

**The Types and Structures of Lexical Bundles in Each Section
of the Communications and Linguistics Academic Articles**

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Abstract

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Considering its important role in applied English Linguistics, several authors have studied lexical bundles (LBs). The previous studies mainly compared the LBs between genres and among native and non-native speakers. There has yet to be any study that combines the LBs from each section of the same academic writing and the LBs of two related disciplines. This study investigates the types and structures of LBs in three rhetorical sections—Introduction, Materials and Methods, and Results and Discussion—of academic articles in the fields of Communications and Linguistics. A corpus of 3,753 journal articles (1,563 in Communications and 2,190 in Linguistics) was compiled from PLOS ONE using AntCorGen, and analyzed using AntConc Software. Extended lexical bundles (four- to six-word sequences) were extracted based on frequency and dispersion thresholds. This study found that the variation of LBs is not only different by disciplines but also by the sections. The cooccurrence of LBs in Communication Introduction and Method is less compared to Linguistics. LBs in Communication suggest a more straightforward and clear method of conveying information. Meanwhile, Linguistics shows complexity competence and greater engagement with abstract concepts and specialized vocabulary. The trends of dominant LB structure in every section are preposition and noun-based LBs, which have higher writing quality and complexity. The study expected to highlight the importance of LBs in academic writing.

Kata Kunci:

academic writing;

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linguistics;

corpus linguistics,

Mengingat perannya yang penting dalam Linguistik Inggris Terapan, beberapa penulis telah mempelajari bundel leksikal (LB). Studi-studi sebelumnya terutama membandingkan LBs antara genre dan antara penutur asli dan bukan penutur asli. Belum ada studi yang menggabungkan LB dari setiap bagian tulisan akademik yang sama dan LB dari dua disiplin terkait. Studi ini

menyelidiki jenis dan struktur LB dalam tiga bagian retorik—Pendahuluan, Bahan dan Metode, serta Hasil dan Diskusi—dari artikel akademik di bidang Komunikasi dan Linguistik. Sebuah korpus dari 3.753 artikel jurnal (1.563 dalam bidang Komunikasi dan 2.190 dalam bidang Linguistik) dikompilasi dari PLOS ONE menggunakan AntCorGen, dan dianalisis menggunakan perangkat lunak AntConc. Bundel leksikal yang diperluas (urutan empat hingga enam kata) diekstraksi berdasarkan ambang frekuensi dan dispersi. T Studi ini menemukan bahwa variasi LBs tidak hanya berbeda menurut disiplin tetapi juga menurut bagian. Kejadian bersamaan LBs dalam Pengantar dan Metode Komunikasi lebih sedikit dibandingkan dengan Linguistik. LB di bidang Komunikasi menunjukkan metode yang lebih langsung dan jelas dalam menyampaikan informasi. Sementara itu, Linguistik menunjukkan kompetensi kompleksitas dan keterlibatan yang lebih besar dengan konsep-konsep abstrak dan kosakata khusus. Tren struktur LB yang dominan di setiap bagian adalah LB berbasis preposisi dan kata benda, yang memiliki kualitas dan kompleksitas tulisan yang lebih tinggi. Studi ini diharapkan dapat menyoroti pentingnya LB dalam penulisan akademik.

INTRODUCTION

The study on lexical bundles (Hereafter: LBs) has drawn the interest of several linguists in the past few decades. There are various terms have been used, including Lexical bundles (Biber et al., 1999), lexicalized sentence stem (Pawley & Syder, 2013), formulaic sequences or chunks (Schmitt & Carter, 2004), clusters (Mahlberg, 2007; Scott, 1997), n-gram (Banerjee & Pedersen, 2003; Stubbs, 2007) depending on by different researchers. Biber (2006) simply defined lexical bundles as an extended lexical expression or the most frequent multi-word sequences. Put simply, LBs are a group of words that larger than two-word sequences (Kwary et al., 2017). These word sequences are evidently important for the language and literacy field.

Given the importance of LBs in academic writing necessary to conduct a study on the LBs found in academic texts, particularly in academic journal articles.

The previous studies of LBs in academic texts are concerned with the comparison study of LBs used by native speakers and non-native speakers in particular science studies, such as in Psychology (Esfandiari & Barbary, 2017), telecommunications (Pan et al., 2016a), pharmacy (Grabowski, 2015), applied Linguistics (Qin, 2014), and history and biology (Cortes, 2004a).

The other comparison study focuses on comparing LBs in the texts written by L1 from particular countries with L2 from different countries. For instance, Cortes (2004b) compares the LBs between English and Spanish, Zipagan & Lee (2018) differentiate the writing of Korean English learners, Ong Sook Beng & Yuen (2015) analyze Malaysian undergraduates, while Ucar (2017) and Gungor & Uysal (2016) analyze Turkish Non-native Writers. Most of the previous studies refer to similar results, that is, the connection between lexical bundles and language proficiency. The higher level of language proficiency affects the complexity of the LBs.

