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High-Proficiency L1 and L2 English Learners' Morphological Words in Writing

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Abstract
English differs from other languages in morphology, which may cause trouble in EFL learning. The interesting topic is whether ESL learners can obtain the same level of morphology in their English learning as native English speakers. The study explores whether high-proficiency EFL learners differ from native EL1 learners in writing using root words, inflected words, and derived words. This article reported on a comparative study between Advanced EFL learners (TOEFL Testees (n = 318)) and native English learners (writers of the Louvain Corpus of Native English Essays (n = 176)) by lexical frequency profile analysis on their use of root words, inflected words, and derived words in writing. The findings suggest that there are significant differences between the two groups. TOEFL writers used a much higher proportion of root words but a much lower proportion of inflected and derived words than native English learners. The findings will expose the differences between EFL learners and native L2 learners in word learning and contribute to L2 language teaching and learning theoretically and practically.
Keywords: high-proficiency EFL learners, native English speakers, productive morphological words, comparison

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Introduction

Though many more studies have involved EL2 productive vocabulary in recent years with the support of computer programs for corpus-based lexical analyses, most observed words with only a distinction of frequency levels, considering nothing of morphological categorization: root words, inflected words, and derived words. English is less complex than some languages in inflection, e.g., French, but more complex than others, e.g., Chinese. The differences between learners' native language and their L2 in morphology may influence their L2 learning: the richer their native language in morphology, the easier it is for the L2 learners to learn their L2 language, and, on the contrary, the richer their second language in morphology, the more difficult it is for them to acquire (Slik, Hout, & Schepens, 2019). Additionally, in English, there are a significant number of derived words that may pose a challenge for EFL learners. Though in recognition, L1 learners acquire different morphological English words at different rates (Anglin, Miller, & Wakefield, 1993), it is still unknown whether EFL learners can achieve the same level as native English learners in morphological words in writing. The answer may help to expose the morphological characteristics of the two groups, the relationship between their productive vocabulary, and the development tendency of EL2 and also supply some implications to EL2 teaching and learning. Therefore, this study will ascertain whether the two groups are the same in using these words by comparing advanced EFL and native English learners' written morphological words by lexical frequency profile analysis on their writings.

Literature Review

English has an extensive vocabulary which is a heavy task for EFL learners to learn (Goldfield and Reznick, 1990; Schmitt, 2008), and English words differ in learnability or the difficulty they exert in language learning. Besides differences in frequency, words' morphological structures may also be a crucial factor causing differences in learning efficiency (Morris, Porter, Grainger, & Holcomb, 2011). Morphologically, there are primarily root, inflected, and derived words in English. In this study, root words refer to those word forms from which inflected and derived words are formed on morphological rules: inflectional and derivational rules. Mature language speakers have mastered these rules and use them in communication receptively and productively (Nation, 1990, 2001; Richards, 1976).

The question of how language learners acquire morphological knowledge aroused L1 researchers' interest. The earliest studies were on the order of L1 children's acquiring different grammatical morphemes. Brown (1973), Villiers and de Villiers (1973) found that children of diverse native language backgrounds gained 14 grammatical morphemes in a similar order. Dulay and Burt (1973, 1974), believing that L2 learners may follow the same order, conducted studies on L2 learners, concluding that L2 children acquire some grammatical morphemes almost in a similar order. It was the same case with L2 adults, e.g., Bailey, Madden, Krashen (1974), Larsen (1975), Pica (1983). Beyond inflectional morphemes, the order of acquiring derivational affixes has also attracted scholars' attention, e.g., Biemiller and Slonim (2001), Leong (1989), Tyler and Nagy (1989) found that learners' knowledge of affixes grows as they go from elementary school into high school. Some empirical studies also examined the order of L2 acquisition of different suffixes, e.g., Danilović, Savić, and Dimitrijević (2013), Mochizuki and Aizawa (2000), Schmitt and Meara (1997), concluding that L2 learners' affix knowledge increases with their vocabulary size.

