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Academic Vocabulary in Applied Linguistics Research Articles: A Corpus-based Replication Study

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Abstract

With the global spread of English as the lingua franca for academic publishing, non-native researchers and university students are constantly facing linguistic barriers including insufficient vocabulary knowledge in writing for publication. This persistent need motivated the development of a good number of corpus-based word lists for frequently used academic and technical words in research articles across disciplines. Nevertheless, despite its importance in corpus-based study of language for word list development, replication research has received far less attention in this line of inquiry. The current study aimed to address this gap and replicated two published studies that investigated the use of academic vocabulary in applied linguistics research articles. To this end, research articles published from 2010 to 2020 in 20 well-known journals in the field were collected, and a corpus with around 48 million words was compiled and analyzed. The findings indicated that academic vocabulary accounted for 11.46% of the corpus, which is similar and close to the reported coverage of the AWL in replicated studies. However, regarding the frequently occurring academic and non-academic content words, the findings showed considerable variation with respect to the results reported earlier. In light of these findings, the study highlighted the importance of replication research to test the reliability of corpus-based vocabulary studies that developed field-specific academic word lists. Finally, the study developed an updated version for applied linguistics academic word list, that might be regarded as a resource and guide for the vocabulary learning component of the relevant EAP programs in the field.

Keywords: academic vocabulary, wordlist research, Applied Linguistics, replication research, research articles, EAP, ERPP

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1. Introduction

Given the importance of vocabulary knowledge for successful uses of language in various contexts, identifying the vocabulary learning needs of language learners has been a consistent concern for vocabulary researchers working in Applied Linguistics. In this regard, in a widely employed classification, the vocabulary of English has been divided into four categories of high-frequency (or general service), academic, technical, and low-frequency words (Coxhead & Nation, 2001; Nation, 2001). It has been argued that in a well-balanced course, English language learners should move from general service words to the academic and technical vocabulary. Within this traditional view on vocabulary learning/teaching (for more recent views, see: Beck et al., 2013; Nation, 2013; Schmitt & Schmitt, 2014; Vilkaitė-Lozdienė & Schmitt, 2019), academic vocabulary has been operationalized very broadly as the words that occur with reasonably higher frequency across different academic genres (such as research articles), but are much less frequent in other text types (Coxhead & Nation, 2001). Previous research indicated that this vocabulary type accounts for around 10 to 14 percent of most academic texts (Coxhead, 2000; Gardner & Davies, 2014), and learning such words in particular poses a major challenge for English language learners studying in a university context (Coxhead, 2000, 2011, 2018b, 2019; Coxhead & Nation, 2001; Nation & Waring, 1997; Xue & Nation, 1984). The Academic Word List (AWL) (Coxhead, 2000) which was developed more than two decades ago aimed to help university students and their instructors in dealing with academic vocabulary. This core academic word list contains 570 word families, and despite some limitations remained as a main source for EAP instruction, materials development, and vocabulary assessment (Coxhead, 2011; Huntley, 2006; McLean & Kramer, 2015; Wells, 2007).

Over the past years, a growing number of corpus-based studies investigated academic vocabulary in different text types, including research articles (Coxhead, 2018b, 2019; Dang, 2019). This line of research generally aims to help English for Academic Purposes (EAP) instructors and students to set better and more informed vocabulary learning goals. A significant finding attained from this growing body of literature is the fact that the use of academic vocabulary shows considerable variation among different disciplines and subject areas (Chen & Ge, 2007; Green & Lambert, 2018; Khani & Tazik, 2013; Lei & Liu, 2016; Liu & Han, 2015; Martínez et al., 2009; Valipouri & Nassaji, 2013; Valizadeh &

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Xodabande, 2021; Wang et al., 2008; Xodabande & Xodabande, 2020). It has been also highlighted that there is a need for creating more restricted and discipline-specific word lists to account for the needs to university students (Durrant, 2014, 2016; Hyland & Tse, 2007). Moreover, with the increased importance of corpus-based approaches in language education (Boulton & Cobb, 2017; Braun, 2007; Chambers, 2019; Farr & O'Keeffe, 2019; Römer, 2011; Vyatkina, 2020), research in English for Specific Purposes (ESP) vocabulary studies is attracting more attention (Coxhead, 2018b; Nation, 2016). Nevertheless, against this promising scholarship, a missing component in vocabulary studies is the scarcity of replication research , and the number of replicated studies remained very limited (Coxhead, 2018a, 2018b; N. Schmitt et al., 2017).

