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Sibel Tosun, Department of Foreign Languages, Fırat University, Elazığ, Turkey, sibeltosun@outlook.com
Fulya Eslek Onur, Applied English and Translation Program, Munzur University, Tunceli, Turkey, fulyaeslek@gmail.com

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An Investigation of Receptive and Productive Morphological Knowledge of Derivational Suffixes in Turkish Learners of English

Sibel Tosun[1]
Fulya Eslek Onur[2]

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ABSTRACT

Morphological awareness (MA) has been regarded as a profoundly important aspect of enhancing both vocabulary breadth and depth. As one of the predictors of morphological competence, knowledge of derivational suffixes has a crucial place among all morphemes because they have the ability to change word class. This descriptive study, which employed a quantitative approach, aimed to investigate students' receptive and productive knowledge of derivational class-changing suffixes and to identify to what extent they can produce appropriate derivatives in different word classes. Predictive roles of receptive and productive MA on writing achievement are also a subject of the current study. To achieve the purpose, 50 undergraduate EFL students studying at the School of Foreign Languages at a state university, whose ages ranged between 18 and 22 participated in the study. The results of the study indicated that the participants were significantly better at the receptive task than in productive task. It has also been found that productive MA uniquely predicts writing performance scores. The current study is noteworthy in that it aims to shed light on the strengths and weaknesses of the learners' morphological knowledge as well as provide insights for similar settings on the areas to specifically focus on while teaching derivational suffixes.

Vocabulary knowledge is considered one of the most significant aspects that shows language proficiency. On the issue, Wilkins (1972) asserted "While without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (pp. 111–112). Bearing this in mind, learners prioritize extending their

[1] Department of Foreign Languages, Fırat University, Elazığ, Turkey, sibeltosun@outlook.com
[2] Applied English and Translation Program, Munzur University, Tunceli, Turkey, fulyaeslek@gmail.com

vocabulary and incorporate new words into their L2 lexicon, yet for learners, understanding the meaning and definition of a vocabulary item does not necessarily denote that learners precisely 'know' that word. Alongside the ability to use a word with language skills (speaking, writing, reading, and listening) including knowledge of a word's spelling, meaning, collocations, register traits, and grammatical characteristics (Nation, 2001), knowing a word also requires "knowledge of the underlying form of a word and derivations that can be made from it" (Richard, 1976, p.83). When learners encounter a word that is unfamiliar to them, they make use of some strategies. Schmitt (1997), for example, outlined some of vocabulary learning strategies and reported that analyzing parts of speech, affixes and roots are helpful strategies for learners although they are not resorted much. The underlying reason for not using these strategies could be the insufficient knowledge of morphological structures, which creates a need in investigating the extent of learners' MA. Moreover, morphological knowledge of part of speech and suffixes refers mainly to derivational morphology, and having the information on how knowledgeable learners are about morphology may yield benefits regarding language learning. Thus, with the purpose of contributing the evidence towards building an accurate picture of the extent of morphological knowledge of EFL learners in the Turkish context, this paper focuses on receptive and productive derivational knowledge and students' awareness of derivational suffixes with its relation to writing ability.

2. Literature Review

The ability to reflect upon and manipulate morphemes and employ word formation rules in one's language is referred as morphological awareness (MA) (Carlisle & Stone, 2003). A word, for instance, has various forms of linguistic information such as phonological information, spelling, semantic information, and grammatical functions. Among these, morphological knowledge is the most useful to the semantic aspect of the vocabulary knowledge since it facilitates the process of inferring meaning by helping learners use morphological information to break down the words given in the written form (Ichikawa, 2014). Furthermore, it has been noted that gaining MA facilitates the increase of L2 vocabulary knowledge directly and indirectly by means of the mediating effect of learners' lexical inferencing ability (Zhang & Koda, 2011). It has been further acknowledged that morphology knowledge enables the identification of words rapidly and accurately, and can help students extract semantic and syntactic information while reading (Kieffer & Lesaux, 2008). Thus, morphological awareness may aid the development of extensive vocabulary, which indirectly facilitates successful comprehension during subsequent reading (Berninger et al., 2010).