Both inflectional and derivational studies have been concerned with individual inflectional

or derivational morphemes from the perspective of differences in frequency, regularity, predictability, and productivity (Bauer and Nation, 1993), which is difficult to reflect L2 learners' development in overall morphological knowledge (Lin, 2012; Mochizuki and Aizawa, 2000).

To track L1 receptive vocabulary development, Anglin, Miller, and Wakefield (1993) conducted a study on L1 children's acquisition of different morphologically defined words, finding that the numbers of the root words, inflected words, and derived words increased in various scales, which means that they were developing in different trajectories. Xanthos et al. (2011) studied the relationship between the lexical richness/complexity in child-directed oral productive data and nine diverse language background children's morphological development speed in speech, with an indicator advocated by Xanthos and Gillis (2010) called *Mean Size of Paradigm* (MSP), the number of distinct inflected word-forms in a sample of language data divided by the number of distinct lemmas. They found that the speed of children's morphological development is positively related to the morphological richness of their spoken language input.

A few studies have also touched on EFL learners' development in productive morphology, with indexes of lexical richness involving language learners' inflectional or derivational aspects. Malvern, Richards, Chipere, and Durán (2004a) used D-value to track 38 children's development in morphological words (inflectional diversity) from the 18th month on in speech. They calculated three versions of the D-score to indicate three aspects of productive vocabulary, finding that the three versions were increasing on different scales. Miranda-García and Calle-Martín (2005) used another measure in the study, named *index of flexionability*, or *allomorphism*, the number of *types* divided by that of *lemmas*, in fact, the variation of *Lemma/token ratio.* Granger and Wynne (1999) pointed out that *lemma/token ratio* and *adjusted lemma/token ratio* measures of lexical richness can show language speakers' usage of root words and inflected words. Lou and Ma (2012) compared EFL and native EL1 learners' language production with Type-Lemma Ratio (TLR) and Lemma-Family Ratio (LFR) as indicators of inflectional diversity and derivational diversity, respectively, finding that concerning the 1st 1000 high-frequency words, native English speakers used more inflectional forms than Chinese students but fewer derivational forms than Chinese students and that as for the 2nd 1000 frequency level words and the low-frequency words, Chinese students used more inflectional forms but the same proportion of derivational forms as American students.

Some studies have also measured morphology under morphological complexity/richness. Slik, Hout, and Schepens (2019) explored the role of morphological complexity in predicting the learnability of Dutch as an additional language, finding that the morphological complexity of L2 learners' native language may influence their duration of residence in their target language context for L2 learning and if their native language is as complex in morphology as their target language or more complex, they may shorten their overseas residence and finish their L2 learning earlier. Brezina and Pallotti (2019) put forward a new measure of morphological complexity (an indicator of average inflectional diversity) called the *Morphological Complexity Index* in two case studies on native and non-native speakers' writing, concluding that morphological complexity varies with speakers' language levels and the characteristics of their native language. Clercq and Housen (2019) made a study of some (English, French as L1 and L2) learners' development in morphological complexity with three measures: *inflectional and derivational diversity* in the whole lexicon (*Type/Family Ratio* by Horst, Collins (2006)), *overall inflectional diversity* (Inflectional Diversity by Malvern, Richards, Chipere, Durán (2004b), and *inflectional diversity* in the verbal system only (Morphological Complexity Index by Pallotti (2015)), showing that French as L2

learners' morphological development had a more continuous increase than that of EL2 learners.

Although the above studies have exposed the diversity in inflection or derivation or both, they have not tracked EFL learners' development in morphologically productive ability systematically and comprehensively. Firstly, they focused mainly on inflectional knowledge (Garbo, 2019; Sim, 2019), e.g., Malvern, Richards, Chipere, and Durán (2004a, 2004b), Brezina and Pallotti (2019), Slik, Hout and Schepens (2019) and, at most, inflectional and derivational aspects simultaneously, e.g., Lou and Ma (2012). Secondly, the indexes used are all proportional ones between one unit of words and another, i.e., *Type Token Ratio*, *Type Lemma Ratio*, *Lemma Family Ratio*, etc., resulting in decimals (ranging from zero to one) of low discrimination. Most importantly, no study has ever delved into the relationship between high-proficiency EFL learners and EL1 learners in different morphological words in writing. It is still unknown how EFL learners' morphological aspects develop, i.e., whether they are the same as native English speakers in morphology.

