

Age and Gender Influences on Productive Vocabulary Expansion: Evidence from Moroccan Middle School EFL Learners

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ABSTRACT

Lexical knowledge plays a crucial role in developing spoken and written proficiency in foreign language learning. This process of word acquisition is determined by several key factors, including age and gender. Previous accounts on age- and gender-related influences on productive vocabulary expansion have paid scant attention to middle school EFL learners. This study investigates whether there are age- and gender-oriented disparities in the pace of productive vocabulary expansion among 8th- and 9th-grade Moroccan EFL students. Both age groups were introduced to English for the first time as the Moroccan Ministry of Education expanded English instruction across all middle school grade levels. Both stratified and convenience sampling are combined in this inquiry. Drawing on a quantitative approach, the data were gathered through the Lexical Availability Test (LAT). This test compared students' gains over an equivalent period with the same amount of exposure. Two separate one-way ANOVA tests were performed, and the results demonstrated significant age and gender variances in the pace of vocabulary expansion among 8th- and 9th-graders in terms of vocabulary size, spelling accuracy, and lexical complexity. This study established theoretical and pedagogical implications that enrich the discourse on SLA, age, gender, and the pace of vocabulary development among adolescents.

Keywords: Age group, English as a foreign language, gender disparities, middle school, productive vocabulary expansion

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INTRODUCTION

Vocabulary learning is a major factor in foreign language learning (Jensen & Cadierno, 2024; Uchihara & Clenton, 2023), as a limited lexical repertoire hinders effective communication (Susanto, 2017). In particular, Nation (2001) highlights the importance of vocabulary proficiency as a key determinant in the development of basic language skills, i.e., speaking, writing, reading, and listening. He also regards the lack of lexical knowledge as the greatest impediment learners must overcome. Within the sphere of foreign language learning, lexical knowledge plays a key role in building L2 competence. In this context, Hu and Nation (2000) reported that for proper comprehension, second-language learners must be familiar with 98% of the lexical items of the text with which they are engaged. Additionally, Laufer (1996) asserts that in neither the native tongue nor a foreign language can one achieve comprehension without grasping the text's lexical items. This underscores the importance of lexical knowledge as a precursor of foreign language comprehension.

Productive vocabulary, which is the main focus of the present research, is regarded as an active capacity that refers to the ability to generate words to capture the intended meaning of the speaker in written and spoken forms (Fontecha, 2014; Nation, 2001; Susanto, 2017). Acquiring knowledge of productive vocabulary is also important for increasing the pace of word processing in real-life communication (Allal-Sumoto et al., 2023). Hence, it is vital to assess the breadth and depth of foreign language learners' vocabulary as key determinants influencing their ability to develop certain linguistic skills (Meara, 1996). Empirical evidence has substantiated that vocabulary knowledge affects L2 competence and overall comprehension (Allal-Sumoto et al., 2023; Uchihara & Clenton, 2023). Beyond the simple process of storing lexical items, productive vocabulary development is a demanding and active cognitive operation that involves processing, encoding, consolidating, and retrieving words and is modulated by age and gender (Bertram et al., 2025; Gordon et al., 2022; Muñoz, 2006; Wu et al., 2025).

Educational language policy in Morocco has taken a new direction, with the recent decision to introduce English classes in public middle schools starting from grade 7 instead of grade 9. According to the Ministry of National Education (2023), this new reform aims to foster multiculturalism, linguistic diversity, and mastery of foreign languages among learners at an early stage. As English

solidifies its position globally, many countries have implemented policies to promote proficiency and early learning of the language. For example, China and Korea have reduced the starting age at which English is made compulsory in their education systems. China has lowered it from 11 to 9 years old, whereas South Korea has lowered it from 13 to 9 years old (Nunan, 2003). Morocco has recently implemented reforms that involve introducing English classes in public middle schools starting from grade 7 instead of grade 9.

Undoubtedly, introducing English earlier in public middle schools can offer students various advantages, the most crucial of which is greater exposure. However, this study seeks to investigate whether lowering the age of English instruction is connected to meaningful developmental differences that play a crucial role in second language acquisition. More specifically, it focuses on whether there are age and gender disparities in productive vocabulary expansion to understand how to optimize lexical development for this scholarly assembly. Importantly, the current study adopts the perspective of the cognitive-interactionist model of SLA, which argues that gender-oriented variances and age-related cognitive maturation are not peripheral contextual factors but rather are influential factors determining learners' L2 vocabulary processing and production in formal instructional settings (Muñoz, 2006; Robinson, 2002).

