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# Vocabulary and the Upper-Division Language Curriculum: The Case of Non-Native and Heritage Spanish Majors

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L2 lexical studies have established that learners need to acquire knowledge of the first 3,000 most frequent words in order to enjoy 95% coverage of the vocabulary used in spontaneous speech (Nation 2006). However, there has been little data available that reveal how many of these most frequent words can be recognized by university language majors, with Robles-García's (2020a, 2020b) recent study being a welcome exception. The present inquiry into L2 vocabulary gains employed the same word-recognition test developed by Robles-García (2020a) in order to characterize the vocabulary size enjoyed by upper-division Spanish majors, both non-native and bilingual native (i.e., heritage) speakers, enrolled in a California public university. The results show that non-native Spanish majors in their third and fourth year of the major are still struggling to learn the first 3,000 most frequent Spanish words. In contrast, the heritage students demonstrated strong word recognition of almost all of the words in this basic inventory. The curricular implications of these results are discussed with respect to both non-native and bilingual native Spanish majors and an argument is made for continued explicit vocabulary instruction throughout the upper-division program.

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## INTRODUCTION

Most university foreign language programs assume their non-native speaker (NNS) language majors have attained a common set of proficiency outcomes, including a sufficiently large vocabulary size, at the point of doing upper-division work and, most certainly, by the end of their four years of university study. Conservatively speaking, language departments expect their NNS graduates to have developed a proficiency rating of *advanced low* or, at a bare minimum, *intermediate high*, as judged by the American Council on the Teaching of Foreign Languages (ACTFL) benchmarks (1996), as they exit the university. Using the scale developed by the Common European Framework of Reference for Language (CEFR), this means that language majors should leave the university having reached the B2 or C1 level (see ACTFL's *Assigning CEFR Ratings to ACTFL Assessments*). Only specialized government-supported language programs, such as The Language Flagship program (National Security Education Program, 2019), with the explicit goal of developing expertise in politically strategic world languages, have more ambitious aspirations of getting their students to the superior level by graduation. The Language Flagship program can accomplish this by virtue of their intensive learning methods and increased time-on-task (Leaver & Shekhtman, 2002; Brown & Brown, 2015). Unfortunately, none of these assessment scales specify what these classifications mean

in terms of L2 vocabulary size; in other words, how many of the most frequent words should be recognized by the L2 learners at any particular stage along this developmental continuum?

Recent data presented by Beard et al. (2018) on proficiency gains by NNS Spanish majors in a Midwest university appear to put in question the feasibility of meeting such goals without an extraordinary investment of additional resources. In the best of circumstances, these researchers speculate that incoming freshmen planning to major in Spanish will have already taken four years of high-school Spanish, scored at least a 3 on the Advanced Placement (AP) exam, and will then go on to accumulate approximately 540 hours of classroom instruction in their university career, perhaps with some short-term study abroad experience. Undoubtedly, many majors fall short of this ideal. In any case, their results show that the average attainment for NNS learners after four years of majoring in Spanish only improves from Intermediate-Low to Intermediate-High on the ACTFL scale. Only 45% of the students in their study reached Advanced-Low or higher in speaking proficiency and only 35% of them reached Advanced-Low or higher in writing proficiency. Clearly, this is not a ringing endorsement for any language program and begs the question of how these students were able to intelligently read the *Quixote* in Spanish or any other works from the Spanish or Spanish-American canon, let alone talk and write intelligently about them. Beard et al. suggest that these modest proficiency results may not be atypical for other NNS Spanish majors at other institutions around the country. Very often the lower-division curriculum and those teaching at this level receive the blame for not having adequately prepared the students for the major. Again, these disappointing proficiency outcomes are intrinsically connected to L2 lexical development as well, but little is known about the exact vocabulary size obtained by these students at each stage. In other words, despite the fact that vocabulary knowledge is a key component of linguistic proficiency, our present assessment measures do not specify any lexical benchmarks concerning vocabulary size, let alone other considerations of lexical depth and proper pragmatic use.

L2 vocabulary knowledge is, of course, intimately related to but not identical with measuring L2 proficiency, whether expressed in terms of ACTFL or CEFR metrics. L2 researchers have yet to fully untangle this relationship with an eye to describing what lexical knowledge accompanies the different levels of L2 proficiency. Nevertheless, each proficiency level implicitly assumes that L2 learners will also have reached a certain vocabulary size that facilitates carrying out an array of communicative functions. As the students move into the upper-division curriculum, the words they need to know are increasingly less frequently encountered both in speech and in print, making advanced L2 lexical development an arduous task.

In this study, therefore, we assume that lexical knowledge goes hand-in-hand with advances in L2 proficiency, but we will only look at word recognition—the first small, but fundamental, part of the larger equation of lexical knowledge usually associated with the term *vocabulary breadth*—with an eye to assessing what non-native speaker (NNS) and bilingual native speaker (NS) learners need to know in order to succeed as Spanish majors. In what follows, we will present data on word recognition from third- and fourth-year Spanish majors, both NNS and NS, and use the results to help make the argument that more explicit instructional attention is called for in the upper-division curriculum.