This study is made to compare a group of advanced EFL learners with a group of native English learners in their productive use of root words, inflected words, and derived words, i.e., to observe the relationship between their use of three categories of morphologically defined words, which may suggest the relation between them in productive vocabulary. The study is to answer the following question: Are advanced EFL learners the same as Native English speakers in their written root woods, inflected words, and derived words?

Method

This study compares the two groups of subjects' coverage of root words, inflected words, and derived words in writing by lexical frequency profile analysis. The morphological words involved in the study refer only to root words, inflected words, and derived words for the limitation of the technology.

Participants

Two groups of participants are involved in the study. One group comprises EFL learners (n = 318) who applied for admission into English-speaking countries for further education and took the TOEFL test. The other group includes native English speakers (n = 176): 90 British university students and 86 American college students. The study got no additional information about EFL learners' biometrics and British university students' age. Among the 86 American University students, 27 were from Indiana University, aged 22 to 48; 17 were from the University of South Carolina, 18 to 19 (most), and 42 were from the University of Michigan, 19 to 23.Research Instruments.

Research Instruments

Range BNC is a computer program designed by Heatley, Nation, and Coxhead (2002) to perform the Lexical Frequency Profile analysis, a scheme put forward by Laufer and Nation (1995) to calculate the numbers and percentages of the words appearing in language data and sort out them into frequency levels by their occurrence in the target language corpus: the British National Corpus. The software has been updated several times, resulting in several versions, different in the number of base word lists. The version used in this study is one with 16 base word lists sourced from the British National Corpus (BNC). Each of the 1st 14 lists consists of 1000 families of words. The 1st contains the words of the highest frequency band in BNC, while the 14th comprises those

of the lowest frequency band. The 15th list consists of proper nouns, such as names of people and places, and the 16th comprises most interjections, exclamations, hesitation, procedure, etc., common in spoken English.

The analysis results present the coverage of different frequency level words in a piece of language production through counting different frequency level words, classified primarily concerning their occurrence in the native language corpus (Edwards and Collins, 2011). Word counting is by *token*, *type,* and *family;* the percentage is only by *token* and *type*. The sample output of the analysis is shown in Table one as follows:

Table 1. *Sample output of the LFP analysis*

WORD LIST	TOKENS/ %	TYPES/%	FAMILIES
One	482/77.74	186/61.79	153
…	…	…	…
15	1/0.16	1/0.33	1/ 1/ 0.33
	1/ 0.33	0.33 1	1
16	0/ 0.00	0/ 0.00	0
not in the lists	7/1.13	7/2.33	7/ ?????
	7/	2.33 ?????	
Total	620	301	301 256 301
	301	256	256

The results in the above table indicate that among the whole composition (620 *tokens*, 301 *types,* or 256 *families*), 482 are from the 1st 1000 frequency level, making up 87.28% of the entire composition (620 *tokens*). If counted by *type*, they are 165, accounting for 78.57% (301 *types*). These are 256 *families*, 153 from the 1st word list (the 1st 1000 frequency level). The not-in-the-list words have not been calculated by *family*. For one thing, there is no reference base word list for it, and for another, usually, there are a lot of nonsense words, misspellings, etc.

To calculate the percentage of root words, inflected, and derived words, the authors compiled the original word lists of Range BNC into three morphological word lists, each consisting of only root words, inflected words, or derived obtained by eliminating the other two types of words. The study uses these three-word lists to extract the statistics of the target morphological words in language data.

Research Procedures

The study has collected two categories of language data, i.e., 318 sample TOEFL compositions written by the above-introduced EFL learners in the TOEFL test and 176 compositions written by the previously-mentioned native English college students.