Over the past three decades, more research has been undertaken into the relationship between English morphological awareness (MA) and literacy growth in both native speakers and EFL learners (Bian, 2017). The literature pertaining to morphology development strongly suggests that it is essential for learners to gain morphological awareness as it contributes to the understanding as well as reading (Kuo & Anderson, 2006) since increasing knowledge of derivations is a predictor of reading comprehension (Carlisle, 2000; Choi, 2015; Foorman et al., 2012; Kieffer & Lesaux, 2008; Lesaux et al., 2010; Nagy et al., 2006).

2.1. Morphological Development and Word Family Knowledge

When learners start learning a foreign language, they have an already developed morphological knowledge in their own language. Still, they need to develop, in a way, extend that knowledge in a foreign language too. In such a process, word- family knowledge becomes an essential part of vocabulary knowledge (Schmitt & Meara, 1997). In English, it is paramount that learners are aware of class changing suffixes in an L2 such as (a) suffixes forming nouns, (b) suffixes forming verbs, (c) suffixes forming adjectives (Tahaineh, 2012) to expand vocabulary knowledge in a word family. As might be expected, in the course of building vocabulary, acquiring a word potentially expedites the acquisition of words in its

word family (Laufer, 1997). To exemplify, knowing the word "employ" makes it easier to learn "employer, employee, employment and employable". To be able to use the language productively, knowledge of word-families is crucial, but it is a complex process due to its relation with language components such as semantics, phonology, and syntax. To illustrate, some changes may happen during word formation regarding spelling, meaning, stress, class, and sound by making it more problematic to identify the root or the affix; for instance, some verb to noun derivations (reduce–reduction) causes changes in pronunciation (Tahaineh, 2012). Moreover, rules for syntactic category change may be misleading since the suffixes are not always applied to some specific words such as *composement and *releasement (Laufer, 1997). Apart from the complex nature of word formation process, another challenge could be considered as the order of acquiring words in a word family. Accordingly, it would be misleading to think that all word forms are learnt altogether. Schmitt & Zimmermann's study (2002) on non-native students, which aimed to explore students' knowledge of different forms of words showed that L2 learners do not know all the forms in a word family, but they are generally aware of the noun and verb forms of words. Looking at the complicated and multifaceted nature of morphology knowledge, more research is needed to reach a deeper understanding of L2 learners' MA.

Explorations of morphological awareness, on the other hand, remain incomplete without making receptive and productive distinctions due to the difference between learners' knowledge of receptive and derivative morphological knowledge. Although there is no doubt on the facilitative effect of derivative knowledge in recognizing other members of a word family, it is mostly on the receptive level. The effect may be lesser in the case of production (Schmitt & Zimmermann, 2002). A significant number of existing studies in the broader literature have examined receptive and productive MA. To begin with, Zyzik & Azevedo (2009) undertook a study on Spanish L2 learners to find out learners' morphological awareness with receptive tasks with which participants were asked to distinguish word class (noun vs. adjective). The results yielded that learners' problems with word class distinctions in productive tasks were also observed with receptive tasks. It was also indicated that learners were the best at distinguishing verb and adjective forms and least accurate in distinguishing between the adjective and noun forms. In a more comprehensive study, Schmitt & Meara (1997) explored the receptive and productive change of word associations and grammatical suffix knowledge of secondary and post-secondary Japanese students at the beginning and end of the year. The students' knowledge of derivative suffixes was reported to be rather poor. It was further highlighted that students had 19-25 percentage more receptive knowledge than productive knowledge. A similar conclusion was reached by Al-Homoud (2017), Bao (2015) and Milton (2009) in their attempt to investigate the relationship between receptive and productive morphological awareness of derivations indicating that receptive MA was greater than productive MA.

2.2. Morphological Development and Writing Skill

The contribution of morphological knowledge in writing has been a matter of interest in recent years. However, the research investigating the relationship between morphological awareness and writing ability is relatively scarce compared to reading comprehension and vocabulary growth. The research suggests that morphology knowledge may facilitate the writing process in point of spelling and text generation (McCutchen et al., 2014). Considering the word form, since the English writing system is morphologically based to some extent, morphology is of vital importance for spelling and decoding (Nagy et al., 2014). McCuthcen et al., (2014) found that learners with higher morphological awareness make use of more morphologically complex words in their writings and spell them more accurately than those who have lower morphological awareness. Along with spelling and text generation, morphological instruction helps learners retrieve vocabulary and construct sentences during text generation (McCutchen et al., 2014)

and help them produce more syntactically complex and varied words (Myhill, 2008), which could be an indicator of good quality texts.

