aim of the present study is not to evaluate participants' L2 performance but to check the possible effects of learning an L2 on academic and low-frequency English vocabulary acquisition and metalinguistic awareness, motivation is not considered within the scope of the study, and thus, groups are not compared from this aspect.

It is worth mentioning here that some of the Latin L2 participants made comments the on the relation of Latin to English and considered it as a reason for attending the L2 course. One of the participants wrote, "I am taking this course because I want to learn more about the origins of the English language," and another wrote, "to get a better understanding of the English language." These two comments relate to English as an L1 in general, whereas some comments were directly related to vocabulary. A Latin L2 participant wrote, "I want to know more about roots, prefixes, and suffixes," and another wrote, "to prepare me for the LSAT and law school." Another Latin L2 participant referred to vocabulary as well as language skills, stating, "I have

always felt that Latin is so useful in expanding one's everyday vocabulary, speaking and writing skills, reading proficiency, and so many other important things." Yet another Latin L2 participant referred to the effect of Latin on languages, not specifically mentioning English, and wrote, "because of Latin's ability to help understand other languages."

However, none of the Spanish L2 participants referred to the effect of learning Spanish on English language. Seven Spanish L2 learners mentioned that the language will help them "to connect to other people" and "to better communicate" by learning to speak it. These comments were deemed natural since Spanish is a widely spoken language throughout the world. As indicated on the World Population Review site, 442 million people speak Spanish across the nations. (http://worldpopulationreview.com/countries/spanish-speaking-countries/)

4.2.3. Diversity of the Fields of the Study

Participants were asked to indicate their majors and minors. Table 4.3 shows the distribution of the participants' fields of study indicated on the G2KY survey. Overall, participants represent a wide array of academic disciplines and various fields of study across the campus. Latin L2 participants (N = 15) represent 8 different fields of study including majors and minors, all of which are in the Humanities and Social Sciences disciplines. Spanish L2 participants (N = 25), however, study in 17 different fields in majors and an additional 3 fields in minors, ranging from Humanities and Social Sciences to Natural Sciences (e.g., Biology & Chemistry) and Formal Sciences (e.g., Mathematics). While the Spanish L2 group is a more heterogeneous group representing a wide variety of disciplines and subdisciplines, there are three common majors between the groups: Anthropology, Psychology, and English, which might indicate excessive use of linguistic knowledge in the Humanities and Social Sciences.

Table 4.3. Participants' Fields of Study

Latin L2 Participants (N = 15)		Spanish L2 Participants (N = 25)	
Majors	Minors	Majors	Minors
Anthropology (3)	History	Africana Studies	Creative Writing
Classical Studies (4)	Classical Studies	Anthropology	Intelligence Studies, Sociology
English (2)		Art History	Mass Communications
History		Biomedical Sciences	Math
Philosophy		Chemistry	Public Administration
Political Science (2)		Creative Writing (2)	
Psychology		Criminal Justice	
Studio Art		Criminology (4)	
		Economics	
		English, Literary Studies	
		Humanities, Film	
		Integrative Animal Biology	
		International Studies	
		Linguistics, Spanish	
		Pre-architecture	
		Psychology (3)	
		Pure Mathematics (3)	

This survey question was included to explore the diversity of the fields of study as to see whether the language course attended was the core course for the participants' major. For example, Latin is the required language for the participants pursuing Classical Studies but only four Latin L2 participants were from this field. As for the Spanish L2 group, there is only one major, Spanish, which requires the language as the core course, and a single participant declared Spanish as the major. One could argue that the language requirement as the core course may be a motivational factor that affects L2 learning. However, the present study does not intend to explore L2 performance; it aims to find the possible effects of learning an L2 on the academic and low-frequency English vocabulary and metalinguistic knowledge of the native English speakers. Thus, participants' responses to this survey question are deemed a part of the demographic data.

4.3. Word Study Habits Survey

The 18-question word study habits survey (Appendix G) is composed of three sections, namely, *How I Learn Words*, *How I Guess the Meaning of Words*, and *Knowledge of Word Parts*. Results obtained in each section are presented and discussed under the subheadings 4.3.1. through 4.3.3.

4.3.1. How I learn words

The first section contains ten items, such as, *I ask someone who knows the meaning*, *I write word meanings on the texts I read*, and *I study with word lists*. Two of the ten items, namely, *I analyze the word parts*, and *I look the words up in the dictionary*, were included as to check specifically the participants' prior habits of analyzing word parts and of dictionary use. Table 4.4 shows their responses to both items.

Table 4.4. Word Study Habits: How I Learn Words

Section A Participant Responses	Course Language	Never		Occas.		Freq.		Always		Blank	
		#	%	#	%	#	%	#	%	#	%
I analyze the word parts.	Latin	2	13.3	9	60	1	6.7	2	13.3	1	6.7
	Spanish	3	12	15	60	4	16	3	12	-	-
I look the words up in the dictionary.	Latin	-	-	5	33.3	7	46.7	3	20	-	-
	Spanish	3	12	5	20	9	36	8	32	-	-

Note. Course language groups: Latin $N = 15$; Spanish $N = 25$.

The statement, *I analyze the word parts*, is the critical item in this section of the survey since it relates to the metalinguistic awareness aspect of word meanings and since it shows the prior habits of the L2 learners who participated the study. While those participants who declared that they occasionally analyzed word parts were equal for both Latin ($N = 15$) and Spanish ($N = 25$) language groups (60%), those who declared frequent use was higher among SL2s (16%)

than LL2s (6.7%). Those who declared that they never analyzed word parts and those who always did were both slightly higher among the LL2s (13.3%) than the SL2s (12%). Only one participant from the LL2 group left the response blank (6.7%).

Expressed differently, those participants who analyzed word parts, whether it was occasionally, frequently, or always, totaled to 80% for the LL2s and to 88% for the SL2s. That is, the ratio of Spanish learners who claimed to analyze word parts was higher than that of the Latin group. Whether the participants' survey responses are supported or not by the results obtained from the metalinguistic awareness test administered at the end of the semester are discussed under the related MLA headings for each group.

The other statement, *I look the word up in the dictionary,* is also a critical item in this section since dictionaries generally give the etymologies of the words which may make learners gain metalinguistic awareness while checking the word meanings. Latin L2 participants declared that they occasionally (33.3%), frequently (46.7%), or always (20%) consult their dictionaries. None of them marked *never* or left the response blank as opposed to 12% of the Spanish L2 group participants who marked *never* option. The ratio of those SL2s who consulted their dictionaries occasionally (20%) or frequently (36%) was lower than that of Latin L2s, while the ratio was higher (32%) with respect to *always* option.

In other words, 100% the LL2 participants declared that they consulted their dictionaries, whereas 88% of the Spanish L2s claimed to do so, which means that the majority of L2 learners in each language group consult their dictionaries. This generally is the case for beginners who learn a second language; however, the aim of the study is to explore whether these learners develop a metalinguistic awareness in their L1 while learning an L2.

4.3.2. How I guess the Meaning of Words

Second part of the Word Study Habits (WSH) survey contains four items, first three of which aim to discover whether the participants try to see/hear a similarity with the words they already know in English as their native language, in their heritage language, and/or in their second language(s). Of the two participants who responded to this item, one reported to do similarity check frequently, while the other did so occasionally. Since only two students reported to have a heritage language, the second item was excluded from response evaluations. As for the last item, it aims to assess whether the participants' responses support the first item in the previous section (i.e., *I analyze the word parts*). Table 4.5 displays the results obtained in the second section.

Table 4.5. Word Study Habits: How I Guess the Meaning of the Words

Section B Participant Responses		Course Language	Never		Occas.		Freq.		Always		Blank	
			#	%	#	%	#	%	#	%	#	%
I try to see/hear a similarity with the words	in English	Latin	-	-	3	20	9	60	3	20	-	-
		Spanish	-	-	7	28	13	52	5	20	-	-
	in my L2(s)	Latin	2	13.3	7	46.7	5	33.3	1	6.7	-	-
		Spanish	8	32	8	32	8	32	-	-	1	4
I separate affixes and try to make out the root-words		Latin	2	13.3	8	53.3	4	26.7	1	6.7	-	-
		Spanish	4	16	12	48	6	24	3	12	-	-

Note. Course language groups: Latin $N = 15$; Spanish $N = 25$.

Participants who declared that they always tried to see/hear a similarity with the words they know in English (L1) were equal for both Latin ($N = 15$) and Spanish ($N = 25$) language groups (20%). Those who declared frequent similarity check was higher among LL2s (60%) than SL2s (52%), while those who declared that they occasionally did so were higher among the SL2s (28%) than the LL2s (20%). No participant in either group marked *never* option or left the

response blank. In brief, all the participants declared similarity check against the words they know in English, whether it was occasionally, frequently, or always.

As for trying to see/hear a similarity with the words in their previously known second language(s), only one LL2 participant (6.7%) declared to do so always. Participants who declared that they occasionally checked word similarity in their L2(s) were almost equal in both LL2 and SL2 groups (33.3 and 32% respectively), and those who frequently did similarity check were higher among LL2s (46.7%) than SL2s (32%). Those who never checked word similarity in their L2(s) were much higher among the SL2 (32%) than the LL2 (13.3%) groups. Only one participant from the SL2 group left the response blank (6.7%).

Stated differently, those participants who did similarity check, whether it was occasionally, frequently, or always, totaled to 87% for the LL2s and to 64% for the SL2s. That is, the ratio of Latin learners who tried to see/hear a similarity with the words in their prior second language(s) was higher than that of the Spanish group.

The last item in this section of the survey, *I separate the word-parts (prefixes & suffixes) that I know and I try to make out the root-words to guess word meanings* (shortened in Table 4.5 as *I separate affixes and try to make out the root-words*), shows that the ratio of those participants who occasionally or frequently searched the root-words was higher in the LL2 group (53.3 and 26.7% respectively) than that of the SL2 (48 and 24% respectively). As for those who never tried to inspect the root-words, the ratio was higher in favor of the SL2 participants (16%) compared to LL2s (13.3%). Nearly twice as many SL2 participants (12%) declared that they did root-word search compared to those in the LL2 group (6.7%).

Stated otherwise, 86.7% of the LL2s and 84% of the SL2s occasionally, frequently, or always separated affixes to seek root-words as to guess the meaning of the new words they

encounter. When compared to the ratio of responses given to the word-part analysis item in the first section of the survey (80% for the LL2s and to 88% for the SL2s), the majority of both L2 groups utilized word-part analysis and root-word search, which indicates that they may have already acquired metalinguistic awareness. Figure 4.1 displays the participants' responses to the items in the first two sections of the Word Study Habits Survey.

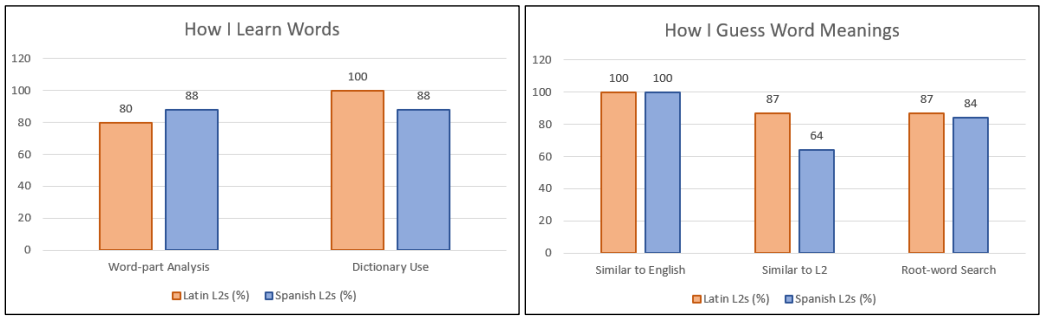


Figure 4.1. Word Study Habits: How I Learn Words and Guess Their Meanings

Whether the participants' responses to these items are supported or not by the results obtained from the metalinguistic awareness test administered at the end of the semester is discussed under the related MLA survey heading.

4.3.3. Knowledge of the Word Parts

The third section of the WSH survey contains four items, first of which inquired whether the participants had *studied word-part analysis*. Only five LL2s (33.3%) and two SL2s (5.8%) indicated that they did. Table 4.6 presents the comments made on the second item, *length of word-part study*, by those who responded to the first item in the affirmative.

Table 4.6. Word Study Habits: How Long I Studied Word-Part Analysis

Inquiry	Responses (Latin *N* = 5; Spanish *N* = 2)
For how long the participant studied word-part analysis:	*Latin L2s:* • Really as more of a sidelined hobby. I really enjoy breaking down antique words and finding new ones. • At my middle school we got a new word every week on the school news and had a different activity each day to expand on our journal entry on just that single word. We learned about roots, prefixes, suffixes, etc. We had to think of and find words of the same root, break them down; how do they relate? Why do they have that same root? Meaning? Why? What? etc. Doing this all three years of middle school I went into high school using this technique throughout my writings, readings, speeches, and even just simple homework assignments. And I still use this now, especially since I like to spend my free time reading and writing for pleasure I am always looking to expand and learn more. • I have been applying word-part analysis to English ever since I first started learning Latin four years ago.[1] • a semester • not formally *Spanish L2:* • Here and there in English courses and to a lesser extent in French courses.

Note. One participant[1] did not indicate Latin as the L2 in G2KY survey.

In response to this section of the survey, one of the LL2 participants mentioned learning Latin for four years before attending the undergraduate L2 course. This participant may have not considered Latin as a language to be 'known' since it has no native speakers today, and thus, is deemed a dead language. It is possible that there were other participants who may have taken a semester or two of Latin language during their secondary education since it is offered as an elective course in high schools; however, none of them mentioned it as the L2 they knew. Therefore, Table 4.1 does not list Latin as one of the previously known second languages.

The rest of the items in this section were: *Who taught you word-part analysis? When?* and *If it was a self-study, how did you learn/practice it?* Table 4.7 shows the participants' responses.

Table 4.7. Word Study Habits: How and When I Studied Word-Part Analysis

Inquiry	Responses (Latin *N* = 5; Spanish *N* = 2)
Who taught the participant word-part analysis, and when:	*Latin L2s:* • It'd be myself, but in a Digital Humanities course I took in Spring, my professor did go over it with the class. • Middle school and several of my high school teachers employed this technique as well. • Although it was never identified specifically as such, my instructor of Latin in high school began the process of me becoming more aware of word-part analysis.[1] • My English teacher 2 years ago. • Myself *Spanish L2:* • Basic English most years of school--elementary up to college. It was reinforced in French courses.
In case of self-study, how word-part analysis was learned / practiced:	*Latin L2s:* • Just out of interest for the words and how they were formed. Words like "defenestrate" have always caught my interest. • Mostly through application in Wheelock's Latin, my college Spanish courses, and my Latin-English dictionary.[1] • Acquired skills over time. *Spanish L2s:* • I read a lot, so I often look for Latin root words in novels or other pieces I am reading. • Books.

Note. One participant[1] did not indicate Latin as the L2 in G2KY survey.

4.4. Vocabulary Pre/Post-test (P/PT)

The 36-item matching definitions vocabulary test (Appendix C) was administered at the beginning of the Latin and Spanish L2 courses as the pre-test, and at the end of the semester as the post-test to compare the scores obtained by the participants. The two test results are presented and discussed below in connection with the first three research questions.

4.4.1. Research Question One

Does learning Latin as a second language help to improve the academic and low-frequency English vocabulary knowledge of undergraduate students who are native speakers of English?

This question requires that a paired-samples *t*-test is administered since the same participants were tested twice. Before running the statistics, the four assumptions of the *t*-test were checked (Field, 2013; Larson-Hall, 2010).

4.4.1.1. Paired-samples *t*-test assumptions. The first assumption is that the dependent variable should be measured on a continuous scale (i.e., interval-level measurement). The first assumption is met since the test scores are measured on a continuous scale from 0 to 36. The second assumption is that the data should be independent. In other words, the same participants should be measured in the related groups. The second assumption is also met since the groups (i.e., pre- and post-test takers) are the same. The third assumption, homogeneity of variance, is that the compared groups have equal or relatively similar variances. Larson-Hall (2010) indicates that equal variances for the paired-samples is assumed to be true. The fourth assumption is that the data are normally distributed. To check this assumption, the descriptive data were explored. Table 4.8 presents the statistics results of the LL2 learners.

Table 4.8. Descriptive Data of the Latin L2 Learners

Total Scores	*N*	Min	Max	$\bar{x}$	*s*	*Skewness*	*SE*	*Kurtosis*	*SE*
Pre-test	15	6	25	14.13	4.912	.558	.580	.508	.1121
Post-test	15	10	26	17.80	4.799	.272	.580	-.637	.1121

Checking the skewness (pre-test .558, post-test .272, *SE* = .580) and kurtosis (pre-test .508, post-test -.637, *SE* = .1121) values, we can assume that the data obtained from both tests are approximately normally distributed. To demonstrate the distribution of the data also visually, normality statistics were performed. Figure 4.2 displays the P-P plots of the Latin L2 learners' P/PT scores.

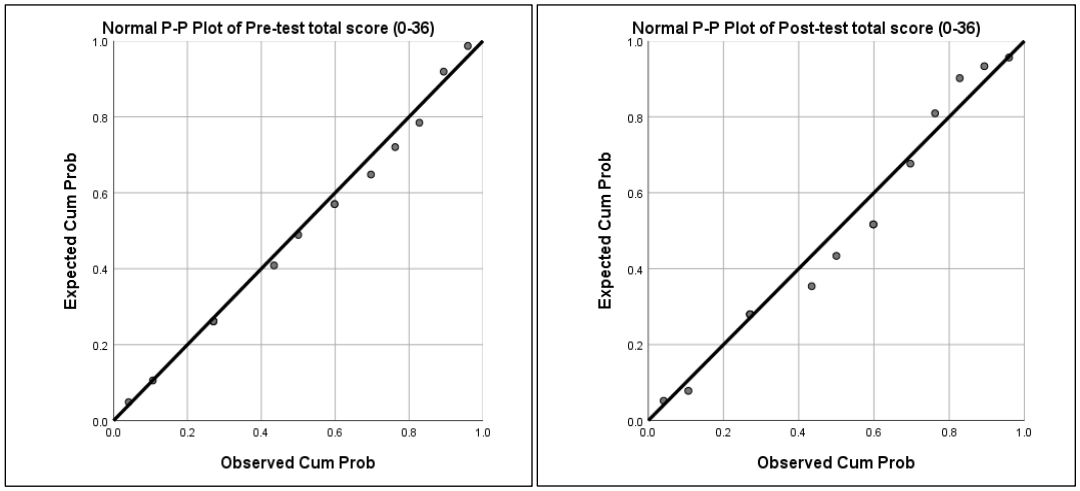


Figure 4.2. P-P Plots of the Latin L2 Learners' Pre/Post-test Scores

P/PT scores cluster quite closely around the diagonal line, which indicates that the distribution is approximately normal. However, the data from both tests are skewed since the data points form an S-shape around the diagonal line, and the skewness is positive since more data points take place below of the line. Figure 4.3 displays the histograms and normality curves of the P/PT scores.

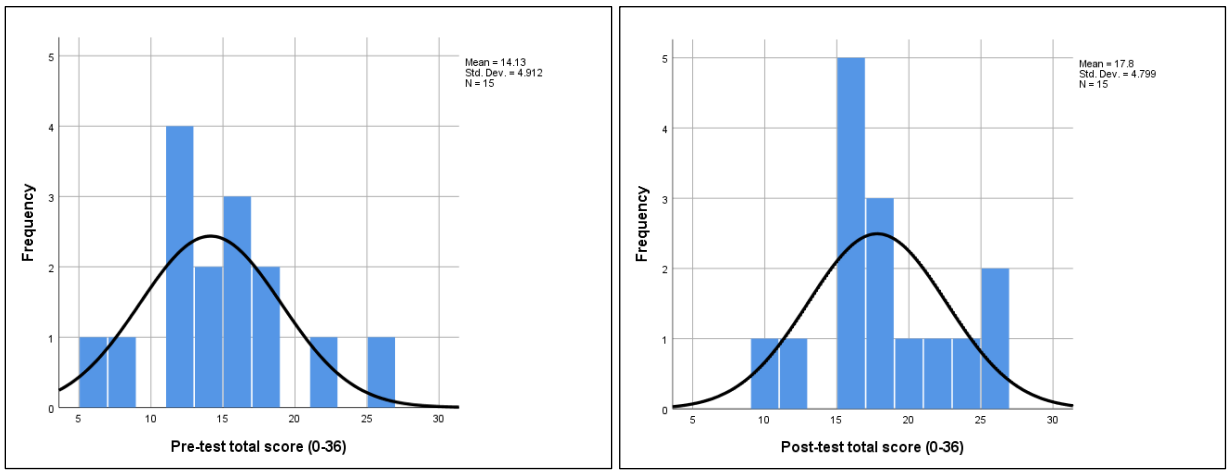


Figure 4.3. Histograms of the Latin L2 Learners' Pre/Post-test Scores

Skewness. Pre-test scores are positively skewed (.558, *SE* = .580), that is, the majority of scores are on the lower end of the scale, but the z-value (*z* = .962) is within the limits of ± 1.92, which indicates that data are normally distributed since 95% of the scores are in the normal range (Field, 2013). Similarly, the post-test z-value (skewness =.558, *SE* = .580, *z* = .469) is also within the limits of ± 1.92, and thus, it is normally distributed, too. Comparing the skewness of the two tests, the z-value of the pre-test (*z* = .962) is between +0.5 and +1, and thus, it is moderately skewed; the z-value of the post-test (*z* = .469) is between 0 and +0.5, and thus, the normality curve is fairly symmetrical since the z-value is closer to the normal distribution mean value of zero (Field, 2013).

Figure 4.4 shows the boxplots of the P/PT scores. An outlier (participant 12) is seen above the pre-test plot. However, this outlier is not an extreme one since it is not marked by an asterisk, and it is considered a mild outlier which does not violate the assumption of normality (Field, 2013; Larson-Hall, 2010).

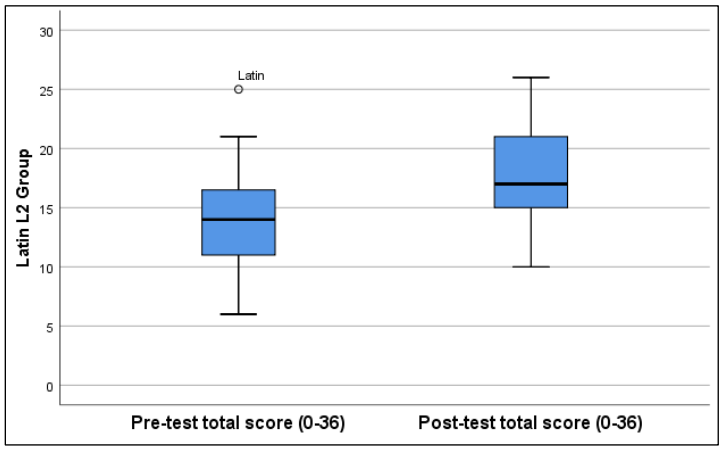


Figure 4.4. Boxplots of the Latin L2 Learners' Pre/Post-test Scores

The test of normality data presented in Table 4.9 supports the visual outputs displayed in Figures 4.2, 4.3, and 4.4 above.

Table 4.9. Test of Normality of the Latin L2 Learners

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Total Score (0-36)	Statistic	*df*	*p*	Statistic	*df*	*p*
Pre-test	.138	15	.200*	.967	15	.814
Post-test	.150	15	.200*	.945	15	.453

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Shapiro-Wilk test figures presented in Table 4.9 indicate *p*-values greater than .05 ($p = .814$ for the pre-test and $p = .453$ for the post-test) which show that the data obtained from both tests are normally distributed (Field, 2013).

4.4.1.2. Paired-samples *t*-test of the Latin L2 learners. All four *t*-test assumptions having been met, a paired-samples *t*-test was conducted to compare the pre- and post-test scores of the Latin L2 leaners to explore whether the means differ significantly. Table 4.10 provides the statistics, Table 4.11 the correlations, and Table 4.12 *t*-test results.

