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Factors Affecting Lexical Knowledge in University Students of Spanish as a Foreign Language: A LexTALE-Esp Based Study

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Abstract
Lexical knowledge has long been recognized as a key component of second and foreign language proficiency, yet relatively little is known about how it develops in learners of Spanish as a foreign language in specific educational contexts. This study investigated the effects of demographic, experiential, and self-reported factors on lexical knowledge assessed with the validated LexTALE-Esp test (Izura et al., 2014) among 59 multilingual Slovenian university students of Spanish. Within the demographic variables, the findings indicated that gender did not significantly affect the vocabulary scores, whereas age and course level were both significant positive predictors. The age of acquisition of Spanish was found to be an important factor: learners who began in primary or secondary school significantly outperformed those who started at the university level. Moreover, participation in Erasmus+ programs and residence in a Spanish-speaking environment emerged as a robust predictor, with those who had lived abroad performing substantially better. Finally, self-reported proficiency was a strong predictor of lexical knowledge and explained 59% of the variance in test performance. This indicates a strong correspondence between university students' metacognitive judgements and their actual test performance.

Keywords
Lexical knowledge, Spanish as a foreign language, LexTALE-Esp test, university students

Introduction

Lexical knowledge among second or foreign language learners constitutes a key factor in the development of linguistic competence in various skills (Alderson, 2005; Qian & Lin, 2020; Robles-García, 2022; Zhang & Zhang, 2022) since "language ability is to quite a large extent a function of vocabulary size" (Alderson, 2005: 88). For example, scores on the vocabulary size test in the DIALANG project correlated strongly with reading (0.64), listening (0.61—

0.65), and writing (0.70—0.79) (Schmitt & Schmitt, 2020: 186–187). A significant correlation between the lexicon and different skills has also been established in other studies, related to listening comprehension (Matthews, 2018; Nguyen, 2024; Zhang & Zhang, 2022), reading comprehension (Jeon & Yamashita, 2014; Schmitt et al., 2011), speaking (Saito et al., 2016), and writing (Agust ń Llach & Terrazas Gallego, 2009). While other studies have examined how demographic and experiential variables influence vocabulary performance using different vocabulary tests (Aguasvivas et al., 2020), to our knowledge no research has yet investigated the relationship between demographic, experiential, and self-reported variables and vocabulary performance on the LexTALE-Esp test (Izura et al., 2014).

Regardless of which skills are emphasized in the learning process, vocabulary knowledge is one of the core requisites for achieving proficiency in all skills and should therefore be systematically assessed in some way.

With these considerations in mind, the key objective in the present study is to profile the lexical knowledge of Slovene university students of Spanish as a foreign language (SFL) and explore the effects of the following variables: demographic (gender, age, course level), experiential (age of acquisition of Spanish, participation in Erasmus+ programs, residence in a Spanish-speaking environment), and self-reported factors (self-rated language proficiency). Due to the fact that our students present a very heterogeneous group starting the university program of Spanish Philology with different levels of proficiency from A1 to B2, we were interested in how all these factors relate to their lexical knowledge. These results will also serve as a springboard for subsequent research in which we intend to explore the influence of lexical knowledge on listening comprehension within the same group of students, as well as for further pedagogical implications, such as curriculum planning of our first- and second-degree programs.

Literature Review: Vocabulary Test

First of all, as Read (1988) suggests, it is important to realize what areas of lexical competence we, as researchers and language teachers, want to test. Schmitt and Schmitt (2020) give a review of vocabulary tests and claim that arguably the best-known test for English vocabulary is the Vocabulary Levels Test (VLT, Nation, 1983) which is based on word frequency. Evidently, there are more such tests for English as a foreign language (EFL) than for SFL. As Chandler (2022) observes, vocabulary teaching and assessment in SFL have lagged behind developments in EFL. Nevertheless, he introduces two vocabulary frequency-level tests—one receptive and one productive—that are adapted from EFL frameworks.

In our research, the main aim was to measure and compare the lexical knowledge of university students with different levels of proficiency and course levels of SFL, including students from 3 years of first degree (bachelor) programs and 2 years of second degree (master) programs. We also aimed to use a validated and previously used vocabulary test which would enable more reliable cross-study comparisons.