There is a dearth of research on the patterns of productive vocabulary expansion by age group and gender among middle school EFL learners on a global scale. Therefore, the paper addresses this gap by investigating whether there are significant age-group and gender-oriented disparities in the productive vocabulary expansion of Moroccan middle graders following the same period of exposure. This study is critical because it contributes, with empirical evidence, insights into how age group and gender affect the development of EFL learners' vocabulary knowledge. It also provides practical pedagogical recommendations for middle school EFL practitioners to accommodate such potential variances in the EFL teaching context.

LITERATURE REVIEW

Theoretical Framework

The current study leverages the cognitive-interactionist model of SLA (Long, 1996; Robinson, 2002) as a theoretical framework that underpins its key variables and interprets its major findings. It draws on Long's (1996) interaction hypothesis, which emphasizes the significance of negotiated interaction and the mutual exchange of information in language acquisition that allows learners to strengthen their linguistic skills by practicing, receiving feedback, and producing adjusted language output. This framework was elaborated by Robinson (2002) to address individual differences, maintaining that cognitive factors, i.e., working memory and attention, are vital in maximizing learners' benefit from interaction

and instructional input. In light of this refined conceptualization, age and gender move beyond being mere demographic indicators to play an influential role in the cognitive system underlying language acquisition.

In the realm of vocabulary development, the cognitive-interactionist framework dovetails with the breadth and depth categorization of the lexical model (Nation, 2001; Qian, 1999). While vocabulary breadth designates the number of linguistic forms that a language learner can comprehend or produce, vocabulary depth denotes the informational knowledge associated with those forms (Meara, 1996). From the cognitive-interactionist standpoint, the cognitive processing of language input determines vocabulary breadth, by repeated exposure, and vocabulary depth through sophisticated processing, connecting linguistic form, meaning, and contextual use (Nation, 2001). Consistent with the established research questions, the current investigation is theoretically driven by the breadth/depth model and is operationalized through the Lexical Availability Test (Ferreira et al., 2019), which evaluates the breadth through the number of lexical items produced and the depth of vocabulary by way of spelling accuracy and lexical sophistication.

The cognitive-interactionist framework is critically relevant for investigating adolescent EFL learners, as it provides insights into the importance of cognitive maturation in formal teaching contexts, where linguistic input is systematically managed (Muñoz, 2006). This theoretical platform also contributes to the broader discussion surrounding the role of age in formal SLA settings. Although children generally achieve higher levels of second language proficiency over time, adults acquire language initially at a faster rate (Krashen et al., 1979). In this respect, Al Maaytah (2026) posits that younger learners benefit from increased brain flexibility, whereas adults are distinguished by more refined metalinguistic awareness and stronger motivational drivers. The relationship between positive attitudes toward L2 and motivation is reconciled by metacognitive strategies, a synergy that serves as a foundation for learning development (Mahmoodi-Shahrehabaki & Oslund, 2025). This framework is in harmony with the scope of the current study, in which both 9th- and 8th-grade participants are introduced to English for the first time. Thus, gender and age-dependent cognitive maturation are the primary determinants of learner variability in the depth of lexical processing, measured by means of vocabulary size, spelling accuracy, and lexical complexity, rather than accumulated exposure.

Productive and Receptive Vocabulary

Foreign vocabulary learning involves two different types: productive and receptive. Fontecha (2014) defined the former as the ability to generate words to capture the intended meaning of the speaker in written and spoken forms. On the other hand, the latter is related to one's capacity to perceive and grasp the meaning of a linguistic form in listening and reading (Laufer & Goldstein, 2004; Nation,

2001; Susanto, 2017). Productive vocabulary is regarded as an active capacity, whereas receptive vocabulary is commonly classified as a passive competency (Fontecha, 2014; Montero-SaizAja, 2021; Nation, 2001; Susanto, 2017). Vocabulary learning is a major factor in foreign language learning, as a limited lexical repertoire hinders effective communication (Susanto, 2017). In particular, Nation (2001) highlights the importance of vocabulary proficiency as a key determinant in the development of basic language skills, i.e., speaking, writing, reading, and listening. He regards the lack of lexical knowledge as the biggest impediment that learners have to conquer. The following subsections underscore the interplay between foreign vocabulary development and two prominent constructs, namely, age and gender.

Age and Vocabulary Expansion in EFL Settings

Extensive studies have been conducted on the relationship between age and vocabulary expansion in first language acquisition. Such research has examined lexical development in children, adults, and impaired learners (Miralpeix, 2008). Nonetheless, Singleton (1995) notes that the age issue in relation to second-language lexical acquisition is often overlooked. Similarly, Haastrup and Henriksen (2001) recognize that syntax has traditionally been prioritized over lexis in models aiming to provide comprehensive explanations of second language acquisition. For instance, Harley and Wang (1997), as cited in Miralpeix (2008), noted that Lenneberg, the originator of the critical period hypothesis for language acquisition, appeared to believe that vocabulary learning was not subject to age-related limitations and focused more on syntax and phonology instead.

