Reading in a Foreign Language April 2022, Volume 34, No. 1
ISSN 1539-0578 pp. 172–183

The Case for Combining Lexical and Morphological Text Profiling: A Response to Cobb

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We are encouraged by Cobb's (2022) description of changes to the Morpholex profiling tool (https://www.lextutor.ca/cgi-bin/morpho/lex/) resulting in more accurate word classifications. This addresses one point in our recent commentary on Morpholex and on Laufer and Cobb's (2020) study using Morpholex (McLean & Stoeckel, 2021). However, Cobb seems to have overlooked or misunderstood some of our other concerns. In this response, we further clarify these issues and suggest three ways morphological text profiling might be improved. We then offer a partial replication of Laufer and Cobb's study to illustrate how those suggestions impact findings.

Word Classification

Cobb (2022) states that Morpholex automatically classifies most derivational forms, and when there is base allomorphy, the decision whether to treat a word as a derivational member of a word family or as a separate baseword is made based on a judgment about whether learners who know the canonical version of the baseword (e.g., *comprehend*) could also understand the derived form with base allomorphy (e.g., *comprehension*).

A minor concern with this methodology is that Morpholex output therefore corresponds with neither the Bauer and Nation (1993) framework nor established wordlists. Bauer and Nation categorized words as basewords or as family constituents based partly on the semantic closeness of a given word to other words with the same root. Morpholex's automatic classification of most words precludes semantic considerations. Bauer and Nation also provided guidance for whether derivational forms with altered roots should be considered part of a word family. So, in our critique of Laufer and Cobb in which we noted that *comprehension* was miscategorized as a baseword (McLean & Stoeckel, 2021), we were pointing out a methodological inconsistency: Laufer and Cobb stated that the basis of their classification was Bauer and Nation's (1993) level 6 family, yet under the Bauer and Nation scheme, *comprehension* is a member of the *comprehend* family, not a baseword.

For increased consistency and replicability, we suggest morphological profilers utilize established, comprehensive wordlists to determine whether words are base or non-base. Then non-basewords could be classified as inflectional or derivational. Nation's (2017) BNC/COCA lists would be suitable for Laufer and Cobb's work because they extend to the 25,000-word level and are based on Bauer and Nation's level 6 word family affix criteria (Nation, n.d.).

The Number of Affixes Needed for Specified Coverage Levels

A more serious concern relates to how Morpholex (and Laufer and Cobb) determines the number of affixes needed to reach critical coverage levels of analyzed texts. We briefly mentioned this in McLean and Stoeckel (2021), but to clarify, we will contrast Morpholex's approach with methodology used in closely-related coverage studies of word (rather than affix) knowledge.

In lexical profiling, software is typically used to calculate the cumulative coverage provided by successive 1,000-word frequency bands (Ks) until 95 or 98% is attained, as these thresholds represent the approximate coverage levels that enable reading with assistance or independently, respectively. In this approach it is assumed that higher-frequency items are learned before those of lower-frequency, and while this assumption is imperfect, research supports its general utility (e.g., Beglar, 2010).

Such an analysis of the first academic text in Laufer and Cobb's corpus, an article by Laufer and Ravenhorst-Kalovski, indicates that the first 3K provide 95% coverage, and 6-7K offer 98% coverage. These thresholds are depicted in red font in the output from Cobb's VPCompleat text profiler (https://www.lextutor.ca/vp/comp/; BNC/COCA 1-25K lists were used) in Figure 1.

Figure 1

Analysis of the First Academic Text in Laufer and Cobb's Corpus with Compleat Web VP (https://www.lextutor.ca/vp/comp/)

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token (%)
K-1 :	386 (53.2)	542 (52.72)	5604 (82.3)	82.3
K-2 :	138 (19.0)	205 (19.94)	587 (8.6)	90.9
K-3 :	128 (17.6)	161 (15.66)	339 (5.0)	95.9
		Coverage 95		
K-4 :	30 (4.1)	36 (3.50)	99 (1.5)	97.4
K-5 :	14 (1.9)	14 (1.36)	21 (0.3)	97.7
K-6 :	12 (1.7)	13 (1.26)	15 (0.2)	97.9
		Coverage 98		
K-7 :	7 (1.0)	9 (0.88)	40 (0.6)	98.5
K-8 :	6 (0.8)	6 (0.58)	6 (0.1)	98.6
K-9 :				
K-10 :	2 (0.3)	3 (0.29)	8 (0.1)	98.7
K-11 :				
K-12 :	1 (0.1)	1 (0.10)	1 (0.0)	
K-13 :	2 (0.3)	2 (0.19)	2 (0.0)	
K-14 :				
K-15 :				
K-16 :				
K-17 :				
K-18 :				
K-19 :				
K-20 :				
K-21 :				
K-22 :				
K-23 :				
K-24 :				
K-25 :				
Off-List:	??	35 (3.40)	89 (1.31)	100.00
Total (unrounded)	726+?	1028 (100)	6811 (100)	≈100.00