Table 4.10. Paired Samples Statistics of the Latin L2 Learners

	Total Scores	*N*	$\bar{x}$	*s*	*SE Mean*
Pair 1	Pre-test	15	14.13	4.912	1.268
	Post-test	15	17.80	4.799	1.239

Statistics table gives values to compute the effect size of the test (i.e., Cohen's *d*). Effect size is calculated by finding the difference between the means and dividing it by the standard deviation. Since the standard deviations for the pre-test ($s = 4.91$) and the post-test ($s = 4.80$) are not equal, the pre-test (control condition) *s*-value was taken as the baseline standard deviation (Field, 2013, Larson-Hall, 2010) because the post-test (treatment condition) scores were obtained after the intervention (i.e., Latin L2 instruction).

Cohen's $d = \bar{x}_{\text{post-test}} - \bar{x}_{\text{pre-test}} / s_{\text{pre-test}} = 17.80 - 14.13 / 4.912 = 0.747$

According to the widely used levels of magnitude, an effect size of .20 is small, .50 is medium, and .80 is large (Field, 2013; Larson-Hall, 2010). The effect size computed for the Latin L2 learners ($d = 0.75$) is very close to the *d*-value of .80, and thus, represents a large effect. In other words, the *d*-value obtained indicates that the probability of finding a real effect in the population is three out of four times.

Table 4.11. Paired Samples Correlations of the Latin L2 Learners

	Total Score (0-36)	*N*	*r*	*p*
Pair 1	Pre-test & Post-test	15	.710	.003

The paired samples correlation data demonstrate how strongly the pre- and post-test scores were related. According to the commonly accepted measures showing the strength of relation, an effect size of ± .10 is small, ± .30 is medium, and ± .50 is large (Field, 2013; Larson-Hall, 2010). Table 4.11 indicates that the P/PT scores were significantly positively related ($r = .71$, $p = .003$). In brief, participants' performance substantially increased from pre-test to post-test.

Table 4.12. Paired-Samples *t*-Test of the Latin L2 Learners

		Paired Differences							
					95% Confidence Interval of the Difference				
	Total Score (0-36)	$\bar{x}$	*s*	*SE Mean*	Lower	Upper	*t*	*df*	*p* (2-tailed)
Pair 1	Pre-test – Post-test	-3.667	3.697	.955	-5.714	-1.619	-3.841	14	.002

The paired-samples *t*-test conducted indicates that, on average, Latin L2 participants scored higher in the post-test ($\bar{x}$ = 17.80, *s* = 4.80) than in the pre-test ($\bar{x}$ = 14.13, *s* = 4.91). Table 4.12 shows that the difference in means, -3.67, 95% CI [-5.71, -1.62], was significant, *t*(14) = -3.84, *p* = .002, and represented a large-sized effect (*d* = .75).

The outcome of the *t*-test suggests that learning Latin as a second language may improve the academic and low-frequency vocabulary levels of the undergraduate students who are native speakers of English.

4.4.2. Research Question Two

Does learning Spanish as a second language help to improve the academic and low-frequency English vocabulary knowledge of undergraduate students who are native speakers of English?

As with the first research question, the second question also requires that a paired-samples *t*-test is administered since the same participants were tested twice. Before running the statistics, only the normality of the distribution assumption was checked for the Spanish L2 learners since it was already explained under Research Question 1 that the first three assumptions were met. That is, the dependent variable is continuous, data are independent, and homogeneity of variance is assumed equal.

4.4.2.1. Normality assumption. The fourth assumption for the *t*-test is that the data are normally distributed. To check this assumption, descriptive data were explored. Table 4.13 presents the statistics results of the SL2 learners.

Table 4.13. Descriptive Data of the Spanish L2 Learners

Total Scores	*N*	Min	Max	$\bar{x}$	*s*	*Skewness*	*SE*	*Kurtosis*	*SE*
Pre-test	25	5	18	10.60	3.452	-.001	.464	-.525	.902
Post-test	25	4	17	11.64	3.740	-.384	.464	-.421	.902

Checking the skewness (pre-test -.001, post-test -.384, *SE* = .464) and kurtosis (pre-test .525, post-test -.421, *SE* = .902) values, we can assume that the data obtained from both tests are approximately normally distributed.

To demonstrate the distribution of the data also visually, normality statistics were performed. Figure 4.5 displays the P-P plots of the Spanish L2 learners' P/PT scores.

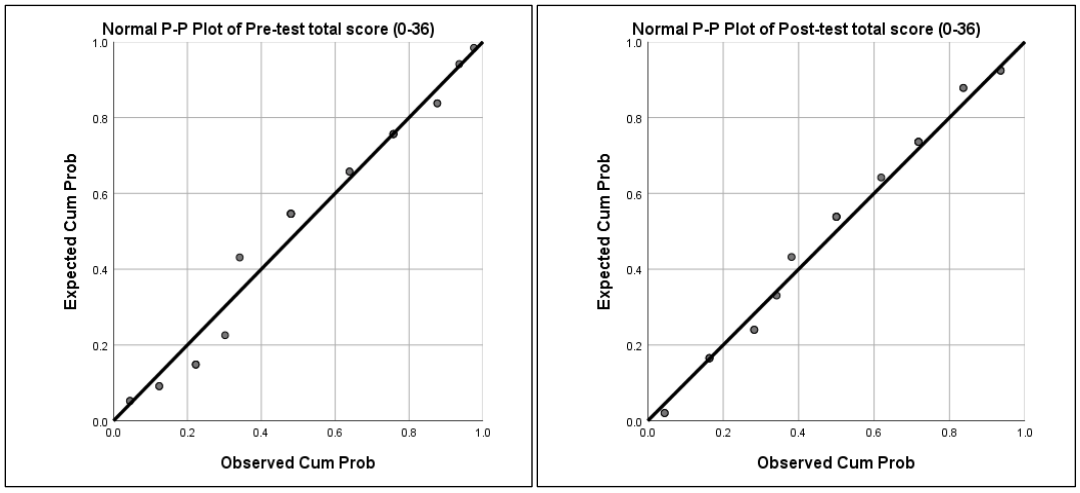


Figure 4.5. P-P Plots of the Spanish L2 Learners' Pre/Post-test Scores

As Table 4.3 displays, P/PT scores cluster quite closely around the diagonal line, which indicates that the distribution is approximately normal. However, the data from both tests are skewed since the data points form an S-shape around the diagonal line. Pre-test data points are almost equally distributed on both sides of the line, whereas post-test data points take place more

above the line, and thus, skewness is negative for the latter. Figures 4.6 displays the histograms and normality curves of the P/PT scores.

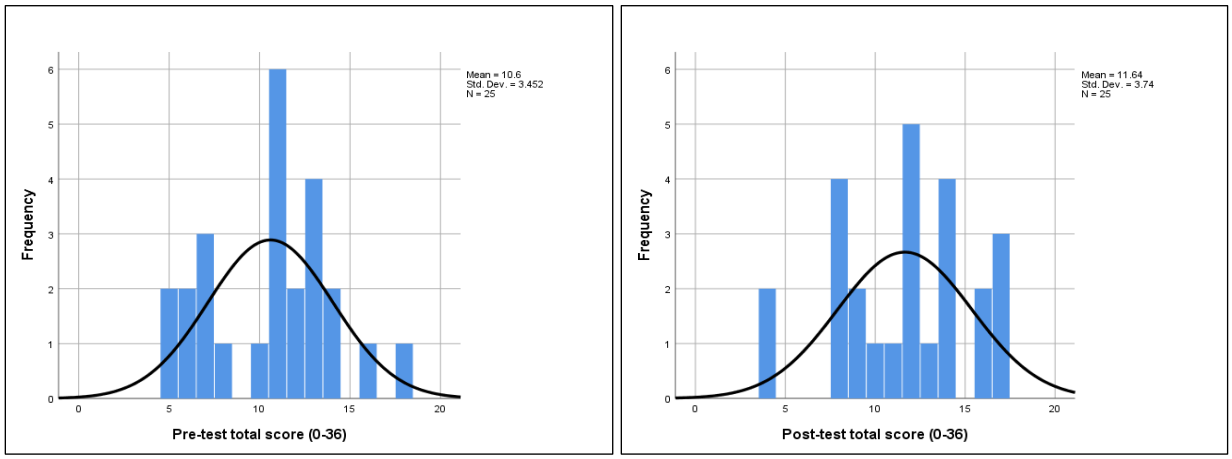


Figure 4.6. Histograms of the Spanish L2 Learners' Pre/Post-test Scores

Pre-test scores are slightly negatively skewed (-.001, *SE* = .464), that is, the majority of the scores are on the higher end of the scale, and the z-value (*z* = -.002) is within the limits of ± 1.92, which indicates that data are normally distributed since 95% of the scores are in the normal range. Post-test scores (skewness = .384, *SE* = .464, *z* = -.828) are also negatively skewed and are within the limits of ± 1.92; therefore, they are normally distributed, too.

Comparing the skewness of the two tests, the *z*-value of the pre-test (*z* = -.002) is between -.05 and 0, and thus, it is almost symmetrical since the *z*-value is very close to the normal distribution mean value of zero; the *z*-value of the post-test (*z* = -.828) is between -1 and -0.5, and thus, it is moderately skewed. Figure 4.7 shows the boxplots of the Spanish participants' P/PT scores. There are no outliers among the SL2s.

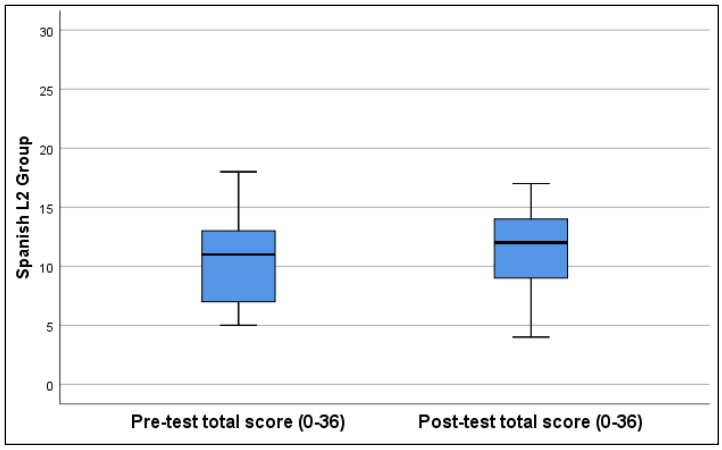


Figure 4.7. Boxplots of the Spanish L2 Learners' Pre/Post-test Scores

The test of normality data presented in Table 4.14 supports the visual outputs displayed in Figures 4.5, 4.6, and 4.7 above.

Table 4.14. Test of Normality of the Spanish L2 Learners

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Total Score (0-36)	Statistic	*df*	*p*	Statistic	*df*	*p*
Pre-test	.186	25	.025	.947	25	.219
Post-test	.138	25	.200*	.944	25	.179

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Shapiro-Wilk test figures presented in Table 4.14 indicate *p*-values greater than .05 ($p = .219$ for the pre-test and $p = .179$ for the post-test) which show that the data obtained from both tests are normally distributed.

4.4.2.2. Paired-samples *t*-test of the Spanish L2 learners. All four *t*-test assumptions having been met, a paired-samples *t*-test was conducted to compare the pre- and post-test scores of the Latin L2 leaners as to explore whether the means differ significantly. Table 4.15 provides the statistics, Table 4.16 correlations, and Table 4.17 *t*-test results.

Table 4.15. Paired Samples Statistics of the Spanish L2 Learners

	Total Scores	*N*	$\bar{x}$	*s*	*SE Mean*
Pair 1	Pre-test	25	10.60	3.452	.690
	Post-test	25	11.64	3.740	.748

Statistics figures in Table 4.15 provide the values to compute the effect size of the test (i.e., Cohen's *d*). Effect size is calculated by finding the difference between the means and dividing the it by the standard deviation. Since the standard deviations for the pre-test (s = 3.45) and the post-test (s = 3.74) are not equal, the pre-test (control condition) value was taken as the baseline standard deviation.

Cohen's $d = \bar{x}_{\text{post-test}} - \bar{x}_{\text{pre-test}} / s_{\text{pre-test}} = 11.64 - 10.60 / 3.45 = 0.30$

The effect size computed for Spanish L2 learners (d = 0.30) is very close to the *d*-value of .20, and thus, represents a small effect. In other words, the *d*-value obtained indicates that the probability of finding a real effect in the population is approximately one third.

Table 4.16. Paired Samples Correlations of the Spanish L2 Learners

	Total Score (0-36)	*N*	*r*	*p*
Pair 1	Pre-test & Post-test	25	.524	.007

The paired samples correlation data demonstrate how strongly the Pre/Post-test scores were related. Table 4.16 indicates that they were positively related (r = .52, p = .007), that is, participants' performance increased from pre-test to post-test but the effect was moderate (i.e., it is at the border of the correlation value of .05).

Table 4.17. Paired-Samples *t*-Test of the Spanish L2 Learners

		Paired Differences							
	Total Score (0-36)	$\bar{x}$	*s*	*SE Mean*	95% Confidence Interval of the Difference Lower	Upper	*t*	*df*	*p* (2-tailed)
Pair 1	Pre-test – Post-test	-1.040	3.518	.704	-2. 924	.412	-1.478	24	.152

The paired-samples *t*-test conducted indicates that, on average, Spanish L2 participants scored higher in the post-test ($\bar{x}$ = 11.64, *s* = 3.74) than in the pre-test ($\bar{x}$ = 10.60, *s* = 3.45). Table 4.17 shows that the difference in means, -1.04, 95% CI [-2.49, -.41], was not significant. The outcome of the *t*-test suggests that learning Spanish as a second language may slightly but not significantly improve the academic and low-frequency vocabulary levels of the undergraduate students who are native speakers of English.

4.4.3. Research Question Three

Is there a difference between learning Latin and learning Spanish as a second langue in improving academic and low-frequency English vocabulary?

The response to this question requires that first an independent samples *t*-test is run to explore whether the two L2 groups' pre-test scores were significantly different. The reason for the choice of the test is that the two L2 groups were independent of each other and that their sample sizes were unequal.

4.4.3.1. Independent-samples *t*-test assumptions. The first assumption is met since the dependent variable (pre-test scores) are measured on a continuous scale (i.e., 0-36) for both L2 groups. The second assumption is also met since the independent variables, Latin and Spanish L2s, are two independent categorical groups. Third assumption is met as well since there is no

relationship between the two L2 groups (i.e., each is composed of different participants, and none of the participants was in both groups).

Next two assumptions have already been examined in relation to the first and second research questions. The fourth assumption requires that there are no outliers in the data. As discussed under subheading 4.4.1.1, there was a mild outlier, one participant in the Latin L2 group (Table 4.2), but it would not violate the assumption of normality since it was not an extreme outlier. The fifth assumption dictates that the data is normally distributed. As the histograms and P-P plots as well as the skewness and kurtosis values presented under subheadings 4.4.1.1 and 4.4.2.1 demonstrate, the pre-test scores of both L2 groups are normally distributed. Additionally, the Shapiro-Wilk pre-test figures presented in Tables 4.11 and 4.16 indicate *p*-values greater than .05 for both L2 groups (i.e., $p = .814$ for Latin, $p = .219$ for Spanish L2s) which show that the data obtained from both groups are normally distributed.

The sixth, and the final assumption requires that the variances of the independent groups are equal, that is, the homogeneity of variance is demonstrated for the two L2 groups. To check the equality of variances, an independent-samples *t*-test for the pre-test scores of the Latin and Spanish L2 groups was conducted.

4.4.3.2. Independent-samples *t*-test of the two L2 groups. The statistics output is presented in Tables 4.18 and 4.19. The latter table gives the Levene's *F* test for equality, which indicates a *p*-value greater than .05 ($F = 1.557$, $p = .220$). Thus, the sixth assumption is also met since the difference between two L2 groups' variances is not significant ($p > .05$). In other words, equal variances are assumed.

Table 4.18. Group Statistics of the Independent-Samples *t*-Test

	Course Language	*N*	$\bar{x}$	*s*	*SE*
Pre-test total score (0-36)	Latin	15	14.13	4.912	1.268
	Spanish	25	10.60	3.452	.690

Table 4.19. Independent-Samples *t*-Test of the Two L2 Groups' Pre-test Scores

		Levene's Test for Equality of Variances		*t*-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	*p*	*t*	*df*	*p* (2-tailed)	Mean Diff.	SE Diff.	Lower	Upper
Pre-test total score (0-36)	Equal variances assumed	1.557	.220	2.670	38	.011	3.533	1.323	.355	6.212
	Equal variances not assumed			2.447	22.382	.023	3.533	1.444	.542	6.525

As for the independent-samples *t*-test (Latin L2s: $\bar{x}$ = 14.13, *s* = 4.91, *SE* = 1.29, *N* = 15; Spanish L2s: $\bar{x}$ = 10.60, *s* = 3.45, *SE* = .69, *N* = 25), the 95% CI for the difference in means is 0.36, 6.21 ($t_{(38)}$ = 2.67, *p* = .01). Group statistics presented in Table 4.18 provides the values to compute Cohen's *d*, that is, the effect size of the test. For the independent-samples *t*-test, the effect size is calculated by finding the difference between the means of the compared groups and dividing it by the pooled standard deviation of the two groups (Field, 2013, Larson-Hall, 2010).

$$\text{Cohen's } d = \bar{x}_{\text{LL2 pre-test}} - \bar{x}_{\text{SL2 pre-test}} / s_{\text{pooled}} = 14.13 - 10.60 / 4.245 = 0.832$$

$$s_{\text{pooled}} = \sqrt{[(s_{LL2})^2+(s_{SL2})^2]/2} = \sqrt{[(4.912)^2+(3.452)^2]/2} = \sqrt{(24.128+11.916)/2} = 4.245$$

According to the widely used levels of magnitude, an effect size of .80 is large, and thus, the effect size computed with the pooled standard deviation (*d* = 0.83) represents a large effect. In other words, the *d*-value obtained indicates that the probability of finding a real effect in the population is four out of five times.

The independent-samples *t*-test conducted indicates that Latin and Spanish L2 groups significantly differed on the pre-test, which would render the obtained scores a confounding factor in the comparison of the two language groups. This fact, in addition to the unequal sample sizes, necessitates that an analysis of covariance is conducted to explore whether there was a significant difference between the L2 groups in improving their academic and low-proficiency English vocabulary knowledge. Prior to running the statistics, assumptions for the ANCOVA were checked (Larson-Hall, 2010).

4.4.3.3. ANCOVA assumptions. The first assumption, normality of distribution, is already discussed under assumptions for the *t*-test subheadings. Since the P/PT scores of both L2 groups are normally distributed, the first assumption is met. The second assumption, strength of correlation among the covariates, is not an issue in this study since the analysis has only one covariate, that is, the pre-test. The remaining three assumptions for ANCOVA, namely, homogeneity of variances, linearity of variances, and homogeneity of regression slopes were checked.

4.4.3.3.1. Homogeneity of variances. This assumption is that the variances of the groups are equal. Larson-Hall (2010) states that Levene's test is a means to check homogeneity of variances and that, if the probability is greater than .05, the variances are equal. Table 4.20 gives the descriptive statistics for the homogeneity of variances, and Table 4.21 shows the Levene's test results. Post-test as the treatment variable is the dependent response variable, and the pre-test is the covariate.

Table 4.20. Descriptive Statistics for Homogeneity of Variances

Dependent Variable: Post-test total score (0-36)

Course Language	$\bar{x}$	*s*	*N*
Latin	17.80	4.799	15
Spanish	11.64	3.740	25
Total	13.95	5.099	40

Table 4.21. Levene's Test of equality of Error Variances [a]

Dependent Variable: Post-test total score (0-36)

F	*df1*	*df2*	*p*
.039	1	38	.844

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pre-test Total Score + Course Language

Homogeneity of variances assumption is met since Levene's test indicates that the variances for the post-test scores were equal for the Latin and Spanish L2 learners, $F_{(1, 38)} = .039$, $p = .844$ ($p > .05$). This result is observed also in Figure 4.8, which displays the side-by-side boxplots for both L2 groups. The lengths of the group boxplots are not markedly different in either test, which indicates that homogeneity of variances assumption is met.

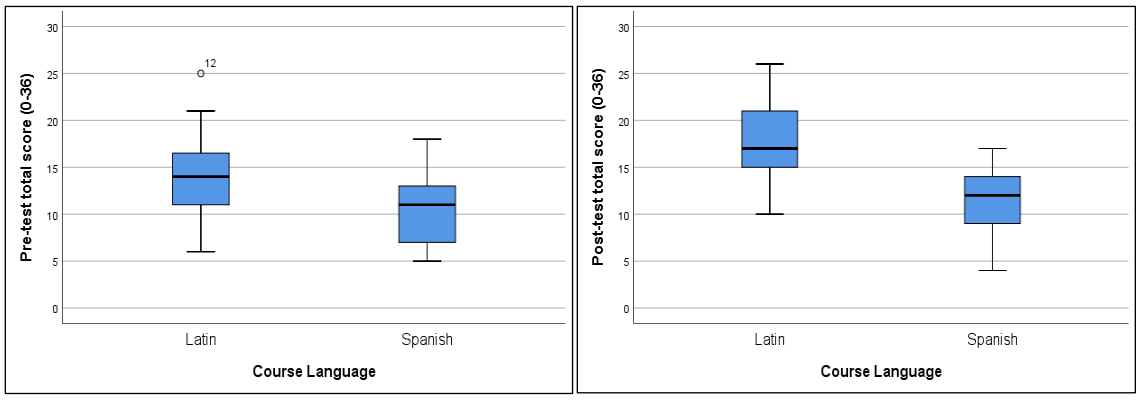


Figure 4.8. Side-by-Side Boxplots of the Pre/Post-test Scores Comparing L2 Groups

4.4.3.3.2. Linearity of variances. This assumption is that the relationship between the response variable and covariate is linear. Figure 4.9 displays the scatterplots for the Latin and Spanish L2 learner groups.

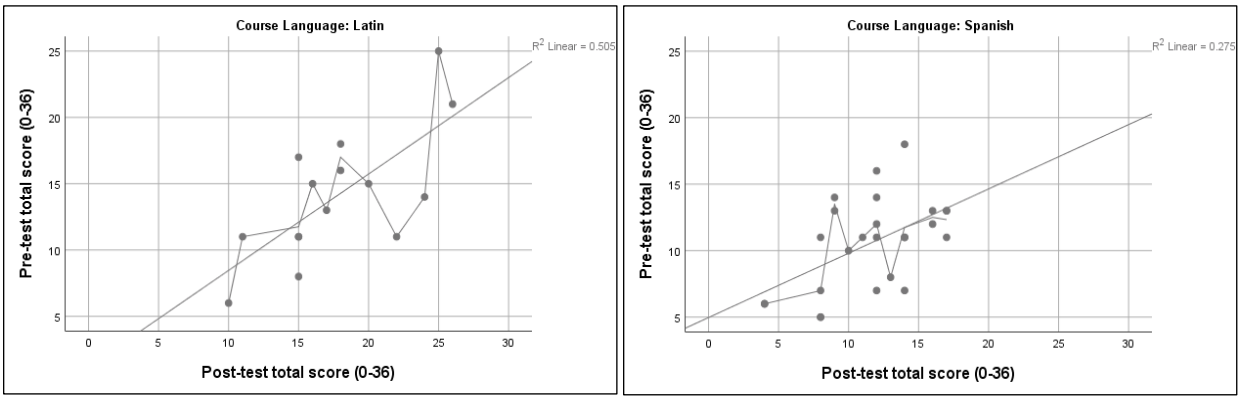


Figure 4.9. Scatterplots of the Latin and Spanish L2 Learners

As Figure 4.9 indicates, both the dependent variable (post-test) and the covariate (pre-test) are linear, and thus, the assumption is met. Scatterplots also show that the regression is positive; stated differently, as the value of the independent variable (covariate) increases, the mean of the dependent variable also increases.

4.4.3.3.3. Homogeneity of regression slopes. This assumption is that the relation between the dependent variable and the covariate is the same for each treatment group. In other words, the regression slopes of the scatterplots are parallel.

In Figure 4.9, regression slopes of the Latin and Spanish L2 learner groups do not seem to be exactly parallel. To check whether slopes are parallel enough, a statistical analysis of interaction between the covariate (pre-test) and grouping variable (course language) was made. Table 4.22 shows the between-subject effects for the regression slopes.

Table 4.22. Homogeneity of Regression Slopes

Tests of Between Subjects Effects
Dependent Variable: Post-test total score (0-36)

Source	df	Mean Square	*F*	*p*
Course * Pre-test	1	2.467	.220	.642
Error	36	11.202		
Total	40			

Since $p > .05$, it can be concluded that the slopes are parallel enough ($F_{(1, 36)} = .22$, p = .64), and thus, homogeneity of regression slopes assumption is met (Larson-Hall, 2010).