According to the previous study, a few of the researchers have tried the LBs of the section in journal articles as an academic text. Once, Cortes (2013), to gain a fuller understanding of lexical bundles used in academic journal articles, all the main sections need to be analyzed.

Swales & Feak (2012) argue that most research papers generally follow the standard Introduction-Methods-Result-Discussion (IMRD) pattern. By using this pattern, students are expected to write systematic reviews in their research papers. With all of those references. The three main sections will be the focus of this current study.

Realizing that there might be some differences in the LBs of one discipline to another, this study took two sub-disciplines from the same broad discipline. In this case, we focus on Communications and Linguistics sub-disciplines or subjects, which are under the broad discipline of Social Sciences. These two subjects were selected because the authors of academic articles in communications and linguistics must have learned academic writing or communications in their undergraduate studies. Therefore, the language used in their academic articles can be a reference for other authors.

The studies on the types of LBs are usually four words long (i.e., Bychkovska & Lee, 2017; Cortes, 2008; Durrant, 2015; Fuster-Márquez, 2014; Grabowski, 2015; Kwary et al., 2017; Pan et al., 2016b; Ucar, 2017; Zipagan & Lee, 2018). This 4-word combination of LBs was claimed to be sufficiently common and more substantial in LB studies. Although the previous study has examined 4-word LBs extensively, longer lexical bundles are important. Longer LBs are important for pointing more clearly to individual text, and they can show more general functional tendencies across text (Mahlberg, 2007). The study set out to explore the most commonly used 4-, 5-, and 6-word lexical bundles found in three key sections of research articles from two related academic fields (communications and linguistics) and analyses the structures of these bundle sizes.

The 4-word LBs are chosen based on several reasons. First, the length of 4-word LBs is manageable (Chen & Baker, 2010). Second, the structure of 4-word LBs offers a clear and structure and functions wider range for analysis (Hyland, 2012). Most of the aforementioned studies claim that many 4-word unit bundles contain 3-word bundles in their structure and are more substantial rather than the other (i.e., (Fuster-Márquez, 2014; Kwary et al., 2017; Zipagan & Lee, 2018). Third, 4-word bundles are used more often than five- or six-word ones (Durrant, 2015). In conclusion, this 4-word structure of LBs can be called "The standards of LBs" since many previous studies enormously usually use these structures.

Most of the researchers focused on 4-word LBs, while the other longer LBs were ignored. However, longer LBs like 5- and 6-word LBs, are somehow important, particularly for non-native learners. Longer LBs (i.e., 5- and 6-word LBs) can be considered as an extended unit of meaning. First, these longer phrasal constructions are important as "extended units of meaning" (Stubbs, 2007). For more details, the longer LBs, such as 5-word and 6-word, are able to help learners understand four purposes those are collocation, colligation, semantic preference, and the semantic prosody of the lexical units. Second, these longer LBs are particularly clearer and serve a fuller understanding. Esfandiari & Barbary (2017) state, "Not all meanings rely on single words, and likewise, lexical bundles are not always limited to four words". These 4-standard LBs will be fully understandable

with longer LB constructions (Greaves & Warren, 2010). Appel & Wood (2016) recently also assert that longer LB formulation will be much clearer since It helps build a clearer understanding of how this aspect of language functions for non-native academic English writers." In conclusion, longer LBs cannot be ignored; longer LBs also evidently can be a good instrument to enhance non-native understanding in using formulaic expressions or LBs.

METHOD

This study's corpus consists of journal articles from PLOS ONE, retrieved with the help of AntCorGen (Anthony, 2019). AntCorGen is a freeware discipline-specific corpus creation tool (Anthony, 2019). In this freeware, researcher is able to download the corpus data from various specific science disciplines in form of txt, from health science field to social science field. There are two subjects were chosen as a corpus data; those are Communications and Linguistics.

Since the study ams to to compare every section of the Lexical bundles of Communications and Linguistics, three main sections of the content of academic articles are chosen. These three sections are (1) Introductions, (2) Material & Method, and (3) Result and Discussion. There are 1563 journal articles in the Communications field, and 2190 journal articles in Linguistics were chosen as the corpus data for this study.

Table 1. The Recapitulation of the Data

Sections	Communications	Linguistics
	Tokens	Tokens
Introduction	1394924	3840698
Materials and methods	1621793	2740041
Result and Discussion	3840698	541790
Total	6857415	7122529

Based on the corpus data presented, the lexical bundles using AntConc (Anthony, 2024). In this study, we use extended lexical bundles, with lexical bundles consisting of four, five, and six repetition words. In selecting the lexical bundles, the cooccurrence and range must also be factored in. In this study, we choose the lexical bundles with higher cooccurrence with a range of more than 1/20 compared with the total data. In this case, the minimum range of Communications

is 78, while in Linguistics is 110. The result of the lexical bundles tabulation per section can be seen in the following discussion.