## THEORETICAL AND PRACTICAL ISSUES:

Understandably, the discussion of proficiency levels will always be confounded by the inherent complexities found in the process of learning an L2, as well as by our changing notions of what constitutes linguistic competence: Does the gold standard for student outcomes refer to competence in L2 grammar, reading, listening, writing, pragmatics, or intercultural knowledge, or some other measure involving an amalgam of all these components—something like the commonly used, but elusive notion of *L2 fluency*? More importantly, what role does lexical knowledge play in any calculation of L2 fluency, L2 competence, or any other measure of L2 language development? For the present study, our purpose is limited to investigating the level of L2 lexical breadth among upper-division university students. More specifically, we seek to determine if Spanish majors near graduation reach the expected benchmarks in terms of vocabulary size, as defined by being able to recognize the first 3,000 most frequent words. The results, then, can be used to help inform a more general assessment of their L2 development, difficult as that task may be, and, subsequently, to make suggestions for the upper-division curriculum.

Hulstijn (2015) has tried to come to grips with the complexities of assessing language proficiency by separating linguistic knowledge into two areas: core vs. peripheral or extended proficiency. Core proficiency loosely resembles Chomsky's (2006) notion of linguistic competence, but Hulstijn views it more from a performance perspective, as suggested by the use of the term *proficiency* instead of *competence*. Core proficiency in Hulstijn's terms not only entails what speakers know, but also what they can do. All native speakers possess and use core proficiency, regardless of whether they are eloquent, educated, gifted, or privy to social or educational opportunities that afford exposure to and practice with academic registers. Extended proficiency, then, refers to that aspect of proficiency that encompasses academic registers and only becomes available to an individual as a function of social privilege. In a sense, Hulstijn's model constitutes a thoughtful reworking and refinement of Cummins' (1979, 2008) seminal work on BICS (basic interpersonal communicative skills) and CALP (cognitive academic language proficiency). In his core/periphery model, Hulstijn would consider bilingual native speakers—or what many researchers label as heritage speakers (see also Polinsky & Kagan, 2007)—as already having acquired control of the core features of their language without much experience with extended proficiency and those characteristics of language that are normally associated with academic contexts and formal writing. Again, specific vocabulary benchmarks are missing from Hulstijn's model, although lexical knowledge forms an inherent part of L2 competence, proficiency, and fluency—however you define or measure it.

Ironically, some NNS learners make significant inroads into the realm of extended proficiency—for example, by virtue of having earned an MA or PhD in L2 studies—without ever having fully acquired all the core linguistic features, such as pronunciation, use of collocations, sophisticated rhetorical structures, or other language features associated with advanced fluency. Our language departments are not unknown to hire professors with near-native accents, but who compensate for any lacunae in core proficiencies with other valued expertise in linguistic, literary, and cultural knowledge, along with being able to write well.

Also complicating our measures of vocabulary assessment are the conceptual issues of what constitutes lexical knowledge itself: in simplistic terms, this means both the lexical breadth and depth that each L2 speaker brings to the table. In the present study, we focus on even a smaller piece of lexical knowledge—that of word recognition. Nation (2001, p. 27)

provides a more thorough analysis of lexical knowledge that includes (1) form (i.e., spoken, written, word parts), (2) meaning (i.e., form/meaning associations, concept/referent associations, word-network associations), and (3) use (i.e., grammatical functions, collocations, constraints on use due to register and frequency). All this corresponds to the proverbial question, “What do you *know* when you know a word?” Similarly, how do language instructors address both breadth and depth from a curricular perspective? While most language practitioners readily acknowledge the importance of attention to vocabulary expansion as part of successful overall L2 development, its formal inclusion in the foreign-language curricula—along with explicit vocabulary instruction and the appropriate lexical coverage in textbook materials—varies drastically or is missing altogether in the classroom trenches (for an overview of the vocabulary found in Spanish textbooks, see Sánchez-Gutiérrez et al., 2020). In the present study, again, we will concentrate on the concept of vocabulary size.

If language assessment is complicated, so is the landscape of today’s language classroom. In many Spanish departments now, both lower- and upper-division classes increasingly include large percentages of heritage students sitting side-by-side with non-native ones. In ethnically diverse California public universities, it is not uncommon for heritage students to constitute 60% or more of the upper-division enrollments. Consequently, language professionals also need to know how heritage students stack up with regard to measures of vocabulary competence, especially in light of this bilingual enrollment surge occurring throughout U.S. public universities (Acevedo, 2018; Gordon, 2018; Reznicek-Parrado et al., 2018). In other words, how much of an advantage do the family-based bilingual experiences of these heritage students (see Au et al., 2002) afford them with respect to dealing with academic registers and the rigors of completing a Spanish major? Can the scope of their vocabulary knowledge help support success in upper-division work? These are vital research questions for the heritage language field. Again, here we will only examine the issues of vocabulary size of heritage students with respect to the first 3,000 most frequent words in the Spanish language.

## THE PROBLEM

The present study is intended to help fuel a debate concerning the importance of stimulating L2 vocabulary knowledge for both NNS students and NS speakers during all four years of university study. More specifically, we seek to determine whether students enrolled in the advanced upper-division Spanish courses have reached the 3,000-word threshold of basic lexical competence given the frequencies found in the Davies and Hayward Davies’ (2017) corpus. To begin to address these questions, we will present data from a word-recognition test administered to Spanish NNS and NS university students enrolled in an upper-division Spanish linguistics course during the last two years of the major. The instrument itself, known as 3K-LEx, was recently developed and validated by Robles-García (2020a, 2020b), and probes the degree of word recognition for the most frequent 3,000 words found in the Davies and Hayward Davies corpus. We will complement these results with a small sample of personal reflections concerning the lexical challenges encountered by NNS juniors and seniors majoring in Spanish. Subsequently, we will argue that the results point to the need to explicitly teach vocabulary at all levels of the Spanish major curriculum, especially in the upper-division courses.