In the field of SFL, the LexTALE-Esp test (Izura et al., 2014) has been employed in numerous studies to assess vocabulary size, especially at advanced proficiency levels, which suited our purpose. One of its advantages, in comparison to some other time-consuming or expensive tests, is that it is quick and easy to measure (it takes only 5 minutes to complete). Lemh öfer and Broersma (2012) proposed a Lexical Test for Advanced Learners of English (LexTALE), which relies on word knowledge as a proxy for proficiency, and later developed LexTALE test for Dutch and German (see www.lextale.com). Further adaptations have been created for other

languages: Brysbaert (2013) introduced LexTALE-FR for French, followed by Izura et al. (2014) with LexTALE-Esp for Spanish. More recently, Amenta et al. (2021) developed LexITA for Italian, Zhou and Li (2022) proposed LextPT for Portuguese, Lee et al. (2023) introduced LexMAL for Malay, Wen et al. (2024) created LexCHI for Chinese, and Luque et al. (2025) designed a Basque adaptation of the test. Participants have to make word/nonword decisions. The list includes words ranging from moderately well-known to very well-known to native speakers. In this way, various proficiency levels can be discerned. The number of nonwords is smaller than the number of words to make the subjective proportions of words and nonwords more equal, given that most participants do not know all the words. The construction of the Spanish LexTALE-Esp test was inspired by Brysbaert (2013) who developed the LexTALE-FR vocabulary test to measure language proficiency in French. Izura et al. (2014) selected an original pool of 90 items, 30 nonwords and 60 words ranging in frequency from very high, that is, words likely to be known by new learners of Spanish (e.g., *ganar* (to win), *matar* (to kill), *playa* (beach)) to very low, which are words only familiar to proficient native speakers (e.g., *cenefa* (edging), *laud* (lute), *alpiste* (birdseed))[1]. The majority of words were nouns (N = 52), followed by verbs (N = 26), and adjectives (N = 12). The authors presented these items to a group of highly proficient Spanish L1 speakers and to a group of Spanish L2 speakers with different L1 backgrounds. The authors claim that the test discriminated well at the high and the low end of Spanish proficiency.

According to Ferré and Brysbaert (2017), LexTALE-Esp also correlates well with other measures of language proficiency in unbalanced bilinguals whose second language ability is well below the level of their native language. They indicate that the existing LexTALE-Esp can be used to estimate proficiency differences in highly proficient bilinguals with Spanish as an L2. More recently, Luque et al. (2025), as well as Bermúdez-Margaretto and Brysbaert (2025), have provided additional convergent validity evidence by showing moderate correlations with other vocabulary measures, focusing on bilingual individuals. The BEST (Basque, English and Spanish tests) dataset study by de Bruin et al. (2017) also incorporated LexTALE-Esp alongside other tests in multilingual assessments.

Methodology

The present study adopted a quantitative, cross-sectional design, conducted during the academic year 2024–2025. The aim was to examine how age, course level, and self-reported language proficiency predict lexical knowledge and further on to examine how gender, age of acquisition of Spanish, participation in Erasmus+ programs, and residence in a Spanish-speaking environment affect lexical knowledge. Data was collected using a standardized instrument: the LexTALE-Esp vocabulary test (Izura et al., 2014). Additionally, a demographic questionnaire was administered to obtain information about participants' characteristics. All statistical analyses were conducted in R (version 4.3.1; R Core Team, 2023) using RStudio (version 2023.06.1; RStudio Team, 2023).

Research questions and hypotheses

The study addressed the following research questions:

RQ1: What is the overall level of lexical knowledge based on LexTALE-Esp scores among multilingual university students?

RQ2: Which demographic variables are associated with differences in lexical knowledge?

In line with the research questions, we formulated the following hypotheses:

H_0: There will be no significant differences in lexical knowledge across genders.