FINDINGS AND DISCUSSION

The Types of LBs in Linguistics and Communications

LBs is an important element in academic writing. LBs serves as Linguistics tools to enhance writing flow and allows the reader easier in understanding the text (Johnston, 2017). Many previous studies prove that the different disciplines have different usage of LBs (i.e. (Cortes, 2004a; Esfandiari & Barbary, 2017; Grabowski, 2015; Pan et al., 2016a; Qin, 2014). This study approves that the variation of LBs is not only different by disciplines but also by the sections. The cooccurrence of LBs based on the journal sections of Communications and Linguistics below.

Table 2. The Cooccurrence of LBs in Communications and Linguistics

Lb Sequence/ Sections	Communications			Linguistics			Total
	4-words LBs	5-words LBs	6-words LBs	4-words LBs	5-words LBs	6-words LBs	
Introduction	17	0	0	26	1	0	44
Materials & Methods	16	1	0	44	10	4	75
Results & Discussion	76	6	0	83	3	1	169

Table 2 shows the LB's co-occurrence in the Communications and Linguistics fields in three parts of academic articles (i.e., Introduction, Material and Methods, and Result and Discussion). The number in the column represents the co-occurrence of the identified LBs. Both of the disciplines have similar patterns; the highest LBs are found in Results and Discussion (169 times), followed by Material & Method (75 times), and the last is Introduction (44 times).

The data shows that 4-word LBs were the predominant LBs in both science disciplines, while the 5-word and 6-word LBs appear less frequently. In line with previous research about academic registers in general. Hyland (2008) explains that four-word LBs in academic registers are more prevalent than five-word bundles, and their range of structure and function is more distinct than that of three-word sequences. These 4-word LBs are frequently used by writers to establish their professionalism and expertise in writing (Hyland, 2008). Biber et al. (2004) further stress that four-word bundles are a stable and conventionalised unit of meaning in

academic prose that often serves to organise discourse and mark stance. Salazar (2014) also says that four-word LBs are the most common in academic corpora. They help organise arguments and help the reader understand complicated information. The prevalence of four-word bundles indicates their function in formulating coherent, organised, and compelling academic texts.

Focusing on the Introduction section, Table 1 illustrates that Linguistics has a higher application of LBs (26 times) than Communications (17 times) in sequence 4. LBs in 5 words and six words in Communications are absent. Almost similar to Communications, the LBs of 5 words in Linguistics only appear once, and the six words are absent. The smaller number of LBs in both science disciplines suggests that the nuance of the Introduction section in both science disciplines is similar; they typically have a more concise style (Swales, 1990).

The results in the Materials & Methods section show that LBs are employed very differently by linguistics and communications. The total LBs in Introduction of Communications are 17 LBs, whereas Linguistics has 58 LBs. The higher co-occurrence of LBs in linguistics material and method describes how linguists structure the procedural step and allow readers to understand the methodological flow well. In line Chen & Baker (2010) and Hyland (2008), who observe that in order to maintain accuracy and clarity, fields involving empirical research typically include more lexical bundles in methodological descriptions. In conclusion, the higher number of LBs in Linguistics shows that this discipline focuses on documentation and data analysis.

Linguistics illustrates richer 5-word and 6-word LBs rather than Communications. There are 153 times in 4-word LBs, 14 times in 5-word LBs, and 5 times in 6-word Lbs. Longer LBs in Linguistics have two functions. First, longer LBs in Linguistics can be an important marker of complex advanced writing since they contribute to syntactic complexity (Biber & Gray, 2016; Cortes, 2004). Second, longer LBs in Linguistics show a clear and fuller understanding (Appel & Wood, 2016; Esfandiari & Barbary, 2017; Greaves & Warren, 2010; Stubbs, 2007).

According to the results and discussion, both disciplines have the highest number of LBs. Most of them are 4-word LBs. According to previous research, 4-

word LBs are frequently used in academic writing (Hyland, 2008; Pan et al., 2016a). This shows that both disciplines substantially rely on 4-word bundles for describing findings and presenting outcomes. Interestingly, Communications has fewer LBs in 5-words and 6-words; however, in this result and discussion, they have 6 LBs, and Linguistics has 4. This result shows a different pattern, suggesting that the Communications discipline uses longer bundles to explain more intricate findings or in-depth explanations in the Result and Discussion section. In contrast, Linguistics usually uses more complex linguistic structures in the introduction and method section. However, the smaller number of LBs suggests more extensive phrasing to clarify difficult outcomes (Cortes, 2004a; Pan et al., 2016a).