In contrast, in Laufer and Cobb's analysis of derivational affixes, no consideration was made for how such affixes map onto any corpus-derived, frequency-based affix list. For each text, they simply summed the occurrences of the most frequent affixes until 95/98% coverage was reached and stated that knowledge of only those affixes was sufficient. Cobb (2022) questions that this is the approach used in Laufer and Cobb. However, these authors claimed, for instance, that "even in the case of both academic and quality press articles … only an average of three different affixes…must be known to meet 95 per cent coverage" (p. 991). Because different combinations of affixes are needed for 95% coverage in each of the texts in question, the only way that this claim is possible is if they were referring to the most frequent affixes in each text. Their National Post (Murphy) text, for example, requires just four derivational affixes to reach 95% coverage, but the fourth of these, -*et*, is ranked tenth in their own frequency-based affix list for newspapers and 29th in their full corpus.

Laufer and Cobb's claims are therefore technically true but of questionable usefulness. If the same approach were taken in coverage studies of word (not affix) knowledge, we would conclude that knowledge of just 708 word families is enough to independently understand the text analyzed in Figure 1. This is because that text contains just 726 different word families (bottom left of Figure 1) and 18 of those are in the bands beyond the 98% coverage threshold. Such an assertion would be strange, however, because a lexicon that small is likely to consist mostly of very high-frequency words, including many that did not appear in this text, and lacking many of the items needed for sufficient coverage. More importantly, even if a learner somehow knew only the 708 words necessary to understand the analyzed text, that knowledge would be of little use in generalizing the ability to comprehend other texts.

A more suitable approach to estimating the affixes needed for critical coverage thresholds, and one consistent with lexical analysis, would be to use a comprehensive, frequency-based list of derivational affixes, just as wordlists are used in lexical profiling.

The Assumption of Full Knowledge of Base and Inflectional Forms

A final, critical consideration is that in estimating the number of derivational affixes needed for specified coverage levels in Morpholex, all base and inflectional forms are assumed to be known; moreover, once an affix is assumed known, all derivational forms containing that affix are assumed known regardless of family frequency. For example, Laufer and Cobb claimed that knowledge of just 4 derivational affixes is sufficient for 95% coverage of the Murphy newspaper article in their corpus. The only way that is possible, however, is if readers know low-frequency words like *piety*, *surrogate*, *postulate*, *maul*, *omnibus*, *flippant*, *tendentious*, *flaccid*, and *schtick*. For the many, even highly proficient, learners who do not know such words, greater affixational knowledge is required.

This could be addressed by combining lexical and morphological analyses so that the number of derivational affixes needed for critical coverage levels is calculated at each of several levels of lexical mastery.

Partial Replication of Laufer and Cobb (2020)

To test the suggestions outlined above, we conducted a manual reanalysis of three texts in Laufer and Cobb's corpus: Laufer & Ravenhorst-Kalovski (academic), Murphy (newspaper), and Lord Jim (graded reader).

We classified numbers, acronyms, irregular forms, and most proper nouns as basewords. We then classified (a) proper nouns that are also lexical items (e.g., *International Women's Day*) and (b) each remaining token as base/non-base according to Nation's BNC/COCA 25K wordlists. For each non-base form, we catalogued the presence of affixes at levels 2–6 of Bauer and Nation's taxonomy. Thus, *learner*, a (non-base) member of the *learn* family in the BNC/COCA lists, was categorized as a derivational form consisting of *learn* + *er*. This alignment with the BNC/COCA lists facilitates consistency and replicability.

We next needed a frequency-based derivational affix list. Although Laufer and Cobb produced such a list, something derived from a larger and more representative corpus was needed so that a small number of texts would not skew affix rankings. Laufer and Cobb, for example, listed -*age* as the seventh most frequent derivational affix in their corpus and the third most in their academic section, but over 45% of all occurrences of -*age* were in a single text. Additionally, the frequencies in Laufer and Cobb's list reflect only the derivational affixes needed for 98% coverage in each text. As such, the occurrences of approximately one-third of the derivational forms in their corpus are not represented in their list.