The relationship between the morphological awareness and writing ability has been investigated in a small number of studies, and literature has witnessed research indicating the predictive ability of morphological knowledge in writing performance (Northey, 2013; Zakaria, 2018). Yet the research on the link between the receptive morphology, productive morphology and writing performance is limited. Thereby, the present research examines receptive and productive MA as a predictor of writing performance as well. Accordingly, four research questions are proposed:

To what extent tertiary level EFL students recognize and identify target stems and derived forms to a receptive degree of mastery?

To what extent tertiary level EFL students use the target words in five derivative class changing categories (from verb to noun, verb to adjective, noun to adjective, adjective to noun and adjective to adverb) productively?

Is there a statistically significant difference between receptive and productive derivational morphology knowledge of the target words of the tertiary level Turkish EFL students?

Which of the morphological awareness tests (receptive and productive) are the best predictors of tertiary level Turkish EFL students' writing scores?

3. Method

3.1. Participants and Research Design

The present study was conducted at the School of Foreign Languages of a state university located on the eastern part of Turkey with 50 Turkish engineering students, whose ages ranged between 18 and 21. Since participant randomization was inconceivable because of administrative constraints, and the researchers were assigned as the co-teachers of the two intact classes, the students in those intact classes were selected as the study group. Thus, convenience sampling was adopted for the current study.

Apart from having the same language background, both classes had exactly the same instructors, courses and exams. The participants were all required to take one-year foreign language education after failing the proficiency test administrated at the beginning of the academic year. The participants had completed A2 level and were studying B1 level at the time of the study. At the end of the year, the students whose Grade Point Average (GPA) are 60 or above are announced as eligible to take the proficiency exam at the end of the year. Those who collect the general score of 60 complete the preparatory school successfully and continue their education in their departments.

Data were collected by the researchers in the Reading & Writing course, with which the participants were aimed to be equipped with vocabulary, reading and writing skills. Being the particular focus of the study, the participants were not explicitly thought derivational morphemes apart from the suffixes that make occupation such as -or, -er, -ist and -or. Additionally, adverb-making suffix -ly along with the transitions such as finally, fortunately, surprisingly, and so on were also covered implicitly. The comparison of adverbs was also covered explicitly in the classroom.

3.2. Instruments

In order to collect data about the morphological awareness of the participants and its relation to writing performance, two morphology tests and a writing task was adapted and developed.

3.2.1. The Morpheme recognition test

A Morpheme Recognition (MR) task, which was modelled by Ku & Anderson (2003), was constructed to test participants' receptive knowledge of the morphological relationships between pairs of words. The participants were given 25 pairs of words and asked to tick (YES) or (NO) boxes. They were inquired to decide if the second word is derived from the first. To illustrate, (danger – dangerous) the participants were asked to judge if the word "dangerous" derived from the word "danger". Apart from genuine derived words, the students were given pseudo- suffixed words like (should - shoulder) and (miss - mission). An excerpt from the MR test is illustrated in Figure 1.

You are given a pair of words. If the second word is derived from the first word, please put a tick to "( ) YES", if not, put a tick to "( ) NO",

miss ---- mission	( ) YES	( ) NO
danger ---- dangerous	( ) YES	( ) NO
long ---- length	( ) YES	( ) NO

Figure 1. An excerpt from the Morpheme Recognition Test

The test consisted of 15 derived and 10 pseudo-suffixed words. All the words in the test were chosen from the participants' B1 level course-books, so they were familiar with the words. Prior to data collection, the test was piloted with 10 students, none of whom took part in the main study, to calculate the reliability and check the clarity and appropriateness of the items. The Cronbach Alpha internal consistency coefficient of the test was calculated to be .81, indicating that the MR is reliable.

3.2.2. The affix elicitation task

An Affix Elicitation (AE) task, which was modeled on Nation's morphological task (2001, p.100), was constructed to assess productive knowledge of the students. In the task, the participants were asked to read 25 separate statements and fill in the blanks by producing the necessary suffixed form of the words given in brackets. An excerpt from the AE test is given in Figure 2.

Read each statement and add the necessary suffix to the words given in brackets " ( )" according to the meaning of the sentences.

The (invent) _____ of computer has changed our lives.
He is a very (knowledge)_____ man in his area. Everybody listens to him.
He finally won his (free)_____ after twenty years in prison.