The Structure of LBs in Communications and Linguistics

Biber utilized structural LB categorization (1999). As presented in Table 3, there are four major categories identified; those are Preposition LBs (Hereafter PB), Noun Based LBs (Hereafter PB), Verb Based LBs (Hereafter PB), and Others as additional Classifications. Li et al. (2020) explain that noun-based LBs similar with nominal phrases with post-modifier fragments, while Verb-based verbs start with infinitive verb components. Moreover, preposition-based constructions (Benelhadj, 2018) are headed by a preposition and require a complement. Moreover, the writer of this study adds other bases (Hereafter others) to replace other bases, such as adverb-based and conjunction-based, found in this study.

Table 3. Structural categorization of LBs in Linguistics and Communications

Lb Sequence/ Sections	Communications				T	Linguistics				T
	PB	NB	VB	Others		PB	NB	VB	Others	
Introduction	7	4	5	1	17	13	7	6	1	27
Materials & Methods	7	4	4	2	17	12	27	16	3	58
Results & Discussion	32	25	19	6	82	28	31	21	7	87

In the Introduction area, the LBs structure of both Communications and Linguistics are almost similar (see Table 3); most of them use Preposition-based LBs. In Communications, mostly uses PB (7 times), followed by VB (5 times), and NB (4 times); only one is categorized as "Others." Moreover, the highest usage of LBs in Linguistics is PB (13 times), followed by NB (7 times) and VB (6 times).

The pattern in Materials and Methods and Results and discussion between Communications and Linguistics are quite different. The communications area frequently tends to use PB, followed by NB and VB. On the contrary, linguistics is embedded in NB, followed by PB and VB. This distinctive result will have different implications between the Communications and Linguistics writing styles. The deeper explanation can be completely explained in the following discussions.

The LBs Structure in Introduction Section of Communications and Linguistics

In the Introduction sections, the structural forms of lexical bundles were first divided into three major types following Biber et al. (1999): noun phrase-based, prepositional phrase-based, and verb phrase-based bundles. This study also found bundles that don't fit cleanly into these groups, like adverb-based bundles (like "as a result of") and conjunction-based bundles (like "on the other hand"), which are included in the "other-based" category. These extra forms show rhetorical methods that are distinctive to each discipline. The widespread usage of conjunction-based bundles in Communications, for instance, implies a preference for clearer logical progression and narrative-style flow, which fits with the communicative aspect of the field. The Linguistics introductions, on the other hand, have more noun phrase-based and prepositional bundles. This shows a deeper, information-rich style that is meant to be conceptually precise and theoretically framed.

Salazar (2014) supports this discovery by saying that the way bundles are structured changes depending on the discipline, since writers from different fields value distinct rhetorical gestures. Cortes (2004) also says that bundle structures in introductions typically show the objective of the research, the importance of the claim, and the author's perspective, but this might change based on the field's rules. These data indicate that the selection and organisation of LBs in introductions are not only pragmatic but also significantly shaped by discipline writing conventions. Moreover, the tabulation of LBs in introduction of communication and linguistics can be seen in Table 4.

Table 4. Tabulation of LBs in Introduction of Communication and Linguistics

LBS-BASED	STRUCTURES	WORD
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Noun based	The language use	one of the most (C, L); a large number of (C, L); a wide range of (C, L)
	Adjectives or adjective phrases	the extent to which (C, L); the present study we (L); studies have shown that (L); the present study was (L); the present study was (L)
Others	Adverbial clause fragment	as well as the (C, L)
Preposition based	Under the new guidelines	at the same time (C, L); on the other hand (C, L); in this paper we (C, L); in this study we (C, L); in the present study we (L); in the current study (L); in the current study (L); in the United States (C); of the present study (L)
	In the language use	in the context of (C, L); in the case of (C, L)
	Prepositional phrase with embedded of-phrase fragment	on the basis of (L); as a function of (L); in the absence of (L)
Verb based	Anticipatory it + verb phrase adjective phrase	it is important to (C, L); it has been shown (L)
	Copula be + noun phrase/adjective phrase	are more likely to (C); is one of the (C)
	Passive verb + prepositional phrase fragment	has been shown to (C, L); can be used to (C, L); have been shown to (L); been shown to be (L)

As shown in table 4, there are 18 LBs (in bold) were used in both Communications and Linguistics discipline such as the extent to which, one of the most, a large number of, a wide range of, as well as the, on the other hand, in the context of, in the case of, in this paper we, in this study we, at the same time, has been shown to, can be used to, it is important to. Those 18 shared LBs illustrate common Linguistics strategies in the Introduction section of both disciplines. Thus, EFL students are able to use those LBs in their introduction narration as one of the complex elements in academic articles.