We adapted a list from Sánchez-Gutiérrez et al. (2018), who calculated affix frequencies from a 131-million-word corpus. Because they parsed words and classified affixes somewhat differently from Bauer and Nation's taxonomy, we made three revisions to their affix list, each recorded in Supplementary Data. First, when a Bauer and Nation affix (e.g., -*ive*) was represented by multiple affixes in Sánchez-Gutiérrez et al. (e.g., -*ive* and -*tive*), the frequencies for these multiple items were summed and listed under the Bauer and Nation affix. Second, when multiple Bauer and Nation affixes (e.g., -*ion*, -*ation*, and -*ition*) were represented by a single Sánchez-Gutiérrez et al. affix (e.g., -*ion*), all the Bauer and Nation affixes were given the same rank in our list. This amalgamation of Bauer and Nation affixes benefits Laufer and Cobb's case, as it results in fewer ranked items accounting for specified coverage. Finally, since Laufer and Cobb defined the word family through Bauer and Nation level 6, all derivational affixes beyond level 6 were removed from the Sánchez-Gutiérrez et al. list and treated as part of the base. Thus, *planetarium*, a derivational form containing the affix -*ium* under Sánchez-Gutiérrez et al., is classified as a base form here (as in the BNC/COCA lists) because -*ium* is not among the first six levels of Bauer and Nation.

In the three-way classification of words as base, inflectional, or derivational, we also needed a way to handle words containing multiple derivational affixes. Laufer and Cobb appear to have listed such items twice, but this causes inaccuracy in a text's token count and overstates the number of derivational forms. Because a principle of a frequency-based approach is that higher-frequency items are usually learned first, we classified each of these words just once according to its less/least frequent derivational affix. In this way, a learner would be credited with "knowing" the word only when they knew its less/least frequent derivational affix. Accordingly, *relationship* (*relate* + *ion* + *ship*) was listed under the less frequent affix -*ship*, rather than -*ion*, in estimating coverage. Though this pertains to fewer than 1% of the tokens in each of the three analyzed texts, it allows the sum of base, inflectional, and derivational forms to equal the number of tokens in a text.

Finally, to estimate the derivational knowledge needed at different levels of vocabulary mastery, we created a simple model in which it was assumed that (a) all words beyond mastered 1,000-word levels are unknown and (b) words employing unknown derivational affixes are unknown regardless of family frequency. Accordingly, *academic*, a member of the 3K *academy* family containing the ninth-ranked -*ic* affix, was treated as unknown for learners with less than 3K mastery regardless of affixational knowledge and for those with knowledge of fewer than 9 affixes regardless of vocabulary level mastery. For this time-intensive manual analysis, we examined the shortest authentic text (the Murphy article) and the graded reader. For the graded reader, in addition to 95/98% coverage, we calculated the derivational affixes needed for 99% coverage. This is because graded readers are commonly used for extensive reading (ER), and when ER is done for fluency development, in principle, all words in the text should be known (Nation & Waring, 2020). Clearly, if all words are known, all derivational affixes in the text would also need to be known. Our use of 99% therefore yields a conservative estimate of the derivational affixes needed for use of the reader for fluency development.

Table 1 shows summary coverage statistics for the three texts as analyzed by Laufer and Cobb and in our reanalysis. In comparison to Laufer and Cobb, we consistently found a higher percentage of basewords, and in two of the texts, we found a lower proportion of derivational forms. Both may be due to our use of the BNC/COCA lists, which classify some morphologically complex words as base forms. Additionally, we found a lower proportion of inflectional forms, perhaps because Laufer and Cobb misclassified some derivational forms ending in an inflectional affix (e.g., *learners*) as inflectional rather than derivational (McLean & Stoeckel, 2021). The two analyses also differed in the token counts for each text, mostly explained by Laufer and Cobb's exclusion of proper nouns and our exclusion of the appendix in the Laufer and Ravenhorst-Kalovski text.