Figure 2. An excerpt from the Affix Elicitation Task

Vocabulary items in the Affix Elicitation Task were also chosen from the participants' course books. Regarding the content of the task, only class changing derivations were included in it. In detail, participants were tested concerning five verb to noun derivations, five verb to adjective derivations, five noun to adjective derivations, five adjective to noun derivations, and lastly, five adjective to adverb derivations. Internal morphological complexity of the words tested changes: while most of them were root words such as "free", some were derived such as the word "knowledge". Affix Elicitation Task was also pilot-tested and internal consistency estimates of reliability were calculated using a statistical package program. Cronbach's alpha was found to be .86, indicating that AE task is reliable.

3.2.3. The writing task

With the aim of investigating the relationship between morphology knowledge and writing performance, a writing task was given to the participants. The task was adapted from the same course book, from which the vocabulary was selected for the two morphology tasks. Due to the fact that it was covered in participants' course-book and considering its familiarity, a 150-word paragraph about the Internet use and its possible effects on people were chosen as the writing topic.

3.3. Procedure

Both morphology tasks and writing task were completed within a week. MA tasks were conducted by the researchers and were completed in one section during regular instructional time. The students were first given Morpheme Recognition Test and then, Affix Elicitation Test. Before administrating each task, the participants were given instruction on how to complete the tasks in their mother tongue and were given a few examples in English to reduce confusion. Morpheme Recognition Test took 15 minutes and Affix Elicitation Test lasted 25 minutes to complete. As for grading the tasks, each correct answer was awarded one point and added to calculate the general scores. The responses were marked incorrect when the participants left questions blank or didn't provide the correct answer.

Writing Task was also given during regular instructional time. Following a brief explanation in their mother tongue, the participants were asked to write a 150-word paragraph entitled "The effects of the Internet Use" and were given 45 minutes to write their paragraphs. After the papers were collected, they were graded by the researchers out of a total score of 20 using a rubric, which consists of five general criteria namely content, organization, vocabulary use, sentence structure, and mechanics. The results of the writings indicated that the inter-rater reliability of the scores (α =.88) was high. Having calculated the writing scores of the participants, the scores were entered in a statistical package program for data analysis.

4. Findings

4.1. Receptive Morphological Awareness

In an attempt to answer the first research question aiming to explore students' receptive morphological knowledge, the participants were given 25 target words to judge if they were correctly derived words. The results from the analysis of descriptives are presented in Table 1.

Table 1
Descriptives for the Morpheme Recognition Task

	N	Min.	Max.	*M*	*SD*
Morpheme Recognition Task	50	10	25	18.84	4.24

As Table 1 suggests, the results from the Morpheme Recognition Tasks revealed that the participants had moderate-high awareness of receptive morphology (N = 50, M = 18.84, SD = 4.24) with a minimum score of 10 and a maximum score of 25. The results indicate that the participants are successful in deciding whether a word is derived from the other.

As for the correct responses for 10 pseudo words placed in the Morpheme Recognition Task, a descriptive analysis was run. The results are shown in Table 2.

Table 2
Descriptives for Correctly Identified Pseudowords

	N	Min.	Max.	*M*	*SD*

Pseudo-words	50	1	9	6.50	2.19

Table 2 shows the participants' performance on pseudo- suffixed words in total. The mean of the correctly identified pseudowords as "wrong" is 6.50 (N = 50, SD = 2.19) with a minimum score of 1 and a maximum score of 9. The findings imply that the participants were rather successful in identifying the pseudo suffixes, which could mean that they could understand the unrelatedness between word pairs even if they are phonologically similar to each other.

4.2. Productive Morphological Awareness

The second research question, which aimed at exploring the productive morphological use of participants was addressed by analyzing the scores obtained by the Affix Elicitation Test. The students' scores analyzed using descriptive statistics are displayed in Table 3.

Table 3
Descriptives for the Affix Elicitation Test

	N	Min.	Max.	*M*	*SD*
Affix Elicitation Task	50	0	18	7.78	3.81

As can be seen in Table 3, the mean score for the test is 7.78 (N = 50, SD = 2.19) with a minimum score of 0 and a maximum score of 18, which indicates that the participants were below average in the productive measure of MA.

The first set of analyses examined the mean scores for the productive task. Further analysis on the use the target words in five derivative class-changing categories (from verb to noun, verb to adjective, noun to adjective, adjective to noun and adjective to adverb) was run. Table 4 shows the mean scores of each word-class changing suffix category.