Scholars have investigated the fundamental factors that contribute to the prevalence of syntax and phonology over vocabulary in the context of the influence of age on language acquisition. According to Haastrup and Henriksen (2001), one explanation is related to the inherent characteristics of lexis. Unlike grammar, vocabulary goes beyond form, encompassing a dimension of meaning. However, most second language acquisition frameworks focus on structural elements, particularly syntactic aspects, thus making it more challenging to incorporate the meaning part of the vocabulary. In addition, unlike phonology and syntax, vocabulary expansion is an endless developmental process. Phonological and grammatical competence differ from lexical competence. Native English speakers of any dialect or language understand phonemes, allophonic variants, phonotactic restrictions, complicated syntactic structures, and stylistic elements at a certain age. Lexical proficiency never achieves this sort of ultimate command. Infant vocabulary acquisition surges and then slows. However, an individual's vocabulary may continue to expand over the course of their lifetime (Stubbs, 1986).

One of the extensively examined topics is the correlation between age and vocabulary expansion by comparing EFL students of various age groups over an

extended period. Going way back, Oller and Nagato (1974) aimed to investigate whether, over the long term, Japanese students who have initiated their EFL instruction from grade 1 in primary education would outperform those who have commenced such studies at the middle school level (from grade 7). Lexical command was evaluated through cloze tests for both student cohorts in the 7th, 9th, and 11th grades. The findings indicated that in grade 7, individuals who commenced their English as a Foreign Language (EFL) at an earlier age demonstrated significantly superior performance compared to those who started later. However, by grade 9, the disparity diminished, although early starters still held the advantage. Nevertheless, in grade 11, there was no noticeable distinction between the two groups, as early EFL starters were unable to sustain their initial advantage over their late counterparts during high school. The study posited that the initiation of English as a foreign language (EFL) instruction during primary education may not yield sustainable advantages in certain instances, underscoring the necessity for enhanced collaboration between elementary and secondary foreign language curricula (Oller & Nagato, 1974).

In a related fashion, Miralpeix (2008) sought to determine whether an earlier introduction to English (at age 8) would result in more proficient vocabulary knowledge by the conclusion of secondary education than a later start (at age 11), despite receiving the same number of formal instruction hours (726). To this end, the research instruments consisted of a background questionnaire, oral tests (semi-guided interview, storytelling, role-play), and written tests (composition, cloze test). Vocabulary measures involved the number of tokens, types, word families, type-token ratio (TTR), lexical density (LD), and a new measure called D proposed by Malvern and Richards to assess lexical diversity. The results of the research indicated that there was no discernible advantage to beginning early since older participants either performed better or similarly to early starters in both free and controlled vocabulary tests (Miralpeix, 2008).

Longitudinal studies consistently demonstrate that, in some contexts, children who began their English as a Foreign Language (EFL) instruction in the first or second grade fail to preserve their vocabulary growth advantage over a prolonged duration, in contrast to those who began their EFL training in the fifth or seventh grade (Miralpeix, 2008; Oller & Nagato, 1974). Wang & Zhang (2025) provided recent evidence from longitudinal research on Chinese EFL 10th and 11th graders, revealing vocabulary breadth as a key determinant of reading comprehension at early stages, in contrast to vocabulary depth, underscoring the significance of cognitive maturation and instructional experience in the acquisition of lexical knowledge. However, few scholarly investigations exist concerning gender and age-related variances in vocabulary growth among public middle school students in the Moroccan educational setting. This research seeks to fill this gap by determining whether there are any differences in the pace of vocabulary

expansion across 8th- and 9th-grade Moroccan students following equivalent amounts of exposure.

Beyond the amount of exposure to L2, investigating variances in lexical expansion among 8th and 9th graders is theoretically meaningful, as both age groups are at separate cognitive developmental stages. Compared with 8th-graders (average age 14-15), 9th-grade learners commonly demonstrate superior active memory capacity, complex executive functioning, and metacognitive awareness, which are key determinants of productive vocabulary access and use (Blakemore & Choudhury, 2006). With empirical evidence, Muñoz (2006) reported that the relatedness between age and vocabulary acquisition in EFL settings is contingent on the learner's grade level and cognitive maturation stage. In a more recent study, Bertram et al. (2025) found that lexical development is a grade-sensitive process that progresses at a steady rate. Additionally, gender-oriented variability in productive vocabulary expansion among 8th- and 9th-grade EFL learners remains an empirical gap, as prior relevant literature has focused on sixth-grade students (Jiménez & Ojeda, 2009) or second-year secondary school learners (Fontecha, 2010). In the Moroccan context, starting English instruction at the eighth-grade level, instead of the 9th grade, constitutes a pivotal transition within the curriculum, which coincides with a period of noteworthy upsides and limiting aspects. This critical juncture is associated with biological, social, behavioral, and emotional shifts that affect student engagement and self-perception, which have direct implications for productive vocabulary expansion. Thus, cognitive developmental variability and contextual shifts within the curriculum form the theoretical rationale for the current cross-sectional comparison.