Table 1

A Reanalysis of the Coverage Provided by Base, Inflectional, and Derivational Forms for Three Texts in Laufer & Cobb (2020)

Text	Analysis	Tokens	Coverage %		
			Basewords	Inflections	Derivations
Laufer & Ravenhorst-Kalovski (2010)	Current	6,703	77.6	91.8 (14.2)	100.0 (8.2)
	Laufer & Cobb	6,855	75.3	92.5 (17.2)	100.0 (7.5)
National Post (Murphy, 2019, March 5-6)	Current	1,178	82.1	93.7 (11.6)	100.0 (6.3)
	Laufer & Cobb	999	77.8	90.9 (13.1)	100.0 (9.1)
Lord Jim (Bookworms 4)	Current	20,028	87.2	96.9 (9.7)	100.0 (3.1)
	Laufer & Cobb	17,900	84.9	95.5 (10.6)	100.0 (4.5)

Table 2 shows the number of each derivational affix in the three texts according to our analysis. Columns 1–3 display the Bauer and Nation affix level, the affix itself, and its frequency rank in our list as derived from Sánchez-Gutiérrez et al. The remainder of the table shows the coverage provided by basewords, inflectional forms, and each derivational affix for the three texts. For each text, the points at which 95% and 98% coverage is reached are in bold.

Table 2 also makes plain our accounting of words with multiple derivational affixes. As described above, such words are listed according to their less/least frequent affix. The table shows the total number of occurrences of each affix followed parenthetically by the number of times the affix does not count towards coverage. For instance, the highest-ranked affix *-ion* occurs 3 times in the Murphy text, but only 2 of these (3 - 1 = 2) count toward coverage. The other occurred in *delusional*, which is counted under the less frequent affix, *-al*. A complete list of such words is in Supplementary Data.

Table 2

A Reanalysis of the Affixes Needed for 95% and 98% Coverage of Three Texts in Laufer and Cobb (2020) When All Basewords and Inflectional Forms Are Assumed Known

Frequency-Based Affix List				Text					
				Laufer & Ravenhorst-Kalovski		Murphy		Lord Jim	
B & N Level	Affix	Rank		Freq[a]	Cum Coverage	Freq[a]	Cum Coverage	Freq[a]	Cum Coverage
			Basewords	5,200	77.58	967	82.09	17,466	87.21
			Inflections	955	91.82	137	93.72	1,937	**96.88**
			Derivations						
6	-ion	1		123 *(-16)*	93.42	3 *(-1)*	93.89	6	96.91
4	-ation			14 *(-3)*	93.58	8	94.57	5	96.93
6	-ition			16 *(-14)*	93.61				
4	-al	2		39 *(-7)*	94.09	8 *(-1)*	**95.16**	9 *(-6)*	96.95
5	-al					3 *(-2)*	95.25	6	96.98
3	-er/-or/-ar[b]	3		103	**95.63**	4	95.59	44	97.20
3	-y	4		1	95.64	1	95.67	23 *(-2)*	97.30
6	-y			11	95.81			22	97.41
3	-ly	5		45 *(-3)*	96.43	15 *(-3)*	96.69	320 *(-36)*	**98.83**
5	-ly					3	96.94	20 *(-3)*	98.92
6	re-	6		3 *(-3)*	96.43			2	98.93
4	-ity	7		5	96.51	2	97.11	1	98.93
5	-ant	8						7	98.97
5	-ent							2	98.98
6	-ic	9		31 *(-5)*	96.90	1	97.20	3	98.99
4	-ment	10		9 *(-1)*	97.02	11	**98.13**	3	99.01
3	-able/-ible[c]	11		6	97.11	2	98.30	8 *(-2)*	99.04
6	-able			5	97.18				
5	pro-	12							
6	-ive	13		3	97.23	1	98.39		
5	-ance	14		5	97.30	2	98.56		
5	-ence								
5	-ory	15							
5	-ary					1	98.64		
5	-atory								
5	-en	16				1	98.73	1	99.04
5	-en							13	99.11
4	in-/im-/il-/ir	17		5	97.37			7	99.14
5	ex-	18				1	98.81		
3	un-	19		3	97.42	3	99.07	34 *(-4)*	99.29
5	un-					1	99.15	1	99.30
4	-ous	20		1	97.43	2 *(-1)*	99.24	18	99.39