Replication refers to the exact or approximate repetition of the earlier studies that aim to determine if the reported findings are reliable and generalizable (Abbuhl, 2018; Marsden et al., 2018; Porte & McManus, 2019; Siyanova-Chanturia, 2014). Although the excessive prioritization of originality and innovation in Applied Linguistics over the past decades negatively impacted conducting replication research within the field (Abbuhl, 2018), recent years have witnessed a growing interest in replication studies (Marsden et al., 2018). It has been also argued that replication is critical in word list research (Miller & Biber, 2015). Accordingly, there is a need to repeat earlier studies focusing on specialized vocabulary with different but similar corpora to see if the same items would be generated for other lists (Coxhead, 2018b). Given that the use of the AWL items in Applied Linguistics research articles was examined in the past decades (Khani & Tazik, 2013; Vongpumivitch et al., 2009), the current study aimed to replicate those studies by following the same procedures, but with analyzing a much larger and more representative corpus. The following section provides a general overview of the studies that investigated the use of the AWL in a number of disciplines. The discussion then turns to the two studies that the current study aimed to replicate.

2. Literature Review

2.1. AWL Studies

The academic word list has long been regarded as a benchmark in developing EAP materials and courses around the world (Coxhead, 2011; Huntley, 2006; D.

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Schmitt & Schmitt, 2011; Wells, 2007). This has created an increased interest among the researchers to investigate its contribution to academic discourse. The early research indicated that the AWL provides around 10% coverage in most academic texts (Coxhead, 2000, 2011; Coxhead & Byrd, 2007). Nevertheless, the evidence provided by some recent studies supported the fact that the AWL is far from being a perfect academic word list. In one of these studies, Hyland and Tse (2007) investigated the use of the AWL in a multi-genre and multi-disciplinary corpus with around 3.3 million words. The corpus was compiled from academic texts including research articles, lectures, lab manuals, textbooks, thesis, and dissertations in a principled approach and based on sound criteria. The texts in the corpus were also balanced among different disciplines. The findings of the study provided strong evidence for the limitations associated with taking a common core view on academic vocabulary. More specifically, the study showed that "although the AWL covers 10.6% of the corpus, individual lexical items on the list often occur and behave in different ways across disciplines in terms of range, frequency, collocation, and meaning" (p. 235). The study was influential in initiating an ongoing attempt among the researchers to develop more discipline-based academic word lists to serve the vocabulary learning needs of students in different subject areas.

Within the same line of inquiry, Chen and Ge (2007) investigated the use of AWL in a corpus of medical research articles. This study reported that 292 out of the 570 words in the AWL were used frequently in the corpus, and 111 items were used very infrequently. Overall, the academic word list (Coxhead, 2000) provided around 10% coverage in the corpus. Moreover, the findings from this study revealed that high-frequent AWL words were employed differently with respect to the original sub-lists developed by Coxhead (2000), as some high frequent words in Coxhead (2000) were used with less frequency in the medical research articles and vice versa. In another study, Martínez et al. (2009) examined the use of academic vocabulary in agriculture research articles using both qualitative and quantitative analysis. The corpus used in this study had 826,416 running words, and the researchers employed similar criteria to Coxhead (2000) to profile the academic words. The findings indicated that the AWL provided 9.06% coverage in the agriculture research articles. It should be noted that some items in the AWL were not used in the analyzed corpus. In this regard, the study showed that around 37.50% of words in AWL were absent in agriculture research articles. Focusing on research articles published in chemistry, Valipouri and Nassaji (2013) studied

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the frequency and distribution of the AWL in a corpus with around four million running words. Similar to earlier studies, this study also found variation in using the AWL items in the corpus. In this regard, the findings indicated that 327 word families from the AWL were used frequently in the corpus, and those items accounted for 9.60% of the tokens.