Gender and Productive Vocabulary

The construct of gender within the domain of foreign vocabulary acquisition has been the focus of numerous scholarly studies dealing with varying aspects. For instance, Harji et al. (2015) assessed students' vocabulary levels, revealing no gender-related differences among first-year university students in Malaysia. In contrast, Boyle (1987) reported that males prevailed over females in grasping words during listening examinations. Such conflicting and inconclusive findings may be attributable to the varying aspects measured, tests and methods utilized, and the learning contexts examined across the different studies (Llach & Gallego, 2012; Montero-SaizAja, 2021). On theoretical grounds, such inconsistencies should arise from the cognitive interactionist standpoint, as gender does not directly influence cognitive processing ability; rather, it is strongly associated with individual difference variables, such as motivation and attentional investment, which vary on the basis of sociocultural environment, type of learning activity, and instructional context (Robinson, 2002).

With respect to gender disparities in receptive vocabulary size, Llach & Gallego (2012) assessed the lexical breadth of female and male learners in the 4th

to 9th grade. The data were collected using a model of the receptive vocabulary levels test (VLT), and the outcomes underscore the upper hand of female learners over their male peers at the beginning, while the latter have an edge at later stages. This study highlights females' consistency in terms of lexical size expansion and males' later maturation by virtue of the psychological and physiological changes they undergo during adolescence.

However, there has been limited academic inquiry into the question of gender and its relation to productive vocabulary. Montero-SaizAja (2021) explored the intersection between gender, learning strategies, and productive vocabulary among 51 EFL learners in the 12th grade of Spanish education. The study consists of a questionnaire and a productive vocabulary level test to evaluate gender-based differences among participants in both learning strategies and productive vocabulary. The authors reported significant variances in the former, as females used more learning strategies than males did, while there were no significant gender disparities in productive vocabulary. While this study provides promising outcomes related to the intersection of gender and productive vocabulary, its sample size remains limited in focus and thus cannot be representative or generalizable for all EFL students belonging to either middle or high school contexts. The present paper aims to extend this scope by providing empirical data related to middle school EFL students.

According to Fontecha (2010), within a designated time frame, female students in the second grade of secondary education in Spain exhibited a statistically significant advantage over their male counterparts in terms of generating the maximum number of words possible on six particular semantic fields. The results also revealed that intrinsic motivation affects students' outcomes in terms of vocabulary production for both genders. Quantitative data collection involved a survey on students' motivation and a lexical availability test. In the Indonesian context, Husna & Yasin (2025) revealed that while female undergraduate students produced more lexical items overall, their male counterparts demonstrated more lexical diversity. The goal of the current research is to broaden the existing knowledge on the role of gender in influencing productive vocabulary development among two middle school cohorts in the Moroccan context.

Research Questions

The purpose of this study is to understand the role of age group and gender in the development of productive vocabulary among middle school EFL learners, a topic that is often overlooked. Therefore, the present study is driven by the following research questions:

- (i) Do age group and gender influence the breadth of productive vocabulary among middle school EFL students?
- (ii) Do age group and gender influence the depth of lexical knowledge among middle school EFL students?

RESEARCH METHOD

Research Design and Instrument

Consistent with the established research objectives and questions, this investigation is based on a quantitative method. A Lexical Availability Test (LAT) was administered to 8th- and 9th-grade students at Othman Ibn Affan public middle school in the Haouz territory. This productive vocabulary test consists of the ease with which participants retrieve and produce the maximum number of words on a particular semantic field and within a specific time frame (Ferreira et al., 2019). It involved five English keywords that describe five distinct lexical domains, namely, drinks, sports, subjects, kinship terms, and numbers. The choice of these word fields is based on the units they have learned until the day of the test. This instrument required students to independently generate as many words as possible within each word category in 20 minutes. This test was utilized to compare students' gains over an equivalent period, with the same amount of instructional exposure (37 hours). Given that both age groups have been introduced to English for the first time, this test offers insights into age and gender disparities in students' lexical variety and vocabulary size.