Fortunately, a plethora of L2 vocabulary studies over the last two decades (e.g., Cobb, 2007; Davies, 2005; Meara, 1980, 2010; Nation, 2006; Read, 2000; Robles-García, 2020b; Schmitt, 2010a, 2010b); Schmitt & Schmitt, 2014; Schütze, 2016) has given the field a clearer

picture of the approximate vocabulary size required for L2 comprehension without constant recourse to dictionary lookups. For spontaneous speech, the research suggests that students need to know from 3,000 to 5,000 of the most frequent words as determined by corpus studies, a size which Nation (2006) and Schmitt & Schmitt (2014) have shown to correlate with 95% word coverage. In the case of Spanish, Davies and Hayward Davies (2017) have provided the most up-to-date word-frequency list based on their corpus of two billion entries. In order to read written texts in Spanish (or any other L2) without constant lookups, Nation has demonstrated that an L2 learner would need 98% word coverage or knowledge of 8,000 to 10,000 words. This increase of only 3% in word coverage corresponds to learning 5,000 to 7,000 additional new words because written texts contain so many words that occur only a few times within the text. In other words, knowing the most frequent words of a language and word coverage are locked together in a logarithmic relationship: the first 1,000 most frequent words provide 80% word coverage; adding another 2,000 words from the frequency list results in a further increase bringing the word coverage total up to 95%; and, finally, tacking on the last 3% in order to add up to 98% word coverage requires learning another 5,000 to 7,000 words from the most frequent word list. Understandably, a literary work such as the *Quixote* might require a vocabulary size even larger than 10,000 of the most frequent words because it uses words and literary conceits from both the Medieval and Renaissance worlds, ways of speaking that now seem strange to modern Spanish usage. (Remember that Don Quixote imagined himself a 14th-century Medieval knight in deeds as well as words, although Cervantes wrote this prose three centuries later in the seventeenth century.)

With respect to vocabulary size and L2 development, knowing more words is, obviously, always an advantage for both receptive and productive tasks, especially when dealing with the subtleties of reading literary discourse where key content-words occur relatively infrequently. From a developmental perspective, recent research on L2 vocabulary acquisition makes it clear that L2 learners need from 6 to 16 repeated encounters with a new word in order to remember it (Schmitt, 2010a), making the process of incidental or non-intentional learning while reading a difficult, if not a highly improbable, proposition (Cobb, 2007, Hulstijn, 2003)—despite its avid proponents (McQuillan & Krashen, 2008) who incessantly repeat the traditional classroom advice to “use context to understand unfamiliar words.” In other words, research shows that incidental or non-intentional word learning is an unreliable learning strategy since the learner needs to have attained 98% word coverage of the text (i.e., 8,000+ of the most frequent words) in order to use context to disambiguate the meaning of an unknown word (Nation, 2006). Unfortunately, the situation resembles a chicken-and-egg dilemma: L2 learners cannot learn a lot of words through incidental learning without already knowing a lot of words. Consequently, in order to attain L2 linguistic proficiency, whether defined in terms of BICS or CALP, the L2 learners first need to develop a basic threshold of 3,000+ of the most frequent words. However, CALP imposes the additional burden of increasing vocabulary size up to 8,000+ of the most frequent words. Accordingly, the lexical needs of CALP encompass first knowing the 3,000-word benchmark so important to BICS because this constitutes the core vocabulary that allows speakers to construct meaning and enjoy 95% word coverage whatever the nature of the discourse: BICS or CALP, core or periphery.

Most recently, Robles-García (2020a, 2020b) has provided the field of Spanish applied linguistics with both an excellent research instrument, the 3K-LEx word-recognition test, and a large amount of baseline data on how many words NNS university Spanish students recognize in their first, second, and third year of study. The 3K-LEx test offers researchers the first statistically reliable way (discussed further below) to assess word recognition for the first 3,000 most frequent Spanish words, which is a fundamental indication of vocabulary size.

His exhaustive study with 1,121 undergraduate students shows that while considerable success has taken place during these years of study with the first tier or the first 1,000 most frequent words, the percentage increase in word recognition for the second and third tiers drops off dramatically (see Robles-García, 2020b, Chart 5).

However, a word of caution is in order. Logically speaking, when an L2 student fails to recognize a word, all other aspects of lexical knowledge will be absent as well. Positive word recognition signals the first, *sine qua non* step in probing lexical breadth, but it says very little about lexical depth or knowledge of other semantic and pragmatic nuances. Accordingly, performance on a word-recognition test provides a limited but still informative window for researchers only interested in assessing vocabulary size in aggregate terms (Read, 2000, p. 148). Self-reports concerning receptive knowledge offer other practical benefits that will be discussed further below.