Two more recent studies investigated the use of the AWL items in psychology research articles. In this regard, Safari (2018) analyzed a corpus of psychology research articles with 3.4 million words. The findings indicated that 95 AWL word families were used infrequently in the corpus. The study further identified 189 non-GSL/AWL words that occurred frequently and compiled a list of 1587 most frequent word families for the psychology discipline. Although the study did not provide specific information regarding the coverage of the GSL and the AWL in the corpus, the author claimed that although the developed psychology word list contained much fewer items, it improved the coverage provided by the lists mentioned above by 2.2%, nonetheless. Finally, Xodabande and Xodabande (2020) investigated a corpus of psychology research articles with 74 million running words. Their findings indicated that the GSL items accounted for 72.08% of the corpus. The coverage of the AWL items was 13.12%, and the cumulative coverage of the two lists accounted for 85.2% of the words in psychology research articles. This study also identified 693 word types outside the GSL and the AWL that occurred frequently and provided 6.1% coverage of the tokens in the corpus.

2.2.The AWL in Applied Linguistics Research Articles

Two studies in previous decades investigated the coverage of the AWL in the Applied Linguistics research articles. In the first study, using a corpus of 200 research articles with 1.5 million running words, Vongpumivitch et al. (2009) investigated the use of the AWL (Coxhead, 2000) and non-GSL/AWL content words in Applied Linguistics. The researchers collected data from five journals, including *Applied Linguistics, Language Learning, The Modern Language Journal, Second Language Research, and TESOL Quarterly.* In this regard, the electronic versions of 40 articles from each journal were obtained and formed the Applied Linguistics corpus (ALC). Following procedures taken by Coxhead (2000) in developing the AWL, the authors used adjusted frequency and range criteria to explore the frequency and distribution of the AWL and non-GSL/AWL

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word forms (defined in this this study as individual word types) in the corpus. The findings revealed that the AWL accounted for 11.17% of the tokens in the corpus, and 475 AWL items (out of 570) met the frequency and range criteria. The study also identified 128 non-GSL/AWL items used frequently in the corpus that met the criteria and provided 2.8% coverage in ALC. Moreover, regarding the frequently used AWL items, the study found that the 475 most frequently used items accounted for 8.6% of the ALC, and 5% of this coverage belonged to the top 100 items. This study found considerable overlap between the 100 most frequent AWL word types in ALC and the first two sub-lists of the AWL (Coxhead, 2000). Finally, given the less coverage of non-GSL/AWL items in the corpus, the study concluded that the AWL forms "play a more important role in academic writing than the non-AWL content word forms in the field of Applied Linguistics" (p. 37).

In another study, Khani and Tazik (2013) developed an academic word list for Applied Linguistics, using the GSL and the AWL as the base lists. The authors rightly mentioned a major shortcoming associated with the previous study conducted by Vongpumivitch et al. (2009) regarding the representativeness of their corpus, which included only five journals and 200 research articles. Moreover, Khani and Tazik (2013) criticized the former study for the use of word forms (i.e. word family) as the unit of counting for vocabulary items and argued for the use of word types based on the evidence provided by earlier studies regarding their usefulness (Ward, 2009). Nevertheless, a more careful reading of Vongpumivitch et al. (2009) reveals that despite using a different terminology (i.e. forms instead of types), they also used and reported word types in their data analysis. Khani and Tazik (2013) collected 240 research articles (with 1,553,450 running words) randomly from 12 journals published between 2000 and 2009. The expanded list of journals included: *Applied Linguistics, English for Academic Purposes, English Language Teaching, English for Specific Purposes, International Journal of Applied Linguistics, Journal of Pragmatics, Language Learning, Language Teaching Research, Language Testing, Modern Language Journal, System, and TESOL Quarterly*. Adjusting the range and frequency criteria proposed by Coxhead (2000), the study analyzed the corpus for the use of AWL and non-GSL/AWL items. The findings revealed that the AWL provided 11.96% coverage in the corpus of Applied Linguistics research articles. Moreover, the data analysis showed that the GSL and the AWL words provided a cumulative coverage of 88%, indicating their importance and significant contribution in the