4.4.3.4. ANCOVA testing. All five assumptions of ANCOVA being satisfied, the analysis of covariance test was run to explore whether there is a difference between learning Latin and learning Spanish as an L2 in improving academic and low-frequency English vocabulary of the participants. Table 4.23 displays the between-subject effects in the ANCOVA output.

Table 4.23. Tests of Between-Subjects Effects

Dependent Variable: Post-test total score (0-36)

Source	Type II Sum of Squares	df	Mean Square	*F*	*p*	Partial Eta Squared	Observed Power [b]
Corrected model	608.172[a]	2	304.086	27.731	.000	.600	1.000
Intercept	84.331	1	84.331	7.690	.009	.172	.771
Pre-test scores	252.432	1	252.432	23.020	.000	.384	.997
Course	120.817	1	120.817	11.018	.002	.229	.898
Error	405.728	37	10.966				
Total	8798.000	40					
Corrected total	1013.900	39					

[a] R Squared = .600 (Adjusted R Squared = .578)
[b] Computed using alpha = .05

The partial eta squared (partial η^2) is the effect size indicating the amount of variance on the independent variable. For ANCOVA, the effect size is small if partial $\eta^2 = .01$, medium if $\eta^2 = .09$, and large if $\eta^2 = .25$. As for the significance value, the means of the groups are significantly different if $p < .05$ (Field, 2013).

Table 4.23 shows that pre-test scores had a strong effect ($F_{(1, 37)} = 23.02$, $p = .000$, power = .997) on the post-test scores. Spanish L2 group's pre-test scores ($\bar{x} = 10.60$, $s = 3.45$, $N = 25$) were lower than those of the Latin L2 group ($\bar{x} = 14.13$, $s = 4.91$, $N = 15$); in other words, Spanish learners were not on equal footing with Latin learners. This difference between the two groups had a large effect ($\eta^2 > .25$) on their post-test performance.

Field (2013) states that, "other things being equal, effect sizes are not affected by sample size, unlike *p*-values" (p. 81). However, he also comments that the issue is not that simple since large samples would produce a better estimation of the population value. Moreover, he mentions that precision (i.e., closely matched effect sizes of the sample and the population) would be affected even if the sample size does not affect the sample effect size.

Taking the above evaluation into consideration, sample size could be a factor that influenced the outcome since 'other things' were not equal. That is, the pre-test results were not equal for the Latin L2 and Spanish L2 participants. Therefore, a larger Latin L2 sample size, or at least one commensurate with that of Spanish L2s, may have generated a moderate or small effect size (partial η^2). However, Larson-Hall (2010) states that "if sample sizes are small, large differences in variance may not be seen as problematic, while, if sample sizes are large, even small differences in variances may be counted as a problem" (p. 251).

Expressed differently, the course language being the condition in this analysis, the difference in the pre/post-test statistics of Latin and Spanish L2 groups is in favor of the former. Table 4.24 shows the comparison of descriptive data for both groups and for both tests.

Table 4.24. Comparison of the Descriptive Pre/Post-test Data of Latin and Spanish L2 Learners

Total Scores (03-36)		Latin L2 (N = 15)				Spanish L2 (N = 25)			
		Pre-test		Post-test		Pre-test		Post-test	
Descriptives		Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. error	Statistic	Std. Error
Mean		14.13	1.268	17.80	1.239	10.60	.690	11.64	.748
Adjusted Mean[a]				16.27	.953			12.39	.719
95% CI for Mean	Lower	11.41		15.14		9.18		10.10	
	Upper	16.85		20.46		12.02		13.18	
5% Trimmed Mean		13.98		17.78		10.52		11.77	
Median		14.00		17.00		11.00		12.00	
Variance		24.124		23.029		11.917		13.990	
Std. Deviation		4.912		4.799		3.452		3.740	
Minimum		6		10		5		4	
Maximum		25		26		18		17	
Range		19		16		13		13	
Interquartile Range		6		7		6		6	
Percentiles	25	11		15		7		8	
	50	14		17		11		12	
	75	17		22		13		14	
Skewness		.558	.580	.272	.580	-.001	.464	-.384	.464
Kurtosis		.508	1.121	-.637	1.121	-.525	.902	-.421	.902

[a] Covariate evaluated at pre-test total score (0-36) = 11.93.

Compared to the pre-test mean scores of the L2 groups (LL2 $\bar{x}$ = 14.13, SL2 $\bar{x}$ = 10.60), there was an increase of 2.14 in the adjusted mean scores of the post-test for the Latin L2 learners ($\bar{x}$ = 16.27) and 1.79 for the Spanish L2s ($\bar{x}$ = 12.39). An increase was also observed in the minimum and maximum test scores of Latin L2 learners in in the post-test, whereas it was a decrease for the Spanish L2 group. Additionally, more Spanish L2 learners were on the lower end of the scale while it was the opposite for the Latin L2 group for the post-test. Figure 4.10 displays the side-by-side boxplots of the pre/post-test scores.

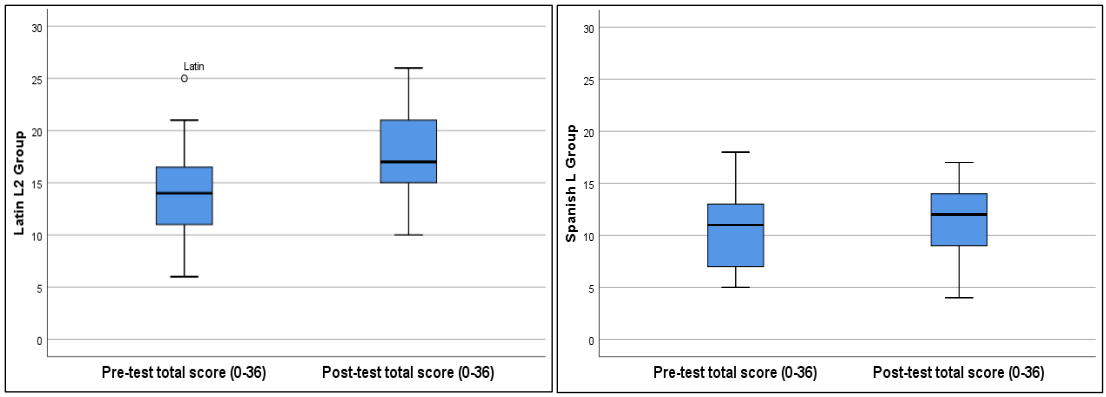


Figure 4.10. Side-by-Side Boxplots of the L2 Groups Comparing Pre/Post-test Scores

Both Table 4.24 and Figure 4.10 indicate that the improvement in the post-test scores of the Latin L2 learners were higher than that of Spanish L2 group. Thus, it is possible that learning Latin as a second language is more beneficial than learning Spanish for the undergraduate native speakers of English in improving their academic and low-frequency English vocabulary.

4.5. Metalinguistic Awareness Test (MAT)

The three-section metalinguistic awareness test (Appendix E) was administered immediately after the participants completed taking the post-test. The results obtained are presented and discussed with reference to the last three research questions.

4.5.1. Research Question Four

Does learning Latin as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?

In response to the fourth research question as well as the following two, a three-item metalinguistic awareness test was administered immediately after the post-test. The first item is

structured to inquire the ability of the participants in deconstructing the words as to match the three key words with their definitions and to eliminate the other three which are included as the distractors forming a question selected from the post-test. The second item includes eight words chosen from among the rest of the questions in the post-test. It aims to explore whether the participants can parse them into their constituents and inquires whether the parsing is done through L1 or L2 vocabulary knowledge. The third item contains an open-ended opinion question inquiring whether the L2 course was helpful in becoming aware of the word-parts and in deciphering the meanings of the words by means of this awareness.

4.5.1.1. The first item of the MAT: Latin L2 group. The first two questions of the metalinguistic awareness test, 1.a and 1.b, in the first item aim to explore whether the participants already knew any of the key words (i.e., provenience, quiddity, and ratiocination) and the distractors (i.e., cogitation, certitude, senility) tested in Question II of the Pre/Post-test.

From the Latin L2 group (*N* = 15), ten participants (66.7%) responded in the affirmative to Question 1.a, *"Was any of the six words already a part of your English vocabulary?"* and marked the ones they already knew (Question 1.b). Four of them claimed that they knew 1 word, three claimed to know 2 words, two 3 words, and one 4 words. Table 4.25shows their metalinguistic awareness test and post-test responses.

Table 4.25. Question II - Key Words: MAT and Post-test Responses of Latin L2s

Key Word	provenience		quiddity		ratiocination	
Participant Responses	Knew the word	Post-test correct	Knew the word	Post-test correct	Knew the word	Post-test correct
% (*N* = 15)	20.0	86.7	6.7	20.0	0.0	40.0

As shown in Table 4.25, the ratio of correct post-test responses is higher than that of word knowledge claims made for each key word. While ratio for *provenience* was more than one

fourth, it was one thirds for *quiddity*. As for *ratiocination*, none of the participants knew the word, but 40 percent of them had correct responses in the post-test.

To check whether the increase in the ratios is the reason for participants' paying attention to the word parts, the next two metalinguistic awareness test questions were analyzed. All the Latin L2 participants except for one (93.3%) responded to Question 1.c, *"Did you check the word parts in these words to help you match the definitions?"* in the affirmative. Table 4.26 displays which word parts were detected to help match the definitions.

Table 4.26. Question II - Key Words: Word-part MAT Responses of Latin L2s

Key Words	provenience *"source of origin"*			quiddity *"the essential nature of a thing"*		ratiocination *"methodological reasoning"*		
Word-part Meanings	pro- *forward*	-veni- *to come*	-ence *noun suf.*	quid- *what*	-ity *noun suf.*	ratio- *reason*	-cin- *to sing*	-tion *noun suf.*
Detected (%)	40.0	33.3	6.7	46.7	20.0	73.3	6.7	13.3
Knows (%)	0.0	20.0	6.7	33.3	6.7	66.7	0.0	6.7
Post-test Correct (%)		86.7			20.0		40.0	

Table 4.26 shows that the ratio of the detected word parts is higher than that of the knowledge of the root-word and affix meanings. Compared to the correct post-test responses, knowledge of the word part meanings is much lower for *provenience* but higher for *quiddity* and *ratiocination*. It is deemed noteworthy to underline the responses to the preposition *pro-* which was marked as detected by 40 percent of the participants, but none of them knew its meaning. One would think that such words as *progress* and *project*, which are in the frequency list of the second thousand words of the Corpus of Contemporary American English, and *promote*, which is in the third thousand tier, would help the participants recall that *pro-* has the meaning *forward*.

As for the root verb *-veni-* (Latin *venire*) following the preposition, only 33.3 percent of the participants claimed to detect it, and only 20 percent knew its meaning. Despite the low percentage of the affirmative responses to the root verb, 86.7 percent of the Latin participants correctly matched the meaning of the key word in the post-test, whereas only 20 percent claimed to know its meaning.

The case for the other key words, *quiddity* and *ratiocination*, was in the contrary. More participants claimed to have detected the root words (*quid-* 46.7% and *ratio-* 73.3%) and to know their meanings (33.3% and 66.7% respectively), but the post-test responses did not justify these claims. Only 20 percent of the participants matched the definition of *quiddity* correctly, and 40 percent marked the correct answer for *ratiocination*. The second root verb of the latter key word, *-cin-* (from Latin *canĕre*, to sing, which connotes telling, and in this case, telling by reasoning), bears a vowel change because of compounding and is not expected to be easily detected by beginning L2 learners. Thus, the outcome was as expected (i.e., one participant claimed to have detected but did not know its meaning). The root *ratio-* matched in the definition with *reasoning* may have offset the negative effect of the unknown root.

Questions 1.e, 1.f, and 1.g of the metalinguistic awareness test are included to probe further the metalinguistic knowledge of the participants since eliminating the distractors facilitates matching the definitions with the key words.

Question 1.e inquires whether the word-part analysis helped the participants to eliminate the words (i.e., the distractors) that do not match the definitions. The ratio of Latin L2s who responded in the affirmative was 60 percent. Question 1.f inquires which words the participants eliminated and which word parts were the keys in their decision. Table 4.27 shows the Latin L2

participants' responses to Questions 1.d and 1.f of the metalinguistic awareness test regarding the three distractors in Question II of the post-test.

Table 4.27. Question II - Distractors: Word-part MAT Responses of the Latin L2s

Distractors	cogitation		certitude		senility	
Word parts	cogit-	-tion	cert-	-tude	senil-	-ity
Meanings	*to think*	*noun suf.*	*true/sure*	*noun suf.*	*aged/old*	*noun suf.*
Detected the word parts (%)	86.7	20.0	26.7	6.7	40.0	20.0
Knows them (%)	73.3	13.3	20.0	6.7	33.3	13.3
Knows the distractor (%)	26.7		40.0		40.0	
Eliminated it (%)	-		26.7		33.3	
Word part of the key (%)	-		13.3	-	26.7	-

The first distractor, *cogitation*, was claimed to be known by 26.7 percent of the participants but was not eliminated by any, which does not justify the responses given to word-part and meaning question. A large portion of the Latin participants (86.7%) claimed to know the root verb *cogit-*, and 73.3 percent of the responders gave its correct meaning. Such an outcome is deemed unexpected since there was no mention of *knowing* in the definitions and recognizing the root verb and recalling its meaning was expected to facilitate eliminating this distractor.

The second distractor, *certitude*, was marked as known by 40 percent of the participants, but only 26.7 percent eliminated it. Of those who indicated that they recognized the root word *cert-* (26.7%), only half gave its meaning (i.e., *true, certain*), the latter being a common English word from the first thousand words list. One would expect that this word would be easily eliminated given that there was no indication of its meaning in the definitions.

The third distractor, *senility*, was marked as known by 40 percent of the participants, but 33.3 percent of them eliminated it although its root word, *senil-*, (from Latin *senilis*, old) was detected and marked as known with the same ratios (40% and 33.3% respectively). *Senile* and

senility are two English words from the ten thousand words list (i.e., within the scope of the adult English native speaker's vocabulary of 14,000 words), and there was no mention of oldness in the definitions. Therefore, it would not be surprising to have more participants to eliminate this distractor.

The four noun suffixes, *-ence, -ity, -tion, and -tude*, forming the key words and distractors in Question II of the post-test were not commonly marked as detected and/or known by the participants in the metalinguistic awareness test although blank spaces were provided for each. The maximum ratio of responders who claimed to detect the suffix and to know its meaning was 20 percent and 13,3 percent, respectively. In most cases, only one participant responded in the affirmative (6.7%). In fact, suffixes may guide the test takers in detecting the meaning of a word particularly in matching definition items. For example, *-tion* refers to an action or its result, and there were two words ending with this suffix, *ratiocination* and *cogitation*, to match with the only definition denoting an action, *reasoning*. This in mind, one would consider only these two words as the possible key word and then search for a hint in the definition to match these roots (i.e., *ratio-* and *cogit-*).

Question 1.g focuses on the definitions. It explores whether any part of the definition or the definition as-a-whole was the factor for the participants in matching it with the key word. Table 4.28 shows the distribution of the responses given by the Latin L2 learners. The percentage of post-test correct responses are included to compare with the definition responses.

Table 4.28. Question II - Definitions: Phrase-Hint Responses of Latin L2s

Key Words	provenience	quiddity	ratiocination
Definitions *[parts]*	*[1] source of [2] origin*	*[1] the essential nature of [2] a thing*	*[1] methodological [2] reasoning*
Part 1 (%)	13.3	33.3	6.7
Part 2 (%)	40	6.7	46.7
The phrase as a whole (%)	20	20	26.7
Total responded (%)	73.3	60.0	80.1
Post-test Correct (%)	86.7	20.0	40.0

Note. Percentages for each key word definition add up to 100 with no responses.

As table 4.28 indicate, the phrase as-a-whole (i.e., definition) was the key factor for 20 percent of the Latin L2 participants for *provenience* and *quiddity*, while it was 26.7 percent for *ratiocination*. In other words, one fifth of these participants did not parse the definitions for the first two key words, while this ratio was over one fourth for third key word. Of those who focused on the parts of the definitions, a higher proportion of the participants marked Part 2 for *provenience* (origin, 40%) and *ratiocination* (reasoning, 46.7%) but indicated Part 1 for *quiddity* (essential nature, 33.3%).

The definition of *provenience*, the source of origin, is noteworthy since Part 1 and Part 2 bear close synonyms in English, namely, *source*, which ultimately comes from Latin *surgere*, and *origin*, from Latin *oriri*, both of which basically mean *to rise*. Thus, those who marked Part 1 (source, 13.3%) for this key word could be considered along with the Part 2 responders (origin, 40%), bringing the ratio to 53.3 percent. Although more than half of the participants claimed that the parts of definition helped them to match the key word and one fifth of them benefited from the definition as-a-whole, only 33.3 percent of them detected the root verb *-veni-* (to come), and 20 percent of these participants claimed to know its meaning (Table 4.26). Considering the ratio of the post-test correct responses for *provenience* (86.7%) and the total

description matching responses (73.3%) as opposed to root-verb recognition responses (33.3%), it could be construed that Latin L2 participants possibly utilized their English word knowledge in matching this key word with its definition.

The case for *quiddity* and *ratiocination* was the opposite, that is, the ratio for those participants who claimed to have benefited from parsing the definition phrase or using it as-a-whole was three times higher than the percentage of correct post-test responses for *quiddity* (60% vs. 20.0%), whereas it was twice for *ratiocination* (80.1% vs. 40.0%). In other words, two thirds of the participants who marked to have matched the definition of *quiddity* did not pick the correct key word in the post test although 46.7 percent of them claimed that they detected the root word *quid-* and that 33.3 percent knew its meaning (Table 4.26). This fact taken into consideration, it could be assumed that the participants may know the meaning of the word part in the key word but cannot relate it to the clue in the definition.

4.5.1.2. The second item of the MAT: Latin L2 group. To explore whether the participants can parse the words into their constituents and whether the parsing is done through L1 or L2 vocabulary knowledge, eight words were chosen from among the post-test questions other than the one already analyzed in the first item of the metalinguistic awareness test. Of the eight words, three are key words (i.e., *libretto, parvenu*, and *sinecure*) and five are distractors (i.e., *antebellum, nostrum, recant, scriptorium*, and *viaduct*). Table 4.29 shows the responses given by the Latin L2 participants.

Table 4.29. Metalinguistic Awareness Test - Item 2: Responses by Latin L2 Participants

Response (%)	Word Part 1: / Word Part 2:	ante bellum	*libr etto*	nostr um	*par venu*	re cant	script(or) ium	*sine cure*	via duct
Already knew the word		40.0	13.3	13.3	0.0	20.0	33.3	13.3	13.3
Knows Word Part 1		60.0	46.7	53.3	0.0	33.3	86.7	66.7	66.7
Recalls it from:	L1	33.3	0.0	6.7	0.0	26.7	13.3	6.7	13.3
	L2	26.7	46.7	53.3	0.0	0.0	73.3	60.0	53.3
Knows its meaning		33.3	33.3	60.0	0.0	33.3	80.0	66.7	66.7
Knows Word Part 2		66.7	6.7	0.0	0.0	13.3	13.3	40.0	26.7
Recalls it from:	L1	13.3	0.0	0.0	0.0	0.0	6.7	6.7	6.7
	L2	53.3	6.7	0.0	0.0	6.7	6.7	33.3	0.0
Knows its meaning		66.7	6.7	0.0	0.0	13.3	13.3	40.0	26.7
Key Word Corr. Match			40.0		13.3			33.3	
Distractor Eliminated		93.3		93.3		46.7	46.7		26.7

The first key word, *libretto*, was correctly matched with its description, *text of an opera*, by 40 percent of the Latin L2 participants. Although 46.7 percent of them claimed to know the first word part, *libr-*, through Latin, only 33.3 percent of them gave the correct meaning, *book*, which corresponds to the clue-word, *text*, in the description. As for the second word part, the diminutive noun suffix *-etto*, only 6.7 percent of the Latin L2 participants marked to know it and gave its correct meaning. In other words, the suffix did not play a part in matching the word for the majority of the Latin L2s. The main word part, which is also a noun covered in the L2 course, was detected by almost half of the participants, but only 40 percent of them marked the correct answer in the post-test. Despite the seemingly decreased ratio, it is a progress since only 13.3 percent of the participants stated that they already knew the key word. This shows that L2 knowledge guided them in parsing the key word and matching the word meaning.

The second key word *parvenu*, a noun which came into English through French (i.e., the past participle of *parvenir*, ultimately from Latin *pervenire*, to arrive, reach) is interesting in that none of the Latin L2 participants knew the word before, and neither could they detect its

constituents. On the one hand, the French prefix *par-* (by, with) has no relation to the Latin adjective *par* (equal) which is also used as a substantive and is found in English phrases such as *at / below / on par*. For those participants who were possibly aware of these phrases, the prefix *par-* may have caused a confusion. On the other hand, however, the word part, *-venu*, shares the same root verb, *venire*, with another key word in the post-test, *provenience*, which is discussed under subheading 4.5.1.1. The word part *-veni-* therein was detected by 33.3 percent of the Latin L2 participants, and its meaning (*venire*, to come) was given correctly by 20 percent of them (Table 4.26). Additionally, the description given for *parvenu* in the post-test, *social newcomer lacking society's manners*, bears the clue verb. Although the corresponding Latin verb was not recognized by any, 13.3 percent of the participants matched the word with its meaning correctly, possibly by eliminating the distractors and guessing the meaning. This key word is a noteworthy example displaying the importance of metalinguistic awareness and informed knowledge of the morphemes that constitute the words.

The third key word, *sinecure*, was already known by 13.3 percent of the Latin L2 participants, and it was correctly matched with its definition, *position requiring little work but profitable returns*, by 33.3 percent. The first word part, *sine-*, was detected and its meaning (*without*) correctly given by 66.7 percent of the participants, and the ratio of those who indicated that they recalled it through Latin was 60 percent. The case was the same for *-cure*, the second word part, and its meaning, *care*; however, the ratio of recall (40.0%) was lower than the former word part, and the source of recall was again largely Latin (33.3%). Only 6.7 percent of the participants benefited from their L1 for both word parts.

Regarding the five distractors explored in Item 2 of the metalinguistic test, Table 4.29 indicates that the ratio of the participants who eliminated these words were higher than that of

those who already knew them. The difference is twice or slightly over for *antebellum* (93.3% vs. 40.0%), *recant* (46.7% vs. 20.0%), and *viaduct* (26.7% vs. 13.3%), whereas it was 1,5 times for *scriptorium* (46.7% vs. 33.3%) and seven times for *nostrum* (93.3% vs. 13.3%). Each distractor is evaluated as to check whether the word parts and their meanings were known and whether the source of this knowledge was the participants' L1 or L2.

Both word parts of the first distractor, *antebellum*, were recognized (*ante-*, 60.0% and *bellum*, 66.7%) although the meaning of the former (*before*) was given correctly only by 33.3 percent of the participants. The source of recall for both constituents was Latin (26.7% and 53.3%, respectively). The high proportion of elimination of this distractor (93.3%) may be explained mainly by the large ratio of recall of both word parts, possibly facilitated by the absence of a suitable clue word in the definitions of the key words provided for this specific question of the post-test (Appendix C, Question VI).

The first word part of the second distractor, *nostrum,* was known by 60 percent of the Latin L2 participants, most of whom indicated that their source of recall was their L2 (53.3%). The second word part, the neuter noun suffix *-um* in Latin, was not recalled at all. This is interesting in that learners of this classical language learn gender endings from the very beginning of the course, and thus, it would not be surprising if they reflected this knowledge in the metalinguistic awareness test. Nonetheless, the main word part (i.e., *noster* in Latin, meaning *our*), was adequate for the participants to eliminate this distractor by 93.3 percent. Also, as in the case of the first distractor, there was no clue word in the descriptions included in this question of the post-test (Appendix C, Question XI), which may have facilitated elimination.