H1: Age and course level will positively predict lexical knowledge.
H2: Earlier age of acquisition of Spanish is expected to enhance lexical knowledge.
H3: Participation in Erasmus+ programs, residence in a Spanish-speaking environment will positively predict lexical knowledge.
H4: Self-reported language proficiency will predict lexical knowledge, reflecting the strong correspondence between learners' metacognitive judgments and their actual test performance.

Participants

The sample consisted of 59 multilingual university students in the Department of Romance Languages at the Faculty of Arts, University of Ljubljana (Slovenia), of whom 54 were female (91.5%) and 5 were male (8.5%). The mean age was 21.71 years (*SD* = 2.49). Of the total participants, 21 (35.6 %) were enrolled in the first year of undergraduate studies, 17 (28.8%) in the second year, 21 (35.6%) in a master's program. The participants represented a wide range of linguistic repertoires, with varying proficiency levels in Spanish, English, German, Italian, French and several other languages. With regard to multilingual profiles, nearly all participants (91.5%) reported proficiency of at least A1 in three or more foreign languages, 81.4% reached at least A2 and 52.5% attained at least B1 in three or more foreign languages. These results indicate that the majority of the sample can be considered multilingual at varying proficiency thresholds, particularly at the basic to intermediate levels.

Instrument and data collection

Lexical knowledge was assessed using the LexTALE-Esp vocabulary test (Izura et al., 2014), a validated tool designed to provide a quick and reliable measure of lexical proficiency in Spanish. The reliability of the test was measured with Cronbach's alpha. This gave a value of $\alpha = .96$ for 90 items. This is of high value, although it must be taken into account that two extreme groups were compared. Still, when the data were limited to the L1 group, reliability remained at a high level of $\alpha = .88$, and it stayed at $\alpha = .96$ if the analysis was limited to the L2 group (Izura et al., 2014). The reliability in our sample was $\alpha = .81$ for 90 items, which is lower than in the previously mentioned study, but still acceptable.

In addition to the LexTALE-Esp, participants completed a demographic questionnaire developed by our research group, which elicited information regarding gender, age, course level, age of acquisition of Spanish, experiences of residence abroad in a Spanish-speaking environment (e.g., Erasmus+), and self-ratings of proficiency levels according to the CEFR.

Results and Discussion

In the present study, the overall LexTALE-Esp score was derived following the procedure described by Izura et al. (2014), and was defined as:

$$\text{Score} = N_{\text{yes to words}} - 2*N_{\text{yes to nonwords}}.$$

The overall vocabulary score was calculated by summing the number of correct responses (i.e., classifying pseudowords as non-words and real words as words) and subtracting twice the number of pseudowords erroneously identified as real words. On average, participants achieved a score of 23.76 (*SD* = 12.23), with scores ranging from –10 to 50 out of 60 as a maximum score. The distribution of scores was slightly negatively skewed (*skewness* = –0.39) and leptokurtic (*kurtosis* = 0.04) (see Figure 1). The Shapiro–Wilk test indicated that the data did not deviate significantly from normality ($W = 0.98$, $p = .52$).

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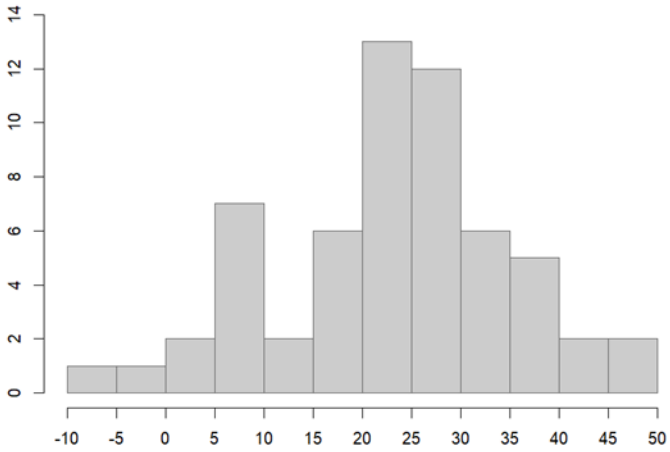
Figure 1
Score Distribution of the Vocabulary Test LexTALE-Esp