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texts derived from journals. Applying the range and frequency criteria (also by excluding the GSL items which is specialized occurrence criterion), the authors identified 773 words types (573 AWL, 200 non-GSL/AWL) that occurred frequently in the corpus, and provided 12.48% coverage. These words had 74.12% overlap with the items in the AWL, and hence the authors recommended focusing on items in this list as they provide a valuable resource for academic vocabulary in Applied Linguistics.

The abovementioned studies provided us with valuable insights regarding the use of academic vocabulary in the research articles published in Applied Linguistics journals. For example, their findings showed that the mastery over AWL items is important for researchers and university students within the field. However, some methodological considerations make it necessary to approach their findings with caution, and more importantly to test their findings against different but similar corpora. In this regard, a major concern relates to the size of corpora investigated in previous studies, which were around 1.5 million words. Although a corpus with this size well serves the study of general service or high-frequency vocabulary (Brysbaert & New, 2009), it fails to provide an appropriate context for creating a reliable list of words beyond this category. In fact, previous research indicated that for vocabulary items beyond this range (which include academic words), a corpus of around 20 million words is needed (Nation, 2016; Sorell, 2013). Moreover, in both studies discussed above, a limited number of research articles (20 to 40) were collected from different journals, and despite the random selection of the articles, this procedure might has resulted in skewed findings. In order to address some of these shortcomings, the current study aimed to replicate the studies conducted by Vongpumivitch et al. (2009), and Khani and Tazik (2013). To this end, the current study collected and analyzed a corpus of Applied Linguistics research articles published in 20 journals in the last decade.

3. Method

3.1. Corpus

The corpus analyzed for the current study was compiled by collecting all published research articles from 20 well-known and established journals in the field of Applied Linguistics. These included 7383 articles published between 2010 and 2020. The selected journals were all written in English and contained both

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theoretical and experimental articles in all areas of Applied Linguistics, broadly defined as the study of second/foreign language learning/teaching and practical application of language theories (Richards & Schmidt, 2010). Moreover, in order to have a more contemporary corpus to represent recent developments and debates in the field, the last decade was used as the time span for the publications. In finalizing the list of the journals, we relied on journal ranking systems in scientific databases including Web of Science and Scopus. In this regard, the list of journals in the linguistics and language category of Scimago journal ranking database (https://www.scimagojr.com/journalrank.php) was used. Then the journals that are not indexed in the Web of Science were excluded. This procedure was followed by obtaining expert recommendations (10 university professors in Applied Linguistics) on including or excluding some journals. Next, the electronic versions of the research articles were obtained, and the PDF files were converted to text files in order to be analyzed by the corpus analysis software. The final corpus contained 7383 research articles with 48,279,142 running words.

Table 1

Selected Journals and the Number of Articles Included in the Corpus

	Journal	No. of articles
1	Modern Language Journal	708
2	Studies in Second Language Acquisition	427
3	Applied Linguistics	460
4	System	917
5	Language Testing	300
6	TESOL Quarterly	440
7	Language Learning	488
8	Language Teaching	304
9	Language Teaching Research	350
10	English for Specific Purposes	285
11	English for Academic Purposes	411
12	RELC	250
13	ReCALL	200
14	Computer Assisted Language Learning	366
15	International Journal of Applied Linguistics	220
16	Second Language Research	266
17	Journal of Second Language Writing	280
18	Innovation in Language Learning and Teaching	227
19	ELT Journal	348
20	Annual Review of Applied Linguistics	136
	Total	7383

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3.2. Software for Analysis

The current study used AntWordProfiler (Anthony, 2014) for profiling the vocabulary used in the corpus of Applied Linguistics research articles. AntWordProfiler is a freeware tool for analyzing the complexity and the vocabulary level of the texts. Two default word lists available in the tool are the GSL (West, 1953) and the AWL (Coxhead, 2000). The computer program compares the loaded corpus against specific vocabulary lists and gives complete frequency information. Furthermore, the output from AntWordProfiler was copied into Microsoft Excel worksheets to identify frequently used academic vocabulary and also frequently used non-GSL/AWL items in the corpus.