The vocabulary test word counts are totaled and compared between the 8th and 9th graders after the same amount of exposure to English instruction (37 hours). The analysis of vocabulary gains encompasses (1) the total number of words, serving as an indicator of lexical breadth; (2) the number of correctly spelled words, as a marker of the depth of phonological and orthographic knowledge; and (3) the number of complex words, specified as lexical items of three or more syllables, as a metric to assess lexical complexity. All types of words that belong to the same lexical field are accepted, nouns and verbs, in all their forms, singular or plural, infinitive, gerund, or regular past. Additionally, repeated tokens are counted only once. In spelling accuracy, unintelligible words are not counted. The three-syllable criterion used for word complexity is regarded as a phonologically grounded index rather than a semantic or morphological index. In this regard, the average number of syllables per word is among the prominent precursors of lexical sophistication (Guo et al., 2013). This operational approach allows a systematic and reliable quantification of the participants' outcomes, precluding the influence of subjective evaluations of lexical sophistication.

Participants and Setting

The total number of students who took the written productive vocabulary test was 187. This includes 98 students belonging to three classes of the 9th grade level, with 58% female and 42% male participants. The test also covered 89 students from two classes of the 8th-grade cohort, out of which females represented 53%, while their male counterparts constituted 47% of the sample. All the participants were exposed to English for the first time, and both age groups were subjected to the same exposure hours (37 hours) before the testing procedure. Stratified sampling and convenience sampling are combined in this inquiry. The selection of two different subgroups of participants, that is, 8th- and 9th-grade students from public middle schools in the Marrakesh-Safi region, makes it a stratified sampling. It also involves convenience sampling, as only available students were tested and observed. While convenience sampling saves time for research purposes, as the target population is readily accessible, it is important to acknowledge that this approach remains subject to bias of noncoverage and self-selection (Golzar et al., 2022). Thus, the outcomes of the current study, while providing valuable contextualized insights, may not be representative and generalizable as students' learning experiences are prone to variation across different regions and sociocultural contexts in Morocco.

Procedure and Data Analysis

An open-ended written vocabulary examination was conducted to assess differences in vocabulary development among students in the 8th and 9th academic levels at Othman Ibn Affan Public Middle School, located in the Haouz territory. During a 20-minute set time, the participants were seated in a quiet classroom environment and asked to produce as many words as they could recall as possible within each semantic field, writing at their own pace.

The assumptions of normality and homogeneity of variance were analyzed before the initiation of the one-way ANOVA tests. The Shapiro-Wilk test was employed to evaluate normality. Despite detecting modest departures from normality in some distributions, the robustness of the ANOVA test is not compromised by these violations in the presence of relatively large group sizes (Field, 2013). Levene's test was leveraged to assess the homogeneity of the dataset. Statistical checks revealed that the assumption was maintained for all the dependent variables, as well as for both the independent variables (all Levene's $p > .05$). Two separate one-way ANOVA tests were performed to determine whether there are statistically significant differences related to both gender and age group among 8th and 9th graders in terms of vocabulary size, spelling accuracy, and lexical complexity. Two tests were carried out based on two independent variables, one specific to gender and the second related to age group, and involved three dependent quantitative variables, namely, the total number of words, the number of correctly spelled words, and the number of complex words.

RESULTS

Age and Vocabulary Production

A thorough analysis of the data garnered from the lexical availability test yielded several key revelations. First, comparing the differences among age groups, that is, 8th grade (average age of 14-15) and 9th grade (average age of 15-16), the results reveal a notable difference, as the former age group produced a total number of words of 3033, with a mean of 34.08, whereas the latter generated 4843 in totality, with a mean of 49.42. The words that both grade levels generated belong to the same semantic fields (drinks, sports, subjects, kinship terms, numbers), varying only in the number of words produced, providing indications about students' lexical breadth in each domain. This suggests that 9th-graders have retained more tokens than their 8th-grade counterparts within the same period of exposure (37 hours), despite both age groups being introduced to English for the first time. Hence, there are differences in the breadth of vocabulary that are linked to age groups.