The sample TOEFL compositions are drawn from 450 essays in an e-book *Sample Essays for the TOEFL Writing Test (TWE) —Answers to ALL TOEFL Essay Questions (ToeflEssays.com, 2004),* a collection of compositions written by EFL learners sitting in actual TOEFL tests as their answers to one of the 185 ETS (American Educational Testing Service) official topics. These essays are of at least 300 words (356.28 words on average), and all have obtained a full scale—six score (one to six score). On average, TOEFL writers' essays are 356.42 *token*s, 175.64 *type*s, or 150.64 *famili*es long.

Those 176 timed compositions written by native English college students are from

LOCNESS (Louvain Corpus of Native English Essays)(Granger, 1998), a corpus of native English learners' essays (https://www.uclouvain.be/en-cecl-locness.htm). LOCNESS is a collection of 272 timed and untimed essays written by native English students. For comparison, the study selected only 176 timed essays, 90 essays by British university students and 86 by American university students. Those written by British university students include expository-historical essays (18 on *French society and institutions*), literary essays (39 on *French Intellectual traditions*), and argumentative essays (33 on *A single Europe: A loss of sovereignty for Britain*). They are about 500 words long each, and those 86 essays written by American university students are all argumentative, among which 69 are about 500 words each and the other 17 essays, 1090 words on average. To alleviate the influence of the length of these 17 long essays, the authors segmented them into smaller pieces of not more than four *bit*s and kept the 1st piece of each (intact in sentences) for analysis. The resultant parts are about 755 words long on average. On average, the 176 essays by native university students are 541.32 *tokens* , 243.86 *types,* or 201.74 *families* long. The compiler of the corpus has deleted all direct quotations. The statistics of the compositions by the two groups are in Table two:

Table 2. *Statistics for language data in the study (N1=318, N2=176)*

	TOEFL	Native
Mean Length (*token*)	356.42	541.32
Mean Length (*type*)	175.64	243.86
Mean Length (*family*)	150.64	201.74

Note 1. N1 = Number of TOEFL testees (i.e., the advanced EFL learners), N2 = Number of native English speaking students, TOEFL= sample TOEFL essays, Native = native British and American university essays

Data Analysis

The study has obtained the descriptive statistics of the two groups' root words, inflected words and derived words to see whether there are any differences between them in using different morphologically defined words, and performed an independent sample T-test on the means of the two groups' root words, inflected words and derived words respective to justify whether the differences are statistically significant.

Results

This section introduces the results of comparing the two groups' root words, inflected words, and derived words, respectively.

Root Words

The descriptive statistics of root words for the two groups are in Table three:

Table 3. *Descriptive statistics of root words*

	N	Minimum	Maximum	Mean	SD
TOEFL	318	42.57	70.98	58.65	5.03
Native	176	38.17	64.44	52.39	4.76
Valid N (listwise)	176				

Note: SD = Std. Deviation

As illustrated in Table three, on average, the root words (counted in *type*) used by native English university students account for 38.17% of the whole composition. In comparison, TOEFL writers used 42.57%, which is much greater than the former. The study has conducted an independent

sample T-test on the difference to see whether it has reached a statistically significant level, and the results are in Table four:

Table 4. *Comparison of TOEFL testees (n = 318) and native students (n = 176) on their root word usage*

Variable	*M*	*SD*	*T*	*Df*	*p*	*d*
Root words			13.48	492	.000	1.61
TOEFL	58.65	5.03				
Native	52.39	4.76				

Table four shows a statistically significant difference between TOEFL testees and native English students in their use of root words in compositions, t(492) = 13.48, p = .000, d = 1.61. TOEFL testees (M = 58.65) use a more significant percentage of root words in writing than native English students (M = 52.39), and the effect size is 1.6, which is smaller than the typical size for effects in the behavioral sciences. It indicates that TOEFL writers employed a statistically significantly more significant percentage of root words in writing than native English students.