3.3. Data Analysis

A consistent concern and source of debate in word lists research is related to determining the appropriate unit of counting (Brown et al., 2020). In this regard, the previous studies employed various units, including types (orthographic forms), lemmas (base word and inflections of a particular part of speech), and word families defined as the base word plus its inflected forms and transparent derivations (Bauer & Nation, 1993). The use of word family assumes that the knowledge of the base word is sufficient for the understanding of its derived and inflected forms (Coxhead, 2000; Xue & Nation, 1984). However, this assumption has been challenged recently on various grounds, and a growing number of studies argued for using lemmas as a more appropriate unit for creating pedagogically useful word lists (Brezina & Gablasova, 2015; Brown et al., 2020; Gardner & Davies, 2014; Lei & Liu, 2016). According to Nation (2016), determining the unit of counting should match the purposes underlying the list development. He further argued that different units employed are indeed all levels of word families as outlined in Bauer and Nation's (1993) scale, where types represent level 1, and word families belong to level 6. Given that the main purpose of this study was to replicate earlier studies investigating academic vocabulary in Applied Linguistics research articles, the current study used word types to make the results comparable.

Regarding the word selection procedures, three criteria, namely range, frequency, and specialized occurrence were used. This is in line with procedures taken by Coxhead (2000) for developing the AWL, and with the two replicated

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studies that adapted the same criteria for their purposes. In order to establish the range criterion, given the huge size of the corpus (around 48 million words) and the large number of research articles, following guidelines provided by Nation (2016), smaller sub-corpora were created. To this end, the text files were randomly assigned to 100 sets, and then combined together, which resulted in 100 text files each containing around 480,000 words (with around 20,000 words variation). AWL (and also non-GSL/AWL) items that occurred in all 100 sub-texts of the main corpus were selected for later analysis. For frequency criterion, the word types needed to occur at least 1368 times in the entire corpus, and at least 14 times in each of the 100 texts (28.5 times occurrence per million words in the corpus). Finally, for specialized use, the selected words had to be beyond the GSL, that represents a the most frequently occurring words in English.

3.4. Approach to Replication

A distinction has been made between exact, approximate, and conceptual research replications (Abbuhl, 2018; Porte & McManus, 2019). The 'exact replication' refers to repeating a study as exactly as possible by following the same methodology and procedures, with the aim of confirming the original findings (Earp & Trafimow, 2015). Given the difficulties involved, exact replications remained the least common type in Applied Linguistics. In 'approximate replication' which is widely used in the social sciences (Johnson & Nicodemus, 2016), the research adheres to the original studies methodologies in most aspects; nonetheless, one or two of the non-major variables are changed (Abbuhl, 2018). The aim of the approximate replication is to test the generalizability of the findings reported by original studies (Booth, 2013). Finally, the 'conceptual replication' involves using a new research design that generally aims to "test the generalizability of relationships to new sets of variables within a larger model, or alternatively, to determine to what extent the findings of the original study were artifacts of its own methodology" (Abbuhl, 2018, p. 149). In light of these considerations, the approach taken in the current study is approximate replication. To this end, by adhering to the methodology of original studies, the current study analyzed a similar but much larger corpus of Applied Linguistics research articles, and the overall aim was to investigate the generalizability of previously reported findings.

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4. Results

Table 1 shows the lexical profile of the Applied Linguistics research articles based on the GSL and the AWL base lists. The first 1000 most frequent words in English accounted for 33,466,713 tokens, and 69.31% of the corpus. The second 1000 most frequent words in English also accounted 2,160,103 tokens, and 4.47% of the corpus. The GSL base lists provided a total coverage of 73.78%. Moreover, the AWL accounted for 5,536,232 tokens and 11.46% of the entire corpus. The cumulative coverage provided by the GSL and the AWL was 85.24%, which meant that 14.76% or 7,126,252 tokens were beyond these lists.