In this introduction section, Communications and Linguistics use primary Preposition-based LBs rather than Noun-based and Verb-based. The second rank and the third of them are switched, respectively. The different LBs distribution in academic writing usually indicates different communicative goals and contextual needs (Biber, 2006; Cortes, 2004a; Durrant, 2015; Hyland, 2012). Therefore, the similar LB distribution in the Introduction explains that the Linguistics and

Communication disciplines have similar communication goals and contextual needs.

In the Introduction parts of both Communications and Linguistics academic works, preposition-based lexical bundles are the most common. This finding is consistent with other research conducted by Qin (2014) and Kwary et al. (2017), which investigated lexical bundle usage across scientific disciplines and indicated that preposition-based bundles are the most common, succeeded by verb-based and noun-based bundles. In the present study, both disciplines demonstrate a significant dependence on prepositional terms to organise introductory discourse.

In the field of communications, writers often use phrases like "in the context of" and "in the case of" to put their research in context. They often use phrases like "in this paper" and "in this study we" to frame the study's objective and lead the reader into it. These phrases show that people want research to be clear and direct about what it wants to do. In the field of linguistics, preposition-based bundles also help research purposes by giving more general descriptions of the study's time and space, like "in the present study" or "in the current study." This usage suggests a more intricate and theoretical framework, aligning with the discipline's focus on situating research within complicated conceptual frameworks.

In both science disciplines, the noun-based and verb-based use LBs are almost similar. The functions of the Verb base and Noun are not different. Communications and Linguistics writer usually use Nouns in their Introduction as research-oriented. The use of noun-based to embed the research-related topic (i.e., the present study we, studies have shown that, the present study was) and quantification (i.e., one of the most, a large number of, a wide range of). On the contrary, the usage of Verb based has the function of a participant oriented to give the stance in their Introduction (i.e., it is important to, it has been shown to, has been shown to, can be used to, been shown to be, are more likely to).

The LBs structure in the Material & Methods Section of Communications and Linguistics

The number of LBs in the Material & Method section of the Communication discipline is exactly the same as in their introduction section (17 times). There is

only a small difference in Noun-based LBs and Verb-based LBs. The LBs in the Introduction to Linguistics is multiple. LBs are repeating word sequences that commonly occur together in particular circumstances. The aim of LBs is to enhance the coherence and meaning of texts. The higher number of LBs in the Linguistics discipline shows that linguists work hard to organize the coherence of the method section for successful information. Moreover, the complete words LBs structure in the Material & Method section is noticeable in Table 5.

Table 5. Tabulation of LBs in Material & Method of Communication and Linguistics

LBS-BASED	STRUCTURES	WORD
Adverb-based	Adverbial clause fragment	As well as the (C, L)
Conjunction based	Conj + NP	Or corrected to normal (L), or corrected to normal vision (L), and the number of (C)
Verb based	Copula be + noun phrase/adjective phrase	Is the number of (C, L),
Noun based	Noun phrase with of-phrase fragment	The end of the (C, L), the total number of (C, L), a sampling rate of (L), the beginning of the (L), the center of the (L), the declaration of helsinki (L), the duration of the (L); the ethics committee of (L); the ethics committee of the (L); the onset of the (L); the order of the (L); study was approved by (C, L); study was approved by the (C, L); consent was obtained from (L)
Noun based	Noun phrase with other post-modifier fragment	Ethics committee of the (L); normal or corrected to (L); normal or corrected to normal (L); normal or corrected to normal vision (L); Participants were asked to (L); the institutional review board (L); the study was approved (L); the study was approved by (L); the study was approved by the (L); written informed consent was (L); written informed consent was obtained (L); written informed consent was obtained from (L)
Verb based	Passive verb + prepositional phrase fragment	Was approved by the (C, L); were included in the (C, L); approved by the ethics (L); approved by the ethics committee (L); approved by the institutional (L); can be found in (L); corrected to normal vision (L); informed consent was obtained (L); informed consent was obtained from (L); was obtained from all (L); were approved by the (L); used in this study (C)
Preposition based	Prepositional phrase with embedded of-phrase fragment	At the end of (C, L); for each of the (C, L); as a function of (L); at the beginning of (L); at the end of the (L); at the university of (L), of the university of (L), at the time of (C), in the

		case of (C), on the basis of (C), in accordance with the (C, L)
Verb based	Verb phrase with active verb	Gave written informed consent (L), had normal or corrected (L); had normal or corrected to (L); had normal or corrected to normal (L)

In this Material & Method section, there are 11 LBs are mutual LBs in both disciplines, such as as well as the, is the number of, were included in the, study was approved by, study was approved by the, in accordance with the, was approved by the, the total number of, for each of the, the end of the, at the end of (See Table 4). This 11 LBs can be a guidance in implementing LBs in method section of academic articles. Table 4 also describe the dominance of LBs in Linguistics rather than Communication.