The present study, then, uses Robles-García's 3K-LEx instrument not only to corroborate his findings concerning advanced NNS Spanish majors, but also to provide a baseline look at the extent of word recognition among the heritage/NS Spanish majors. The present study tested a small number of NNS and NS students enrolled in an advanced upper-division course during their third or fourth year of their university career. Our data from California public university students concur with Robles-García's rather pessimistic picture of word recognition among NNS students in the first, second, and third years of study in a Midwest university. In addition, our results show that NS speakers taking upper-division courses, whether born in Mexico/Central America or the U.S., appear to have an advantage with respect to the 3,000-core vocabulary size. We will then discuss the pedagogical implications for designing the lower-division and upper-division curriculum for all Spanish majors, non-native and bilingual.

## THE TESTING INSTRUMENT AND INFORMANTS:

Similar in design to Meara's (2010) English test, the Robles-García 3K-LEx instrument consists of a *yes/no* word-recognition survey, randomly selecting 9 words from each separate quartile of the first 3,000 most frequent Spanish words (12 quartiles in total each consisting of 250 words) as informed by the *Corpus del español* (Davies & Hayward Davies, 2017) and its two-billion-word database. Robles-García improved on Meara's approach by sampling separately from each and every quartile instead of drawing words randomly from each 1,000-word tier as a whole. In addition, he carefully maintained the same relative proportional mix of nouns, adjectives, and verbs found in each quartile of the frequency list. Function words (e.g., articles, pronouns, clitics, prepositions, etc.) were discarded.

Nation and Beglar (2007) pioneered another method of lexical inquiry that asked students to indicate the meaning of the words through multiple choices. This approach provides a more accurate basis for judging lexical knowledge, but it also takes more time to administer which, in turn, drastically reduces the number of words that can be included in the test. Meara's *yes/no* format and Robles-García's adaptation of it allow for the inclusion of 108 words, as compared to only 30 words in the Nation and Beglar test. Therefore, 3K-LEx can be administered in approximately 20 minutes rather than in the 40 minutes to an hour required by Nation and Beglar's multiple-choice format, increasing the chances that the informants will actually respond to the online survey.

Using self-perception tests to explore vocabulary knowledge was first pioneered by Paribakht and Wesche (1993) and their use of the Vocabulary Knowledge Scale (VKS) which

blends self-reported receptive knowledge of words with the supplying of L1 equivalents and also making sentences with the tested words. The VKS test has been used extensively to collect data on reading comprehension at the university and schools levels, mostly with respect to English language development (Bruton, 2009).

The 3K-LEx test only uses the lower range of the VKS that focuses on receptive knowledge. In order to test the validity of the 3K-LEx test, Robles-García constructed two versions, each with a different inventory of randomly selected words from the 12 quartiles; he then established that these different trials yielded statistically equivalent results. Although the words were selected randomly, obvious cognates were avoided and some discretion was exercised in order to provide a sense of thematic variety for each separate quartile grouping. Both Meara and Robles-García added 54 distractors or nonce words to their inventory of 108 words that could be used to penalize any participant who was simply guessing. These nonce words (e.g., *sogro*, *necera*, *avispora*, *monal*, *recebro*, etc.; for a full list, see Appendix A) were created following typical Spanish phonological sound patterns to make them look and sound like real words. A total of 1,121 students participated in the Robles-García study: 595 students from first-year Spanish, 335 from second-year, and 191 from advanced language courses.

As a group, first-year NNS learners in Robles-García's (2020a, 2020b) study understandably failed to recognize the entire inventory of the most frequent 3,000 words. First-year students are still actively acquiring the language from the ground up and it's too early for them to have a vocabulary as large as the first 3,000 most frequent words. In aggregate terms, once again, this group demonstrated word recognition for 54% of the first thousand most frequent words, 26% for the second thousand most frequent words, and 15% for the third thousand most frequent words. These beginners predictably had their greatest success (72%) with words drawn from the first quartile, the first 250 words drawn from the Davies and Hayward Davies (2017) word-frequency list. The real surprise came from the third-year (i.e., advanced) students and their recognition of words in the four quartiles from the third tier (i.e., words 2,000 to 2,999 on the frequency list): They only recognized 41%, 33%, 50%, and 30% of the words from the third-tier quartiles, respectively. In other words, these students were far from being ready to comprehend authentic texts and the type of discourse found in their upper-division courses.

Our instantiation of the 3K-LEx test was basically identical to the Robles-García instrument except for the replacement of a few words deemed too elementary for students enrolled in an upper-division Spanish linguistics course (see those words marked with an asterisk in Appendix A). Substitutions were also drawn from the Davies and Hayward Davies' frequency list from the corresponding quartiles (e.g., *perder* instead of *solo*, *subir* for *dinero*, *elegir* for *rey*, etc.). Nonsense word distractors were also reduced from 54 to 22. The informants were asked to rate the vocabulary items using a Likert scale from 0-2: 0 = *I don't know this word*; 1 = *I know how to use this word*; 2 = *This isn't a Spanish word*.

The informants for the present study consist of 64 California public university students enrolled in an upper-division Spanish applied linguistics course during their junior and senior years. The vast majority of students were Spanish majors, both NNS learners (N = 26) and NS or heritage students. These bilingual native speakers were either born in Mexico/Central America (N = 11) or in the U.S. (N = 27) with Spanish spoken in all of their households to a greater or lesser degree, according to their self-reports. The linguistic background of these students was quite diverse and defied strict categorization; some had come at an early age to the U.S., others as teenagers. Nevertheless, the most relevant linguistic factor contributing to their bilingual fluency appears to revolve around whether Spanish was spoken at home. The NNS learners also had a diverse linguistic history with some of them progressing through the

university language courses from start to finish, while others had arrived at the university already with intermediate proficiency as a result of language study in high school.