The preposition *re-* in the third distractor, *recant*, was detected and known by 33.3 percent of the Latin L2 participants, all of whom recalled it through L1, whereas the second word

part, *-cant*, was recognized and known by 13.3 of them, none of whom related it to their L1 and half of whom recalled it through the L2. This root verb, *cantare* in Latin, was covered in the L2 course book, and the English verb *recant* belongs to the first 12,000-words list. These two facts along with the knowledge of the prefix would facilitate elimination; however, there was a key word in the same post-test question, *recuse*, which shared the same prefix. It was correctly matched with its definition, *withdraw from judging to prevent partiality*, by 66.7 percent of the participants. Having picked the correct key word for *recuse*, at least 66.7 percent of the participants should have eliminated *recant* instead of the achieved 46.7, which is almost two thirds of what would be expected. Of the ten participants (N = 15) who matched recuse correctly, three did not eliminate *recant*. This post-test question (IX in Appendix C) once more confirms the importance of the awareness of metalinguistic knowledge since both root verbs were covered in the L2 course early on.

The fourth distractor, *scriptorium*, was eliminated by more participants than those who claimed to know the word already (46.7% and 33.3%, respectively). The first word part, *scriptor*, (*script* was also accepted) was known by 86.7 percent of the Latin L2s, and its meaning, *writer*, was known by 80 percent. The majority of the responders recalled its meaning from their L2 (73.3%). As for the second part of the distractor, the suffix *-ium* (i.e., a place where the activity is performed) was known by 13.3 percent of the participants, half of whom recalled it from Latin. The elimination of this distractor would be expected to be much higher than the achieved 33.3 percent since the majority of the participants knew *script(or)*. However, there were two descriptions in this post-test question, *text of an opera* for the key word *libretto* and *rear section of the main floor of a theater* for the key word *parterre*, both of which require close attention with relation to the distractor *scriptorium*. The clue word *text* in the first definition is also related

to *writing*, and the clue words *section* and *floor* in the second definition are related to *-ium*; therefore, there is one more option in this question for the clue word *text, libretto* (matched by 40.0%), and one for the clue words for *section* and *floor, parterre* (matched by 13.3%). The keystone is the clue word *theater* which is not related to writing. Hence, the second definition is not suitable for *scriptorium*. This recognition leaves *parterre* to consider in-depth. The word part, *terre* (Latin *terra*), in this key word which means *earth*, *ground* and gives base to many common English nouns such as terrace, terrain, terrestrial, and territory, all of which are high-frequency words. Knowing the meaning of this word part would render *floor of the theater* the option for *parterre* and not for *scriptorium*, a justified decision to eliminate the latter. This post-test question (X in Appendix C) once more demonstrates the significance of metalinguistic awareness and word-part knowledge.

The fifth distractor, *viaduct*, was eliminated by 26.7 percent of the Latin L2 participants, but only 13.3 of them already knew the word, which is quite low considering that it is in the 12,000-words list and is expected to be within the vocabulary of the adult native speakers. The first word part, *via-* (way), comes from Latin and is a high-frequency word in English (in the first 3,000 tier). The second word part, *-duct* (from Latin *ducere*, to lead), is also a common morpheme in a plethora of English words, such as abduct, conduct, deduct, and induct, all of which are high-frequency words and fall into the word lists between the first 3,000 and 6,000 tiers. Therefore, *viaduct* would be an easy distractor to eliminate since there was no clue word in the three definitions provided in Question X of Appendix C to match its meaning although 66.7 percent of the responders knew *via* through Latin (53.3%). *Viaduct* is another distractor that underscores the importance of metalinguistic awareness in deciphering the word meanings and in

finding the connections between the words and their definitions by means of word part knowledge.

In brief, the analysis of Latin L2 participants' responses to the eight words in Item 2 of the test indicates that it does not suffice to recognize the word parts and to know their meanings. Metalinguistic awareness is indispensable in detecting the connection between the word parts and the clue words in the definitions. If one way is to find the correct definitions, the other is to eliminate the distractors. The latter may prove even a better tool when the words share the same word parts. In the case of Latin L2 participants, their L2 language generally guided them in matching or eliminating the five distractors explored, and the ratio of correct responses was 26.7 percent or higher, the highest being 93.3 percent. The remaining three words in Item 2 of the metalinguistic awareness test were matched by a ratio as low as 13.3 percent, the highest of the three being 40.0 percent.

4.5.1.3. The third item of the MAT: Comparison of the Two L2 groups. This item contains an open-ended opinion question inquiring whether the L2 course was helpful in becoming aware of the word-parts and in deciphering the meanings of the words by means of this awareness. The yes/no question at the beginning of the metalinguistic awareness test probes whether the participants agree that their L2 was beneficial in this respect. Of all the Latin L2 participants (N = 15), thirteen responded in the affirmative (86.7%) and two dissented (13.3%). In the space provided for the participants to explain why they found or not found learning their L2 helpful, 73.3 percent commented on meanings and definitions, 66.7 percent on word parts and endings, 60.0 percent on Latinate roots, 13.3 percent on utilization, and 26.7 percent on inadequacies. Table 4.30 presents the summary of comments made by Latin L2 participants with

respect to the effectiveness or inadequacy of the L2 course from the point of various aspects of metalinguistic awareness.

Table 4.30. Metalinguistic Awareness Test - Item 3: Opinions of Latin L2 Participants

Aspects	Participant Comments
Effectiveness	helpful, useful
• Meaning	identify, recognize, see clues, understand identify longer words, identify more accurately, ascertain definitions deduce, figure out, find, guess
• Roots and affixes	analyze, break down, parse, focus on word endings and parts recognize derivatives, similarities, words
• Utilization	in reading and writing in self-expression (speaking and writing) in choosing more precise words
• Vocabulary	increase vocabulary, learn complex words helpful (but a lot of vocabulary to learn both in L1 and in L2)
Inadequacy	helps a little, helps slightly sometimes useful not enough in testing

Appendix H contains participants' statements in response to Item 3 of the metalinguistic awareness test. As is seen therein, one of the Latin L2 participants commented on the course content from the point of lack of cultural background information on the L2, which is not related to parsing the Latinate English words or to deciphering their meanings, and criticized the load of grammar and translation, which are the two main components of the classical teaching method approved by the department and employed in the course books. Another participant commented on the lack of repeated use, which is related more to the characteristic of the language itself. Latin is not a language widely spoken or written except in specific circles. Repeated use, therefore, is in the hands of the learners through extensive reading in addition to repeating the extensive exercises provided in the course book. The aforementioned comments made by the two participants, therefore, were not included in Table 4.30 as the inadequacies.

4.5.2. Research Question Five

Does learning Spanish as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?

As also explained under subheading 4.5.1, a three-item metalinguistic awareness test (Appendix E) was administered immediately after the post-test to collect data in response to research questions four, five, and six. The aim of the first item is to inquire the ability of the participants in deconstructing the words as to match the three key words with their definitions as well as to eliminate the other three which are included as the distractors. The second item contains eight words chosen from among the rest of the questions in the post-test and aims to explore whether the participants can parse them into their constituents and whether the parsing is done through L1 or L2 vocabulary knowledge. The third item is an open-ended opinion question which inquires whether the L2 course was helpful in becoming aware of the word-parts and whether this awareness was a means in deciphering the meanings of the words.

4.5.2.1. The first item of the MAT: Spanish L2 group. The first two questions of the metalinguistic awareness test, 1.a and 1.b, in the first item aim to explore whether the participants already knew any of the key words (i.e., provenience, quiddity, and ratiocination) and the distractors (i.e., cogitation, certitude, senility) tested in Question II of the Pre/Post-test.

From the Spanish L2 group (N = 25), eighteen participants (72%) responded in the affirmative to Question 1.a, *"Was any of the six words already a part of your English vocabulary?"* and marked the ones they already knew (Question 1.b). Seven of them claimed that they knew 1 word, six claimed to know 2 words, four 3 words, and one 4 words. Table 4.31 shows their metalinguistic awareness test and post-test responses.

Table 4.31. Question II - Key Words: MAT and Post-test Responses of Spanish L2s

Key Word	provenience		quiddity		ratiocination	
Participant Responses	Knew the word	Post-test correct	Knew the word	Post-test correct	Knew the word	Post-test correct
% (*N* = 25)	44.0	76.0	4.0	8.0	4.0	36.0

As shown in Table 4.31, the ratio of correct post-test responses is higher than that of word knowledge claims made for each key word. While the correct responses for *provenience* and *quiddity* doubled the knowledge claims (1.72 and 2 times, respectively), it was nine times for *ratiocination*, that is, only 4 percent of the participants knew the word, but 36 percent of them had correct responses in the post-test.

To check whether the increase in the ratios is the reason for participants' paying attention to the word parts, the next two metalinguistic awareness test questions were analyzed. One third of the Spanish L2 participants (76%) responded to Question 1.c, *"Did you check the word parts in these words to help you match the definitions?"* in the affirmative. Table 4.32 displays which word parts were detected to help match the definitions.

Table 4.32. Question II - Key Words: Word-part MAT Responses of Spanish L2s

Key Words	provenience *"source of origin"*			quiddity *"the essential nature of a thing"*		ratiocination *"methodological reasoning"*		
Word-part Meanings	pro- *forward*	-veni- *to come*	-ence *noun suf.*	quid- *what*	-ity *noun suf.*	ratio- *reason*	-cin- *to sing*	-tion *noun suf.*
Detected (%)	36.0	4.0	8.0	8.0	4.0	28.0	4.0	8.0
Knows (%)	0.0	0.0	0.0	0.0	0.0	4.0	0.0	4.0
Post-test Correct (%)	76.0			8.0		36.0		

Table 4.32 shows that the Spanish L2 participants did not know the meaning of the word parts in *provenience* and *quiddity* although some declared to have detected them. As for the key

word *ratiocination*, only one participant (4.0%) gave the correct meaning for *ratio-* and the noun suffix *-tion*. Despite this fact, the ratio of correct post-test responses was higher than that of the claimed word part recognition for *provenience* (76.0% vs. 36.0%) and *ratiocination* (36.0% vs. 28.0%). As it was with the Latin L2 participants, the preposition *pro-* which was marked as detected by 36 percent of the participants is worth mentioning also in the case of Spanish L2s since none of them knew its meaning. This preposition is common in a considerable number of low-frequency English words (e.g., *progress, project,* and *promote*), and an awareness of the affixes in L1 would help the participants recall that *pro-* has the meaning *forward*.

As for the root verb *-veni-* (Spanish *venir*) following the preposition, only one participant (4.0%) claimed to detect it but did not know its meaning although this L2 verb was learned in Chapter 5 of the course. Despite this fact, 76 percent of the Spanish participants correctly matched the meaning of the key word in the post-test. This may indicate that word-part analysis was not utilized by these L2 learners.

The case for *ratiocination* was different in that more participants claimed to have detected the root word *ratio-* (28.0%) and to know its meaning (4.0%). Although the percentage of correct post-test responses was higher than that of the word part recognition, it was not as large as that of *provenience* (36.0% and 76.0%, respectively). Only two participants (8.0%) correctly matched the definition of *quiddity*, one of the least known words among the 36 key words in the post-test.

Questions 1.e, 1.f, and 1.g of the metalinguistic awareness test aims to probe further the metalinguistic knowledge of the participants since eliminating the distractors facilitates matching the definitions with the key words.

Question 1.e inquires whether the word-part analysis helped the participants to eliminate the words (i.e., the distractors) that do not match the definitions. The ratio of Spanish L2s who responded in the affirmative was 40 percent. Question 1.f inquires which words the participants eliminated and which word parts were the keys in their decision. Table 4.33 shows the Spanish L2 participants' responses to Questions 1.d and 1.f of the metalinguistic awareness test regarding the three distractors in Question II of the post-test.

Table 4.33. Question II - Distractors: Word-part MAT Responses of the Spanish L2s

Distractors	cogitation		certitude		senility	
Word parts	cogit-	-tion	cert-	-tude	senil-	-ity
Meanings	*to think*	*noun suf.*	*true/sure*	*noun suf.*	*aged/old*	*noun suf.*
Detected the word parts (%)	44.0	16.0	36.0	8.0	24.0	4.0
Knows them (%)	32.0	12.0	36.0	0.0	16.0	4.0
Knows the distractor (%)	36.0		32.0		20.0	
Eliminated it (%)	16.0		4.0		16.0	
Word part of the key (%)	16.0	-	-		8.0	-

The first distractor, *cogitation*, was claimed to be known by 36 percent of the participants but was eliminated by only 16 percent. Nearly half of the Spanish participants (44.0%) claimed to know the root verb *cogit-*, and 32 percent of them gave its correct meaning. There was no mention of *knowing* in the definitions and recognizing the root verb and recalling its meaning would facilitate eliminating this distractor; however, this was not the case since only 16 percent of the participants eliminated it.

The second distractor, *certitude*, was marked as known by 32 percent of the participants, but only 4 percent eliminated it. Those who indicated that they recognized the root word *cert-* (36.0%) also gave its correct meaning. One would expect that this word would be easily eliminated by a larger proportion of the participants given that there was no indication of its

meaning in the definitions and that the root meaning *certain* is a common English word from the first thousand words list as well as the Spanish word *cierto* covered in the L2 course vocabulary.

The third distractor, *senility*, was marked as known by 20 percent of the participants, but 16 percent of them eliminated it although its root word, *senil-*, was detected and marked as known with almost the same ratios (24.0% and 16.0% respectively). It would not be surprising if a larger percentage of native speaker participants recognized *senile* and *senility* since these are two English words from the first ten thousand words list and since there was no mention of oldness in the definitions.

Spanish L2 participants did not commonly mark the four noun suffixes, *-ence*, *-ity*, *-tion*, *and -tude*, as detected and/or known in the metalinguistic awareness test although blank spaces were provided for each. The maximum ratio of responders who claimed to detect the suffixes and to know its meanings was 16 percent and 12 percent, respectively. In most cases, only one (4.0%) or none of the participants responded in the affirmative. As also indicated under subheading 4.5.1.1, suffixes are useful guides in detecting the meaning of a word in matching definition tests. For example, *-tion* refers to an action or its result, and there were two words ending with this suffix, *ratiocination* and *cogitation*, to match with the only definition denoting an action, *reasoning*. This in mind, a test taker would consider only these two words as the possible key word and then search for a hint in the definition to match their roots, *ratio-* and *cogit-* in this case.

Question 1.g focuses on the definitions and explores whether any part of the definition or the definition as-a-whole was the factor for the participants in matching it with the key word. Table 4.34 shows the distribution of the responses given by the Spanish L2 learners. The

percentage of post-test correct responses are also included as to compare them with the definition responses.

Table 4.34. Question II - Definitions: Phrase-Hint Responses of Spanish L2s

Key Words	provenience	quiddity	ratiocination
Definitions *[parts]*	*[1] source of [2] origin*	*[1] the essential nature of [2] a thing*	*[1] methodological [2] reasoning*
Part 1 (%)	12	36	8
Part 2 (%)	4	4	28
The phrase as a whole (%)	64	28	48
Total responded (%)	80	68	84
Post-test Correct (%)	76	8	36

Note. Percentages for each key word definition add up to 100 with no responses.

As table 4.34 indicate, the phrase as-a-whole (i.e., definition) was the major key factor for the Spanish L2 participants for all three key words (i.e., 64% for *provenience*, 28% *quiddity*, and 48% for *ratiocination)*. Of those who focused on the parts of the definitions, a larger proportion of the participants marked Part 1 for *provenience* (source, 12%) and for *quiddity* (essential nature, 36%) but indicated Part 2 for *ratiocination* (reasoning, 28%).

As it was also mentioned under subheading 4.5.1.1, the definition of *provenience* is noteworthy since Part 1 (*source*) and Part 2 (*origin*) are close synonyms in English. Thus, those who marked Part 1 (12.0%) for this key word could be considered along with the Part 2 responders (4.0%), bringing the ratio to 16 percent. Additionally, 64 percent of the participants claimed that they benefited from the definition as-a-whole but only 4 percent detected the root verb -*veni*- but none of these participants knew its meaning (Table 4.32). Considering the ratio of the post-test correct responses for *provenience* (76.0%) and the total description matching responses (80.0%) as opposed to root-verb recognition responses (4.0%), it could be inferred that

Spanish L2 participants utilized their English word knowledge in matching this key word with its definition.

The case for *quiddity* and *ratiocination* was similar in that the ratio of those participants who claimed to have benefited from parsing the definition phrase or using it as-a-whole was also higher than the percentage of correct post-test responses but with a larger gap (84.0% vs. 36.0% and 68.0% vs. 8.0%, respectively). In other words, the majority of participants who marked the definition did not pick the correct key word in the post test although some of them claimed that they detected the root words *quid-* and *ratio-* but did not know their meanings except for one (Table 4.32).

4.5.2.2. The second item of the MAT: Spanish L2 group. To investigate whether the participants can deconstruct the words into their constituents and whether the analysis is done through L1 or L2 vocabulary knowledge, three key words (i.e., *libretto*, *parvenu*, and *sinecure*) and five distractors (i.e., *antebellum*, *nostrum*, *recant*, *scriptorium*, and *viaduct*) were selected from among the post-test questions other than the one that was already analyzed in the first item of the metalinguistic awareness test. Table 4.35 displays the responses given by Spanish L2 participants.

The first key word, libretto, was correctly matched with its description, text of an opera, by 28 percent of the Spanish L2 participants. Although 56 percent of them claimed to know the first word part, libr-, and 52 percent claimed to recall it through Spanish, only 28 percent of them gave the correct meaning, book, which corresponds to the clue-word, text, in the description. As for the second word part, the diminutive noun suffix -etto, only 8 percent of the participants marked to know it and gave its correct meaning, half of whom remembered it from their L2.

Table 4.35. Metalinguistic Awareness Test - Item 2: Responses by Spanish L2 Participants

Response (%)	Word Part 1: / Word Part 2:	ante bellum	*libr etto*	nostr um	*par venu*	re cant	script(or) ium	*sine cure*	via duct
Already knew the word		36.0	24.0	8.0	12.0	60.0	24.0	12.0	36.0
Knows Word Part 1		52.0	56.0	24.0	24.0	68.0	68.0	24.0	52.0
Recalls it from:	L1	48.0	4.0	4.0	20.0	72.0	64.0	8.0	48.0
	L2	16.0	52.0	16.0	4.0	0.0	4.0	8.0	4.0
Knows its meaning		20.0	28.0	12.0	0.0	40.0	52.0	0.0	24.0
Knows Word Part 2		20.0	8.0	8.0	48.0	24.0	20.0	24.0	36.0
Recalls it from:	L1	8.0	0.0	4.0	48.0	20.0	12.0	24.0	32.0
	L2	8.0	4.0	0.0	0.0	4.0	4.0	0.0	0.0
Knows its meaning		8.0	0.0	0.0	0.0	0.0	12.0	16.0	12.0
Key Word Corr. Match			28.0		0.0			24.0	
Distractor Eliminated		48.0		64.0		36.0	24.0		68.0

Stated differently, the suffix did not play a large part in matching the word for the majority of the Spanish L2s. The main word part, which is also a noun covered in the L2 course (*libro* in Spanish), was detected by more than half of the participants (56.0%), but the ratio of those who claimed to know its meaning and who marked the correct answer in the post-test was only 28 percent. This shows that L2 knowledge guided Spanish L2 learners in parsing this key word and in matching its meaning.

The second key word, *parvenu*, is noteworthy in that, none of the Spanish L2 participants could give the meaning of either of the word parts although 12 percent of them claimed to know the word itself. Additionally, the word parts *par-* and *-venu* were detected by means of their L1 (48.0% and 42.0%, respectively), but this knowledge did not help any of the Spanish L2s to match the key word with its description correctly although the description bears the clue word *come*. The difficulty in matching the meaning may be due to the fact that *parvenu* comes to English through French and that the prefix *par-* does not correspond to any prefix or preposition in Spanish. Similarly, the ending of *-venu*, which is the past participle of French *parvenir*, is

quite different from Spanish *venido*. However, as also discussed under subsection 4.5.1.2, the word part -*venu* shares the same root verb with another key word in the post-test, *provenience*. The word part -*veni*- therein was detected by 4.0 percent of the Spanish L2 participants, but its meaning (to come, *venir* in Spanish) was not given by any (Table 4.32) although the verb was learned in Chapter 5. This shows the importance of informed knowledge of the word parts that constitute the words since one may think to know or may actually know the meaning of the word parts but still may not be able to decipher the word's definition or correctly match when options are provided. This may be important especially from the point of phonological shifts in Spanish cognates which makes it harder for the learners to detect the similarities especially for those who are not literate in Spanish and not familiar with its orthography (Lubliner & Hiebert, 2011).

It is deemed worthwhile to mention here that the present study focuses on the morphological awareness of the native English speakers which would play an important role in their acquisition of academic and low-frequency English vocabulary. Therefore, detecting the orthographic similarities in the morphemes of the words they encounter with while reading the academic material and writing papers is the primary concern in their achievements. Analyzing the orthographic and phonological transparencies of Spanish-English cognates in the academic word list (AWL), Lubliner and Hiebert (2011) found that "75% of the AWL headwords are cognates, most of which are more common in Spanish than in English" (p. 88) and that "the cognates in this corpus are substantially more transparent in terms of orthography" (p. 86). The researchers also underline the fact that morphological and metalinguistic awareness is essential to recognize and utilize these cognates. In fact, the main focus of the present study is to explore whether this awareness is achieved through learning a Latinate language.

The third key word, *sinecure*, was already known by 12 percent of the Spanish L2 participants, and it was correctly matched with its definition, *position requiring little work but profitable returns*, by 24 percent. The first word part, *sine-*, was detected and its meaning (*without*) correctly given by 24 percent of the participants, and the ratio of those who indicated that they recalled it was 8 percent through L1 and 8 percent through L2 (in Spanish, *sin*). The case was the same for *-cure*, that is, they recalled the second word part by 24 percent, but 16 percent gave its meaning, *care*. Shortly, one fourth of the participants knew both word parts, and the ratio of correct responses in the post-test was equally one fourth although the ones who already knew the key word was half this amount. This shows that word part knowledge is helpful in matching the definitions.

Regarding the five distractors explored in Item 2 of the metalinguistic test, Table 4.35 indicates that the ratio of the participants who eliminated three of these words were higher than that of those who already knew them (i.e., *antebellum* 48.0% vs. 36.0%, *nostrum* 64.0% vs. 8.0%, and *viaduct* 68.0% vs. 36.0%). The difference was the same for *scriptorium* (24.0%) and lower for *recant* (36.0% vs. 60.0%). Each distractor is evaluated as to check whether the word parts and their meanings were known and whether the source of this knowledge was the participants' L1 or L2.

Both word parts of the first distractor, *antebellum*, were recognized (*ante-*, 36.0% and *bellum*, 20.0%), and the meaning of the former (*before*) was given correctly only by 20 percent of the participants. The source of recall for this constituent was 48 percent L1 and 16 percent L2. The latter word part, *bellum* (*war*), was claimed to be recalled by 8 percent of the participants through L1 and 8 percent through L2 although this constituent is present only in English compounds (*antebellum* and *postbellum*) and is not available in Spanish. However, another word

in Spanish, *duelo* (*duello* in English), comes from Latin *duellum* and is the older form of *bellum*. Although there is no obvious reference to *duello* in the word part *bellum*, participants may have conjectured its meaning possibly by linking it to the English compounds already in their vocabulary. The word *war* in Spanish is *guerra*, which is also a word in Late Latin, would not be the source of the participants' claimed recall of *bellum* from L2. Nonetheless, knowledge of the key word by 36 percent and the first word part by 48 percent of the participants was sufficient for 48 percent of them to eliminate the distractor.

The first word part of the second distractor, *nostrum*, was known by 24 percent of the Spanish L2 participants, two thirds of whom indicated that their source of recall was their L2 (16.0%). The second word part, the neuter noun suffix *-um* in Latin, was claimed to be recalled by 8 percent of the responders, half of whom gave L1 as the source of their knowledge. This is interesting in that word gender is not available in English except for those by nature, such as man/women. Nevertheless, the knowledge of the main word part (*nostros* in Spanish, meaning *we*) and the absence of a clue word in the descriptions included in this question of the post-test (Appendix C, Question XI) must have been adequate for 64 percent of the participants to eliminate this distractor.