Inflected Words

The study has also calculated the descriptive statistics of inflected words, i.e., the percentage of inflected words among the whole composition (counted by *type*), and the results are in Table five as follows:

Table 5. *Descriptive statistics of inflected words*

	N	Minimum	Maximum	Mean	SD
TOEFL	318	11.19	35.58	24.57	4.25
Native	176	18.51	36.36	27.24	3.44
Valid N (listwise)	176				

Note: SD = Std. Deviation

As exposed in Table five, the mean percentage of inflected words (counted in type) used by native English university students is 36.36% of the whole composition, very near to TOEFL writers' 35.58%.The study has conducted an independent sample T-test to see whether the difference is statistically significant, whose results are in Table six:

Table 6. *Comparison between TOEFL testees (n = 318) and native students (n = 176) on their inflected word usage*

Variable	*M*	*SD*	*t*	*df*	*p*	*d*
Inflected words			-7.58[a]	427.72[a]	.000	-0.45
TOEFL	24.57	4.25				
Native	27.24	3.44				

[a] The *t* and *df* were adjusted because variances were not equal.

The results in Table six suggest that the difference between the two groups in using inflected words is statistically significant, t(427.72) =-7.58, p=.000, d = -0.45. It means that TOEFL writers (M =

24.57) have used a much smaller percentage of inflected words in writing than native English students (M = 27.27), and the effect size is -0.45, which is near to medium size for effects in the behavioral sciences.

Derived Words

The study has obtained the descriptive statistics of derived words, i.e., the percentage of derived words among the whole composition (counted in *type*), which are shown in Table seven as follows:

Table 7. *Descriptive statistics of derived words*

	N	Minimum	Maximum	Mean	SD
TOEFL	318	5.69	24.53	12.90	2.98
Native	176	7.92	23.28	14.22	3.27
Valid N (listwise)	176				

As shown in the descriptive statistics in Table seven, the mean percentage of derived words (counted in type) in native English university students' writings is 14.22% of the whole composition. In companion, that of TOEFL writers is 12.90%, very near the former. The study has conducted an independent sample T-test to check whether the difference is statistically significant, and the results are in Table eight:

Table 8. *Comparison between TOEFL testees (n = 318) and native students (n = 176) on their derived word usage*

Variable	*M*	*SD*	*T*	*df*	*p*	*d*
Derived words			-4.55	492	.000	-0.18
TOEFL	12.90	2.98				
Native	14.22	3.27				

Table eight shows that the difference between the two groups in the use of derived words is statistically significant, $t(492) = -4.55$, $p = .000$, $d = -0.18$, which suggests that advanced EFL writers (n = 318) have employed a smaller percentage of derived words in writing than native English students (n = 176). The effect size *d* is -0.18, which is small for effects in the behavioral sciences.

Discussion

The study shows that TOEFL writers have used a much more significant percentage of root words in writing but a smaller percentage of both inflected and derived words than native English learners.

At first appearance, it may indicate TOEFL writers have mastered a more significant number of root words for production. We may further extrapolate that these high-proficiency EFL learners have a more excellent vocabulary. In contrast, since native English learners have used fewer root words, they certainly have a smaller vocabulary. However, if taking it a second thought, things may be more complex, and the truth may be contrary since language users tend to select words for use in a completely different way for daily oral communication and writing.

In daily communication with a limitation in time, speakers usually try to select simple words and use them repeatedly so that listeners can catch what they are saying more easily. Without a doubt, simpler high-frequency words are their first choice; therefore, they choose root words. However, in writing, especially in formal written communication, since the use of words is not limited as in a forced answer task such as a multiple-choice task, but free, a task awarding writers

relatively enough time for consideration and choosing from their storage of words. They tend to choose more formal words to avoid using simple words repeatedly. Thus, those low-frequency words and their variants will be more favorable.

Consequently, since the more advanced writers have more options, they will try to choose more variants of words and more different words to express the exact meaning so that the whole piece looks more complex and colorful. Whereas those green-handed writers, having only a small number of choices for expression, will use words more repeatedly. Thus, their writings seem dull and less variant, with a more significant number of words repeated, especially using more root words.

Looking from the other side, in writing, the diverse use of words generally indicates the more significant number of writers' productive vocabulary, the principle followed by those scholars advocating the use of context-dependent measures in studies related to L2 productive vocabulary, e.g., Laufer (1994), Laufer, Nation (1995), etc. Therefore, in this study, TOEFL writers' option of a more significant number of root words may indicate they have a significant amount of root words sources on the one hand and also that they have been learning words primarily by rote recitation item by item, rather than by way of inflection and derivation or other associations. Therefore, their vocabulary usually consists of root words available. Another reason may be that they avoid using more complex words, including morphologically complex words, for fear of being faulty since they have no confidence in using them, which is an intentional simplification (Blum and Levenston, 1978).