Table 2.
Lexical Profile of the Applied Linguistics Research Articles

LIST	TOKEN	TOKEN%	CUMTOKEN%	TYPE	GROUP
1st GSL	33466713	69.31	69.31	3995	998
2nd GSL	2160103	4.47	73.78	3382	986
AWL	5536232	11.46	85.24	2979	569
Non-GSL/AWL	7126252	14.76	100	241911	241911
	48279142		252267		244464

Further analysis of data revealed that 778 word types from the AWL occurred frequently in the corpus of Applied Linguistics research articles. These items accounted for 4,828,839 tokens and provided around 10% coverage of the corpus. The 10 most frequent AWL types in the corpus included: *research, participants, task, data, analysis, acquisition, academic, text, context, and tasks*. These items accounted for 974,476 and 2.01% of the corpus. Moreover, the coverage provided by the top 50, 100, and 200 most frequent AWL items in the corpus were 3.30%, 4.72%, and 6.47% respectively. Moreover, data analysis showed that 2200 AWL word types occurred infrequently in the corpus, and they accounted for 642,683 tokens and only 1.33% of the corpus. This coverage for the 2200 items was smaller than the 2.01% coverage provided by the top 10 AWL items. Regarding the non-GSL/AWL content words, 413 items met the criteria set for the current study. These items accounted for 2,045,884 tokens and 4.25% of the corpus. The top 20 most frequent non=GSL/AWL items provided 1.2% coverage. The list of the top 50 most frequent AWL and non-GSL/AWL items in the corpus is shown in Table 3. Among these items, 36 words (72%) are shared with the AWL (these

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words are represented by boldface font).

Table 3.
Top 50 Most Frequent AWL and Non-GSL/AWL Items in the Corpus.

Rank	Words	Frequency	Rank	Words	Frequency
1	**research**	160284	26	**processing**	29649
2	**participants**	73481	27	non	29403
3	**task**	71963	28	corpus	28992
4	**data**	64809	29	**target**	28849
5	**analysis**	61222	30	**assessment**	27913
6	**acquisition**	55899	31	**communication**	27512
7	**academic**	52537	32	online	27439
8	classroom	47245	33	cognitive	27245
9	linguistic	46469	34	scores	26968
10	vocabulary	44005	35	**texts**	26839
11	proficiency	42035	36	**contexts**	25899
12	**text**	40783	37	**strategies**	25327
13	**context**	40274	38	**individual**	24944
14	**tasks**	38753	39	**theory**	24286
15	feedback	37581	40	**core**	24185
16	**interaction**	35739	41	**features**	23113
17	**instruction**	34421	42	**evidence**	23111
18	linguistics	33865	43	comprehension	22439
19	**focus**	32378	44	**researchers**	22132
20	**approach**	31990	45	**similar**	21747
21	lexical	31711	46	**input**	21540
22	**role**	31608	47	**factors**	20736
23	**process**	31336	48	**cultural**	20413
24	**items**	30588	49	**structure**	19895
25	discourse	30153	50	**motivation**	19784
Total			1821489 (3.77%)		

Finally, adding the frequently used AWL (778) and non-GSL/AWL (413) content words to a single list and sorting them based on their frequency resulted a list containing 1191 word types (Appendix A). These items accounted for 6,874,723 tokens and provided 14.25% coverage in the corpus. Although the list contained about 1200 words, it should be highlighted that the top 200 words provided 7.6% coverage which is larger than the remaining 891 words. Given this considerable variation in the relative value of the words in the list, a practical approach might be considering the first 500 words as the academic words for the Applied Linguistics field. These words provide around 11% coverage in the corpus, which is just 0.46% less that coverage provided by the all AWL word families that expand to around 3000 word types.