## RESULTS

The data from administering the 3K-LEx instrument online are graphically displayed in Figure 1, which gives the percentage of recognized words for the first (blue = 1K), second (red = 2K), and third thousand tiers (yellow = 3K) of the most frequent 3,000 words. The students were separated into three groups: NNS speakers (i.e., Spanish not spoken at home), NS-Mex speakers born in Mexico/Central America (i.e., Spanish spoken at home), and NS-USA speakers born in the U.S. (some Spanish spoken at home).

The NS speakers, whether born in Mexico/Central America or the U.S., appear to recognize with very few exceptions the first 3,000 most frequent words of the Spanish language across all three tiers: the average number of recognized words by thousand-word tier for the NS-Mex group was 99.7%, 99.7% and 95.4%, respectively; and for the NS-USA group, 99.1%, 97.6%, 89.4%. The differences in lexical knowledge among bilinguals, whatever their personal history, are minimal with respect to their vocabulary size, provided that Spanish was spoken at home. A few of the most prominent words that commonly caused recognition problems, especially for the U.S. born bilinguals, were the following: *eje* 'axis, axle', *penumbra* 'shadow, penumbra', *cumbre* 'peak', *agujero* 'hole', *obrero* 'worker', *alcalde* 'mayor'.

By contrast, the situation for the NNS speakers tells a different story. For the first 1,000 tier, they demonstrated almost complete word recognition (95.4%). But, then, they experienced difficulties, recognizing only 54.8% of the lexical items in the third-thousand word tier, with a noticeable drop in word recognition beginning around the 1,750th word or the 7th quartile of the second tier (75.4% known words) and continuing to deteriorate rapidly with respect to the words in the third tier (54.8%). Interestingly enough, Robles-García also reported that the intermediate and advanced NNS students also began to falter in word recognition starting around the 7th quartile of the second tier (see 2020b, Figure 5).

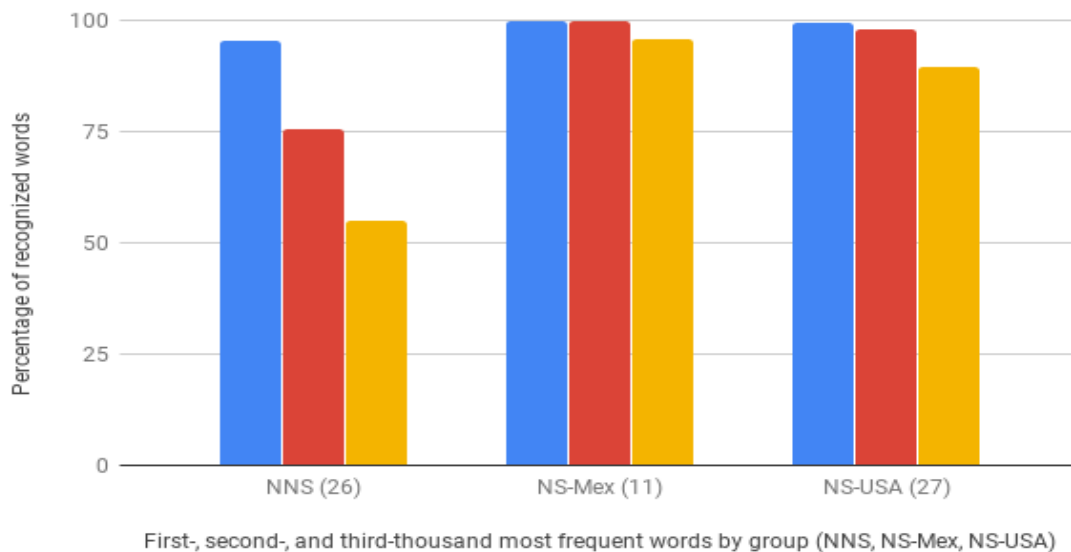


Figure 1. Recognized Most Frequent 3000 Words

NB: Percentage of recognized words for the first- (blue, 1-999), second- (red, 1,000-1,999), and third-thousand (yellow, 2,000-2,999) tiers of the most frequent words by group (e.g., NNS (95.4%, 75.4%, 54.8%), Mexican/Central American NS (99.7%, 99.7%, 95.4%), and U.S. NS (99.1%, 97.6%, 89.4%)).

Again, these are aggregated and averaged percentages that mask a great deal of variation by word, as well as for each individual whose L2 proficiency has been shaped by a unique set of personal experiences and overall fluency in Spanish. The NNS learners not only had problems with the same small set of words listed above that gave problems to the NS, but they also failed to recognize extremely common words such as *lanzar*, *temor*, *cadena*, *callar*, *carretera*, *rama*, *bilo*, *rueda*, *rezar*, *sabio*, *sudor*, *socio*, *tragar*, *cerro*, *carcajada*, *resaltar*, *bueco*, *sabiduría*, *tibio*. For future research, study abroad (SA) exposure could also be controlled for because NNS students who go abroad might be expected to develop more lexical knowledge, provided that their SA experience is sufficiently long enough and entails real participation in local social networks. (Pinar, however, reported rather modest lexical gains for SA in his 2016 study.)