These results are comparable to those reported by Jelić (2024), who employed the same vocabulary test with Croatian university students of Spanish and obtained a mean score of 28.87 (*SD* = 9.97). Given the structural and lexical similarities between Croatian and Slovenian, it is not unexpected that the Slovenian group did not reach the higher mean scores observed among Spanish-dominant bilinguals but instead showed performance closer to that of the Croatian sample. By contrast, Ferré and Brysbaert (2017) reported substantially higher mean scores for Spanish-dominant bilinguals (*M* = 53.2) and Catalan-dominant bilinguals (*M* = 48.9), both of which exceed the average obtained in the present sample. This suggests that cross-linguistic similarities between Croatian and Slovenian contribute to the convergence in results, whereas differences with more distant language groups account for the observed performance gap.

In addition to cross-linguistic factors, research indicates that vocabulary growth is also shaped by the stage of language learning. For instance, Robles-García (2022) found substantial lexical development during the early years of university L2 courses, but little to no growth in later years, suggesting a plateau effect at higher proficiency levels. This developmental trajectory provides an additional perspective for interpreting the present findings, as the relatively modest vocabulary scores may reflect not only cross-linguistic factors but also the stage of learners' lexical development.

Turning to item-level performance, in our study the pseudoword *acutación* was the most frequently misclassified item, with 69% of participants identifying it incorrectly. In contrast, the pseudoword *pemición* was the most accurately identified, with 93% of participants providing the correct response. All participants correctly recognized the real words *camisa* [shirt], *orgulloso* [proud], and *alegre* [happy], which may be explained by a combination of lexical transparency, frequency, and semantic salience. *Camisa* and *alegre* are classified as A1 words in the *Plan curricular del Instituto Cervantes* (2006) which places them within the basic lexicon taught at the earliest stages of Spanish instruction. *Camisa* is also widely recognizable internationally (cf. Italian *camicia*, French *chemise*), and *alegre* may be supported by associations with the Italian musical term *allegro*, while both *alegre* (A1) and *orgulloso* (classified as B2 word) denote highly salient emotional concepts that are semantically accessible across languages.

Moreover, a limited set of items reached a high level of recognition certainty, defined here as a proportion equal to or greater than 0.90 in one of the three response categories. The words that fulfilled this criterion were *zapato* (0.98), *besar* (0.98), and *matar* (0.98), *nevar* (0.95) and *tacaño* (0.92). The results of all 90 words and nonwords are presented in Table 1.

Table 1
Proportion of Responses for Each Word and Nonword

Item	**-2**	**0**	**1**	**Item**	**-2**	**0**	**1**	**Item**	**-2**	**0**	**1**
terzo	0,37	0,63	0,00	merodear	0,00	0,78	0,22	nevar	0,00	0,05	0,95
pellizcar	0,00	0,69	0,31	decar	0,24	0,76	0,00	musgo	0,00	0,81	0,19
pulmones	0,00	0,14	0,86	alardio	0,19	0,81	0,00	tacaño	0,00	0,08	0,92
batillón	0,61	0,39	0,00	pandilla	0,00	0,51	0,49	plaudir	0,34	0,66	0,00
zapato	0,00	0,02	0,98	fatacidad	0,22	0,78	0,00	besar	0,00	0,02	0,98
tergiversar	0,00	0,88	0,12	pauca	0,25	0,75	0,00	matar	0,00	0,02	0,98
pésimo	0,00	0,08	0,92	aviso	0,00	0,03	0,97	seda	0,00	0,36	0,64
cadeña	0,54	0,46	0,00	rompido	0,58	0,42	0,00	flaco	0,00	0,07	0,93
hacha	0,00	0,24	0,76	loro	0,00	0,37	0,63	esposante	0,32	0,68	0,00
antar	0,08	0,92	0,00	granuja	0,00	0,56	0,44	**orgulloso**	**0,00**	**0,00**	**1,00**
cenefa	0,00	0,92	0,08	estornudar	0,00	0,34	0,66	bizcocho	0,00	0,41	0,59
asesinato	0,00	0,05	0,95	torpe	0,00	0,05	0,95	hacido	0,32	0,68	0,00
helar	0,00	0,25	0,75	alfombra	0,00	0,08	0,92	cabello	0,00	0,03	0,97
yunque	0,00	0,69	0,31	rebuscar	0,00	0,15	0,85	**alegre**	**0,00**	**0,00**	**1,00**
regar	0,00	0,14	0,86	cadallo	0,24	0,76	0,00	engatusar	0,00	0,88	0,12
abracer	0,27	0,73	0,00	canela	0,00	0,27	0,73	temblo	0,31	0,69	0,00