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5. Discussion

Regarding the coverage provided by the AWL in research articles, the findings of the current study are in line with the existing literature in general and the two studies focusing on Applied Linguistics in particular. In this regard, the 11.46% coverage of the AWL in the corpus analyzed in this study confirms the previous findings that this academic word list accounts for around 10% of most academic texts (Coxhead & Byrd, 2007; Martínez et al., 2009; Valipouri & Nassaji, 2013). Moreover, despite some minor variations, the coverages reported for the AWL in previous studies investigating Applied Linguistics research articles were similar to the current study, as the list provided around 11% coverage across the three corpora (Khani & Tazik, 2013; Vongpumivitch et al., 2009). Nonetheless, it should be noted that the coverage of the AWL shows some variation in some disciplines (Table 4). For example, in line with Khani and Tazik (2013) the current study also found higher coverage of the AWL in the Applied Linguistics research articles compared to Agriculture (Martínez et al., 2009), and Chemistry research articles (Valipouri & Nassaji, 2013). However, the 11.46% coverage of the AWL in this study is lower than the 13.12% coverage reported for psychology research articles (Xodabande & Xodabande, 2020).

Table 4.
Coverage of AWL and GSL in the Current and Some Previous Studies

Word lists	Hyland and Tse (2007)	Valipouri and Nassaji (2013)	Martínez et al. (2009)	Khani and Tazik (2013)	Vongpumivitch et al. (2009)	This study
GSL	74	65.46	67.53	76.40	-	73.78
AWL	10.6	9.96	9.06	11.96	11.17	11.46
GSL+AWL	84.7	75.42	76.59	88	-	85.24

As for frequently used AWL and non-GSL/AWL items in Applied Linguistics research articles, the findings of the current study differed considerably with the two earlier studies. In this regard, the comparison of the frequently used AWL items identified in this study with the results reported by Khani and Tazik (2013) revealed that the two lists had 68.89% shared items. In other words, 536 AWL words are shared across the two lists, 242 academic words identified in the current

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study are not included in Khani and Tazik (2013), and 67 academic words identified by Khani and Tazik (2013) are not in the list of the words identified in this study. Moreover, as the study by Vongpumivitch et al. (2009) reported only the 100 most frequently-occurring AWL word forms, the comparison revealed 12.85% shared items, and all the AWL words included in their final list were among the 778 items in the current study. Moreover, 678 frequently occurring academic words were not included in the list developed by Vongpumivitch et al. (2009). For frequently occurring non-GSL/AWL words in Applied Linguistics research articles, the findings showed even more variation compared to the replicated studies. In this regard, the comparison of these items with Khani and Tazik (2013) revealed that only 149 or 36.08% of the items shared among the lists. List comparison further revealed that 264 non-GSL/AWL content words that occurred frequently in the corpus analyzed in this study were not identified by Khani and Tazik (2013), and around 50 words in their list were different from the current study. Comparing the results with Vongpumivitch et al. (2009) also revealed that there were only 17 or 4.12% shared items with respect to the non-GSL/AWL words, and around 95% of the words in the lists were different.

Overall, the list of the 1191 frequently occurring academic and non-GSL/AWL words identified in this study showed 57.51% overlap with the list developed by Khani and Tazik (2013), and only 9.91% overlap with the Vongpumivitch et al. (2009). These findings highlight the importance of replication research in word list research, as the use of a different and larger corpus produced considerably different results. One reason for the variation observed in the developed lists relates to size and the balance of the investigated corpora. Vongpumivitch et al. (2009) investigated a corpus of 200 research articles from only five journals, which resulted in selecting different words in their final analysis. Although Khani and Tazik (2013) used a corpus with the same size (around 1.5 million words), their approach in selecting research articles from 12 journals resulted in increased reliability of their final list. However, given the broad scope of the Applied Linguistics (Richards & Schmidt, 2010) and the fact that the well-known journals in the field publish research articles dealing with different areas of the field, the selection of only 20 articles from each journal limited the representativeness of their corpus. Moreover, as stated before, the size of the corpora is a crucial factor in developing a reliable list of the words beyond the high-frequency words (Sorell, 2013). Given that the size of the corpora analyzed by the original studies was relatively small, they ended up with different words in their final list. The size