Table 4
Descriptives for Derivate Class Changing Categories

	N	Min.	Max.	*M*	*SD*
Verb to Noun	50	0	5	2.38	1.08
Verb to Adjective	50	0	5	0.88	1.14
Noun to Adjective	50	0	3	0.64	0.94
Adjective to Noun	50	0	3	0.80	0.99
Adjective to Adverb	50	0	5	3.20	1.24

An overall look at Table 4 indicates that the participants were the best at producing the suffix (-ly) that changes word class from adjective to adverb (N = 50, M = 3.20, SD = 1.24). The participants were rather successful in constructing words that change word category from verb to noun (N = 50, M = 2.38, SD = 1.08). Nonetheless the participants were the least successful in forming adjectives from nouns (N = 50, M = 0.64, SD = 0.94). As for changing word category from adjective to noun (N = 50, M = 0.80, SD = 0.99) and verb to adjective (N = 50, M = 0.88, SD = 1.14), the participants performed poor.

4.3. The Comparison of Receptive and Productive Morphological Knowledge

In order to find out the significance of the difference between receptive and productive morphological knowledge, the mean scores of Morpheme Recognition and Affix Elicitation test were computed using the Independent Samples T-test.

Table 5
Comparison of Receptive and Productive Morphological Test Scores

	N	*M*	*SD*	*T*	*df*	*p*
Receptive	50	18.84	4.24	17.98	49	.000**
Productive	50	7.78	3.82			

Note. ** p <.01.

As it is presented in Table 5, there is a statistically significant difference between receptive (M = 18.84, SD = 4.24) and productive (M = 7.78, SD = 3.82) morphological knowledge of the participants ($t(49)$ = 17.98, p< .01). The results suggest that the participants showed a significantly better performance in receptive measure than the productive one.

4.4. The Predictive Roles of Receptive and Productive Morphological Awareness on Writing Achievement

Multiple linear regression was also computed to assess the ability of morphological awareness test (predictive and receptive) to predict the participants' writing performance. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Cook's distances were all well below 1.00, indicating that there were no cases that had an undue influence on the regression coefficients. According to the determined predicting variables, the results of multiple regression analysis are given in Table 6.

Table 6
Multiple Regression Results for The Predicting Ability of Morphological Awareness Tests on Writing Performance

Predictors	*β*	*t*	*Sig.*	Correlations		
				Zero order	Partial	Part
Receptive test	-.141	-1.26	.214	.183	-.181	-.128
Productive test	.767	6.863	.000	.708	.707	.696

As Table 6 reveals, the overall regression model was statistically significant, $F(2, 47) = 25.18$, $p < 0.01$. The R2 value of .517 indicated that 52% of the variance in listening proficiency was predicted by two factors. Out of the two predictors, only productive test measure was significant (β = .767, p < .001) explaining 48% of the total variance. Receptive test (β = -.141, p = .214) fell short of statistical difference. Overall, a significant regression equation was found between productive morphological knowledge and writing performance while no equation was indicated between receptive morphological knowledge and writing performance. All in all, it can be concluded that productive test scores were the best predictor of writing scores of the participants.

5. Discussion

This study sought to explore the morphological awareness of the students and its relation with writing performance. One significant finding is that while EFL learners are relatively successful in determining

roots and suffixes and their relationship with each other in the receptive measure, they fell behind in using derivatives productively to change word class. This reflects the findings of previous research by Al-Homoud (2017), Bao (2015), Milton (2009) and Schmitt & Meara (1997), which revealed that receptive MA of the learners is greater than their productive MA. The significant gap between learners' productive and receptive MA may point out to the difference in the cognitive demand required for MA. Considering that a deeper level of processing at both semantic and syntactic level is necessary for productive use of MA (Carlisle, 2000), it is very likely that learners may have performed poorly on the productive test. Namely students may have an understanding of morphology enough to recognize suffixes and roots and the relationship between them, yet may have failed in constructing derivatives with their limited morphology knowledge as the task required an understanding of the context, necessary word class and the knowledge of suffixes necessary to be able to produce correct derived form of words (Schmitt & Zimmermann, 2002).