In fact, in English, root words account for a large part of low-frequency words, and the mono-syllabic ones will decline in number with the increase of Greeco-Latin words and with the decrease of word frequency levels (Carr, Owen, and Schaeffer, 1942; Oldfather, 1940, as cited in Bellomo, 2009). Complex words from the Greeco-Latin source account for about two-thirds of the English vocabulary (Carr, Owen, & Schaeffer, 1942). Proficient language learners should be able to use more complex words rather than root words.

EFL learners' words are usually monotonous and lack variation, especially under forced conditions, e.g., sitting on a test, which results in a more significant percentage of root words. In contrast, native English learners may have a rich source of root words and, at the same time, rich resources of other words, e.g., derived words and infected words, etc., embodied in significantly greater percentages of inflected and derived words in their writings. It may also be because that they have intentionally tried to avoid repeatedly using too many root words by resorting to complex morphological words, e.g., more inflected and primarily derived words, making their writing more attractive. In brief, advanced writers can use a greater variety of words rather than repeat those usually used words.

Conclusion

The study shows that TOEFL writers have used much more root words in writing, but fewer inflected and derived words than native English learners. However, it does not necessarily suggest they have a more extensive productive vocabulary than native English learners. On the contrary, their more significant number of root words and a smaller number of inflected words and especially derived words may indicate what direction they should strive for in developing a second language productive vocabulary. They should not depend on the mechanical recitation of words one after another as the only way for vocabulary acquisition but consider associations among words in different aspects. Word knowledge includes lexical breadth, i.e., the number of words, and lexical

depth, i.e., the rich information about word use. In language teaching, teachers should also try to raise learners' morphological awareness and supply language learners with a complete picture of word knowledge so that language learners would have a master of comprehensive information on word usage, including morphological information about words' context.

Limitations and Directions for Future Studies

Though the study has arrived at some conclusions, they can only be tentative but not conclusive statements on second language acquisition. They deserve further testing for the following reasons.

Firstly, the subjects involved in the study are not randomly selected, which may alleviate their representativeness. On the one hand, the study has chosen Advance EFL learners for their full marks in their TOEFL writing test, which may not ensure they are all high-proficiency EFL learners since some students may be more robust in writing but weaker in other language skills. On the other hand, the selection of native English learners was made by the compiler of LOCNESS, probably by recruiting volunteers, and so they may be of greater idiosyncrasy but less native English learners' shared properties. To assess language learners' actual ability, the participants should better be from a broader scope in living places, educational levels, majors, etc. In a word, the more heterogeneous, the better.

Secondly, the essays of the two groups are on different topics, which may have also undermined the credibility of the conclusions since different topics (Mu and He, 2006) and, especially, different styles (Bao, 2010; Johansson, 2008) of writing may have the potentiality of influencing word using. Thus, in future studies, the writing styles of different times must be the same, and the topics for writings in comparison should be at least highly relevant.

Thirdly, for the limitation of the current technology, beyond the three kinds of morphological words investigated in this study, the other type of morphological words cannot be extracted and thus have yet to be studied,i.e., compound words. Such words are as common and vital in EFL learners' vocabulary repository as the other three and deserve to be studied. In fact, in the not-in-the-list part of the results of Rang BNC, a large proportion are compound words. In the future, if there were any breakthrough in technology to consider compounds, the analysis would be more accurate.

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References

Anglin, J. M., et al. (1993). Vocabulary Development: A Morphological Analysis. *Monographs of The Society for Research in Child Development - MNONGR SOC RES CHILD DEVELOP*, *58*(10), 1-166.

Bailey, N., et al. (1974). Is there a "Natural Sequence" in Adult Second Language Learning? *Language Learning*, *24*(2), 234-243.