Examining spelling accuracy, 9th-grade students have a higher mean number of correctly spelled words, that is, 30.62, than 8th-grade students, who averaged 12.55 words. In addition, the results show that the percentage of correctly spelled words among 9th graders is 62%, as opposed to 37% for 8th-grade students. This finding indicates that spelling accuracy is another area of age-related variation in vocabulary acquisition, as 9th-grade students showed more competence in this regard than their 8th-grade peers did. Breaking down lexical complexity, the mean number of '3-syllable and above' words for 9th-grade students is 5.04, while their 8th-grade peers have a mean of 3.40. This shows that there are slight differences in terms of lexical complexity depending on age group among the selected participants. The following table recaps the statistical results of the two age groups in the production vocabulary test:

Table 1: *Statistics of the Performance of the Two Age Groups in the Lexical Availability Test*

	Grade	N	M	SD	Minimum	Maximum
Total words	8th	89	34.08	17.01	5	91
	9th	98	49.42	20.72	8	112
	Total	187	42.12	20.49	5	112
Correctly spelled words	8th	89	12.55	12.80	0	62
	9th	98	30.62	16.45	4	82
	Total	187	22.02	17.33	0	82
Complex words	8th	89	3.40	3.15	0	15
	9th	98	4.99	3.32	0	14
	Total	187	4.24	3.32	0	15

Note. *M* = mean, *SD* = standard deviation

A one-way ANOVA test was performed to probe into the differences between the two age groups, that is, 8th and 9th graders, in terms of vocabulary size, spelling accuracy, and lexical complexity. The results show significant differences between 8th- and 9th-grade students with respect to the total number of words produced ($F=30.244$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .140$, 95% CI concerning the mean difference [9.84, 20.84]), the number of correctly spelled words ($F=69.276$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .272$, 95% CI for the mean difference [13.79, 22.36]), and the number of complex words ($F=11.164$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .057$, 95% CI for the mean difference [0.65, 2.52]). On the basis of Cohen's (1988) benchmarks, the analysis of effect sizes revealed that age group is a major predictor of both vocabulary breadth ($\eta^2= .140$) and spelling accuracy ($\eta^2= .272$) but has a medium but statistically meaningful effect on lexical complexity ($\eta^2= .057$).

Gender and Vocabulary Production

An investigation of the findings reveals key gender trends in vocabulary production among 8th- and 9th-grade students. Compared with their male counterparts, female students produced more lexical terms across the two age groups. The distribution of the total number of generated words is 1915 and 3300 for 8th- and 9th-grade females, respectively, with a mean of 50.14 words. On the other hand, their corresponding male peers produced a total count of 1118 and 1543 tokens, respectively, with a mean of 32.06 words. Additionally, the data also show gender-based variances concerning the sum of correctly spelled words for both grade levels. Concerning 8th-grade students, out of 1915, a figure of 786 words is correctly spelled by females, with a percentage of 41%, while only 331 accurately spelled tokens—that is, 29.7% of the aggregate number of 1118 generated by their male counterparts.

With respect to the 9th graders, female students precisely wrote 2098 words, that is, 63.6% of the final count they produced was within 3300, as opposed to 903, constituting 58.5% of the total number of tokens authored by male students, which are correctly spelled. Additionally, the averages of correctly spelled words for 8th- and 9th-grade females are 16.72 and 36.80, whereas their male counterparts averaged 7.88 and 22.02, respectively.

An analysis of the data, as illustrated in Figure 1, shows gender-related differences in spelling accuracy between the two grade levels. Therefore, according to these findings, a clear pattern is identified, indicating an advantage of female students over their male peers in terms of both the breadth of vocabulary size and spelling accuracy. The results also revealed that female students produced 557 words belonging to the category of complex words, with an average of 5.355 words, whereas the corresponding total count for male students was 235 words, with an average of 2.86 words. This substantial gap in the number of complex

words indicates that female students not only have the upper hand in the scope of vocabulary knowledge but also in the complexity of the words retained.

The following table shows the statistical results of the free production vocabulary test by gender among 8th- and 9th-graders:

Table 2: Performance Statistics by Gender in the Lexical Availability Test

	Gender	N	M	SD	Minimum	Maximum
Total words	F	104	50.14	20.27	12	112
	M	83	32.06	15.87	5	82
	Total	187	42.12	20.49	5	112
Correctly spelled words	F	104	27.73	18.41	0	82
	M	83	14.87	12.75	0	56
	Total	187	22.02	17.33	0	82
Complex words	F	104	5.36	3.19	0	15
	M	83	2.83	2.95	0	14
	Total	187	4.24	3.32	0	15

Note. *M* = mean, *SD* = standard deviation

A one-way ANOVA test was carried out to examine gender differences in terms of vocabulary size, spelling accuracy, and lexical complexity. The results show significant differences between females and males with respect to the total number of words produced ($F=44.320$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .193$, 95% CI concerning the mean difference [12.72, 23.44]); the number of correctly spelled words ($F=29.271$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .137$, 95% CI for the mean difference [8.17, 17.55]); and the number of complex words ($F=30.826$ and $\text{sig}=0.000$; that is, $p<0.05$, $\eta^2= .143$, 95% CI concerning the mean difference [1.63, 3.42]). As documented by Cohen (1988), the analysis of effect sizes revealed that gender is a major explanatory variable for variance in vocabulary breadth ($\eta^2= .193$) and lexical complexity ($\eta^2= .143$) and has a medium to substantial effect on spelling accuracy ($\eta^2= .137$). The findings of the production vocabulary test provide evidence that shows significant disparities between the two age groups, 8th and 9th graders, in terms of vocabulary size, spelling accuracy, and lexical complexity. In addition, it identifies a clear pattern that demonstrates a significant advantage for female students, who belong to both age groups, over their male peers, not only in the breadth of vocabulary size but also in terms of spelling accuracy and lexical complexity.