The preposition *re-* in the third distractor, *recant*, was detected and known by 68 percent of the Spanish L2 participants, 72 percent of whom recalled it through L1, whereas the second word part, *-cant*, was recognized and known by 24 percent, all of whom related it to their L1. The root verb, *-cant* (*cantar* in Spanish), was covered in the L2 course book, and the English verb *recant* belongs to the first 12,000-words list. Despite these facilitating facts and the high ratio of the knowledge of the prefix, only 36 percent of the participants eliminated the distractor. The presence of another word in the same post-test question, *recuse* which shared the same

prefix may have prevented a better performance. This key word was correctly matched with its definition, *withdraw from judging to prevent partiality*, by 44 percent of the participants. Having picked the correct key word for *recuse*, at least 44 percent of the participants should have eliminated *recant* instead of the achieved 24 percent, which is almost half of what would be expected. Of the eleven Spanish L2 participants (N = 25) who matched *recuse* correctly, seven (63.6%) did not eliminate *recant*. This post-test question (IX in Appendix C) confirms the importance of both the awareness of metalinguistic knowledge and the knowledge of affixes.

The fourth distractor, *scriptorium* (Spanish *escritorio*, introduced in Chapter 2), was eliminated by 24 percent of the Spanish L2 participants, while the ratio of those who claimed to know the main word part, *scriptor*, was much higher (68.0%). It shares the same root also with the Spanish verb *escribir*, which was covered in the course book, and its meaning, *writer*, was known by 52 percent. The majority of the participants recalled it from their L1 (64.0%). As for the second word part of the distractor, the suffix *-ium* (i.e., a place where the activity is performed) was known by 20 percent of the participants, 12 percent of whom recalled it from L1. The elimination of this distractor would be expected to be much higher than the achieved 24 percent since the majority of the participants knew *scriptor*. However, there were two descriptions in this post-test question, *text of an opera* for the key word *libretto* (matched by 28.0%), and *rear section of the main floor of a theater* for the key word *parterre* (matched by 32.0%), both of which require close attention with relation to the distractor *scriptorium*. As explained under 4.5.1.2, the keystone in comparing these three words is the clue word *theater*, which is not related to writing, and thus, renders the distractor an invalid option to match. Then the clue words *section* and *floor* in the definition would help match it with *parterre* since its second word part (*tierra* in Spanish) means *earth, ground* and is present in many high-frequency

English nouns such as terrace, terrain, terrestrial, and territory. Thus, the clue word *text* would match with *libretto*, which means *booklet*. This post-test question (X in Appendix C) once more demonstrates the significance of metalinguistic awareness and word-part knowledge.

The fifth distractor, *viaduct*, was eliminated by 68 percent of the Latin L2 participants, but only 36 percent of them already knew the word, which is quite low considering that it is in the 12,000-words list and is expected to be within the vocabulary of the adult native speakers. As for its word parts, 52 percent of the participants knew *via-*, 48 percent stated that they recalled it through L1, and 24 percent knew its meaning (*by way of*). The second word part, *-duct*, was known by 36 percent and recalled from L1 by 32 of the responders, whereas only 12 percent knew its meaning. A higher percentage would not be surprising since *-duct* it is a common morpheme in a plethora of English words, such as abduct, conduct, deduct, and induct, all of which are high-frequency words and fall into the word lists between the first 3,000 and 6,000 tiers. Additionally, *viaduct* is an easy distractor to eliminate since there is no clue word in the three definitions provided in Question X of Appendix C to match its meaning.

In other words, the analysis of Spanish L2 participants' responses to the eight words in Item 2 of the test indicates that it does not suffice to recognize the word parts and to know their meanings. Metalinguistic awareness is essential in detecting the connection between the word parts and the clue words in the definitions. Both finding the correct definitions and eliminating the distractors are equally important. In some cases, elimination may be even a better tool, especially when the words share the same word parts. In the case of Spanish L2 participants, their L2 language generally did not guide them in eliminating the five distractors explored, and the ratio of correct responses was 68 percent or less, the lowest being 24 percent. Two of the

remaining words in Item 2 of the metalinguistic awareness test were matched correctly by almost one third of the participants, but none of them could match the third word.

4.5.2.3. The third item of the MAT: Comparison of the two L2 groups. To explore whether the L2 course was helpful in becoming aware of the word parts and whether this awareness was a means in deciphering the meanings of the words, an open-ended opinion question was added to the metalinguistic awareness test. The yes/no question at the beginning of Item 3 inquires whether the participants agree that their L2 was beneficial in this respect. Of all the Spanish L2 participants (N = 25), 14 responded in the affirmative (56.0%) and eleven dissented (44.0%). In the space provided for the participants to explain why they found or not found learning their L2 helpful, 44 percent commented on word parts and endings, 40 percent on meanings and definitions, 12.0 percent on Latinate roots, and 32 percent on inadequacies. Table 4.36 presents the summary of comments made by Spanish L2 participants related to the effectiveness or inadequacy of the L2 course on their metalinguistic awareness of word meanings and word parts, and vocabulary.

Table 4.36. Metalinguistic Awareness Test - Item 3: Opinions of Spanish L2 Participants

Aspects	Participant Comments
Effectiveness	helped
• Meaning	helped to narrow down the choices / recognize the words
• Roots and affixes	helped word part awareness / break down; some words similar / familiar
• Vocabulary	reinforces existing L1 vocabulary
Inadequacy	helped in a way / to an extend Beginning Spanish 1 / one semester not enough not familiar enough; similar but still not clear enough; could not relate to L1 could not find / notice Spanish words could not use to access words / word parts confused more did not help at all

Appendix H contains participants' statements in response to Item 3 of the metalinguistic awareness test. As is seen therein, one of the Spanish L2 participants wrote that hearing the pronunciation of the post-test words was a personal need for being able to better connect them to another language. Indeed, articulating academic and low-frequency words may pause a problem even in one's L1. However, this study does not focus on phonetics, and thus, participants were expected to detect word parts and meanings in the pen-and-paper test. Lack of pronunciation, therefore, is not included in Table 4.36 as an inadequacy.

4.5.3. Research Question Six

Is there a difference between learning Latin and learning Spanish as a second langue in improving metalinguistic knowledge of English language?

In response to this research question, the results obtained from the metalinguistic awareness test taken by both Latin (N = 15) and Spanish (N = 25) L2 groups were analyzed under three subheadings to cover each of the three items in the test.

4.5.3.1. The first item of the metalinguistic awareness test. The first item explores whether the participants already knew any of the key words (i.e., *provenience, quiddity,* and *ratiocination*) and the distractors (i.e., *cogitation, certitude, senility*) tested in Question II of the Pre/Post-test. Table 4.37 shows the comparison of the key word responses, and Table 4.38 that of the distractors. Affixes are excluded since they were detected only by a couple of participants, and mostly their correct meanings were not given. The root verb *-cin-* in *ratiocination* was not included in the comparison since it bears a vowel change due to compounding in Latin.

Table 4.37. Question II - Key Words: Word-part MAT Responses of Latin and Spanish L2s

Key Words Definitions	provenience *"source of origin"*		quiddity *"the essential nature of a thing"*		ratiocination *"methodological reasoning"*	
Word-parts Meanings	-veni- *to come*		quid- *what*		ratio- *reason*	
L2 Groups	Latin	Spanish	Latin	Spanish	Latin	Spanish
Detected (%)	33.3	4.0	46.7	8.0	73.3	28.0
Knows (%)	20.0	0.0	33.3	0.0	66.7	4.0
Post-test Correct (%)	86.7	76.0	20.0	8.0	40.0	36.0

Table 4.37 is analyzed together with the data presented in Appendix I, which lists the correctly answered key words in descending order. *Provenience* ranks the first among the words known most by the Spanish L2 participants (76.0%), and the second by the Latin L2s (86.7%); however, the ratio of correct answers are higher in the latter group by 10.7 percent. *Quiddity* is one of the least known words ranking third from the last among both L2 participants, but the ratio of correct answers among Latin L2s (20.0%) is higher than that of Spanish L2s (8.0%) by 12 percent. *Ratiocination* ranks nineth among both L2 participants; however, it is in the upper half of the Spanish L2 list (36.0%) but in the lower half of the Latin L2 list (40.0%) although the ratio of the correct answer is 4 percent higher in the latter group.

Expressed in other words, Latin L2 participants performed better than the Spanish L2s in all three key words included in Item 1 of the metalinguistic awareness test. However, when ranking is analyzed within each L2 group, these words may find place in the same rank, but the key words in each percentage group may be quite different in number. This explains the position of *ratiocination* in the upper half despite the lower percentage of correct answers. Briefly, Latin L2 group performed better in matching the key words in Question II of the Post-test.

To check whether this performance is valid for the rest of the key words in the post-test which are not analyzed in Item 1 of the metalinguistic awareness test, Tables 4.38 and 4.39 were compiled. The former shows the list of correctly matched key words by Latin L2 group and the latter by the Spanish L2s.

Table 4.38. Key Words with Higher Latin L2 Performance

Difficulty Level	Q #	Key Word	Latin Corr. %	Spanish Corr. %	Latin + Diff.
Easy > 75%	IV.12	premonition	93.3	64.0	29.3
	II.4	provenience	86.7	76.0	10.7
	VI.18	cerulean		52.0	34.7
	V.15	nomenclature	80.0	60.0	20.0
	IV.11	odium		12.0	68.0
Easy to Moderate < 75 % to 50%	III.7	bellicose	73.3	24.0	49.3
	XI.33	corpuscle			
	VI.16	venial	66.7	44.0	22.7
	IX.27	recuse			
	XI.31	victuals	60.0	60.0	0.0
	IV.26	deign		48.0	12.0
	V.14	jussive		32.0	28.0
	XII.36	bona fide			
	III.9	pusillanimous		12.0	48.0
	X.29	salver	53.3	52.0	1.3
	I.3	subterfuge		28.0	25.3
	XII.34	sui generis		8.0	45.3
Moderate to Hard < 50% to > 25%	VI.17	catenary	46.7	12.0	34.7
	IV.10	peccadillo		8.0	38.7
	II.5	ratiocination	40.0	36.0	4.0
	VII.20	plebe		32.0	8.0
	X.28	libretto		28.0	12.0
	I.2	perdition		24.0	16.0
	XII.35	ad hoc		4.0	36.0
	VIII.24	sinecure	33.3	24.0	9.3
	VII.19	pulchritude	26.7	16.0	10.7
Hard < 25%	II.6	quiddity	20.0	8.0	12.0
	VII.21	parvenu	13.3	0.0	13.3

Note. Difficulty Levels - Bachman (2004, p.138).

Table 4.38 displays that Latin L2 participants performed better in 27 of the 36 key words tested in the post-test (75.0%). One key word, *victuals*, is not included since both groups marked it correctly with the same ratio (60.0%). The difference in the ratio of correct answers between the two L2 groups is as much as plus 68 percent as with *odium*, which was an easy word for the

Latin L2 group, and as little as 1.3 percent as with *salver*, which was a moderately difficult word for both L2 groups. Table 4.39 lists the eight key words (22.2%) Spanish L2 participants performed better than Latin L2s in correctly matching their definitions.

Table 4.39. Key Words with Higher Spanish L2 Performance

Difficulty Level	Q. #	Key Word	Spanish Corr. %	Latin Corr.%	Spanish + Diff.
Easy	V.13	verbiage	68.0	53.3	14.7
Moderate to Hard	III.8	plenipotentiary	48.0	46.7	1.3
	IX.25	evince	44.0	40.0	4.0
	I.1	fugue	40.0	26.7	13.3
	X.30	parterre	32.0	13.3	18.7
	XI.32	belladonna	28.0	26.7	1.3
	VIII.22	adjutant	28.0	13.3	14.7
Hard	VIII.23	factotum	12.0	6.7	5.3

The difference in the ratio of correct answers between the two L2 groups was as much as plus 18.7 percent as with *parterre*, which was a hard word for the Latin L2 group (13.3%) but moderate for the Spanish L2s (32.0%). As for the words with the lowest difference in L2 group performance, it was as little as 1.3 percent as with *plenipotentiary* and *belladonna*, former moderately easy and latter moderately difficult word for both L2 groups. The average of plus differences for the Latin L2s was 24.6 percent, whereas it was 8.0 percent for the Spanish participants. Briefly, Latin L2 group performed better not only in the number of correctly marked words, but also in the span of differences between the correct response ratios when the L2 group averages are compared.

4.5.3.2. The second item of the metalinguistic awareness test. To explore whether there is any difference between the two L2 groups, their performances are compared. Table 4.40 displays their achievement with respect to their knowledge of words in English and their ability in matching or eliminating the words.

Table 4.40. Metalinguistic Awareness Test - Item 2: Comparison of Word Knowledge

Response (%)	Words:	ante-bellum	*libretto*	nostrum	*par-venu*	recant	scripto-rium	*sine-cure*	via-duct
Knows the Key Word	Latin	40.0	13.3	13.3	0.0	20.0	33.3	13.3	13.3
	Spanish	36.0	24.0	8.0	12.0	60.0	24.0	12.0	36.0
Matched the Key Word	Latin		40.0		13.3			33.3	
	Spanish		28.0		0.0			24.0	
Eliminated the Distractor	Latin	93.3		93.3		46.7	46.7		26.7
	Spanish	48.0		64.0		36.0	24.0		68.0

Table 4.40 indicates that Latin L2 participants matched all three key words (*libretto*, *parvenu*, and *sinecure*) and four distractors (antebellum, nostrum, recant, and scriptorium) with higher percentages than those of Spanish L2s. The only word the latter group achieved a higher performance was the distractor viaduct. This means that Latin L2 learners were more successful in matching the key words and eliminating the distractors despite their relatively lower prior knowledge of the words in English. To explore whether their comparatively better performance was based on word part knowledge, Table 4.41 is compiled.

Table 4.41. Metalinguistic Awareness Test - Item 2: Comparison of Word Part Knowledge

Response (%)	Word Part 1: / Word Part 2:	ante bellum	*libr etto*	nostr um	*par venu*	re cant	scriptor ium	*sine cure*	via duct
Knows the Word Part 1	Latin	60.0	46.7	53.3	0.0	33.3	86.7	66.7	66.7
	Spanish	52.0	56.0	24.0	24.0	68.0	68.0	24.0	52.0
Knows its Meaning	Latin	33.3	33.3	60.0	0.0	33.3	80.0	66.7	66.7
	Spanish	20.0	28.0	12.0	0.0	40.0	52.0	0.0	24.0
Knows the Word Part 2	Latin	66.7	6.7	0.0	0.0	13.3	13.3	40.0	26.7
	Spanish	20.0	8.0	8.0	48.0	24.0	20.0	24.0	36.0
Knows its Meaning	Latin	66.7	6.7	0.0	0.0	13.3	13.3	40.0	26.7
	Spanish	8.0	0.0	0.0	0.0	0.0	12.0	16.0	12.0

Latin L2 participants indicated that they knew twelve word parts, seven of which were known by a higher ratio than that of the Spanish L2s. Additionally, Latin L2s gave the correct meanings of each of the twelve word parts they claimed to know, and the ratio of correct meanings were generally the same as the ratio of their word part knowledge. Spanish L2 participants, in turn, indicated that they knew all sixteen word parts, nine of which were known by a higher ratio than that of the Latin L2s. However, Spanish L2 responders did not give the correct meanings for the six of these word parts, which may be inferred that they thought they knew them but in fact they did not. Of the remaining ten word parts, three were known by a higher ratio, but the ratio of the meanings given for them were lower than those given by the Latin L2s. There was only one word part, the prefix *re-*, in which Spanish L2 participants' performance surpassed that of the Latin L2s. The analysis of Table 4.41, en masse, shows that word part knowledge helped Latin L2 participants more. To inspect whether the participants in both language groups relied on their L1 or L2, Table 4.42 was compiled.

Table 4.42. Metalinguistic Awareness Test - Item 2: Comparison of Source Languages

Source of Recall (%)		Word Parts > / L2 Groups	ante bellum	*libr etto*	nostr um	*par venu*	re cant	scriptor ium	*sine cure*	via duct
L1	Word Part 1	Latin	33.3	0.0	6.7	0.0	26.7	13.3	6.7	13.3
		Spanish	48.0	4.0	4.0	20.0	72.0	64.0	8.0	48.0
	Word Part 2	Latin	26.7	46.7	53.3	0.0	0.0	73.3	60.0	53.3
		Spanish	8.0	0.0	4.0	48.0	20.0	12.0	24.0	32.0
L2	Word Part 1	Latin	13.3	0.0	0.0	0.0	0.0	6.7	6.7	6.7
		Spanish	16.0	52.0	16.0	4.0	0.0	4.0	8.0	4.0
	Word Part 2	Latin	53.3	6.7	0.0	0.0	6.7	6.7	33.3	0.0
		Spanish	8.0	4.0	0.0	0.0	4.0	4.0	0.0	0.0

Table 4.42 shows that some of the participants from both L2 groups indicated that they recalled word part 1 of each word through their L1 with the exception of *libr-* and *par-*, both of

which were not recognized through L1 by the Latin L2 group. The ratio of this reliance on L1 was higher for the Spanish L2 group except for *nostr-*, which was slightly higher for the Latin L2s (4.0% vs. 6.7%). As for the word part 2, Latin L2 participants recalled six of them through L1 with higher ratios than those of Spanish L2s except for the prefixes *par-* and *re-* which were recalled by none of the Latin L2s through L1.

Expressed differently, with respect to Latin L2 participants, four of the 16 word parts were not related to English, and of the remaining twelve, seven were related with a higher ratio compared to that the Spanish L2s, and five were related with a lower ratio. With respect to Spanish L2 participants, one of the 16 word parts was not related to English, and of the remaining fifteen, nine were related with a higher ratio compared to that the Latin L2s, and six were related with a lower ratio. In sum, Spanish L2 participants relied by a larger percentage on their L1 in relating the word parts of the selected words.

Analysis of the data presented in Table 4.42 also reveals that some of the participants from both L2 groups indicated that they recalled word part 1 of each word through their L2 with the exception of four by the Latin L2s (the root noun *libr-* pronoun *nostr-*, and the prefixes *par-* and *re-*), and one (the prefix *re-*) by the Spanish L2s. The ratio of reliance on L2 was higher for the Spanish L2 group except for *-bellum* and *-cure*, which were slightly lower for the Latin L2s (13.3% vs. 16.07% and 6.7% vs. 8.0%, respectively). As for the word part 2, Latin L2 participants recalled five of them through their L2 with higher ratios than those of Spanish L2s. The difference was slight in three of them (6.7% vs. 4.0% for each) and significant in two (53.3% vs. 8.0% for *-bellum* and 33.3% vs. 0.0% for *-cure*, respectively).

Expressed differently, Latin L2 participants relied on their L2 in recalling seven of the word parts with a higher percentage than that of the Spanish L2 group, and two with a lower

percentage. Spanish L2 participants recalled five of the word parts through their L2 with higher percentage than that of the Latin L2s, and six with a lower percentage. Seven of the sixteen word parts were not linked to their L2 by the Latin L2 participants, and five by the Spanish L2s. Four word parts (root verbs *-cant*, *-duct*, and *-venu*, and the suffix *-um*) were common in both groups. In sum, Latin L2 participants relied by a larger percentage on their L2 in relating the word parts of the selected words.

Table 4.43 summarizes the word part metalinguistic awareness responses given by both the Latin L2 and Spanish L2 participants in relation to their reliance on their L1 and L2s. The figures listed in the last column (i.e., ± differences between the L2 group percentages) are computed by deducting Spanish L2 averages from those of the Latin L2 group. Also, the averages of correct word part meanings for both L2 groups are added as to compare them with the reliance of the participants on English and on their L2s.

Table 4.43. Metalinguistic Awareness Test - Item 2: Word Part Response Overview

	Of the Total 16:	# of Word Parts		% of Word Parts		± Diff.
Lang.	Language Groups:	LL2s	SL2s	LL2s	SL2s	%
L1	Not related	4	1	25.0	6.2	18.8
	Rel. with a higher ratio	7	9	43.7	56.3	-12.5
	Rel. with a lower ratio	5	6	31.3	37.5	-6.3
	Total L1-related	12	15	75.0	93.8	-18.8
	Average corr. meaning			46.7	22.0	
L2	Not related	7	5	43.7	31.2	12.5
	Rel. with a higher ratio	7	5	43.8	31.3	12.5
	Rel. with a lower ratio	2	6	12.5	37.5	-25.0
	Total L2-related	9	11	56.3	68.8	-12.5
	Average corr. meaning			20.8	6.0	
Average corr. word part meaning				67.5	28.0	

Table 4.43 shows that the majority of Spanish L2 participants (93.8%) rely on L1, whereas three fourths of Latin L2s do so (75.0%). Despite the lower percentage on the part of

Spanish L2s, their performance in providing the correct word part meanings through L1 was less than that of the Latin L2s (22.0% and 46.7%, respectively). The gap between the claimed recall from L1 and the provided correct meanings by Spanish L2 participants was much larger than that of Latin L2s (71.8% vs. 27.4%). Although a small margin of error is expected, the large gap on the part of Spanish L2s may indicate that their metalinguistic and morphological awareness needs to be raised even with respect to their native language.

Regarding the native English speaker participants' reliance on their L2, Table 4.43 displays that the Spanish L2s again claim to know the meaning of the word parts with a higher ratio than that of the Latin L2 group (68.8% and 56.3%, respectively). Although the gap is narrower in the case of L2 reliance (12.5%) than that of L1 (18.5%), the ratio of correct meanings compared with that of the Latin L2 group is much higher (6.0% vs. 20.8%). Expressed differently, more than one third of the Spanish L2 participants provide correct word part meanings through their L2, and less than half of them do so through L1 when compared to the performance of the Latin L2s.

The difference is reflected also in their overall achievement in combined L1 and L2 reliance compared to that of Latin L2 group (28.0% and 67.5%, respectively). On the whole, it may be inferred from the data presented in Table 4.43 that Latin L2 participants were more efficient in their reliance on both source languages (i.e., English and Latin) than Spanish L2s were. It should be considered that this inference is limited to the eight words explored in the Item 2 of the metalinguistic awareness test. A larger number of words and L2 participants may generate different results. Limited to the scope of this study, it may be concluded that both L2 groups would benefit from informed metalinguistic and morphological awareness although

Spanish L2s may accrue more profit from an explicit instruction in both languages to generate a lasting awareness.

4.5.3.3. The third item of the MAT: Comparison of the Two L2 Groups. The open-ended opinion question included in this item explores whether the L2 course was helpful in becoming aware of the word-parts and in deciphering the meanings of the words. The yes/no question at the beginning of Item 3 inquires whether the participants agree that their L2 was beneficial in this respect (effectiveness). Of all the Latin L2 participants (N=15), 13 responded in the affirmative, and of all the Spanish L2s (N = 25), 14 acknowledged it (86.7% and 56.0% respectively). The figures indicate that, while the majority of Latin L2s found it useful, slightly over half of the Spanish L2s agreed to its usefulness. Table 4.44 displays the ratio of participant responses with respect to the aspects their statements relate to.

Table 4.44. Metalinguistic Awareness Test - Item 3: Comparison of the Two L2 Groups

	Participant Responses (%)	
Aspects	Latin L2 (*N* = 15)	Spanish L2 (*N* = 25)
Effectiveness (*Yes* Responses)	86.67	56.0
• Latinate Roots	60.0	12.0
• Word Endings / Parts (Affixes)	66.7	44.0
• Meanings / Definitions	73.3	40.0
• Utilization	13.3	0.0
• Vocabulary	20.0	4.0
Inadequacy	26.7	32.0

Table 4.44 indicates that Latin L2 participants responded in the affirmative to the effectiveness aspects with a higher ratio than that of the Spanish L2s (86.67% vs. 56.0%), whereas it was the reverse in the case of inadequacies (26.7% vs. 32.0%). None of the Spanish

L2s mentioned the effect of learning their L2 on any of the four skills of language use in their L1 (e.g., reading texts or writing papers). As for the breakdown of the effectiveness aspect, the between-groups ratio was higher for the Latin L2 participants (i.e., slightly over half in *meaning/definitions*; one thirds in *affixes*; one fifths in *Latinate roots* and *vocabulary*). Figure 4.11 depicts the within-group comparison of the breakdown of effectiveness ratios.