With respect to the productive use of derivational class changing suffixes, the results suggest that the participants were the best at producing suffixes that change word class from adjective to adverb. The underlying reason for such an outcome could be the instruction provided to the participants as a part of their grammar instruction. More specifically, as the students were instructed on how to make adverbs while learning "comparison of adverbs", they may have used that information while completing the task to produce adverbs. The second category that the participants did well was verb - to noun category. Types of the derivational morphemes may be the reasoning behind this performance. That is, because these noun making suffixes targeted in the task are mostly neutral suffixes which are attached to independent words without difficulty, and do not make changes in pronunciation, participants acquire such derivatives easier than the others (Tyler & Nagy, 1987), and perform word formation relatively easier than non-neutral suffixes. Another reason for the success could also be the familiarity of some occupation making suffixes such as -er, -ist and -or. As the students were partly introduced those suffixes, they may have tended to perform better in producing them.

Concerning the contribution of MA to the writing performance of the participants, only productive MA was found to be a significant predictor for the outcome measure of L2 writing, which is also in line with Northey (2013) and Zakaria (2018). Although receptive knowledge of derivational morphology may have a positive effect on productive knowledge of morphology, it does not mean that being successful in the receptive test will bring the same amount of success in writing performance. In light of the findings, it can be concluded that learners who can use derivational suffixes productively to construct words could produce better quality writings. Considering the fact that longer words (Crossley et al., 2014), less frequent words (Crossley et al., 2014), syntactic complexity and lexical diversity (McNamara et al., 2009) are indicators of high-quality writings, raising learners' MA could help in those areas and improve writing quality. That is to say, when MA is high on the productive level, learners are more likely to produce words that are not present in their active lexicon and perform better in writing than those who have low productive morphological awareness.

6. Implications and Suggestions for Further Research

The findings of the study bear some implications for teachers and dictionary and book writers. In the light of the findings discussed above, it can be highlighted that vocabulary knowledge alone is not adequate, although required, to be able to choose the necessary suffix and add it to a base word placing it into certain syntactic context. When learners have a grasp of how roots, suffixes, prefixes are combined, they potentially hold on of the most effective tool towards vocabulary development (Anderson & Freebody, 1981). Although students come across derived forms starting from beginner levels with words such as beautiful, natural, teacher, it is much of a problem to be aware of these forms considering the lack of explicit instruction, especially at beginner levels (Brown, 2010). Word formation knowledge is particularly required to enhance

morphological awareness in such cases (Berninger et al., 2010). Besides, regarding MA as an indicator of productive vocabulary (Hayashi & Murphy, 2011; Schmitt & Meara, 1997), and its effect on writing performance, teachers should offer explicit instruction to raise learners' MA in order to facilitate their vocabulary and literacy development in English and improve writing outcomes. Furthermore, keeping in mind that derivational relations affect recognition speed as derived forms are kept linked to one another in our lexicon (Nagy et al., 1989), it can be useful for teachers to focus on teaching members of word families. It is suggested for teachers to specifically concentrate upon verb making and adjective making derivational suffixes since they mostly require extra effort with changes in spelling and pronunciation.

The results also provide insights for textbook writers. By reference to the English books he examined, Thaineh (2012) confirms that the books are not equipped enough with activities that make students understand the formation of structures and forces them to memorize lexical items. Thus, textbook and dictionary writers need to address the issue more closely by not assuming that the students acquire derivational morpheme knowledge just by exposure without instruction.

7. Conclusion

This study has added some noteworthy findings regarding students' receptive and productive morphological knowledge of derivational suffixes. The findings of the study reveal that the participants' receptive knowledge of derivational morphemes is greater than their productive morphological knowledge. They showed rather poor knowledge of derivational suffixes in the productive test. It can also be concluded that productive MA is uniquely predictive of writing achievement suggesting that success in producing derivations contributes to success in overall writing. The fact that the level of the knowledge of morphology is diverse at receptive and productive measures, and their relationship with writing performance differs, points out to the need to learn more about morphological relations in students' minds and promote their learning. Given that every facet of MA requires careful attention, it is a field that entails more research.

Although this study provides valuable insights into our understanding of learners' MA, the number of participants remains a limitation. It is recommended that the study is replicated with the inclusion of more participants. An experimental longitudinal study is also suggested in order to investigate the development of both receptive and productive MA. Last but not least, further studies could focus on the relationship between writing skill and morphology knowledge with more writing samples and assessment type by controlling other factors which may affect writing quality.

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