DISCUSSION

The outcomes of this study revealed that despite both age groups being introduced to English for the first time and with the same amount of exposure, 9th-grade students outperformed their 8th-grade counterparts in the productive vocabulary test. In the realm of second language acquisition, this finding is significant, as it questions the prevalent assumption of 'the younger, the better' and requires a thorough analysis of the developmental and pedagogical dimensions that are involved in the connection between age and adolescent EFL learning. Cognitively, such disparities in productive vocabulary performance are tied to the growth of metalinguistic and executive functions. Blakemore & Choudhury (2006) revealed that between early and mid-adolescence, a significant and continuous process of development occurs at the level of working memory, cognitive, and metacognitive control. Having such an advanced cognitive structure allows older students to connect well with productive vocabulary that is based on active retrieval, organization, and word use.

Concerning the age factor paradox in second language learning, although the critical period hypothesis (Lenneberg, 1967) reveals an edge for younger learners in terms of phonological mastery, the findings of this study align with those of prior investigations by Muñoz (2006), which proved that older learners can be exceptionally effective in formal learning environments, specifically at the outset of the learning process in vocabulary and morphosyntax. Additionally, the findings of this investigation are consistent with those of García Mayo (2003), who reported that older adolescents exhibited a distinctive advantage in controlled productive tasks over younger learners despite having the same amount of exposure, which is associated with the differences in terms of the levels of cognitive growth and learning strategies. In this regard, Murphy (2026) asserts that instructional practices must cater to learners' developmental realities, including age, through meaningful use of vocabulary across a myriad of contexts and emotional engagement.

In a large-scale study, consistent results were recorded, as 9th-grade students outscored their 8th-grade peers on vocabulary tasks based on standardized evaluations and effect size analyses, showing more developmental sensitivity of vocabulary expansion (Reed et al., 2016). Motivation can also play a decisive role in the observed performance gap, as both its intrinsic and extrinsic dimensions are integral to vocabulary learning (Ryan & Deci, 2000). Being on the verge of academic transition to high school, 9th-grade students may develop greater instrumental motivation for language learning. Existing research indicates that instrumental motivation is a strong catalyst in the last years of middle school, as opposed to primary school, where intrinsic motivation is the most prevalent type (Tragant & Muñoz, 2000). To put it succinctly, vocabulary acquisition is a composite system shaped by cognitive development affecting phonological

processing, engagement with words over time, and motivation (Oga-Baldwin & Fryer, 2026).

Findings from this study also demonstrate a statistically significant edge for female participants belonging to both age groups in terms of the depth and the breadth of the vocabulary they produced in the LAT. A similar pattern of findings was obtained in a study led by Fontecha (2014), who found that, within a designated time frame, female students in the second grade of secondary education in Spain exhibited a statistically significant advantage over their male counterparts in terms of generating the maximum number of words possible on particular subjects. The present outcomes also corroborate previous research on gender-oriented disparities in productive vocabulary tasks, namely, Jiménez & Ojeda (2009), which identified a notable advantage for females over their male peers. Motivation has frequently been identified as one of the primary explanations of gender-specific disparities in the acquisition of vocabulary (Fontecha, 2010; Llach & Gallego, 2012).

Underscoring the importance of tracing vocabulary development across school years to better comprehend gender-oriented variances, Bertram et al. (2025) pointed out that although lexical breadth and retrieval speed remain comparable in the first three years, females demonstrate a more pronounced advantage by the 7th grade. However, the results of the present study are challenged by the work of Montero-SaizAja (2021), who found that females use more learning strategies than males do, while there were no significant gender disparities in productive vocabulary. Similar observations were established by Alonso & Garcia (2015) for 10th-grade EFL Spanish students. Such discrepant findings should be taken with caution, given the manifest contextual and methodological differences across studies. Both counterstudies were confined to the Spanish context, where learners are exposed to English instruction across the span of their formal education. In contrast, the participants in the current study are introduced to English for the first time under a newly enacted language-in-education policy in Morocco, increasing the salience of cognitive and gender-oriented variances in the multifaceted process of vocabulary growth. Methodologically, both studies rely on the productive vocabulary levels test (Laufer & Nation, 1995), which solicits learners to identify the intended words in gapped sentences using initial letters. Conversely, this study adopts a free lexical availability test, which is anchored in the active retrieval of lexical items across open-ended semantic fields. In this regard, it has been demonstrated that learning strategies and motivation serve as primary determinants of reading comprehension performance (Taye & Lodebo, 2026). Thus, a more multilayered explanation for the gender-oriented variability in vocabulary expansion and processing should be considered.