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floroso	0,47	0,53	0,00	cuchara	0,00	0,08	0,92	polvoriento	0,00	0,46	0,54
arsa	0,20	0,80	0,00	jilguero	0,10	0,90	0,00	pemición	0,07	0,93	0,00
brecedad	0,08	0,92	0,00	martillo	0,00	0,34	0,66	hervidor	0,00	0,47	0,53
ávido	0,00	0,36	0,64	cartinar	0,15	0,85	0,00	cintro	0,22	0,78	0,00
capillo	0,00	0,42	0,58	ladrón	0,00	0,02	0,98	yacer	0,00	0,42	0,58
lacayo	0,00	0,68	0,32	ganar	0,00	0,02	0,98	atar	0,00	0,32	0,68
lampera	0,32	0,68	0,00	flamida	0,15	0,85	0,00	tiburón	0,00	0,10	0,90
látigo	0,00	0,42	0,58	candado	0,00	0,75	0,25	frondoso	0,00	0,69	0,31
bisagra	0,00	0,76	0,24	**camisa**	**0,00**	**0,00**	**1,00**	tropaje	0,22	0,78	0,00
secuestro	0,00	0,19	0,81	vegada	0,20	0,80	0,00	hormiga	0,00	0,19	0,81
acutación	0,69	0,31	0,00	fomentar	0,00	0,34	0,66	pozo	0,00	0,34	0,66

Note: Boldfaced items indicate real words that were correctly recognized by all participants.

Effects of demographic and experiential variables

Gender

An independent samples *t*-test was conducted to examine potential gender differences in vocabulary test performance. Women obtained an average score of 24.43 points (*SD* = 12.21), while men achieved an average of 16.6 points (*SD* = 11.1). This difference was not statistically significant, $t(4.94) = -1.49$, $p = .20$, although the effect size was moderate with wide confidence intervals, Cohen's $d = 0.66$ (95% CI [–0.27, 1.58]). The results indicate that gender was not a significant factor in vocabulary outcomes, thereby supporting H_0. Previous research on the relationship between gender and L2 vocabulary knowledge has yielded mixed findings, though often pointing toward a female-leaning advantage. For instance, studies with Spanish learners of English have shown that women frequently outperform men in receptive vocabulary size, particularly within high-frequency word bands (Jiménez Catalán & Ojeda Alba, 2009). Likewise, Agustín Llach (2011) reported that female learners produced more lexically-rich written texts, suggesting broader active vocabularies. Moreover, these findings are consistent with Hyde and Linn's (1988) meta-analysis of 165 studies on gender differences in verbal ability which reported a small mean effect size ($d = 0.11$) in favor of females. For vocabulary specifically, the difference was virtually negligible ($d = 0.02$), leading the authors to conclude that gender differences in verbal ability are no longer meaningful.

Age and course level

Based on Spearman correlations, age and course level were significantly correlated, $r(57) = .54$, $p < .001$. For that reason, we have conducted three regression models to examine the effects of age and course level on vocabulary performance.

In the first model, age alone was a significant predictor, $F(1, 57) = 14.26$, $p < .001$, explaining 20% of the variance ($R^2 = .20$). Each additional year of age was associated with an increase of approximately 2.20 points in vocabulary scores.

In the second model, course level alone was a significant predictor, $F(1, 57) = 21.07$, $p < .001$, accounting for 27% of the variance ($R^2 = .27$). Graduate students scored on average 13.16 points higher than undergraduates.