Few informants, whether NNS or NS, made false guesses when presented with nonce words, which instills a degree of confidence that their overall responses really do provide reliable information about their respective vocabulary sizes. The NNS learners tended to state that they did not recognize these nonce words, while the NS students registered relatively more correct rejections of these nonce words as not being part of the Spanish language. From the perspective of Hulstijn's model, these trends with nonce words bring to mind a suggestion that the NS students might enjoy more competence with Hulstijn's notion of core proficiency, which allows them to reject nonce words with more confidence than the NNS learners. The ability to recognize nonce words is an interesting topic that should be more thoroughly explored in future L2 lexical studies because of its relationship to linguistic competence.

In summary, two general trends in the data are obvious: NS students have a distinct lexical advantage in terms of sheer vocabulary size when compared to the NNS group who are still struggling to learn the words from the third tier and, in a more limited way, the second tier as well. No doubt these NNS learners were also struggling to increase their lexical knowledge of those less frequent words contained in the fourth-, fifth-, sixth-, seventh-, and eighth-thousand word tiers, which are, nonetheless, so important for success in reading literature. With respect to the NS students, their apparent control of the first 3,000 most frequent words puts them in an enviable position for spontaneous conversations, but only further research will shed light on their lexical readiness for reading literature. In the next section, we review the personal reflections from a few of the NNS learners concerning their struggle to learn L2 vocabulary, especially beyond the basic inventory of the first 3,000 most frequent words.

## PERSONAL TESTIMONIES OF NON-NATIVE LEARNERS

Along with gathering data by means of the online 3K-LEx vocabulary test, we invited a small group of non-native Spanish majors to volunteer some thoughts on their experiences learning vocabulary during the last three or four years of university. A common concern among their observations dealt with the lack of explicit attention given to vocabulary development in both lower- and upper-division classes in contrast to the traditional obsession with proper grammatical structures.

As a non-native speaker in upper-division Spanish courses ..., I have struggled with understanding the necessary vocabulary. Native speakers get introduced to a huge array of vocabulary at home in their daily lives, so they do not need to learn it in school. However, for students like me, who do not have experience with lots of vocabulary input, it is essential to learn about vocabulary in classes. I believe that learning more vocabulary helps more with understanding and communicating than does learning grammar and tenses, which is the usual focus of the classes.

Recently in my upper-division class on Spanish Applied Linguistics, I understood every concept on the midterm and what every question was asking. However, because I could not understand the vocabulary in the presented material on the midterm, I could not apply the linguistic rules that I learned in class even though I knew them. If I had known more vocabulary I would have been able to do much better on this midterm, even though the midterm was not specifically testing for vocabulary understanding.

Another often repeated theme dealt with the advanced lexical demands stemming from literature classes and the lack of formal attention to learning these less frequent words.

In the real world, one must be able to articulate and understand advanced vocabulary in order to communicate, as well as be able to understand readings/literature...I also struggled with not understanding vocabulary in the required reading and especially with reading a novel. Having to look up the vocabulary constantly made it very hard to get through long readings and was very discouraging.

However, one major flaw I personally find in vocabulary learning is the lack of teaching of higher level words found in literature and also commonly used slang words. I found that both in High School and here at ..., vocabulary was taught in very predictable ways with very predictable themes, such as food, family, work or school, all of which were repeated over various years. While these certainly are important, there are countless higher level words or commonly used words that do not fit into this "theme" based learning of vocabulary. All of these words are important when reading novels and I wish I could have been exposed to at least a few of these before encountering them in a novel.

One student emphasized the importance of learning not just the infrequent words found in literature, but also the phrases or collocations that begin to give an L2 speaker's Spanish more flair, style, and authenticity.

However, 90% of the problems I encounter have to do with a lack of practical vocabulary. Most of the classes are reading intensive and the difficulty of this comes from the time investment alone. It takes me longer than most Spanish majors to complete readings because I am constantly having to switch tabs to look up words so that I fully understand the assignments. More often than not though, it is phrases and not words that I do not understand. There are many culturally bound phrases that I never learned having learned Spanish in a somewhat "culture-free" environment.

Finally, one student mused, almost poetically, on the painstakingly slow and deliberate process involved in expanding L2 vocabulary knowledge. Nothing comes of it without great effort. Many become discouraged, but this particular student realized the benefits and the joys

awaiting her as she persevered. Clearly, this type of student will succeed in improving her L2 proficiency as time goes on. But what about the average student, who lacks this kind of discipline and motivation to keep slogging away at those 8,000+ words, along with the frequently used collocations? Clearly, the average student needs explicit instruction throughout their four years of the major in order to cope with the demands of upper-division work.