Linguistics Introduction frequently uses Preposition-based (13 LBs), followed by Noun-based (7 LBs) and verb-based (6 LBs). In contrast, in the Material & Method section, they primarily use Noun-based (27 LBs), followed by preposition-based (16 LBs) and verb-based (12 LBs). Numerous previous studies explain that Noun-based LBs are commonly used in academic writing essays (i.e., Chen & Baker, 2010; Hyland, 2008; Pang, 2010; Xu, 2012). This finding is parallel with the LBs in the Method section of Linguistics.).

The highest co-occurrence of Nouns based in the Material & Method section of Linguistics is noun phrases with another post-modifier fragment (13 LBs) and noun phrases with of-phrase fragments (14 LBs). However, the noun phrases with other post-modifier fragments are not varied and contain repetition of incomplete LBs. Therefore, noun phrase with of-phrase fragments shows more frequently, such as a sampling rate of the beginning of the, the center of the, the declaration of the, the end of the, the onset of the, the order of the). In the previous studies, LBs with of-phrase fragments were also found dominantly in academic texts (i.e., Biber et al., 1999; Hyland, 2008; Li, 2016). The heavy usage of noun phrases is linked to the complexity of grammar in academic texts(i.e., Biber, 2006; Biber & Gray, 2016; Pan et al., 2016a, 2016b). According to Li (2016), a noun phrase with an off-phrase fragment is used to define the employment of specific methods or to characterize

and predict conclusions, aim, analysis, and limitations. Therefore, the usage of Nouns based on of-phrase fragments in the Material and Method section stands as an important grammatical element in explaining methodology and process in the Linguistics discipline.

The second rank of LBs in Material & Method of Linguistics is verb-based LBs. Most of them dominate with Passive Verb + prepositional phrase fragments. Hyland (2008), passive verb phrases (e.g., can be found in) and anticipatory constructions (e.g., it is important to) dominate lexical bundles in academic writing. Articles in health, life, and physical sciences also favorably use past tense and past participle verb-based (Kwary et al., 2017). Therefore, the passive Verb + prepositional phrase fragment in the Material & Method section of linguistics is used to report what has been done.

The implementation of LBs in Material & Method of Communication are not different with their Introduction. In both sections they have very minimum LBs compering to Linguistics. Therefore, the Communications tend to use simpler language rather than Linguistics.

Lexical Bundles in Results & Discussion Section of Communications and Linguistics

Many experts show the LBs varies use across science disciplines, such as in Psychology (Esfandiari & Barbary, 2017), telecommunications (Pan et al., 2016b), pharmacy (Grabowski, 2015), applied Linguistics (Qin, 2014), and history and biology (Cortes, 2004a). This study also finds that LBs in the journal section across science disciplines are also different. The trends in the LBs co-occurrence are always increasing, from Introduction to Material & Method-result to Results & Discussion. Both disciplines show a significantly increasing number of LBs in this Results & Discussion section. The total number of LBs found in both science disciplines is 169 LBs. There are 57 LBs shared between the Communications and Linguistics areas; 25 LBs are typically only found in Communications, and 30 LBs are typically only found in Linguistics.

In Results and Discussion, there are 57 shared LBs, such as due to the fact, due to the fact that, as well as the, as shown in fig, and the number of, the results of

the, a function of the, the end of the, the total number of, the size of the, a large number of, the nature of the, there was no significant, there was a significant, the difference between the, the extent to which, the fact that the, the other hand the, we found that the, that there is a, in the present study, in this study we, on the other hand, on the other hand the, with respect to the, in line with the, to the fact that, at the same time, in addition to the, in contrast to the, by the fact that, may be due to, as a function of, as a function of the, in the case of, in the context of, for each of the, at the end of, in the absence of, of the number of, in the number of, in terms of the, as a result of, important to note that, it should be noted that, it is important to note, it is possible that, it is important to, it should be noted, it is likely that, be due to the, is consistent with the, is in line with, should be noted that, are shown in table, can be used to (see table 6). These 57 shared LBs is mutual LBs as guidance to learn in writing academic article.

Table 6. Tabulation of LBs in Results & Discussion of Communication and Linguistics