In the combined model including both predictors, the overall fit improved, $F(2, 56) = 14.30$, $p < .001$, with 34% of the variance explained ($R^2 = .34$). Both age and course level remained significant: each additional year of age predicted an increase of 1.40 points ($b = 1.40$, $SE = 0.58$, $t = 2.40$, $p = .02$), while graduate students scored on average 10.27 points higher than undergraduates ($b = 10.27$, $SE = 3.01$, $t = 3.42$, $p = .001$), controlling for age.

The results confirmed H1, demonstrating that both age and course level significantly predicted vocabulary knowledge, as older and graduate students consistently outperformed younger and undergraduate students. Age and course level, however, are far from straightforward predictors of lexical performance, which makes cross-study comparisons challenging, particularly when methodologies and samples differ. To date, LexTALE studies have not addressed this dimension. Nevertheless, age, course level, and especially proficiency have been investigated in lexical availability research (Agustín-Llach, 2021). This work shows that older and more proficient learners exhibit richer vocabulary production and more organized lexical networks, which aligns with our findings.

Age of acquisition

Participants varied in terms of language learning history: 13 participants (22%) had been learning Spanish since primary school[2], 34 (58%) since secondary school[3], and 12 (20%) since starting university. Descriptive statistics are presented in Table 2.

Table 2

Means and Standard Deviations of Test Scores by Age of Acquisition of Spanish

	M	*SD*
Primary School ($n = 13$)	26.92	15.02
Secondary School ($n = 34$)	25.85	8.52
University ($n = 12$)	14.42	14.30

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A one-way ANOVA revealed a significant effect of age of acquisition of Spanish on vocabulary scores, $F(2, 56) = 5.05$, $p < .01$, with a large effect size ($\eta^2 = .15$). Post-hoc comparisons using Tukey's HSD indicated that university-onset learners scored significantly lower than both primary- and secondary-onset learners ($p < .05$). No difference was observed between primary- and secondary-onset learners ($p = .96$).

The data confirmed H2, as participants who began learning Spanish earlier demonstrated significantly greater overall scores. Although research on the effect of age of acquisition (AoA) on ultimate L2 proficiency has failed to reach a clear consensus (Chen & Zhu, 2023), the same authors report a substantial link between AoA and vocabulary knowledge in EFL, citing two recent studies that confirm this association (Peters et al., 2019; Saito, 2022, as cited in Chen & Zhu, 2023). It is important to emphasize, however, that AoA in the contexts of EFL and SFL differs, since English is typically learned in early childhood as the first foreign language and Spanish in adolescence as the second or third in the Slovenian educational system. According to Lenneberg's (1967) Critical Period Hypothesis, there is a biologically determined window during which language acquisition occurs most efficiently; however, in our case the hypothesis is not directly applicable, as the comparison involves AoAs of 12, 15, and 19 years rather than early childhood onset.

Participation in Erasmus+ Programs

Of all participants, 13 (22%) had taken part in an Erasmus+ exchange program. A comparison with Welch's *t*-test of vocabulary test scores between Erasmus participants ($M = 32.23$, $SD = 12.21$) and non-participants ($M = 21.37$, $SD = 11.25$) showed statistically significant difference, $t(18.17) = 2.88$, $p < .01$. The difference between groups was large; Hedges' $g = 0.87$ indicated that Erasmus participants scored almost one standard deviation higher on overall score compared to non-participants.

Residence in a Spanish-Speaking environment

Participants' length of residence in a Spanish-speaking environment ranged from none (63%) to more than one year (3%). Descriptive results are presented in Table 3.

Table 3

Means and Standard Deviations of Test Score by Duration of Residence in Spanish-speaking Countries

	M	*SD*
Never ($n = 37$)	20,19	11.24
Up to 1 month ($n = 13$)	25.15	10.71
Up to 6 months ($n = 6$)	34.67	11.02
Up to 12 months ($n = 1$)	35.00	-
More than 12 months ($n = 2$)	42.50	10.61

A one-way ANOVA showed a significant effect of residence duration on vocabulary scores, $F(4, 54) = 4.15$, $p < .01$, with a large effect size ($\eta^2 = .24$). Tukey's HSD post-hoc tests revealed that participants with no residence differed significantly from those with up to six months

($p < .05$). Other group comparisons were not significant. However, the small number of participants that stayed longer than 6 months limits the reliability of these findings.