4	-ize/ise	21	9		97.57			1		99.39
4	-ful	22	3		97.61	1	99.32	51		99.65
5	-ian	23				1	99.41			
4	-ist	24	4		97.67	1	99.49			
6	-ist									
6	-ify	25								
5	inter-	26								
5	en-	27								
5	sub-	28								
5	-age	29	123		**99.51**					
5	-ite	30								
4	-ism	31								
3	-ness	32	1		99.52	2	99.66	37	*(-2)*	99.82
5	-ship	33	14		99.73					
5	-eer	34								
3	-ish	35						5		99.85
3	-less	36	1		99.75	1	99.75	24		99.97
6	pre-	37	1		99.76					
6	-ee	38								
5	mis-	39	1		99.78	1	99.83			
5	-ese	40								
3	-th	41	8		99.90			2		99.98
6	-th									
5	-dom	42								
5	-wise	43	2		99.93					
5	fore-	44								
5	-ward	45						2		99.99
4	-ess	46				1	99.92			
5	-hood	47						2		100.00
5	circum-	48								
5	post-	49								
5	mid-	50								
5	-i	51								
5	bi-	52								
3	non-	53	2		99.96					
5	anti-	54								
5	-let	55								
5	semi-	56								
5	-ette	57								
5	-ling	58								
5	-most	59								
5	hyper-	60								
5	-an	61								
5	-ery	62								
5	-esque	63								
5	ante-	64								
5	-ally	65	1		99.97	1	100.00			
5	arch-	n/a[d]								
5	counter-	n/a								
5	neo-	n/a								
5	-ways	n/a								
	other[e]		2	[f]	100.00			1	[g]	100.00

Note. Bold font denotes the point at which 95% and 98% coverage is reached.
[a]Parenthetical values show the count of derivational affixes not counting toward cumulative coverage because they are the more/most frequent of multiple affixes in a token. [b]Bauer and Nation do not mention *-or/-ar*, but the BNC/COCA wordlists have forms with these variants (e.g. *actor*, *beggar*). [c]Bauer and Nation put *-ible* at level 7, but the BNC/COCA wordlists feature forms with this variant (e.g. *forcible*). [d]The Bauer and Nation affixes *arch-*, *counter-*, *neo-*, and *-ways* are not Sánchez-Gutiérrez et al. (2018) affixes and so could not be frequency ranked.
[e]BNC/COCA families occasionally have constituents with affixes outside of Bauer and Nation levels 2–6.
[f]*comparison* (2 tokens). [g]*everlasting*

In most cases, our calculations of the number of derivational affixes needed for critical coverage levels when all basewords and inflectional forms are assumed known do not differ substantially from Laufer and Cobb's findings (Table 3). The exception is the 98% coverage level for the Laufer and Ravenhorst-Kalovski text. Laufer and Cobb reported that the 10 most frequently occurring affixes in the text enable 98% coverage while we found 29 derivational affixes are needed under a frequency-based model to affix acquisition.

Table 3

Derivational Affixes Required for 95% and 98 % Coverage of Three Texts When All Basewords and Inflectional Forms Are Assumed Known

Text	Analysis	Derivational Affixes Needed for Specified Coverage	
		95%	98%
Laufer & Ravenhorst-Kalovski (2010)	Current	3	29
	Laufer & Cobb	3	10
National Post (Murphy, 2019, March 5-6)	Current	2	10
	Laufer & Cobb	4	12
Lord Jim (Bookworms 4)	Current	0	5
	Laufer & Cobb	0	4

Finally, combining lexical and morphological analyses, Table 4 shows the number of derivational affixes needed for specified coverage thresholds at various vocabulary mastery levels for the Murphy text and for the graded reader (details in Supplementary Data). Unsurprisingly, as vocabulary mastery increases and provides more coverage, the number of required derivational affixes decreases. The problem with this pattern, however, is that it is contrary to the natural development of lexical knowledge in which word and derivational knowledge grow in tandem (Mochizuki & Aizawa, 2000).

Consequently, though it is theoretically correct to say that just 10–12 derivational affixes are needed for 98% coverage of the Murphy article, no one would normally possess complete lexical mastery of the text (i.e., mastery of all basewords and inflectional forms through the 16K level plus off-list words) while knowing just 10 derivational affixes. Rather, Table 4 indicates that even advanced learners with vocabulary mastery at the 10K level would need to know 65 derivational affixes for 98% coverage. Mastery of the first 5K is sufficient for 95% coverage if the first 13 derivational affixes are known. Although this is substantially more than Laufer and Cobb's estimate of 2 when perfect vocabulary mastery is assumed, 95% coverage of an authentic text seems attainable for English learners with somewhat limited lexical and derivational knowledge. However, this is still well beyond most learners in expanding circle and many EFL settings (McLean & Stoeckel, 2021).

Our findings for Lord Jim are similar to those of Laufer and Cobb for 95 and 98% coverage (though learners with 3K lexical mastery require substantially more derivational knowledge for

98% coverage). The important finding here is the markedly greater derivational knowledge needed for 99% coverage, a conservative coverage level for use of the text for fluency development. For even highly proficient English learners, at least 20 derivational affixes are needed.