LBS-BASED	STRUCTURES	WORD
adjective based	adjective phrase	due to the fact (C, L); due to the fact that (C, L)
adverb-based	Adverbial clause fragment	as well as the (C, L); as shown in fig (C, L); as shown in table (C); as can be seen (L);
noun based	noun phrase with of-phrase fragment	a function of the (C, L); the end of the (C, L); the total number of (C, L); the size of the (C, L); a large number of (C, L); the nature of the (C, L); the average number of (C) the distribution of the (C); the effect of the (C); the majority of the (C); a wide range of (C); the rest of the(C); a significant main effect of (L); a main effect of (L); the main effect of (L); a significant effect of (L); the performance of the (L)
noun based	noun phrase with other post-modifier fragment	there was no significant (C, L); there was a significant (C, L); the difference between the (C, L); the extent to (C, L); the fact that the (C, L); the other hand the (C, L); this is the first (C); there was no significant difference (L); significant main effect of(L); a significant main effect (L); a significant interaction between (L); there were no significant (L); these results suggest that (L); a significant difference between (L); significant difference between the (L); this suggests that the (L); the present study we (L)
noun based	personal pronoun + lexical verb phrase	we found that the (C, L); we find that the (C); we did not find (L)
noun based	Pronoun/noun phrase + be (+ . . .)	we were able to (C)
noun based	that fragment	that there is a (C, L); that the number of (C)
preposition based	Other prepositional phrase (fragment)	in the present study (C, L); in the current study (C, L); in this study we (C, L); on the other hand (C, L); on the other hand the (C, L); with respect to the (C, L); in line with the (C, L); to the fact that (C, L); at the same

time (C, L); in addition to the (C, L); in contrast to the (C, L); by the fact that (C, L); more likely to be (C); in this case the (C); in the present study we (L); may be due to (C, L); of the present study (L)

The LBs found in Communication and Linguistics. This LBs can be considered an important LBs in writing journal articles. Based on the structure, the most concurrent in this shared LBs are Preposition based, followed by Noun based and Verb based. In Noun and prepositional phrases account > 60% of lexical bundles in academic writing (Biber et al., 1999; Pan et al., 2016b).

The phenomena of LB distribution in the Results and Communication of Communications and Linguistics area are interesting. Similar to the Introduction and Method sections. The higher occurrence of LBs in Communications focuses on preposition-, based, followed by Noun and Verb. However, the result and discussion LBs in linguistics are directly based, followed by prepositions and verbs. In much previous research, preposition prepositions are usually used as an indicator of writing competency; the higher usage of prepositions embedded in writing means the higher skill of the writer (Pang, 2009; Chen & Baker, 2010; Li, 2016). Meanwhile, Noun-based LBs related to the grammatical complexity (Biber, 2006; Biber & Gray, 2016; Pan et al., 2016a). Thus, the Results & Discussion section of both science disciplines can be considered as high-quality research since the dominant LBs are proposition-based and Noun-based.

The usage of verbs in both Communication and Linguistics. In the Results & Discussion section, the writer usually uses Copula be + noun phrase/adjective phrase (times) followed by Passive verb + prepositional phrase fragment (time). Copula is usually used to give stance and framing signals such as it is important to note that, are more likely to, were more likely to, are likely to be, was no significant, difference, did not differ significantly. Moreover, the passive is used to explain the procedure, such as are shown in fig, are presented in Table, can be seen in, can be found in, has been shown to. Those passive forms are commonly used as a rhetorical process to report the findings to specific data sources. The implementation of passive form shows a positive nuance of academic writing in both science disciplines. Passive verb patterns are uncommon in low-level L2 writing, (Ädel &

Römer, 2012; Chen & Baker, 2010), but frequent in advanced Chinese student theses (Hyland, 2008; Wei & Lei, 2011).

CONCLUSION

This study set out to determine the usage of LBs in three journal sections of Communication and Linguistics disciplines. This study proves that the variation of LBs is not only different by discipline but also by section. The co-occurrence of LBs in Communication's Introduction and Method is less compared to Linguistics. The small number of LBs in Communication suggests a more straightforward and clear method of conveying information (Pan et al., 2016). In contrast, the higher co-occurrence of LBs in Linguistics shows complexity competence and greater engagement with abstract concepts and specialized vocabulary (Cortes, 2004; Biber et al., 1999). The trends of dominant LB structure in every section are preposition and based LBs, which are very correlated with higher quality and complexity. Generally, the finding in this study is expected to highlight the LBs' important in academic writing.

REFERENCES

- Ädel, A., & Römer, U. (2012). Research on advanced student writing across disciplines and levels: Introducing the Michigan Corpus of Upper-level Student Papers. Römer, U, 3–34.
- Appel, R., & Wood, D. (2016). Recurrent Word Combinations in EAP Test-Taker Writing: Differences between High- and Low- Proficiency Levels. *Language Assessment Quarterly*, 13, 55–71.
- Banerjee, S., & Pedersen, T. (2003). The design, implementation, and use of the Ngram statistics package. *Lecture Notes in Computer Science*, 2588, 70–381.
- Benelhadj, F. (2018). Discipline and genre in academic discourse: Prepositional Phrases as a focus. *Journal of Pragmatics*, 190–199.
- Biber, D. (2006). *University Language: A corpus-based study of spoken and written registers*. John Benjamins Publishing Company.
- Biber, D., Conrad, S., & Cortes, V. (2004). *If you look at...: Lexical bundles in university teaching and textbooks*. *Applied Linguistics*, 25(3), 371–405.