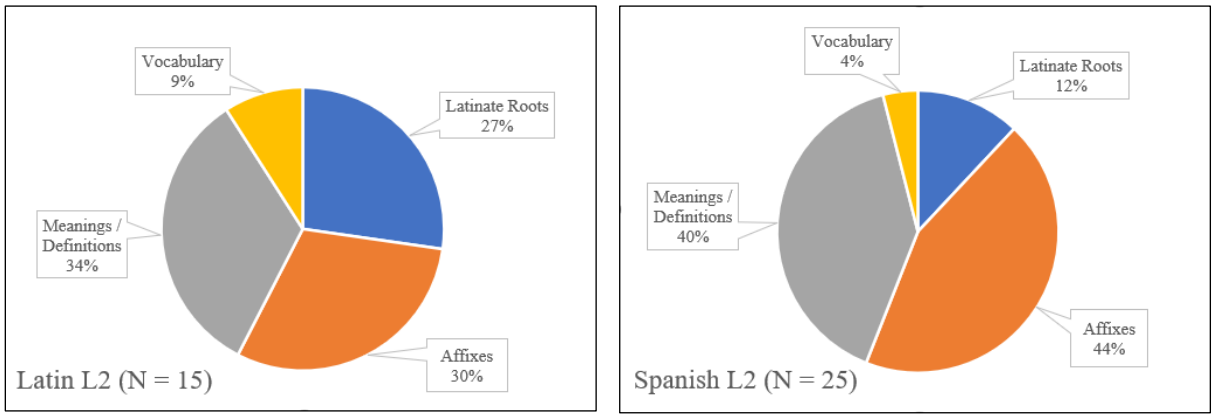


Figure 4.11. Within-group Comparison of L2 Participant Responses to Effectiveness

As Table 4.9 displays, the ratio of comments related to *Latinate roots* and *vocabulary* was higher within the Latin L2 group than within the Spanish L2 group. With reference to *affixes* and *meanings/definitions*, the case was in the contrary, that is, Spanish L2 group ratios was higher than those of the Latin L2s. Expressed differently, Latin L2 participants relied on their knowledge of Latinate roots more than the Spanish L2s did, and the effect of Latin on English vocabulary expansion was more than that of Spanish on the latter group's, whereas they relied less on English *meanings/definitions* and *affixes* than Spanish L2 did.

4.6. Interviews

Interviews were conducted at the end of the semester with four L2 participants, two from the Latin and two from the Spanish L2 group. The interview questions were open-ended, and participation was voluntary. Since the two groups are composed of unequal numbers of participants (Latin, $N = 15$ and Spanish, $N = 25$), the uneven ratio of the interviewees (13.3% and 8.0%, respectively) may be questioned. It is noteworthy to refer to the subheading 3.3.2.1, which explains the unusual decrease in the number of Latin L2 participants due to those who dropped from the course by not attending the Latin final exam, which was when the post-test and the metalinguistic awareness test were administered. This fact mainly contributed to the imbalance between the participating L2 groups, and consequently, to the uneven interviewee ratio. A subsequent question may be why at least one additional Spanish L2 volunteer was not recruited. To preclude this rightful inquiry, it is noteworthy to state that the second language final exams were administered on the first day of the finals period, and the Spanish L2 participant, who was the third volunteer in class, could not do the interview because of the subsequent final exams. This was also the reason for not being able to seek other volunteers. Post-finals period was not suitable either since fall break is the time of Holidays and New Year celebrations when the students travel.

Interviews conducted with the four volunteers were transcribed (Appendix J) and analyzed, and sample statements from participant comments are presented in Table 4.45 in the same sequence with the four open-ended questions of the interviews. As the quotes indicate, while both Latin L2 participants strongly asserted the benefits of Latin, one of the Spanish L2s affirmed and the other did not agree to the usefulness of learning Spanish on English vocabulary. The latter Spanish L2 seemed confused about concepts, sought explanation, and after

comprehending what the issue was, and either agreed somehow hesitantly or did not agree with certainty.

Table 4.45. Summary of Responses by Both L2 Groups to the Interview Questions

Interview Questions	Language Groups	
	Latin L2 Participants	Spanish L2 Participants
1) Did you find learning a second language useful in improving your English vocabulary knowledge?	▪ Yes. It helped even more with grammar, but it helped with vocabulary a lot. ▪ It also helps with the words that I have seen, and I know what they mean, but I did not realize I knew what they meant until now I know the root, so now it makes sense. ▪ Definitely. It greatly improves, especially when academic writing, helping to find not just to broaden my vocabulary in the sense that I can read better and understand things, but I can also refine my own thoughts better and, and put them on paper. ▪ It helps me be more critical of other authors as well; maybe, if that was not the best word, if they could have used something better. So, it is very useful on those sorts of things.	▪ Yes. It was actually very helpful. I noticed the first time I took the test I did not know as many of the words, but then the second time I knew more of the words. ▪ It does not really help my English. ▪ I see some of it … it is like: "Oh, that reminds me of so and so, what if," … so, I put it together like that.
2) Did learning a second language contribute to your work in other courses you took? How?	▪ Yes. Because I am in German and Greek right now. So, having the practice in those [grammatical] cases has helped out tremendously, especially in German. ▪ There is definitely a lot of language crossover, and it has helped out my English grammar tremendously. ▪ Yes. [It] helps me to remember definitions of lots of terms in my linguistics class. ▪ I find that using the skills that I learned in learning Latin helped me to also be more critical in not of just that language in general, but also of the sorts of topics and things.	▪ In my other classes, like the classes where you have to read more often, like history and stuff and they are more complicated, I can understand the words more. ▪ I actually noticed that like outside of class, or just like talking to people or stuff like that, I can pick up on words. ▪ No. Learning Spanish did not contribute to any of the other classes I am learning.

Table 4.45. (Continued)

Interview Questions	Language Groups	
	Latin L2 Participants	Spanish L2 Participants
3) Do you think your awareness of the subtleties in word meanings improved?	▪ It makes me have a greater attention to detail. It makes me more analytical, especially when I am reading because, translating a word, it might only be a letter difference ... that can change entire meaning of a sentence. ▪ When we are given a college-level essay assignment, I want to make sure that I am getting all of the details out, so I get all the full points. ▪ The differences in the prefixes or differences in the roots help me to keep straight the terms that a lot of my fellow students [who do not know Latin] struggle with keeping separate.	▪ Yes. That is like the main way I picked up on different words in English that I did not know. ▪ I used stuff from Spanish in order to determine what the meaning was in English because we worked on a lot of that in Spanish, like a prefix or a suffix in a word and then like how it is similar to an English one. ▪ It did, some of the times. Like, I do not know the ones off the top of my head, but I would see a lot while reading in class and on the cultures part of the textbook. ▪ I would say a little bit because, I will be honest, I did not really look at the textbook much and go over some of the stuff I did not know.
4) Would you consider benefiting from this awareness as a life-long tool in expanding your vocabulary?	▪ Definitely. I think that for me it is always very important, because I would like to continue to study Latin. But even if I do not, it is still going to help in anything that I do, even outside of the academic world. ▪ It helps to understand the terms of legal agreements, … governmental papers and things, … to be more aware of what you are getting yourself into.	▪ Yes, it is actually, kind of cool and interesting to see this actually applies to something else. Like it is not just for the class. It helps with everything.

Interview results reflect the opinions expressed by the participants in response to the open-ended question in Item 3 of the metalinguistic awareness test. Table 4.44 and Figure 4.11 also demonstrate the findings, supporting the sample interview quotes (Table 4.45).

Concisely expressed, learning Latin helped Latin L2 participants more than learning Spanish helped the Spanish L2s in acquiring academic and low-frequency words in English, and this is supported by the participants' opinions conveyed both through their statements in the metalinguistic awareness test and through the interviews.

CHAPTER FIVE:

CONCLUSIONS AND IMPLICATIONS

5.1. Introduction

This research study explored the effects of learning Latin or Spanish as a second language on English academic and low-frequency vocabulary acquisition and metalinguistic knowledge of undergraduate native speakers of English.

The first chapter introduced the scope of the study, presented the definitions and related terms, underlined the significance of vocabulary learning, and delineated the implications and limitations of the study as well as its implications for practice. The second chapter began with the description of the concepts of incidental and implicit learning, incidental vocabulary acquisition, form focused instruction, and mental lexicon, followed by the research done on the vocabulary acquisition of language learners at various levels of education and post education. This chapter also covered the related research approaches and instructional considerations. The third chapter detailed the methodology utilized in the study with respect to its purpose, research design, data collection and analysis, and assumptions. The fourth chapter presented in detail the results obtained through the tools utilized in collecting data, namely, the surveys, tests, and interviews. This fifth and closing chapter summarizes the findings, discusses the limitations, and indicates the implications for practice and suggestions for further research.

5.2. Summary of Findings

The results obtained are summarized in relation to the six research questions, the first three of which are related to the pre/post-test, and the other three to the metalinguistic awareness test. The first two of the research questions in both sets, in turn, are related to each L2 participant group, and the third is related to their comparison. In reviewing the findings, research questions are revisited and presented in parallel to this arrangement.

5.2.1. Research Questions One and Two

Does learning Latin *(Question One)* or Spanish *(Question Two)* as a second language help to improve the academic and low-frequency English vocabulary knowledge of undergraduate students who are native speakers of English?

The statistical test conducted indicates that, Latin L2 participants scored higher in the post-test than in the pre-test and the difference in means was significant, representing a large-sized effect. The outcome suggests that learning Latin as a second language may improve the academic and low-frequency vocabulary levels of the undergraduate students who are native speakers of English.

Likewise, the same test run for the Spanish L2 participants reveals that they also scored higher in the post-test than in the pre-test, but the difference in means was not significant. This finding suggests that learning Spanish as a second language may slightly but not significantly improve the academic and low-frequency vocabulary levels of the undergraduate students whose native language is English.

5.2.2. Research Question Three

Is there a difference between learning Latin and learning Spanish as a second langue in improving academic and low-frequency English vocabulary?

Data analyzed in response to the first two research questions reveal that the improvement in the post-test scores of the Latin L2 participants were higher than that of Spanish L2 group, which may indicate that learning Latin as a second language is more beneficial than learning Spanish for the undergraduate native speakers of English in improving their academic and low-frequency English vocabulary. In response to a possible comment on the sound changes Spanish language have gone through, it should be considered that this study focuses on the morphosyntax of the word parts, not on their phonetical aspect. The rationale behind this approach is that Latin is not a spoken language, and thus, evaluating the learner groups on different bases would render the findings incomparable. Additionally, the study focuses on the academic and low-frequency English vocabulary of the undergraduate students who encounter the task of reading academic materials laden with multi-syllabic complex words that bear precise meanings and who are required to write academic papers with appropriate wording. Therefore, their ability in parsing the words into its constituents, learning and recalling them, and using them in their writings does not directly relate to how differently Spanish is pronounced, but what the meanings of the Latinate English words are.

5.2.3. Research Questions Four and Five

Does learning Latin *(Question Four)* or Spanish *(Question Five)* as a second language help to improve the metalinguistic awareness of English native speaker undergraduate students in terms of morphosyntax of their native language?

There were two word sets selected from the post-test to investigate participants' responses from the aspect of metalinguistic awareness. The first set, composed of three key words and three distractors, was one of the matching definition questions in the post-test. As the data analyses reveal, the ratio of the detected word parts was higher than that of the knowledge of the root-word and affix meanings for both L2 groups, and the ratio was lower for the Spanish L2 learners. Thus, it may be inferred that the participants may have known the meanings of the word part in the key word but could not relate them to the clues in the definitions.

The second word set comprised eight words, five of them distractors and three of them key words. No definition was included since the aim was to have the participants detect the word parts and give their meanings. In the case of Latin L2 participants, their L2 course generally guided them in eliminating the five distractors or matching the three key words explored. The ratio of correct responses given for distractors by the Latin L2 learners was 26.7 percent or higher, the highest being 93.3 percent. The ratio of correctly matched key words, however, was comparatively lower, all between 13.3 and 40.0 percent. In the case of Spanish participants, the ratio of correct responses given for the distractors were 24 percent or higher, the highest being 68 percent. The ratio of correctly matched key words were lower, one of which had no correct answer and the remaining two were 28 and below.

5.2.4. Research Question Six

Is there a difference between learning Latin and learning Spanish as a second langue in improving metalinguistic knowledge of English language?

The ratios given in the previous subheading indicates that Spanish L2 learners benefited from their L2 language less than the Latin L2s did. For some word parts, the gap between the

level of reliance on the second language was larger. More importantly, the number of the incorrect meanings they provided for the word parts they claimed to know was six out of sixteen, the highest ratio being 52 percent for the correct ones. The corresponding numbers for the Latin L2 group was three incorrect responses and the highest ratio of correct meanings was 80 percent. The comparison indicates that Latin L2 participants used their L2 language knowledge more effectively in deciphering the academic and low-frequency English words.

These results are also reflected in their responses to the open-ended opinion question of the metalinguistic awareness test. The majority of Latin L2 participants wrote that they found Latin useful in detecting the meanings of the words in English, whereas more than half of the Spanish L2s stated that Spanish was not useful. The participants' opinions mirrored on the statements made during the interviews with two volunteers from each second language group. The two Latin L2 interviewees strongly expressed the benefits of learning Latin on their L1 vocabulary, whereas one of the Spanish L2 interviewees voiced a moderate benefit, and the other, indicated almost no benefit at all.

5.3. Limitations of the Study

The first limitation of the study is that it was conducted with a comparatively small number of participants due to the reasons discussed in chapter four. In a nutshell, the main reason was that the demand for studying Latin was low, which is the general trend in the States (Appendix B). Another reason is that almost half of the Latin L2 participants either dropped out or withdrew from the course, even as late as finals week. Hence, the number of Latin L2 learners decreased from the initial 29 who took the pre-test to 15 who completed the post-test and the metalinguistic awareness test. The case with the Spanish L2 participants was not as severe; only

four of them dropped out or withdrew while 25 completed the tests at the end of the semester. Nevertheless, the total number of participants was 40, which is acceptable in second language research (Larson-Hall, 2010).

The second limitation of the study is that it was conducted with only two language groups, Latin and Spanish. More languages from the Latinate group, such as French and Italian can be added to explore the differences among them in a wider scale. This would not only provide a broader overview but also increase the total number of participants.

The third limitation is that the study was done for one semester with the Beginning Level 1 learners. It could be expanded to Beginning Level 2, administering the post-test and metalinguistic test at the end of the second level. A longer duration of second language learning may bring different results since the learner proficiency would be improved and the number of vocabulary items studied would be larger.

The fourth point that could be considered a limitation is that the principal investigator was also the Latin instructor. This could not be eliminated since there was only one Latin instructor teaching Beginning Latin 1 during the semester the study was conducted. However, it is not deemed a confounding factor since the study explores the effect of second language learning on the vocabulary knowledge of the first language, and thus, the evaluation of second language performance is not within the scope of the study since there was no change in the usual course content and the books approved by the department, as it was the case with also the Spanish course. Another point to mention is that the Informed Consent Form contained a paragraph indicating that participation in the study would not require the L2 learners to do extra work in addition to their regular course program, that there would be no intervention to the required course work, and that their performance in the research tests would not negatively affect

their final grades. The consent form also indicated that participants would receive no payment or other compensation for taking part in the study. Therefore, neither a focused effort in the pre- and post-test performances during the semester nor a bias in the evaluation of the course work was expected.

5.4. Implications for Practice

Low-frequency and academic words in English are mostly multi-syllabic and singular in meaning and are commonly of Latin and Greek origin. Nagy (2007) states that as the learners encounter with the words in the range of lower frequencies, their metalinguistic awareness, that is, their recognition of the internal structure of multi-syllabic words increase. Morphological awareness is a cognitive construct which develops with age and with vocabulary growth, and it is valid across languages. With respect to the possible effects of learning a second language from the same branch of a language family, the contribution of the metalinguistic awareness in deciphering the meanings of unknown words, in acquiring the subtleties of word meanings, and in retaining and recalling vocabulary items is not the exclusive privilege of a certain branch of any language family. Whether the vocabulary is acquired incidentally or it is learned through instruction, and whether the instruction is implicit or explicit, inferencing meanings through morphemes is a functional means.

5.4.1. Comments on Teaching L1 English Vocabulary through Latin L2

An exploratory study conducted by Sparks, Ganschow, Fluharty, and Little (1996) presents an overview of Latin instruction in the United States since 1800s. To provide a compact view of the historical sequence, the related paragraphs (pp. 166-167) are compiled in the form of

a table by keeping the major events and comments intact but by excluding the details. Table 5.1 displays the history of teaching Latin as a second language.

Table 5.1. Developments in the History of Latin Language Teaching in the United States

Years	Status of Latin Language Teaching
1800s	Anyone who went to secondary school and college studied Latin.
Turn of the c. (early 1900s)	About half of all public high school students studied Latin.
Late 1920s	Latin was a required testing area on the College Entrance Exams.
1924	Thorndike[1] attacked the justifications of mental discipline and transfer of learning that Latin had professed and stated that Latin students performed better than students not enrolled in Latin due to preselectivity.[2]
Late 1960s and Early 1970s	• Less than one percent of high school students were studying Latin. • A call for the relevancy of modern languages caused Latin's revered role to decline. • A national awareness of the increase in illiteracy coincided with this decline in Latin enrollment. • Since the decline of Latin study in the late 1960s, the enrollment in Latin has been slowly increasing.[3]
1979	Government declared the study of a foreign language an imperative in the education process.
1982-1983	• An increased emphasis on language study in the nation's schools was called for. • Educational process created a need for empirical data on the benefits of the study of Latin on academic achievement.
Late 1970s and 1980s	Research began to flourish to document Latin's value and maintain its position in the curriculum of the American education system.

[1] *Mental Discipline in High School Studies* by Thorndike, 1924.

[2] Students who took the *Test of Selective and Rational Thinking* were selected.

[3] Appendix B indicates that the percentage of total language course enrollments in the US declined since 1968 from 3.0% to 1.8% of the total L2 enrollments as of 2016.

While Thorndike (1924) opposed to the benefits of learning Latin, the revised edition of a book edited by Kelsey (1927) supported teaching of Classics. Discussing the value of Latin and Greek as educational instruments, he states that "[w]hatever contributes to the student's grasp of the essential element of vocabulary and structure adds to his power over language as an instrument of thought, and so to his effectiveness as a doer of the day's work" (p. 22). In the Symposium II section of the book, one of the contributors, Sadler (1927), states that an "engineer should be able to express his ideas concisely," and he underlines the fact that "the origin of most

lawsuits in engineering … may be traceable directly to some idea loosely or inadequately expressed" (p. 92). Are the books emphasizing the value of Latin available only in the dusty shelves of history because the language is said to be 'dead'? On the contrary, many books on the effects of Latin have been written to date (e.g., Leonhardt, 2016; Ostler, 2007; Simmons, 2002; Solodow, 2010).

Despite the supporting publications and research studies, Latin is still seen by many as a dead language that offers no use in learning it. Such an approach, being falsely conceived, is a weakness in teaching Latin. Students prefer to take courses in languages that are spoken, such as Spanish. Appendix B presents the figures that reflect this. For example, according to this most recent report published by the Modern Language Association of America (Looney & Lusin, 2019), of the 1,417,838 students who enrolled in second language courses in the fall semester of 2016, only 1.8 percent studied Latin as opposed to 50.2 percent, who studied Spanish. The ratio of those who enrolled in French and Italian, both of which are also from the Italic branch of the Indo-European language family, were 12.4 and 4.0 percent, respectively.

Latin instructors, curriculum designers, and material writers can contribute to the efforts aiming to reverse this attitude and encourage second language learners to benefit from the strengths of Latin language. Simmons (2002, p. 245) quotes J. W. Mackail who said, "Latin and Greek are not dead languages … they have merely ceased to be mortal." As Solodow (2010) states, Latin is alive in the modern languages, or as Leonhardt (2016) explains, it is a fixed language (i.e., its core components, in other words, its basic patterns are not changeable), and not a 'dead' language, as the extinct languages are. If those in the field of second language education and research promote Latin as an immortal language that has lived to the present day in modern languages, literature, and science, this trend may change in favor of the learners since Latin gave

life to its descendant languages (Appendix A). Dictionary.com, the digital English dictionary based on Random House Unabridged Dictionary and supplemented with American Heritage and Harper Collins dictionaries, reveals the percentage of English words derived from Latin on their site (https://www.dictionary.com/e/word-origins/).

> About 80 percent of the entries in any English dictionary are borrowed, mainly from Latin. Over 60 percent of all English words have Greek or Latin roots. In the vocabulary of the sciences and technology, the figure rises to over 90 percent. About 10 percent of the Latin vocabulary has found its way directly into English without an intermediary (usually French). For a time, the whole Latin lexicon became potentially English and many words were coined on the basis of Latin precedent. (n.d.)

Considering the ratio of Latinate words in English, Latin may even be taken as the natural prerequisite for learning the complex English vocabulary items. Furthermore, English is the predominantly used language in academia across disciplines, and academic texts largely contain multisyllabic words with precise meanings. Establishing a morphological awareness by explicitly teaching Latin morphemes would provide an indispensable means for native English students at all levels of schooling, but especially at the tertiary level. Latin as a second language instructors and appropriately designed course materials will help undergraduates benefit most in their academic studies if the syllabi and textbooks emphasize the etymology of the words and teach the word structures along with the language (e.g., *Vocabula* and *Latina est gaudium et utilis* sections in Wheelock's Latin textbook).

Ostensibly a weakness in Latin instruction is the grammar translation method generally employed in teaching the language in the classroom environment as utilized, for example, by Reading Latin (Jones & Sidwell, 2000) and Wheelock's Latin (Wheelock & LaFleur, 2011)

textbooks. In fact, it is a strength especially for the adult learners since Classical Latin vocabulary and grammar bear the basics of orthography and structure both at the word level (morphology) and sentence structure level (syntax). If the aim is to acquire a metalinguistic awareness through explicit instruction in support of academic studies, as in the case of undergraduates, the classical method of teaching serves the purpose. Otherwise, there are books which employ a more contemporary account of teaching methods (e.g., Lingua Latina per se Illustrata, Orberg, 2010, and leveled Cambridge Latin course books). There are also books available for conversational Latin (e.g., Traupman, 2001) and for simplified contemporary reading (e.g., Barocas, 2000). It is the matter of purpose in learning a language that counts. Instructors, curriculum designers, and material builders must take that purpose into account to serve the learners' needs best.

5.4.2. Comments on Teaching L1 English Vocabulary through Spanish L2

In contrast to the state of Latin as an L2, Spanish bears an advantage since it is the second most widely spoken language which has well over half a million speakers all around the world. It is the official language in twenty countries, and over twenty one million individuals study the language as the L2 (https://blogs.cervantes.es/londres/tag/yearbook-of-spanish-in-the-world-2019/). Because Spanish is studied by a large number of second language learners, there is copious material available for teaching the language at all levels of proficiency (e.g., Dicho y Hecho: Potowski, Sobral, & Dowson, 2015; Aventuras: Blanco & Donley, 2014). However, when the connection between English and Spanish vocabularies is taken into consideration, phonological changes that the latter underwent through the history pose a barrier in word recognition when its morphology and orthography are not addressed.

Montelongo, Hernández, and Herter (2016) underline that "English-Spanish cognates are words that are orthographically and semantically identical or nearly identical in English and Spanish as a result of a common etymology" (p. 1), and they suggest that orthography lessons be designed to teach spelling conversion rules (e.g., English *ph* into Spanish *f*, or inclusion of the epenthetic schwa) for transforming over 20,000 English-Spanish cognates. The researchers propose that curriculum writers need to integrate morphology and orthography into instructional materials since "English-Spanish cognates are an understudied and under-taught category of words, [and the] sheer number of cognates and their value as academic vocabulary words demand their inclusion into the curriculum" (p. 13).

Lubliner and Hiebert (2011) mention false and partial cognates emanating from language changes over time; however, they accentuate that "more than 90% of Latin-based cognates (French–English and Spanish–English) are full cognates, sharing substantial overlap in form and meaning" (p. 78). The researchers indicate that, despite the orthographic similarity and etymologic relatedness of English-Spanish cognates, recognition becomes difficult when phonological correspondence is weak. The transparency analysis of the corpus which they compiled with English-Spanish cognates in the General Service List and Academic Word List revealed that "the cognates in this corpus are substantially more transparent in terms of orthography than phonology" (p.86). Systematically teaching the phonological and orthographic shifts between the English-Spanish cognate pairs will help develop skills in identifying cognates and acquiring a metalinguistic awareness. The frequency analysis of the corpus demonstrated that 75 percent of the 570 headwords in the Academic Word List are English-Spanish cognates, and most of them are more common in Spanish than in English.