Bao, G. (2010). 英语学习者语言复杂性变化对比研究(A Survey of the Development of Lexical Richness in L2 compositions from a Multidimensional perspective). *现代外语(Modern Foreign Languages)*, *33*(2), 167-176.

Bauer, L., & Nation, P. (1993). Word families. *International Journal of Lexicography*, *6*(4), 253-279.

Bellomo, T. S. (2009). Morphological Analysis and Vocabulary Development: Critical Criteria. *The Reading Matrix*, *9*(1), 44-55.

Biemiller, A., & Slonim, N. (2001). Estimating Root Word Vocabulary Growth in Normative and Advantaged Populations: Evidence for a Common Sequence of Vocabulary Acquisition. *Journal of Educational Psychology*, *93*(3), 498-520. https://doi.org/10.1037/0022-0663.93.3.498

Blum, S., & Levenston, E. A. (1978). Universals of lexical simplification. *Language Learning*, *28*(2), 399-415.

Brezina, V., & Pallotti, G. (2019). Morphological complexity in written L2 texts. *Second Language Research*, *35*(1), 99 –119. https://doi.org/10.1177/0267658316643125

Brown, R. (1973). *A First Language: The Early Stages*. Harvard University Press.

Carr, W. L., et al. (1942). The Sources of English Words. *The Classical Outlook*, *19*(5), 45-46.

Clercq, B. D., & Housen, A. (2019). The development of morphological complexity: A cross-linguistic study of L2 French and English. *Second Language Research*, *35*(1), 71-97. https://doi.org/10.1177/0267658316674506

Danilović, J., et al. (2013). Affix Acquisition Order in Serbian EFL Learners. *Romanian Journal of English Studies*, *10*(1), 77–88.

de Villiers, G. G., & de Villiers, P. A. (1973). A Cross-sectional Study of the Acquisition of Grammatical Morphemes in Child Speech. *Journal of Psycholinguistic Research*, *2*(3), 267-278.

Edwards, R., & Collins, L. (2011). Lexical Frequency Profiles and Zipf's Law. *Language Learning*, *61*(1), 1-30. https://doi.org/10.1111/j.1467-9922.2010.00616.x

Garbo, F. D. (2019). Matthew Baerman, Dunstan Brown & Greville G. Corbett. Morphological Complexity (Cambridge Studies in Linguistics 153). Cambridge: Cambridge University Press, 2017. Pp. xx + 188. *Nordic Journal of Linguistics 42*, 129–134. https://doi.org/10.1017/S0332586519000015

Goldfield, B. A., & Reznick, J. S. (1990). Early Lexical Acquisition: Rate, Content, and the Vocabulary Spurt. *Journal of Child Language*, *17*(1), 171-183.

Granger, S. (1998). The computer learner corpus: a versatile new source of data for SLA research. In S. Granger (Ed.), *Learner English on Computer* (pp. 3-18). Addison/Wesley/Longman.

Granger, S., & Wynne, M. (1999). Optimising Measures of Lexical Variation in EFL Learner Corpora. In J. M. Kirk (Ed.), *Corpora Galore: Analyses and Techniques in Describing English. Papers from the Nineteenth International Conference on English Language Research on Computerized Corpora* (pp. 249-257). Rodopi.

Heatley, A., et al. (2002). *RANGE and FREQUENCY programs*. Retrieved May 10 from http://www.vuw.ac.nz/lals/staff/Paul_Nation

Horst, M., & Collins, L. (2006). From 'Faible' to Strong: How does their Vocabulary Grow? *Canadian Modern Language Review/ La Revue Canadienne des Langues Vivantes*, *63*(1), 83-106. https://doi.org/10.3138/cmlr.63.1.83

Johansson, V. (2008). Lexical Diversity and Lexical Density in Speech and Writing: A Developmental Perspective. *Lund Working Papers in Linguistics*, *53*, 61-79.

Larsen, D. E. (1975). The Acquisition of Grammatical Morphemes by Adult ESL Students. *TESOL Quarterly*, *9*(4), 409-419.