To address unequal group sizes, participants were also categorized dichotomously into those who had ever resided in a Spanish-speaking environment versus those who had not. Results again revealed a significant effect, $F(1, 57) = 9.74$, $p < .01$, $\eta^2 = .14$. Participants with residence experience ($M = 20.19$, $SD = 11.24$) outperformed those without residence ($M = 29.77$, $SD = 11.69$).

Consistent with H3, students with immersion experience, whether through study abroad or residence, achieved notably higher scores in lexical knowledge. Regarding direct exposure to L2, such as Erasmus exchange or a different kind of residence, Milton & Meara (1995) estimate that European exchange students while studying in English-medium environments (but not taking English-language courses) for 6 months gained approximately five times more vocabulary than students without immersion experience in L2. This study aligns with our results, which similarly show outperformance of students living in Spanish speaking countries.

Self-reported language proficiency

Participants reported different levels of proficiency across a range of languages, with Spanish and English showing the highest concentrations at upper-intermediate (B2) and advanced levels (C1–C2). By contrast, German, Italian, French, and other regional languages were represented mainly at beginner or intermediate levels, with only a small number of students reporting advanced proficiency.

The distribution of self-reported language proficiency (see Table 4) reveals clear patterns across languages. Besides Slovene or other Slavic language as L1, English was the strongest L2 language overall, with almost all students reporting at least a B1 level and the vast majority reaching B2 or higher. Spanish showed the widest spread of proficiency levels, ranging from A1 to C2, but most students clustered around B2 and C1. In contrast, German, Italian, and French were predominantly reported at beginner to lower-intermediate levels, with only isolated cases of higher proficiency. Regional languages such as Croatian, Serbian, and Bosnian displayed a more heterogeneous profile, with learners distributed across all proficiency bands, including a small number at advanced levels. Other languages (e.g., Macedonian, Portuguese, Russian) were represented mostly at beginner levels, indicating limited exposure or learning experience.

A high positive impact of multilingualism on vocabulary acquisition has already been highlighted in our previous study with Slovenian university students of Spanish, especially at the more advanced levels of proficiency (Šifrar Kalan et al., 2024).

A Spearman correlation indicated a strong positive relationship between self-reported Spanish proficiency and vocabulary test performance, $r(57) = .73$, $p < .001$. Although self-ratings were ordinal, they were treated as continuous for regression analysis. A subsequent linear regression confirmed that self-reported proficiency significantly predicted vocabulary scores, $F(1, 57) = 81.13$, $p < .001$, explaining 59% of the variance ($R^2 = .59$). The regression equation was:

Vocabulary score = –9.72 + 8.82 × self-rating

The slope was significant ($b = 8.82$, $SE = 0.98$, $t(57) = 9.01$, $p < .001$), suggesting that each higher self-reported proficiency level corresponded to an average increase of 8.82 points. The

intercept was significant, $a = -9.72$, $SE = 3.86$, $t(57) = -2.52$, $p < .05$. Although participants had an option of rating their proficiency as 0 (not proficient), none in this sample selected that value. Therefore, the intercept represents a model-based extrapolation of the expected score for a non-proficient individual.

Table 4
Frequency of Self-reported Proficiency in Different Languages (CEFR levels)

Language	None	A1	A2	B1	B2	C1	C2	Total
Spanish	0	3	3	12	27	13	1	59
English	0	0	0	8	27	20	4	59
German	33	13	7	5	1	0	0	59
Italian	34	14	4	3	1	0	3	59
French	48	4	3	1	2	1	0	59
Croatian	21	6	14	6	5	5	2	59
Serbian	28	4	9	4	3	4	7	59
Bosnian	34	4	9	4	1	4	3	59
Macedonian	54	1	1	1	1	1	0	59
Portuguese	51	4	2	1	1	0	0	59
Russian	52	4	2	0	1	0	0	59

Consistent with H4, learners' self-reported proficiency strongly aligned with their actual test performance. The close relationship between EFL learners' vocabulary size and their L2 proficiency has also been found by several researchers (Miralpeix & Muñoz, 2018; Schmitt, 2014).