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of the corpus employed in the current study was much larger, which made it possible to investigate the vocabulary use in a wider context. In light of the recent developments in corpus compilation and analysis tools (Anthony, 2014, 2019), there is a need to test the findings of the previous studies that developed corpus-based word lists (Coxhead, 2018b). A final reason for the observed differences might be the use of different time spans for sampling and collecting research articles. The two earlier studies were conducted in the last decades, but the data analyzed in this study was based on more recently published research articles (2010 to 2020). As the field of Applied Linguistics is dynamic area of research and inquiry, the changing research trends and directions inevitably impacts the use of vocabulary. Hence, by acknowledging the great contributions made by the earlier studies to the field of Applied Linguistics, the current study provides an updated version of their findings.

6. Conclusion

The study of vocabulary used in specialized areas is gaining increased attention (Coxhead, 2018b). In line with this surge of interest, a growing number of studies examined the vocabulary used across different Applied Linguistics texts (Gholaminejad & Anani Sarab, 2020; Khani & Tazik, 2013; Nasrabady et al., 2020; Shirazizadeh & Amirfazlian, 2021; Vongpumivitch et al., 2009). Nevertheless, a missing element in this line of inquiry is replication research. Given the importance of replication research in Applied Linguistics in a general (Abbuhl, 2018), and vocabulary studies in a particular (Coxhead, 2018a; Miller & Biber, 2015), the current study aimed to replicate two studies that investigated the use of academic vocabulary in Applied Linguistics research articles (Khani & Tazik, 2013; Vongpumivitch et al., 2009). In doing so, research articles published from 2010 to 2020 in 20 well-known journals were collected and analyzed. With respect to the coverage provided by the AWL, the findings were in line with replicated studies, and the list accounted for 11.46% of the words in the corpus. However, regarding the frequently occurring AWL and non-GSL/AWL content words, the findings were considerably different. More specifically, the words identified in this study had 57.51% overlap with the list developed by Khani and Tazik (2013), and only 9.91% overlap with the Vongpumivitch et al. (2009). In light of these observations, the current study highlighted the importance of

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replication research to test the reliability of corpus-based vocabulary studies that developed field-specific academic word lists. In order to help researchers and university students, a list of frequently used words in Applied Linguistics research articles are provided in Appendix A. The first 500 words in the list provide around 11% coverage and might be regarded as a practical goal for the vocabulary component of EAP programs in Applied Linguistics (the coverage of the whole list is 14.25%).

The current study had some limitations that should be acknowledged. First, the study relied on a popular journal ranking website and expert opinion in selecting the journals, however, the selected journals still might not be a truly representative sample of publications in the field of Applied Linguistics. Although these journals publish research in a variety of areas of interest in the field of Applied Linguistics, this should be taken into account in interpreting the findings. Second, for the aims of this replication study, the GSL (West, 1953) and the AWL (Coxhead, 2000) were used as the base lists, while new alternatives developed by using much larger and more contemporary corpora exist for both of them (Brezina & Gablasova, 2015; Browne et al., 2013a, 2013b; Gardner & Davies, 2014). Despite the fact that the GSL and the AWL provide considerable coverage in the Applied Linguistics texts (around 85%), the contributions of new general service and academic word lists need further investigation. Finally, in line with most of the previous studies, the current study considered academic vocabulary somewhere between general (high frequency) and technical words and hence excluded the GSL items from the data analysis. However, it has been argued that academic vocabulary cuts across high-, mid-, and low-frequency words (Coxhead, 2019), which means that some general service words can function as academic vocabulary in specific fields. This important consideration should be noted by the potential users of the list developed in this study. Despite these limitations, the findings of the current study provide Applied Linguistics students, instructors, researchers, and materials designers with an updated list for widely-used and important vocabulary in the field. Making such resources available is the first step in designing research informed vocabulary learning programs. The future research can focus on bridging the gap between corpus-based vocabulary research and their implementation in language teaching and materials development. In this regard, the affordances provided by digital technologies for teaching academic and technical vocabulary can benefit the EAP students and open up new directions for further research (Kohnke et al., 2020; Nami, 2020; Xodabande & Atai, 2020).

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