Table 4

Number of Derivational Affixes Required for Specified Coverage Levels of Two Texts at Different Levels of Vocabulary Mastery

Vocabulary Mastery Level	Text				
	Murphy		Lord Jim		
	95%	98%	95%	98%	99%
1K	n/a	n/a	n/a	n/a	n/a
2K	n/a	n/a	0	n/a	n/a
3K	n/a	n/a	0	20	n/a
4K	n/a	n/a	0	5	33
5K	13	n/a	0	5	23
6K	10	n/a	0	5	23
7K	10	n/a	0	5	23
8K	5	n/a	0	5	20
9K	5	n/a	0	5	20
10K	5	65	0	5	20
11K	5	32	0	5	20
12K	5	22	0	5	20
13K	3	19	0	5	19
14K	3	19	0	5	19
15K	3	16	0	5	19
16K	3	15	0	5	19
25K + offlist	2	10	0	5	10

Note. n/a = specified coverage is unattainable even when all derivational affixes are known

Discussion

The development of Morpholex and Laufer and Cobb's study using the profiling tool have been helpful for better understanding the morphological profiles of different discourse types. However, they understate the derivational knowledge needed for critical coverage levels by (a) considering the derivational affixes in a given text separate from any broader model of affix acquisition and (b) by assuming all basewords and inflectional forms are known. When a frequency-based approach is applied to both word and affix knowledge as in Table 4, we see a predictable relationship in which coverage varies depending on levels of each.

This has implications for how researchers and teachers interpret the output from existing morphological and lexical profilers. For instance, for 95% coverage of the Laufer and Ravenhorst-Kalovski text, morphological profiling indicates just 3 derivational affixes suffice

(Table 3) while lexical profiling shows that mastery of the first 3K is enough (Figure 1). However, both cannot simultaneously be true. Knowledge of just 3 derivational affixes is sufficient for 95% coverage only when basewords and inflectional forms at all frequency levels are known. Similarly, mastery of the first 3K provides 95% coverage only when all derivational forms in the text from the first 3,000 word families are known. As such, morphological profiling by itself understates the derivational knowledge needed for critical coverage levels for those who have less than complete knowledge of the base and inflectional forms in a text. Likewise, level 6 family-based lexical profiling underestimates the lexical mastery needed for critical coverage levels for learners with incomplete derivational knowledge. We believe combining the two analyses, as done here, provides more nuanced estimates that better reflect the needs of real-world learners.

References

Bauer, L., & Nation, P. (1993). Word families. *International Journal of Lexicography, 6*(4), 253–279. https://doi.org/10.1093/ijl/6.4.253

Beglar, D. (2010). A Rasch-based validation of the Vocabulary Size Test. *Language Testing, 27*(1), 101–118. https://doi.org/10.1177/0265532209340194

Cobb, T. (2022). Counting affixes with Morpholex: A response to McLean and Stoeckel (2021). *Reading in a Foreign Language, 34*(1), 165–171.

Laufer, B., & Cobb, T. (2020). How much knowledge of derived words is needed for reading? *Applied Linguistics, 41*(6), 971-998. https://doi.org/10.1093/applin/amz051

McLean, S., & Stoeckel, T. (2021). Lexical mastery thresholds and lexical units: A reply to Laufer. *Reading in a Foreign Language, 33*(2), 247–259. https://doi.org/10125/67403

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

Nation, I. S. P. (2017). The BNC/COCA Level 6 word family lists (Version 1.0.0) [Data file]. Available from http://www.victoria.ac.nz/lals/staff/paul-nation.aspx

Nation, P. (n.d.). *The BNC/COCA word family lists*. https://www.wgtn.ac.nz/__data/assets/pdf_file/0005/1857641/about-bnc-coca-vocabulary-list.pdf

Nation, P., & Waring, R. (2020). *Teaching extensive reading in another language*. Routledge.

Sánchez-Gutiérrez, C. H., Mailhot, H., Deacon, S. H., & Wilson, M. A. (2018). MorphoLex: A derivational morphological database for 70,000 English words. *Behavior Research Methods, 50*, 1568–1580. https://doi.org/10.3758/s13428-017-0981-8

Acknowledgement

The authors would like to thank Dale Brown for his helpful feedback on an earlier version of this article. Any remaining errors are the sole responsibility of the authors. This research was supported by a Grant-in-aid for Scientific Research (20K00792) from the Japan Society for the Promotion of Science.

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