Echeverría (2017) emphasizes that “explicit and meaningful activities full of context are a very effective tool for language learners, whose first and second languages share cognates to learn not only how to recognize them but also when to use cognates” (p. 38). Based on their findings, Urdaniz and Skoufaki (2019) state that activities focused on raising the awareness of academic cognate words can be beneficial. Morin (2003) emphasizes the importance of teaching word parts explicitly.

> Given that vocabulary knowledge is the key not only to literacy but also to written and oral communication, even at the most basic levels of L2 proficiency, it follows that there should be more interest in discovering how L2 learners can begin to develop a knowledge of L2 word formation and at what level of proficiency they can take advantage of a knowledge of word parts to aid in their own vocabulary acquisition. (p. 215)

In conclusion, recent research suggest that scaffolding L1 English vocabulary acquisition / expansion through L2 words by explicitly teaching their orthographic, phonological, and semantic similarities and differences help establish the foundations of a metalinguistic awareness. To achieve this objective, language instructors, curriculum developers, and textbook designers need to integrate what the research evidence suggests into their syllabi and instructional materials alike.

5.4.3. Morphological Awareness and L1 Vocabulary - a Personal Experience

The benefit of morphological awareness as a tool for vocabulary acquisition and also for becoming a life-time language learner is demonstrated by the following personal experience. As early as my elementary school years, I was made aware of the borrowed words in my native tongue, Turkish, from other languages such as French and Arabic, both of which belong to

different language families that are not related to Turkish. Arabic provides a typical example of how having the morphemic knowledge of the base words helps acquiring the words derived from them. A sample is the three-letter base, *h-k-m*, which fundamentally means *the wisdom in making decisions*, its connotations being discernment, judgment, jurisprudence, dominance, firmness, and reinforcement.

With a quick search of my 'black box' which treasures items from six different languages, I came up with twenty words in Turkish that contain these three consonants in the same order but with vowel changes and, in some derivatives, also with the addition of affixes: *ahkâm*, *hakem*, *hakim*, *hakimiyet*, *hekim*, *hikmet*, *hüküm*, *hükümdar*, *hükümet*, *hükümran*, *istihkâm*, *mahkeme*, *mahkûm*, *mahkûmiyet*, *muhakeme*, *muhkem*, *mütehakkim*, *tahakküm*, *tahkim*, and *tahkimat*. For example, by knowing that *hakim* means a judge and that *m-* at the beginning of the word *mahkûm* refers to the person who is affected by the act, I can make out that *mahkûm* is a convict.

The workings of the morphemes, unless explicitly taught or individually attained, is not readily available to most native speakers. For example, *hakem* (referee) is a high-frequency word known by even young children, but *muhkem* or *tahkimat* are low-frequency words that one may not come across except in technical or military contexts, and thus, they must be learned. However, knowing how the morphological system works and what the word parts mean facilitates not only acquisition but also retention and recall of the words.

Arabic is not in the same language family with Turkish, but the number of words borrowed from Arabic is the highest among other languages lending words to Turkish (Nişanyan, 2003). When the ratio of borrowed words is high, as in English, morphological awareness becomes a more functional tool in acquiring vocabulary. Denning, Kessler, & Leben (2007)

emphasize the fact that Latinate words have similar structures and that the study of morphemes helps to understand how they contribute to the meaning of the multi-syllabic words. Nagy (2007) underlines that teaching language learners how to utilize word parts can increase their ability to parse complex words.

The effort put in and the time spared for learning these word-building units may seem demanding, but the result is rewarding: skill in using this indispensable tool brings about a remuneration received lifetime since vocabulary building is a life-long process. Nation (2001) questions whether it is worthwhile to learn morphemes, and making a detailed cost / benefit analysis, concludes as follows:

> The word building systems of English are very important ways of enabling learners to make the most effective use of the stem forms that they know. … Using word parts to help remember new words is a major vocabulary learning strategy. It deserves time and repeated attention because it can involve such a large proportion of English vocabulary. (pp. 280-81)

5.5. Suggestions for Further Research

Other researchers in the field of second language acquisition may find it practicable to expand the present study for future research, possibly with the following alterations.

1) It may be conducted with the same second languages (i.e., Latin and Spanish) but with a larger number of learners. This could be achieved by coordinating with different tertiary schools to eliminate the problem of limited undergraduate Latin learners. A point to consider in this case is that the course contents, and thus, the covered vocabulary items in each language group may not be common in the participating institutions.

2) It may be conducted with Latin and other Latinate languages, such as French and Italian, in addition to Spanish. This would eliminate the limited number of Latin learners problem by expanding the total number of participants divided in equal groups. It would also give a chance to explore the differences between distinct pairs.
3) It may be conducted by extending the duration of the study. For example, it could cover two semesters. This option could generate the problem of having all the participants attend both levels of the second language course, which ultimately may affect the total number of the participants negatively.
4) In the case of extended study, the pre-test definitions could be switched to those of the distractors to gauge the knowledge of these words which are from the higher-frequency levels. This would enable the researcher to detect whether elimination process during the post-test was based on the word part knowledge. It would also give the chance to administer the post-test without jeopardizing test-retest reliability.
5) It may also be conducted by altering the content of the data collection tools and adjusting them for further research. For example, the key word definitions that were correctly matched the least can be altered, or the metalinguistic awareness test content and/or format can be modified.

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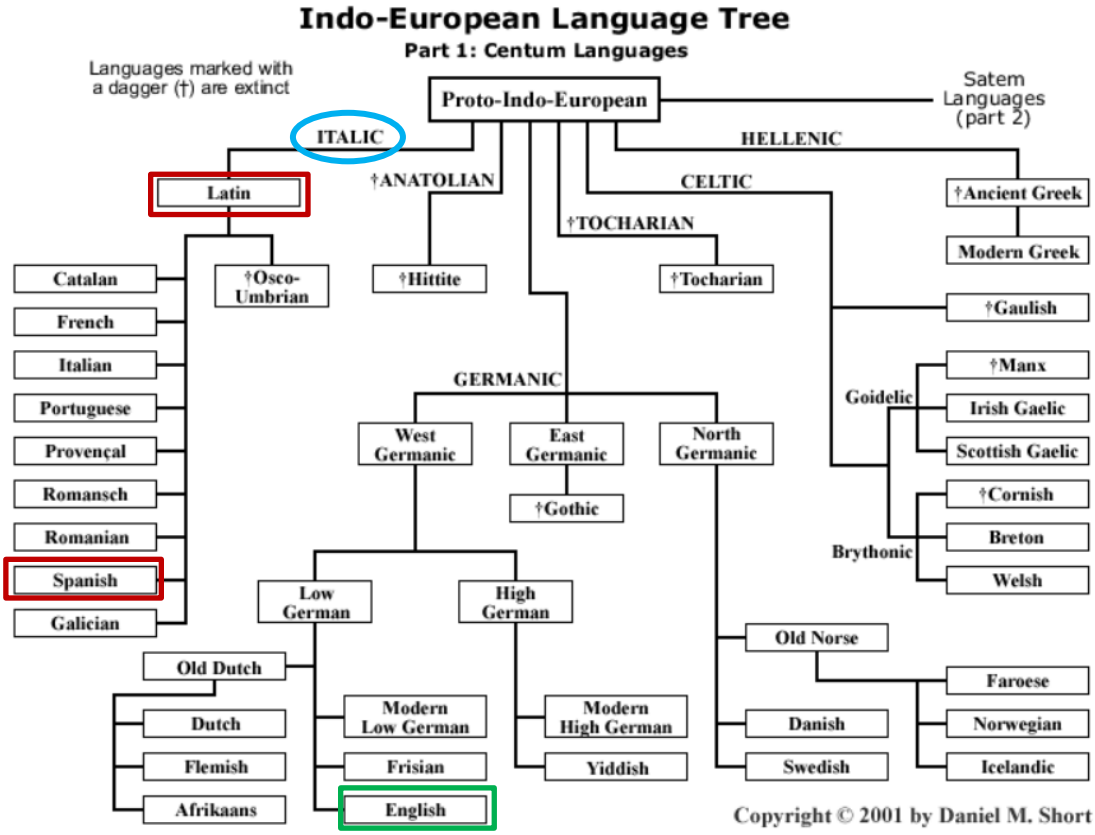
APPENDICES

Appendix A: Indo-European Language Family Tree



With the written permission of Daniel M. Short.

Note. Only the Centum Languages chart, which covers the Western branches of the Indo-European language family, is shown in the appendix. Part 2 (Satem Languages) is not included since the Eastern branch of the family is not within the scope of to the present study.

Appendix B: Percentage of Total Language Course Enrollments

Table 6
Percentage of Total Fall Language Course Enrollments for the Fifteen Most Commonly Taught Languages in 2016

	1968	1980	1990	1995	2002	2006	2009	2013	2016
Spanish	32.3	41.0	45.1	53.2	53.4	52.2	51.4	50.6	50.2
French	34.4	26.9	23.0	18.0	14.5	13.1	12.9	12.7	12.4
American Sign Language[1]	—	—	0.1	0.4	4.4	5.1	5.5	7.0	7.6
German	19.2	13.7	11.3	8.5	6.5	6.0	5.7	5.6	5.7
Japanese	0.4	1.2	3.9	3.9	3.7	4.2	4.3	4.3	4.9
Italian	2.7	3.8	4.2	3.8	4.6	5.0	4.8	4.5	4.0
Chinese	0.5	1.2	1.6	2.3	2.4	3.3	3.6	3.9	3.7
Arabic[2]	0.1	0.4	0.3	0.4	0.8	1.5	2.1	2.1	2.2
Latin	3.0	2.7	2.4	2.3	2.1	2.0	1.9	1.7	1.8
Russian	3.7	2.6	3.8	2.2	1.7	1.6	1.6	1.4	1.4
Korean	0.01	0.04	0.2	0.3	0.4	0.5	0.5	0.8	1.0
Greek, Ancient[3]	1.7	2.4	1.4	1.4	1.5	1.4	1.3	1.1	0.9
Portuguese	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.7
Hebrew, Biblical[4]	—	—	0.5	0.5	1.0	0.9	0.8	0.8	0.7
Hebrew, Modern	—	—	0.6	0.7	0.6	0.6	0.5	0.4	0.4
Other languages	1.6	3.5	1.2	1.5	1.8	2.1	2.4	2.2	2.5
Total percentage	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total enrollment	1,124,021	924,337	1,185,465	1,138,772	1,395,807	1,575,838	1,673,566	1,561,131	1,417,838

Number of institutions reporting: 2,547.

1. Figures for ASL are not available before 1990.
2. Includes enrollments reported under "Arabic," "Arabic, Algerian," "Arabic, Classical," "Arabic, Egyptian," "Arabic, Gulf," "Arabic, Iraqi," "Arabic, Levantine," "Arabic, Modern Standard," "Arabic, Moroccan," "Arabic, Qur'anic," "Arabic, Sudanese," and "Arabic, Syrian."
3. Includes enrollments reported under "Greek, Ancient," "Greek, Biblical," "Greek, Koine," "Greek, New Testament," and "Greek, Old Testament." Excludes enrollments reported under "Greek," "Greek and Hebrew," and "Greek and Latin."
4. Includes enrollments reported under "Hebrew, Biblical," "Hebrew, Classical," and "Hebrew, Rabbinic." Excludes enrollments reported under "Hebrew" and "Hebrew, Biblical and Modern." Before 1986, some censuses combined Biblical Hebrew and Modern Hebrew enrollments under Hebrew.

Enrollments in Languages Other Than English in United States Institutions of Higher Education, Summer 2016 and Fall 2016: Final Report

Dennis Looney and Natalia Lusin

Web publication, June 2019

Appendix C: Pre/Post-test

Name: _____ Course code: _____

Choose the correct words to match the definitions on the right. Write the number of that word next to its meaning.

I	1 perdition 2 delectation 3 fugue 4 malfeasance 5 ignominy 6 subterfuge	____ loss of memory ____ final spiritual ruin ____ artifice used to evade a rule
II	1 provenience 2 cogitation 3 quiddity 4 certitude 5 senility 6 ratiocination	____ source of origin ____ methodological reasoning ____ the essential nature of a thing
III	1 pusillanimous 2 pellucid 3 uxorious 4 plenipotentiary 5 antediluvian 6 bellicose	____ aggressively hostile ____ invested with full authority ____ lacking courage and resolution
IV	1 obeisance 2 premonition 3 odium 4 umbrage 5 peccadillo 6 libertine	____ trifling fault ____ intense dislike ____ anxiety over a future event
V	1 plenitude 2 verbiage 3 jussive 4 misnomer 5 verisimilitude 6 nomenclature	____ overabundance of words ____ expressing a mild command ____ terms comprising a set or system
VI	1 preternatural 2 venial 3 cerulean 4 antebellum 5 ductile 6 catenary	____ not seriously wrong ____ of a chain or linked series ____ of a deep, purplish blue color

Appendix C (Continued)

VII	1 parvenu 2 regalia 3 voluptuary 4 plebe 5 pulchritude 6 scrivener	____ comeliness ____ member of the freshman class ____ social newcomer lacking society's manners
VIII	1 factotum 2 triumvirate 3 adjutant 4 sinecure 5 argonaut 6 potentate	____ executive military officer ____ employee having many responsibilities ____ position requiring little work but profitable returns
IX	1 dight 2 recuse 3 dure 4 deign 5 evince 6 recant	____ reveal the possession ____ think fit with one's dignity ____ withdraw from judging to prevent partiality
X	1 salver 2 stylus 3 parterre 4 libretto 5 viaduct 6 scriptorium	____ text of an opera ____ tray for serving food and beverages ____ rear section of the main floor of a theater
XI	1 nostrum 2 victuals 3 corpuscle 4 tumulus 5 belladonna 6 palmetto	____ food supplies ____ a poisonous plant ____ a freely-floating cell
XII	1 per se 2 ipso facto 3 sui generis 4 quid pro quo 5 ad hoc 6 bona fide	____ of its own kind ____ for a specific purpose ____ without deception or fraud

Appendix D: Pilot Post-test Item Analysis

Classical Item Analysis and Cronbach's Alpha – Pilot Post-test				
Items (*N* = 36)	Total Correct (%)	Difficulty Level (p)	Discrimination Power (D)	Cronbach's Alpha if Item Deleted
fugue	28.57	0.18	0.57	.616
perdition	42.86	0.29	0.57	.582
subterfuge	47.62	0.29	0.57	.621
provenience	80.95	0.39	0.79	.645
ratiocination	71.43	0.29	0.57	.631
quiddity	28.57	0.14	0.29	.625
bellicose	71.43	0.32	0.64	.602
plenipotentiary	66.67	0.32	0.64	.633
pusillanimous	33.33	0.18	0.36	.637
peccadillo	38.10	0.25	0.50	.609
odium	61.90	0.25	0.50	.636
premonition	95.24	0.46	0.93	.655
verbiage	57.14	0.29	0.57	.618
jussive	66.67	0.29	0.57	.615
nomenclature	85.71	0.46	0.93	.659
venial	71.43	0.36	0.71	.637
catenary	38.10	0.21	0.43	.623
cerulean	90.48	0.46	0.93	.635
pulchritude	61.90	0.25	0.50	.619
plebe	57.14	0.32	0.64	.627
parvenu	14.29	0.04	0.07	.660
adjutant	28.57	0.14	0.29	.625
factotum	14.29	0.07	0.14	.622
sinecure	14.29	0.11	0.21	.628
evince	42.86	0.18	0.36	.632
deign	52.38	0.21	0.43	.595
recuse	66.67	0.32	0.64	.641
libretto	38.10	0.21	0.43	.607
salver	47.62	0.11	0.21	.636
parterre	38.10	0.21	0.43	.652
victuals	76.19	0.39	0.79	.602
belladonna	23.81	0.14	0.29	.624
corpuscle	80.95	0.39	0.79	.631
sui generis	61.90	0.29	0.57	.648
ad hoc	19.05	0.07	0.14	.649
bona fide	71.43	0.32	0.64	.639

Note. Cronbach's Alpha = 636; *N* of cases = 21; p < .25 (difficult), >.75 (easy); D >.30 (discriminates well)

Appendix E: Metalinguistic Awareness Test

Student name: _____ Course code: _____

Please respond to the following questions. Kindly use your best handwriting for legibility.

1. The below question was one of those in the word knowledge test you have just taken.

II	1 provenience 2 cogitation 3 quiddity 4 certitude 5 senility 6 ratiocination	____ source of origin ____ methodological reasoning ____ the essential nature of a thing

a) Was any of the six words already a part of your English vocabulary? ___Yes ___No

b) If yes, mark below the ones you already knew:

___ *provenience,* ___ *cogitation,* ___ *quiddity,* ___ *certitude,* ___ *senility,* ___ *ratiocination*

c) Did you check the word parts in these words to help you match the definitions? ___Yes ___No

d) If yes, indicate the word parts you detected and give their meanings.

provenience _____=_____ | _____=_____ | _____=_____

cogitation _____=_____ | _____=_____

quiddity _____=_____ | _____=_____

certitude _____=_____ | _____=_____

senility _____=_____ | _____=_____

ratiocination _____=_____ | _____=_____ | _____=_____

e) Did this analysis help you eliminate the words that do not match the definitions? ___Yes ___No

f) If yes, which words did you eliminate and > which word parts were the keys in your decision?

_____ > _____ | _____ > _____ | _____ > _____

g) While matching the definitions with the words, which parts of the definitions helped you to decide?

___ *source of* ___ *origin* > ___ *the phrase as a whole*

___ *methodological* ___ *reasoning* > ___ *the phrase as a whole*

___ *the essential nature of* ___ *a thing* > ___ *the phrase as a whole*

Appendix E (Continued)

2. The below words were also in the test. If you already knew the word, mark it with an **x** on the left. Fill in the *word part* and *meaning* columns to the best of your knowledge and mark the *language (L)* columns with **E** if you recognize the word part from *English* and **S** (*second language*) if you recognize it from the language you learned in this course.

x	English word	Word part	L	Meaning	Word part	L	Meaning
	antebellum						
	libretto						
	nostrum						
	parvenu						
	recant						
	scriptorium						
	sinecure						
	viaduct						

3. Was your learning the language in this course helpful in becoming aware of the word parts and in accessing the meanings of English words you did not know? ___Yes ___No > ***Please explain***.

_____

_____

_____

_____

_____

_____

_____

_____

Appendix F: Reasons for Attending the Second Language Course

Latin L2 Learners' Statements 12 wanted, 1 both wanted and was required, 2 were required (*N* = 15)	**Spanish L2 Learners' Statements** 5 wanted, 6 both wanted and were required, 12 were required, 2 other reasons (*N* = 25)
I **want** to study Medieval History and learning Latin will help me do that.	I **want** to be fluent in Spanish
I am taking this course because I **want** to learn more about the origins of the English language.	To help in any way I can. [Researcher's note > thus, **want**]
I will need a proficient understanding of classical languages if I am to be successful in my future academic endeavors [Researcher's note > **want**].	I **want** to learn Spanish basics.
To prepare me [Researcher's note > **want**] for the LSAT and law school	My family speaks Spanish, and I would also like [Researcher's note > **want**] to learn.
General interest [Researcher's note > **want**], and because of Latin's ability to help understand other languages	Desire to [Researcher's note > **want**] actually learn and apply the language.
I **want** to learn Latin for my major and because I am interested.	I need it [Researcher's note > thus, **requirement**] and **want** it.
I **want** to know more about roots, prefixes, and suffixes. It will also help me with political jargon.	I need to take two classes in a foreign language [Researcher's note > thus, **requirement**]. I chose Spanish because my whole family is Hispanic and speaks Spanish, so I **wanted** to learn.
I want to become a lawyer, so I thought that taking Latin would be useful in defining and understanding laws [Researcher's note > **want**].	It is a course **requirement** and I refused to take French again. I **wanted** to study something different and more known I suppose.
To learn [Researcher's note > **want**] a foundation of foreign language	For my Major [Researcher's note > thus, **requirement**] and how useful it is to connect to other people [Researcher's note > **want**]
I want to be an archivist which means I will typically be working in a museum and this seemed like the most applicable foreign language to take [Researcher's note > **want**].	Spanish I is **required** for my major, but I am also interested in learning [Researcher's note > **want**]. My career path as a teacher may require me to speak at least a little to communicate.
To get a better understanding of the English language [Researcher's note > **want**].	Mostly because it's a **requirement** to be able to achieve my major, but also because it's an interesting language, and allows for me to be better connected to others who speak the language. [Researcher's note > **want**]
I have always been interested [Researcher's note > **want**] in Latin and pursuing it; however, none of my previous schools offered it, so when I came to college, I was so excited that I finally had the option to take it. I love writing and reading and I know pursuing would only make me love these activities so much more. And I have always felt that Latin is so useful in expanding one's everyday vocabulary, speaking and writing skills, reading proficiency, and so many other important things. To me, Latin just makes so much sense.	**Required** for major
1. I thoroughly enjoy [Researcher's note > **want**] learning Latin, ever since I first took a Latin class in my sophomore year of high school. 2. Latin is a **requirement** for my major.	Exit **requirement** for degree program
It's necessary for my minor. [Researcher's note > **required**]	Course **requirement**
Needed for my major [Researcher's note > **required**]	Taking a foreign language is a **requirement** for the degree I'm working towards.
	To fill language **requirements**
	My French credits are too old for the college to accept them. [Researcher's note > thus, to fulfill the **requirement**]
	I volunteered to do it at the beginning of the semester [Researcher's note > thus, **requirement**].
	Need it to graduate [Researcher's note > thus, **requirement**]
	Requirements
	Requirement
	Chose Spanish as the language for my major [Researcher's note > thus, **requirement**]
	My Spanish teacher requested that I do so. [Researcher's note > thus, **requirement**]
	When I clicked on what the notification was it **automatically added** me without my permission.
	Didn't mean to click accept.

Appendix G: Words Study Habits Survey

Quiz Instructions

Please respond to the following three-section questionnaire.

This is a snipped view of the online survey.

Question 1 0 pts

Section A - How I learn words

Please respond to Questions 1 to 10 in this section.

I ask someone who knows the meaning.

- Never
- Occasionally
- Frequently
- Always

Question 2 0 pts

I guess from the context.

- Never

Question 3 0 pts

I analyze the word-parts.

- Never

Question 4 0 pts

I look the words up in the dictionary.

- Never

Question 5 0 pts

I write word meanings on the texts I read.

- Never

Question 6 0 pts

I study with word lists.

- Never

Question 7 0 pts

I study with flash-cards.

- Never

Appendix G (Continued)

Question 8 0 pts

I write the words several times.

- Never

Question 9 0 pts

I try to use the words in my writing / speech.

- Never

Question 10 0 pts

I practice with my friend(s) / family member(s).

- Never

Question 11 0 pts

Section B - How I guess the meaning of words

Please respond to Questions 11 to 14 in this section.

I try to see / hear a similarity to the words in English that I already know.

- Never
- Occasionally
- Frequently
- Always

Question 12 0 pts

*I try to see / hear a similarity to the words in my *native language.*

** if not English*

** in case of an additional native language (simultaneous bilingual)*

- Never

Question 13 0 pts

I try to see / hear a similarity to the words in other languages that I know.

- Never

Question 14 0 pts

I separate the word-parts (prefixes & suffixes) that I know, and I try to make out the root-words to guess word meanings.

- Never

Appendix G (Continued)

Question 15 0 pts

Section C - Knowledge of word parts

Please respond to Questions 15 to 18 in this section.

Have you ever studied word-part analysis?

If your answer is NO, skip the last three questions questions.

- ○ Yes
- ○ No

Question 16 0 pts

If YES, for how long?

(e.g., a semester / a year, etc.)

HTML Editor

B I U A A Tx ≡ ≡ ≡ ≡ ≡ x² x₂ ☰ ☰

12pt Paragraph

Question 17 0 pts

Who taught you word-part analysis? When?

(e.g., myself, my teacher, my friend, etc.; in high school, at a course, etc.)

If your answer is myself, answer the next question.

HTML Editor

B I U A A Tx ≡ ≡ ≡ ≡ ≡ x² x₂ ☰ ☰

12pt Paragraph

Question 18 0 pts

If it was a self-study, how did you learn / practice it?

(e.g. read books, searched the Internet, etc.)

HTML Editor

B I U A A Tx ≡ ≡ ≡ ≡ ≡ x² x₂ ☰ ☰

12pt Paragraph

Thank you for responding to the questionnaire.