To my ears Spanish sounds like a tightly woven cloth. Threads of different color, texture, each more unique and striking than its neighbor, tumble over one another in one intricate piece, baffling in its beauty. It is a language of depth and richness, and many years ago I decided that I wanted to understand, to appreciate it, and engage with it as more than just an awestruck bystander of its artistry. That is why I began to learn. Learning, I soon came to understand, took more than just an appreciation of what I was studying. Thousands of words were given to me, grammatical rules were preached, and I was **overwhelmed** (our emphasis). Perhaps the only reason I didn't drown was because of my passion and hunger for understanding. Every time I encountered a word I did not know, I wrote it down alongside its English meaning. When the sheets of paper I had used to catalog these words became leaning stacks of paper filling my room, I transferred them online. Quizlet, Word, Excel, are now full. After a while, I realized what I had created, my stores of thread. I can see different fibers in my sections of words online, some bright red for the passionate and sexual words of *La Celestina*, others crisp white from *Los Milagros de Nuestra Señora María*, some others still, earthy neutrals from *Cantar de mio Cid*. Over years of study, I have been able to obtain what I need to become an artist of the Spanish language, much like the artists that inspired me in the first place. It is not easy to weave, to speak fluently. I've spent countless hours repeating words to memory, twirling a language's fibers into strong thread. I still need practice before I can come out as a master of the Spanish language, of weaving, but I know that continuing on the path that I am on, I will one day inspire someone like those inspired me years ago. Every new artist needs a mentor, I've decided. Why can't it be me?

## PEDAGOGICAL IMPLICATIONS

In this study, we have looked at the L2 development of word recognition, an initial measure of vocabulary size, among upper-division Spanish majors from both a quantitative and qualitative perspective with a particular focus on the first 3,000 most frequent words. Again, this number affords students approximately 95% word coverage for oral and written texts. It should be remembered that 98% word coverage requires knowing 8,000+ of the most frequent words and allows learners to read literary texts in a more independent fashion freed from constant dictionary lookups. That extra 3%, moving from 95% to 98%, deals with words of much lower frequency in the language than what is represented by 95% word coverage. Consequently, increasing the L2 vocabulary size from 95% to 98% demands much time, effort, and repeated encounters if learners are to pick up these words incidentally through reading alone.

Although there exists much individual variation with respect to the developmental lexical patterns and the data here appear as aggregated numbers and averages, certain trends still surface in ways that corroborate Robles-García's (2020b) results with over 1,000 subjects, an impressive informant population. Third- and fourth-year Spanish majors have solidified their

knowledge of the first 1,000-word tier of the most frequent words whether non-native or heritage speakers. The NS learners have a solid command of all three thousand-word tiers (1K, 2K, 3K). NNS learners still experience gaps in this basic lexical inventory, along with much individual variation, beginning around the 7th quartile (approximately, around the 1,750th most frequent words). As a result, they never appear to reach the basic 3,000-word benchmark during their undergraduate career. In their personal reflections, they have clearly articulated their difficulties in expanding their vocabularies and make a direct appeal for more explicit interventions from the curriculum to assist them.

The striking similarity between the lexical developmental patterns among NNS Spanish learners chronicled by Robles-García (2020b) in his more exhaustive study (N = 1,121) and the results reported here with a more limited group of NNS informants (N = 26) should sound the alarm for action on the part of the language profession. The learning stagnation that NNS learners suffer after reaching the 7th quartile of the 3,000 most frequent words could result not only from a decreased amount of attention paid to L2 lexical development in the curricular materials (i.e., textbooks), but also from less emphasis placed on lexical development from the instructors' perspective. This lexical neglect occurs despite the fact that these L2 learners are obliged to read more sophisticated texts in their upper-division courses which demand a robust vocabulary size. Whatever incidental word learning is taking place—and some incidental learning is undoubtedly taking place, although not very efficiently, as Schmitt (2010a) has argued—it simply cannot keep pace with the goal of acquiring the first 3,000 most frequent words, not to mention coming to grips with the more ambitious, but highly desirable, goal of learning the more infrequent words that lie in the range going up to 8,000+ words. Understandably, NNS students feel “overwhelmed” (see the last personal reflection cited above) in the face of the increased lexical demands imposed by reading literature. As one student put it, learning “theme” words commonly found in communicative language approaches (e.g., the pharmacy, the bank, the railroad station, the family, ...) is all well and good in the early stages of learning, but there needs to occur a follow-up with the patently less frequent words so that learners “could have been exposed to at least a few of these [words] before encountering them in a novel.” In a nutshell, explicit vocabulary teaching needs to be an integral part of each and every class, in both lower- and upper-division courses right up until graduation.

However, this is not the kind of advice that most Spanish professors normally want to hear. The tacit assumption among faculty is that a solid lexical foundation should be learned/taught by the end of all lower-division series, along with the acquisition of all grammatical structures, too. Neither one of these goals actually happens, not because the instructors are inept or the students are not as clever as previous generations, but because L2 vocabulary expansion takes considerable time and personal discipline (again, see the last student reflection given above about becoming your own mentor). The widespread practice of ignoring vocabulary study in the upper-division flies in the face of the facts concerning L2 vocabulary development, as we have tried to illustrate in this study. No doubt, many language departments consciously or subconsciously suppress the true nature of the vocabulary needs of their majors. This lexical challenge could very well constitute one explanation for the limited proficiency outcomes of graduating seniors observed by Beard et al. (2018), without minimizing the many other factors other than vocabulary involved in reaching fluency in an L2.

With respect to the bilingual or heritage learners from homes where Spanish is still being spoken, the data show that they have a clear vocabulary size advantage, at least as far as the basic 3,000 most frequent words is concerned. Consequently, our NS students participate in spontaneous conversation with relative ease in comparison to the NNS learners. Obviously,

recognizing words is not the same as knowing words in the full sense of lexical competence that includes semantic, cultural, and pragmatic knowledge as well. Accordingly, not answered in this study is what heritage students might know about the more infrequently encountered words in the range from the list of frequent words from 3,000 to 8,000. Likewise, future research should probe whether knowing up to 8,000 words smooths the way for a felicitous engagement with academic Spanish for the NS students.