Laufer, B. (1994). The Lexical Profile of Second Language Writing: Does it Change Over Time? *RELC Journal*, *25*(2), 21-33. https://doi.org/10.1177/003368829402500202

Laufer, B., & Nation, P. (1995). Vocabulary Size and Use: Lexical Richness in L2 Written Production. *Applied Linguistics*, *16*(3), 307-322. https://doi.org/10.1093/applin/16.3.307

Leong, C. K. (1989). Productive Knowledge of Derivational Rules in Poor Readers. *Annals of Dyslexia*, *39*(1), 94-115. https://doi.org/10.1007/BF02656903

Lin, C. (2012). The Nature of Word Learnability in L2 Contexts. In D. Hirsh (Ed.), *Current Perspectives in Second Language Vocabulary Research* (pp. 57-76). Peter Lang.

Lou, X., & Ma, G. (2012). A Comparison of Productive Vocabulary in Chinese and American Advanced English Learners' Academic Writings. *Theory and Practice in Language Studies*, *2*(6), 1153-1159. https://doi.org/10.4304/tpls.2.6.1153-1159

Malvern, D., et al. (2004a). Developmental Trends in Lexical Diversity. *Applied Linguistics*, *25*(2), 220-242. https://doi.org/10.1093/applin/25.2.220

Malvern, D., et al. (2004b). *Lexical Diversity and Language Development: Quantification and Assessment*. Palgrave Macmillan.

Miranda-Garicía, A., & Calle-Martín, J. (2005). The Validity of Lemma-based Lexical Richness in Authorship Attribution. *ICAME Journal*(29), 115-129.

Mochizuki, M., & Aizawa, K. (2000). An Affix Acquisition Order for EFL Learners: an Exploratory Study. *System*, *28*(2), 291-304. https://doi.org/10.1016/S0346-251X(00)00013-0

Morris, J., et al. (2011). Effects of lexical status and morphological complexity in masked priming: An ERP study. *LANGUAGE AND COGNITIVE PROCESSES*, *26*(4/5/6), 558-599. https://doi.org/10.1080/01690965.2010.495482

Mu, L., & He, X. (2006). Effect of essay-test topics on language output. *CELEA Journal（Bimonthly）*, *29*(1), 99-104(115).

Nation, P. (1990). *Teaching and Learning Vocabulary*. Heinle & Heinle

Nation, P. (2001). *Learning Vocabulary in Another Language*. Cambridge University Press.

Pallotti, G. (2015). A simple view of linguistic complexity. *Second Language Research*, *31*(1), 117-134. https://doi.org/10.1177/0267658314536435

Pica, T. (1983). Adult Acquisition of English as a Second Language under Different Conditions of Exposure. *Language Learning*, *33*(4), 465-497.

Richards, J. C. (1976). The Role of Vocabulary Teaching. *TESOL Quarterly*, *10*(1), 77-89.

Schmitt, N. (2008). Instructed Second Language Vocabulary Learning. *Language Teaching Research*, *12*(3), 329-363. https://doi.org/10.1177/1362168808089921

Schmitt, N., & Meara, P. (1997). Researching Vocabulary through a Word Knowledge Framework: Word Associations and Verbal Suffixes. *SSLA*, *20*, 17-36.

Sim, A. D. (2019). Morphological complexity by Matthew Baerman, Dunstan Brown, Greville G. Corbett (review). *Language*, *95*(4), 803-806. https://doi.org/10.1353/lan.2019.0075

Slik, F. v. d., et al. (2019). The role of morphological complexity in predicting the learnability of an additional language: The case of La (additional language) Dutch. *Second Language Research*, *35*(1), 47–70. https://doi.org/10.1177/0267658317691322

Tyler, A., & Nagy, W. (1989). The Acquisition of English Derivational Morphology. *Journal of Memory and Language*, *28*(6), 649-667.

Xanthos, A., & Gillis, S. (2010). Quantifying the Development of Inflectional Diversity. *First Language*, *30*(2), 175-198.

Xanthos, A., et al. (2011). On the role of morphological richness in the early development of noun and verb inflection. *First Language*, *31*(4), 461 –479. https://doi.org/10.1177/0142723711409976