Conclusion and Pedagogical Implications

The present study examined the influence of demographic, experiential, and self-reported factors on vocabulary test performance in multilingual Spanish students at the University of Ljubljana. Results revealed that while gender had no significant effect, age and course level were significant predictors of vocabulary knowledge, with older participants performing better. Graduate students consistently outperformed undergraduates on the vocabulary test, suggesting that higher course level—and the associated age factor—was linked to greater lexical knowledge. Moreover, the age of acquisition of Spanish played an important role: those who began in primary (age 12) or secondary school (age 15) significantly outperformed learners who began at university level. Experiential factors also emerged as influential. Both participation in Erasmus+ programs and residence in a Spanish-speaking environment were strongly associated with better outcomes. Finally, self-reported proficiency was a robust predictor, explaining a large share of the variance in vocabulary performance and suggesting that learners' perceptions of their abilities—that is, their metacognitive judgements—closely align with their actual test results.

Taken together, these findings highlight the complex interaction between learners' demographic backgrounds, language learning histories, and self-perceptions. The results tentatively suggest that sustained exposure to the target language and an earlier onset of learning may play an important role in vocabulary acquisition; nevertheless, given the sample size and the focus on vocabulary only, these findings should be interpreted with caution and warrant further investigation. As with any research endeavor, this study could not avoid certain limitations. First, the relatively small subgroups and their uneven distribution may have constrained the generalizability of the results. Second, it should be noted that our results were often compared with studies in EFL, which remain far more numerous than studies focusing on vocabulary in SFL. Finally, although the study provides a valuable step towards understanding how demographic, experiential, and self-reported factors contribute to vocabulary, for broader understanding of lexical knowledge the findings should be examined in relation to other language skills. Future research will therefore extend this work by exploring the relationship between vocabulary and additional language skills, beginning with listening comprehension.

From a pedagogical perspective, the results suggest that L2 students of Spanish, even advanced-level students, need to continue building up their vocabulary. We can relate our suggestions to the arguments put forward by Dodigović and Agustín Llach (2020), who emphasize the importance of needs analysis, curriculum planning, and systematic support for vocabulary learning strategies. As they note, "vocabulary learning strategies are frequently taken for granted, leaving the students ill-equipped for the task" (p. 2). Teachers, therefore, should not assume that learners will naturally acquire effective strategies but should explicitly coach them in their use (Dodigović & Agust ń Llach, 2020; Thornbury, 2002).

Moreover, technology offers powerful tools for enhancing lexical acquisition. AI-based instruction within computer-assisted language learning (CALL) environments has been shown to provide personalized, continuous, and immediate feedback (Dodigović, 2005, 2007), particularly valuable in contexts where immersion opportunities are limited. Integrating such technology into the curriculum could compensate for the limitations observed in learners who begin language study later or who lack immersion experiences.

In conclusion, effective vocabulary instruction should combine insights from learner profiles (age, age of acquisition of Spanish, residence, self-perceptions) with pedagogical innovation. Teachers and curriculum designers are encouraged to systematically incorporate strategy training and leverage AI-driven approaches, ensuring that learners receive both the strategic tools and the continuous feedback necessary for successful second language lexical development.

Notes

1. Overall, 26 words had a frequency of less than one occurrence per million words (pm), 23 had a frequency from one to five occurrences pm, 14 words had a frequency ranging between 6 to 10 occurrences pm, 17 words had frequencies from 11 to 20 pm, 8 words had frequencies between 21 and 100 pm, and two words (*ganar* (to win) and *matar* (to kill)) had frequencies above 100 occurrences pm.
2. In Slovenia, Spanish is systematically offered in public primary schools from the age of 12, the earliest point at which students can select it as second foreign language.
3. In Slovenia, Spanish is systematically offered in secondary schools from the age of 15.

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