In short, there is great need of creating a new lexical instrument similar in nature to Robles-García's 3K-LEx, but thoughtfully adapted for the upper ranges of the lexicon—a research agenda that Schmitt (2010b) advocated for a decade ago. Likewise, knowing the approximate vocabulary size that corresponds to the different stages of L2 development would be helpful for everyone concerned (see Webb & Nation, 2017 for one effort to do this for the ESL/EFL field). One interesting project along these lines comes from the five-language CEFRLex corpus being developed at the Catholic University of Louvain, which attempts to offer a much-needed window into the lexical inventory contained in textbook materials for levels A1 to C2 (François et al., 2014). This is a nice start, but much more lexical research is needed in order to fine-tune the upper-division curriculum in support of both NNS and NS learners.

In other words, the less frequent words leading up to 8,000+ are important to both types of Spanish majors, along with productive knowledge of a large inventory of authentic collocations, those lexical phrases used appropriately in certain pragmatic contexts that create a real sense of language fluency and authenticity. As one non-native learner put it: “There are many ‘culturally bound’ phrases that I never learned having learned Spanish in a somewhat ‘culture-free’ environment.” The learner is, of course, referring to the often culturally sterile environment of many L2 classrooms, devoid of authenticity and a palpable connection to the Spanish-speaking communities. While the classroom can never offer the same richness as interacting with the community, more can always be done in order to make classroom activities more connected to the real world, which is the intent behind task-based learning (Willis & Willis, 2007). Although this might be hard to achieve, it still remains an admirable goal toward which the profession must continue to strive.

Likewise, students must assume the responsibility of becoming a “weaver” of the threads of language, as one participant described it in the reflections given above, “twirling a language’s fibers into strong thread.” This metaphor aptly captures the complexities of *knowing* a language, word by word—form, meaning, and use (for more discussion of this, see Schmitt, 2010a)—which constitutes the slow journey to advanced or superior proficiency. A good place to start for the NNS Spanish majors would be a consolidation of the 3,000 most frequent words. The NS students clearly have a different set of needs.

The mix of Spanish majors—both NNS and NS—present in today’s upper-division classrooms demands that we address the issue of explicit vocabulary teaching. Departments and faculty should recognize the potential win-win goal of their majors reaching a vocabulary size of 8,000+ of the most frequent words. Sensitivity is called for to accommodate the learning circumstances of both types of learners, the NNS and NS Spanish majors. However, the real obstacle continues to be the faculty’s belief that vocabulary instruction lies outside the realm of their responsibilities, but rather consists of something learned incidentally or already taught and dispatched with during the first- and second-year courses. The attitude of “that’s not our job” is belied by the results presented here and in Robles-García’s study. In the unabashed tradition of *Pogo* from the comic strip of yesteryear (and we beg indulgence for the non-inclusive language therein): “We have met the enemy and he is us.”

## ACKNOWLEDGEMENTS

We would like to thank Ulf Schütze, Ferran Suñer, Lillian Jones, and Rob Manheimer for their comments and suggestions on a previous draft of this paper.

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## APPENDIX A. MODIFIED 3K-LEX VOCABULARY TEST BY QUARTILES

Quartile (250 total words)	Spanish words	Nonsense words
TIER 1: Q1	Encontrar Pequeño Esperar Tiempo Trabajo *Perder (< solo) Cuerpo Creer Mano	Sogro
Q2	*Olvidar (< todo) Meter Cara Mostrar Empresa Fuerza *Subir (< dinero) Descubrir Antiguo	Necera Pierte
Q3	Lanzar Suerte Asunto Dolor Crecer Cerrar Enviar *Eligir (< rey) Abierto	Pran Quecir
Q4	*Madera (< vivo) Rato Lluvia Cuento *Pesar (< colocar) Recuerdo Caballo Recoger Piedra	Avispura Treboteca
<b>TIER 2</b>		
Q5	Seco	Pascado

	Esconder Vuelta *Caja (< grito) Encargar Ruido Labio Saltar Alimento	Calio Monal
Q6	*Raíz (< desnudo) Temor Pérdida Confianza Cadena *Daño (< bailar) Cuello *Cercano (< robar) Muestra	Recebro Abamunar
Q7	Callar Esquina Lejano Fiel Carretera Traje Mentira Pasear Rama	Fidro Gustorio Pente
Q8	Humo Asomar *Hilo (< sucio) *Herida (< escalera) Obrero Rueda Bolsillo Dulce *Apagar (< perdido)	Acrusa Barlo
<b>TIER 3</b>		
Q9	Borrar Adivinar Cárcel Alcalde Rezar Ancho Orilla	Frescencia

	Pecado *Salario (< alegre)	
Q10	Sudor Huella Pisar Vientre Pálido Socio *Fallecer (< gota) Castigar *Tragar (< tonto)	Azandar Garimbano
Q11	Picar Orgullosa Suelto Eje *Agujero (< apellido) *Semilla (< docente) *Pluma (< colega) Cerro Uña	Trumedecer
Q12	*Carcajada (< chiste) Desafío Penumbra Resaltar Ahogar Hueco Sabiduria Tibio Cumbre	Pedifoso

\* = substitution different from Robles-García's test