The observed gender-based tendencies in vocabulary production can be attributed not only to motivational factors but also to underlying biological mechanisms. Specifically, the processing of lexical information is believed to take

place within the declarative memory system, which is subject to some degree of regulation by estrogen, the primary sex hormone in females, as demonstrated by Ullman et al. (2008). Gender-oriented differences in vocabulary learning strategies, pedagogical practices, and sociocultural variables are also likely to determine such differences. López Rúa (2006) reported that females tend to favor formal rules and repetition techniques, whereas males are more inclined toward imagery-based vocabulary instruction. Additionally, it is demonstrated that girls outperform boys in the internalization of novel lexical items that are phonologically familiar or connected to familiar objects (Kaushanskaya et al., 2013). Topic interest has also been established as a significant predictor of gender variance in L2 vocabulary development (Lee & Pulido, 2017). Moreover, data-driven insights revealed that female students tend to use more social and affective strategies in their approach to language learning (Nadif, 2025). Thus, motivational, biological, learning strategies, and instructional considerations may separately or interactively influence the results of this study.

CONCLUSION

The current study investigated age groups and gender-based disparities in productive vocabulary expansion among middle school EFL Moroccan students. This carries considerable implications at both the theoretical and pedagogical levels. The observed outcomes concerning the effect of age on vocabulary acquisition demonstrate the need for advanced theoretical models in SLA that shift past the traditional frameworks based on the ‘older-younger’ dichotomy that does not apply to varied linguistic domains and learning settings. This calls for a rethinking of the perceptions of age requirements for foreign language learning programs. The findings also revealed the need for a sophisticated implementation of developmental psychology in SLA theory. This entails two important considerations, notably, learners’ continuous cognitive maturation throughout adolescence (Birdsong, 2006) and their metacognitive awareness, which is closely associated with age (Anderson, 2002).

The results of this study establish substantial pedagogical implications for optimizing students’ vocabulary learning experiences and outcomes. First, the creative use of available resources is recommended for fostering an adapted enhancement of vocabulary. For example, flashcards linked to new lexical items should be used in a quest to make the learning process enjoyable and rewarding. Additionally, using more repetitions and checking lexical comprehension more frequently can help facilitate the process of vocabulary understanding and acquisition. Second, teachers should promote practical, cooperative, and competitive activities, such as games and challenges, that allow students of both genders to apply their vocabulary in concrete and meaningful contexts. Third, teachers should treat demonstrating the spelling of new words to students with as

much importance as explaining their meanings. According to Ehri and Rosenthal (2010), knowing how words are accurately spelled is a difference-maker in the expansion of vocabulary size over time. Relevant to this point, it is advisable to regularly integrate orthographic item dictation, which, according to Kazazoğlu (2013), refers to the dictation of single words to check students' spelling and train them to recognize sounds and words as well as to correct errors. To put it succinctly, activities targeting vocabulary learning should be tailored to age groups and gender-oriented needs.

The evaluated data revealed clear patterns that demonstrate a statistically significant female advantage in the breadth and depth of productive vocabulary. Additionally, the results indicated significant differences in terms of productive vocabulary size, lexical sophistication, and spelling accuracy across age groups. It would be highly valuable to explore the key determinants contributing to such variances in future research to obtain a reliable interpretation of these outcomes. While the paper at hand contributes insights into gender and age-oriented variances in the development of productive vocabulary knowledge, future longitudinal studies could validate and yield more generalizable conclusions.

Although this study offers valuable insights, it is important to acknowledge its limitations. First, the single-school design may limit the generalizability of the outcomes across broader Moroccan middle school populations. Future research would benefit from a nationally representative sample. Second, the syllable-based criterion of lexical complexity, while it provides an effective tool for codification, may not reflect the semantic or morphological sophistication of lexical items. The inclusion of such variables in future analytical frameworks could offer a more comprehensive understanding of the development of lexical knowledge among middle schoolers. Third, future longitudinal designs expanding the scope of this study across broader age ranges, i.e., grades 7-12, would substantiate the findings of this study by monitoring longer developmental arcs, and the integration of mixed methods could provide further insights into how age and gender collectively shape productive vocabulary growth among middle school learners.

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