Appendix H: Participant Comments - Item 3 of the Metalinguistic Awareness Test

Latin L2 Participants' Comments
▪ It allowed me to **recognize** Latin **roots** with words and help me **find** their **meaning**.
▪ Yes, Latin has caused me to focus on **word ending** when reading or writing English. Additionally, the words learned in Latin are often the **roots** of English words. As a result, I have found it to be easier to attempt to **ascertain** the **definition** of a word from analyzing its **word parts**.
▪ By learning the Latin verbs and nouns, I am better able to **parse** unknown English words into its Latin **roots** and have a better guess at the word's **meaning**.
▪ **Parsing** English words using Latin vocabulary *could be* **helpful**; however, there are still a lot of words I do not know --in English and Latin!
▪ It helped *a little* bit, but I do not remember every word taught in the course, and most of the words I did know were ones I already knew or could **figure out** through English (most of those were not the ones mentioned on this sheet).
▪ It helped *slightly* in **recognizing** English words that I did not know but only a few, *not enough* to do well on the test.
▪ It only helped *a little* bit with the **root** part of the word. For example, with "scriptorium", I know scriptor means writer, but I do not know what -ium means. So, while I can **deduce** what it essentially means, I do not know its full definition.
▪ Yes, I definitely think so! Knowing English fluently and knowing a good amount of Spanish while learning this Language allowed me to see all of the **similarities** between the three and observe just how much truly **derives** from Latin. I will now be able to **analyze** words I would never be able to **understand**.
▪ Latin has allowed me to start **identifying** the roots of words which is then helping me better **understand** what words **mean**.
▪ Through the learning of Latin, I have been able to increase my **vocabulary** in English by extrapolating possible **derivatives** from Latin words. I have also been able to **identify** more accurate **meanings** of words I already know, allowing me to choose **more precisely** the words I want to **utilize** in self-expressions.
▪ Learning a Latin base has helped me see the common **roots** shared between various Romantic languages as well as to **identify** them inside of longer words. The similarity of Latin to its modern derivations is evident once you learn the fundamentals.
▪ Learning Latin helps me **break down** English words to get part of the whole **meaning** of the word. Latin is like the **clues** to the meaning.
▪ Knowing Latin **roots** helps when **breaking down** more complex vocabulary.
▪ While the Latinate words were *sometimes* **useful** for comparison, the *lack of repeated use* lead them to leave my mind almost as quietly as the Latin words!
▪ No. We focused too much on *translation*, in my opinion. We never learned the culture part of Latin; so, when translating, I never understood what meaning to use since there was no *cultural background knowledge*. Also, never understood *word order* either. [PI's note > This participant does not answer Q.3, but rather comments on the *course content*. Cultural background is not related to *parsing* the words to decipher the meanings of Latinate English words. *Grammar and translation* are the backbone of Classical Latin instruction.]

Note: Analysis key codes are marked with bold, italic, and/or underline.

Appendix H (Continued)

Spanish L2 Participants' Comments
▪ My ability to **break words apart** increased.
▪ Yes, it **helped** me to become more **aware of word parts,** but it also showed that I don't know a lot of these words. Some words are **familiar,** but I don't remember or never looked up their definition.
▪ It did help **to an extent**. I believe I will know and understand **word parts** better in upper level Spanish, so Spanish 3 and 4. We may not know enough from Spanish 1.
▪ There were a few more words that I **recognized** this time [PI note: @post-test] that I didn't before. To be fair, I still didn't recognize the majority of these words; however, my Spanish knowledge helped me to **narrow down the choices**.
▪ Some words share a **root word** or are **closely similar** to an English counterpart.
▪ I could never remember if "ante" meant before or after **until learning "antes de" in Spanish**.
▪ *A few* of the word parts came from Spanish words. When I could translate their **meaning**, I was able to **break the English word down**.
▪ It **helped break down** the words and looking at each word in **a different perspective**.
▪ Although I do not have a strong vocabulary, I was able to **pull apart words** and try my best to consider each **meaning**. I think learning a new language has **helped** me become **more aware**. Going into the future, I believe I can use this technique to understand the English language, too.
▪ I believe so. I may not have recognized every word I saw, but it was **easier to break down** the words since I had more than one place to draw from. To be fair, I am not sure it is much of an improvement, considering I am still in the beginning Spanish, but I am sure **there is change**.
▪ It **helped** *to an extent* because I could only recognize certain parts of a couple words that I learned from Spanish. However, the more I study Spanish, the easier it will become to **recognize** word parts from Spanish, and then associate their **definition** of them.
▪ *In a way* yes, but most of what I learned this semester was a review for me in Spanish, so I used the prior knowledge I had from learning Spanish to help with the words I did not know.
▪ Some word parts in English and Spanish are **similar**. So, if I was not fully aware of one in English, the **aid of Spanish helped** to clarify what that word part meant. Also, being aware of English helps with Spanish because a lot of English words are **derived** from Spanish.
▪ We are learning Spanish. I am learning words I don't know, but *not really parts of the English words* that I don't know.
▪ I did not use any of my Spanish knowledge in taking this test. When I saw the words, I used my English experience to determine the words.
▪ Most of the words on the *test* were out of my vocabulary, so it was hard to understand the meaning of them. I don't think that learning Spanish helped at all with recognizing the meanings of English words that I did not know.
▪ I do not know the definitions of any of these words even after this class because none of them did not seem similar enough to Spanish words for me to know the meaning. Even if some were similar, the meaning was still unclear.
▪ I mostly knew a lot of **root words** from studying English a lot and reading a lot.

Appendix H (Continued)

Spanish L2 Participants' Comments
▪ I am unaware of most of the vocabulary words although they are a part of the only language I know. Learning a second language is difficult to comprehend at times so trying to use a second language to help identify word parts in my primary language was *not at all effectiv*e. If I cannot fully comprehend words from the English language, then I cannot use a second language to access the meanings and word parts in my primary language.
▪ I do **not believe** it was helpful since I did **not find or notice** any Spanish words within these words above.
▪ I have not fully learned the Spanish language. I have also not fully mastered my native language which is English. I believe that it *takes more than three months* to understand and fully grasp a new language. I can only remember *a few* words from this semester, so I am *still very unaware* of many words.
▪ I personally would have to *hear* the word and how it is pronounced to be able to better connect it with another language. *Mispronouncing* some words affect my answer choices which I often do with other languages. [PI note: Phonetics is not the focus of this study.]
▪ I chose no because I am currently taking *Spanish 1*. A lot of Spanish words are **similar** to English words and vice versa, but I do not think *Spanish 1* is a class at which I only learn basic vocabulary. For example, "las uvas" will help me identify big words in English such as parvenue. [PI note: *las uvas* means grapes, *parvenue* relates to Spanish venir, to come; this participant marked the word as known neither in pre/post-tests nor in MA test.]
▪ Learning Spanish confused me more when it came to accessing the meanings of English words that I did not know. English is my second language and Spanish is my third language. My primary language is Afrikaans and it confused me. [PI Note: As noted under subheading 4.2., This participant was contacted by email to check the NES status. Response received indicated that this participant was born in the United States to an immigrant family, learned the heritage language at home but attended schools wherein the instruction was in English.]

Appendix I: Key Words Correctly Matched by the Participants

Rank	Q #	Key Words (*N* = 36)	# of Correct in the % Group	Number and Percentage of Correct Answers by Latin L2s (*N* = 15)													
				14	13	12	11	10	9	8	7	6	5	4	3	2	1
1	IV.12	premonition	1	93.3													
2	II.4	**provenience**	2		86.7												
	VI.18	cerulean															
3	IV.11	odium	2			80.0											
	V.15	nomenclature															
4	III.7	bellicose	2				73.3										
	XI.33	corpuscle															
5	VI.16	venial	2					66.7									
	IX.27	recuse															
6	III.9	pusillanimous	5						60.0								
	V.14	jussive															
	IX.26	deign															
	XI.31	victuals															
	XII.36	bona fide															
7	I.3	subterfuge	4							53.3							
	V.13	verbiage															
	X.29	salver															
	XII.34	sui generis															18↑
8	III.8	plenipotentiary	3								46.6						18↓
	IV.10	peccadillo															
	VI.17	catenary															
9	I.2	perdition	6									40.0					
	II.5	**ratiocination**															
	VII.20	plebe															
	IX.25	evince															
	X.28	*libretto*															
	XII.35	ad hoc															
10	VIII.24	*sinecure*	1										33.3				
11	I.1	fugue	3											26.7			
	VII.19	pulchritude															
	XI	belladonna															
12	II	**quiddity**	1												20.0		
13	VII	*parvenu*	3													13.3	
	VIII	adjutant															
	X	parterre															
14	VIII	factotum	1														6.7

Note: Words in bold are analyzed in Item 1, and words in italics are analyzed in Item 2 of the Metalinguistic Awareness Test.

Appendix I (Continued)

Rank	Q #	Key Words (N = 36)	# of Correct in the % Group	Number and Percentage of Correct Answers by Spanish L2s (N = 25)																
				19	17	16	15	13	12	11	10	9	8	7	6	4	3	2	1	0
1	II.4	**provenience**	1	76.0																
2	V.13	verbiage	1		68.0															
3	IV.12	premonition	1			64.0														
4	V.15 XI.31	nomenclature victuals	2				60.0													
5	VI.18 X.29	cerulean salver	2					52.0												
6	III.8 IX.26	plenipotentiary deign	2						48.0											
7	VI.16 IX.25 IX.27	venial evince recuse	3							44.0										
8	I.1	fugue	1								40.0									
9	II.5	**ratiocination**	1									36.0								
10	V.14 VII.20 X.30 XII.36	jussive plebe parterre bona fide	4										32.0							18↑
11	I.3 VIII.22 X.28 XI.32	subterfuge adjutant *libretto* belladonna	4											28.0						18↓
12	I.2 III.7 VIII.24 XI.33	perdition bellicose *sinecure* corpuscle	4												24.0					
13	VII.19	pulchritude	1													16.0				
14	III.9 IV.11 VI VIII	pusillanimous odium catenary factotum	4														12.0			
15	II IV XII	**quiddity** peccadillo sui generis	3															8.0		
16	XII	ad hoc	1																4.0	
17	VII	*parvenu*	1																	0.0

Note: Words in bold are analyzed in Item 1, and words in italics are analyzed in Item 2 of the Metalinguistic Awareness Test.

Appendix J: Interview Transcriptions

Interview-1: Latin L2 Participant #1

(Fillers, phrase repetitions, PI prompts to continue, and the greetings and expressions of gratitude for participation are excluded.)

Q-1: Did you find learning Latin useful in improving your English vocabulary knowledge?

LLI-2: Definitely. Using all the different vocabulary words I learned in learning Latin, verbs and nouns, does not matter, both have so many different derivatives in English, that it greatly improves, especially when academic writing, helping to find not just to broaden my vocabulary in the sense that I can read better and understand things, but I can also refine my own thoughts better and, and put them on paper. Knowing more meanings of words and the roots of where they come from to have a very specific connotations and lack of integrating.

PI: Do the roots you learned help you with the meaning of the words, as to derive the meaning of, or understand the deeper meanings of the words in English?

LLI-2: Yes. Definitely. When I encounter a word that I can find its Latin roots, when I am reading, I always, I kind of check the different parts: Does it have a proposition, a cut down verb; what would it have meant if it was the same kind of word in Latin; is there a difference in the meaning; is it very similar or is it very different? Because sometimes the meanings do change over time, but sometimes they are exactly the same thing. And see, if it helps me be more critical of other authors as well; maybe, if that was not the best word, if they could have used something better. So, it is very useful on those sorts of things. Definitely.

Q-2: Did learning Latin contribute to your work in other courses you took?

LLI-2: Yes. Again, recognizing words in English, knowing the roots of those words, helps me to remember definitions of lots of terms in my linguistics class. So many different words, they are very similar, but understanding that the differences in the prefixes or differences in the roots help me to keep straight the terms that a lot of my fellow students struggle with keeping separate.

PI: Yes, meaning, other students who do not know Latin or any other second language?

LLI-2: Right. Other students that may not know Latin or may not know another language but also more, better, other students who are not as critical. And I think that is something that is very important when learning Latin as it helps the learner to become much more critical because learning Latin is such a very strict discipline, as opposed to other languages. And so, the language, teaching, the methods of teaching the language, are very different, and because it focuses more on parsing, and analysis. And so, that helps to build more analysis in my own classes. And I find that using the skills that I learned in learning Latin helped me to also be more critical in not of just that language in general, but also of the sorts of topics and things. And I apply it, on a broader sense, to subjects in those classes.

Q-3: Do you think your awareness of the subtleties in word meanings improved?

PI: You already mentioned that your comprehension of the word meanings improved, too. So;

Q-4: Would you consider benefiting from this awareness as a life-long tool in expanding your vocabulary?

LLI-2: Definitely. I think that for me it is always very important, because I would like to continue to study Latin. But even if it was not what I was going to do, or I do not end up doing that, I do not know, but I would like to, but even if I do not, it is still going to help in anything that I do, even outside of the academic world. I mean, it helps to understand the terms of legal agreements, getting a bank account and things like that. Things that you are dealing with, governmental papers and things, it helps you to be more aware of what you are getting yourself into. So, it is beneficial not even just in the academic setting.

PI: These, these are all my questions. Do you want to add anything to our interview?

LLI-2: I think I have covered most of the main benefits that I find in Latin. Yes, I think that is about it.

Note: LLI-# stands for Latin L2 Interviewee; PI, Principal Investigator

Appendix J (Continued)

Interview-2: Latin L2 Participant #2

(Fillers, phrase repetitions, PI prompts to continue, and the greetings and expressions of gratitude for participation are excluded.)

Q-1: Did you find learning Latin useful in improving your English vocabulary knowledge?

LLI-1: Yes. It helped even more with grammar, but it helped with vocabulary a lot. It also helps with the words that I have seen, and I know what they mean, but I did not realize I knew what they meant until now I know the root, so now it makes sense. It is not just the memorization game. I now have, I can look at that and, that is what it means.

Q-2: Did learning Latin contribute to your work in other courses you took?

LLI-1: Yes. Because I am in German and Greek right now. So, having the practice in those cases has helped out tremendously, especially in German, because German, when we are speaking it, they require a lot of [cases]; in English, we require, like it is all about word order. So, in German, there is a little bit of word order, but it is really all about those endings. And so, they have cases, accusative and dative, that in English we do not have, or we do not have anymore. So, it definitely helped to understand, what endings to use, and I got a lot of that practice. So, there is definitely a lot of language crossover, and it has helped out my English grammar tremendously.

Q-3: Do you think your awareness of the subtleties in word meanings improved?

LLI-1: It makes me more, it makes me have a greater attention to detail. It makes me more analytical, especially when I am reading because, translating a word, it might only be a letter difference. Like today, when we were doing the third principle part, if it just changes from a *C* to an *X*, that can change from present tense to perfect. To perfect, exactly. So, and that can change entire meaning of a sentence. So, it is, it has made me more analytical, and it has made me better translator, too, because of a slight change can be a huge difference.

PI: Do you think that the analysis of the sentences also helped you in any way in your train of thought?

LLI-1: Well, go, searching for the king *[PI note: the verbs in a sentence]*, that always helps first and that has helped a lot. Just in, it has helped in my Greek class because on our exams we have, all of ours are essays, essentially. So, when we are given a college-level essay assignment, I want to make sure that I am getting all of the details out, so I get all the full points. And so, being able and looking, being able to isolate what are the keywords that are being given to me, those are things that you know we get a lot of practice of in Latin, so it is kind of had that good crossover.

Q-4: Would you consider benefiting from this awareness as a life-long tool in expanding your vocabulary?

LLI-1: It is already been helping, especially with essays for other classes. It has given me the, like, there are certain words that I would use interchangeably, but now, I am starting to recognize certain ones have a certain ones have a little bit stronger meaning, that are not necessarily synonyms even though I have always thought they were. So, in that case, the subtleties can make a big difference, especially maybe in terms of formality. A certain word that is better used as a colloquialism with your friends, versus words that are a bit more professional even though lay people would see them as essentially the same meaning.

PI: Do you have anything else to add to the questions, or what we discussed so far?

LLI-1: No, I think the grammar has been a big help. Like I said, the vocabulary, that takes a while just because there are so many words. But learning the rules has made, like how we talked, halfway through the course, when you said that eventually you will get to a point where you can look at it and you start to read. When I go back to chapter one to do review it just flies off the page. So, it just takes time and, eventually, I will be able to do that with these more complex sentences that we are learning, too, but it is an interesting feeling.

It feels cool, and it is like being able to travel in time because you are reading words that were written in, over 2000 years ago. They are a lot like us. So, it is one of those things, because we have this so long of a distance from the past that we think that we are nothing like them but they make funny jokes, and, they insult each other, and they have love affairs and they write poems, and things like that. So, they are very much like us even though they are two millennia ago. So, itis, it is an interesting feeling, it is really very

Appendix J (Continued)

	difficult to describe. But I am getting better in describing it because I have more words.
PI:	*Yes. It is not only the language, it is not only the vocabulary. Language brings the culture, too.*
LLI-1:	Right. Like, *"Amabo te."* What we would call 'please,' they were just like, "I will love you." So, it shows that cultural thing that something like a simple word, like 'please' for us or *"bitte"* for the Germans, they have a clause. So, that is cool. It gives insight into their culture, what they found important.
	That is one of the things that helps out when reading, too. Like when we did today in class about the placement of the *"etiam"* and, how just the placement of that and the use of the pronouns that can make a sentence either flattering or very insulting. And that is just one example. Just putting one word in can make something either really, really flattering or it can be really insulting to somebody. So, that is where those subtleties come in, and how important they can be.
PI:	*Intricacies of the languages, and the words, of course.*
LLI-1:	Granted. It does make the language more tedious and difficult to learn, but it is still fun. It is just, it gets tougher, but, I mean, I practice.
PI:	*But, enjoy learning it.*
LLI-1:	Right. It is easier to stay motivated with difficult material if you enjoy it.

Interview-3: Spanish L2 Participant #1

(Fillers, phrase repetitions, PI prompts to continue, and the greetings and expressions of gratitude for participation are excluded.)

Q-1:	**Did you find learning Latin useful in improving your English vocabulary knowledge?**
SLI-1:	Yes. It was actually very helpful. I noticed the first time I took the test I did not know as many of the words, but then the second time I knew more of the words. And then also in my other classes, like the classes where you have to read more often, like history and stuff and they are more complicated, I can understand the words more, which I thought was cool because I actually noticed that like outside of class, or just like talking to people or stuff like that, I can pick up on words; it was easier, so I thought that was cool.
PI:	*So, you partly answered the second question,*
Q-2:	**Did learning Latin contribute to your work in other courses you took?**
	and you said you understood more when you read.
Q-3:	**Do you think your awareness of the subtleties in word meanings improved?**
SLI-1:	Yes. That is like the main way I picked up on different words in English that I did not know. I used stuff from Spanish in order to determine what the meaning was in English because we worked on a lot of that in Spanish, like a prefix or a suffix in a word and then like how it is similar to an English one. So, I would use that in order to figure out what a word was in English.
Q-4:	**Would you consider benefiting from this awareness as a life-long tool in expanding your vocabulary?**
SLI-1:	Yes. I actually, I have been using it for other stuff, too, like writing papers and stuff. I can use different words easier because I know what they mean. But, yes, it is actually, kind of cool and interesting to see this actually applies to something else. Like it is not just for the class. It helps with everything.
PI:	*Do you do you see that improvement makes you kind of standing out among others now, at least by listening or reading? Would you think that you have progressed compared to your peers who do not know another language?*
SLI-1:	Yes, I think so. I think it would. It helps to have a second language that you can use, I guess, to learn, like I said, learn a language because English and Spanish are very similar. So, I mean yes, it has helped me in, like figure out other words, or like see how words are related, in order to figure out a different word and stuff like that. So, yes, it branches out to other meanings.

Note: SLI-# stands for Spanish L2 Interviewee; PI, Principal Investigator

Appendix J (Continued)

Interview-4: Spanish L2 Participant #2

(Fillers, phrase repetitions, PI prompts to continue, and the greetings and expressions of gratitude for participation are excluded.)

Q-1: Did you find learning Latin useful in improving your English vocabulary knowledge?

SLI-2: Improving my English vocabulary, I do not really see it. Improving my English vocabulary in the sense of the way they conjugate the words, like sometimes they say, "My restaurant *es favorito*." you know, is like "my restaurant favorite." It is supposed to be "my favorite restaurant." You know, we are taught that. So, it does not really help my English, but it definitely helps the Spanish more than anything. But, no, I do not see it helping my Spanish, I mean, my English. *[This participant seems to be confusing the linking verb 'es' plus the adjective complement in 'es favorito' with the attributive adjective in 'favorite restaurant.']*

PI: Did Spanish at least make you more cognizant of English words, related to their roots, and prefixes and suffixes?

SLI-2: I can see some of it, yes, like if I see a word, I do not know how to say it in Spanish, like "artistic, *artistico*." It is like you see it, 'Oh artistic!' Like the art, you know, the beginning of the words, I can point out and I can see that to the English.

PI: That is, that is true for cognates, right? That is, the similar words in both languages.

SLI-2: Mm-hmm. *[Does not seem convinced.]*

PI: Okay. Did it help you to guess the meanings of Spanish words or whatever you learned in Spanish to guess the meaning of English words when you see them in your reading or hear them?

SLI-2: What you mean by that?

PI: For example, you hear art and you understand artistic. And there must be so many words in Spanish that you learned, and it kind of made you recall other words in English and made you more aware of those little pieces that make up the words.

SLI-2: Yes, I would say, because I see some of it, and I could put it all together. You know, you see it, and then it is like: "Oh, that reminds me of so and so, what if," you know, so I put it together like that.

Q-2: Did learning Latin contribute to your work in other courses you took?

SLI-2: No. Learning Spanish did not contribute to any of the other classes I am learning.

PI: Okay. So, you do not see any subtleties in Spanish words that you learned that match up with the subtleties of English words?

SLI-2: I do. Like, are you talking about, like how I said if I see "difficio." It is like I can, it is like "difficult," like it is spelled just like difficult, but it is different letters. Is that what you are kind of talking about? *[noun-adjective confusion here]*

PI: Yes.

SLI-2: Yes. There is a lot of those.

Q-3: Do you think your awareness of the subtleties in word meanings improved?

PI: A lot. For example, difficult has dis- / dif-, in this case, as a prefix; and -fic-, facere to make, that comes from Latin both to Spanish [hacer] and English; and the noun ending. So, now you know that, if you see a part that tells about something being done or made, so you may see it in other words. Did it help you that way?

SLI-2: Yes, it did. To point out, some of the times, if I, like, are you talking about, like, if it will help me, like, if I am taking a test and I see it, I can relate it to the English word and pick it out? Yes. It definitely helps.

PI: How about while reading? Did you encounter with any words that you have not used or seen before but guessed?

SLI-2: A lot. Yes, like I do not know the ones off the top of my head, but I would see a lot while reading in class and on the cultures part of the textbook.

Appendix J (Continued)

PI:	*So, you, would you say that your reading ability also increased in that respect; word knowledge and comprehension of the deeper meanings of the words?*
SLI-2:	I would say a little bit because, I will be honest, I did not really look at the textbook much and go over some of the stuff I did not know. But some of the stuff I did not know while we were reading in class, it kind of would help because I would see it and be like "Oh, okay. Makes sense."
PI:	*So, in a way, I understand that you did not use the word pieces or parts in, as a tool in understanding the word meaning or in understanding the text you are reading.*
SLI-2:	Yes. Correct.
PI:	*Not much.*
SLI-2:	Yes.
PI:	*Okay, then. Some people do, and some people do not!*
SLI-2:	Yes. I do not.
PI:	*Okay. Do you have anything else to add?*
SLI-2:	No. I do not have anything else.

About the Author

Hayriye Karliova has a BA in Latin Language and Literature and a BA in American Culture and Literature, both from Istanbul University. She completed the English Language Teaching Program and received her MA in Foreign Language Education from Marmara University, Istanbul. She also has a *Teaching English as a Second Language Certificate* from the University of California, Berkeley. She taught English vocabulary at Marmara University (2007) and English at Yeditepe University (2009-2011), both in Istanbul. During her doctoral study at the University of South Florida (2013-2020), she taught English for INTO-USF English Language Program and Latin for the World Languages Department of the College of Arts and Sciences. Hayriye Karliova is a native speaker of Turkish. Her heritage language is Bosnian, and she studied Latin, Ancient Greek, and Italian.