- Biber, D., & Gray, B. (2016). *Grammatical Complexity in Academic English*. Cambridge University Press.
- Biber, D., Johansson, S., Leech, G., Conrad, S., Finegan, E., & Quirk, R. (1999). *Longman grammar of spoken and written English*. Longman.
- Bychkovska, T., & Lee, J. J. (2017). At the same time : Lexical bundles in L1 and L2 university student argumentative writing. *Journal of English for Academic Purposes*, 30, 38–52. <https://doi.org/10.1016/j.jeap.2017.10.008>
- Chen, Y.-H., & Baker, P. (2010). Lexical bundles in L1 and L2 academic writing. *Language Learning & Technology*, 30–49.
- Cortes, V. (2004a). Lexical bundles in published and student disciplinary writing: Examples from history and biology. *English for Specific Purposes*, 23(4), 397–423. <https://doi.org/10.1016/j.esp.2003.12.001>
- Cortes, V. (2004b). Lexical bundles in published and student disciplinary writing: Examples from history and biology. *English for Specific Purposes*, 397–423.
- Cortes, V. (2008). A comparative analysis of lexical bundles in academic history writing in English and Spanish. *Corpora*, 3(1), 43–57. <https://doi.org/10.3366/E1749503208000063>
- Cortes, V. (2013). The purpose of this study is to: Connecting lexical bundles and moves in research article introductions. *Journal of English for Academic Purposes*, 12(1), 33–43. <https://doi.org/10.1016/j.jeap.2012.11.002>
- Durrant, P. (2015). Lexical Bundles and Disciplinary Variation in University Students' Writing: Mapping the Territories. *Applied Linguistics*, 1–30.
- Esfandiari, R., & Barbary, F. (2017). A contrastive corpus-driven study of lexical bundles between English writers and Persian writers in psychology research articles. *Journal of English for Academic Purposes*, 29, 21–42. <https://doi.org/10.1016/j.jeap.2017.09.002>
- Fuster-Márquez, M. (2014). Lexical bundles and phrase frames in the language of hotel websites. *English Text Construction*, 84–121.
- Grabowski, Ł. (2015). Keywords and lexical bundles within English pharmaceutical discourse: A corpus-driven description. *English for Specific Purposes*, 38, 23–33. <https://doi.org/10.1016/j.esp.2014.10.004>
- Greaves, C., & Warren, M. (2010). What can a corpus tell us about multi-word

- units? . In A. O’Keeffe & M. McCarthy (Eds.), *The Routledge Handbook of Corpus Linguistics* (pp. 212–226). Routledge.
- Gungor, F., & Uysal, H. H. (2016). A Comparative Analysis of Lexical Bundles Used by Native and Non-native Scholars. *English Language Teaching*, 9(6), 176. <https://doi.org/10.5539/elt.v9n6p176>
- Hyland, K. (2008). Academic clusters: Text patterning in published and postgraduate. *International Journal of Applied Linguistics*, 41–62.
- Hyland, K. (2012). Bundles in Academic Discourse. *Annual Review of Applied Linguistics*, 32.
- Johnston, K. M. (2017). *Lexical bundles in applied linguistics and literature writing: A comparison of intermediate English learners and professionals Master’s thesis*. Portland State University.
- Kwary, D. A., Ratri, D., & Artha, A. F. (2017). LEXICAL BUNDLES IN JOURNAL ARTICLES ACROSS ACADEMIC DISCIPLINES. *Indonesian Journal of Applied Linguistics*, 7(1), 131. <https://doi.org/10.17509/ijal.v7i1.6866>
- Li, L. (2016). *Sentence initial bundles in L2 thesis writing: A comparative study of Chinese L2 and New Zealand L1 postgraduates’ writing* . University of Waikato.
- Li, L., Franken, M., & Wu, S. (2020). Bundle-driven move analysis: Sentence initial lexical bundles in PhD abstracts. *English for Specific Purposes*, 85–97.
- Mahlberg, M. (2007). Corpus stylistics: bridging the gap between linguistic and literary studies. In M. M. Hoey, M. Mahlberg, Stubbs, & W. Teubert (Eds.), *Discourse and Corpora* (pp. 219–246). Continuum.
- Ong Sook Beng, C., & Yuen, C. K. (2015). Functional Types of Lexical Bundles in Reading Texts of Malaysian University English Test: A Corpus Study. *GEMA Online Journal of Language Studies*, 15(01), 77–90. <https://doi.org/10.17576/GEMA-2015-1501-05>
- Pan, F., Reppen, R., & Biber, D. (2016a). Comparing patterns of L1 versus L2 English academic professionals: Lexical bundles in Telecommunications research journals. *Journal of English for Academic Purposes*, 21, 60–71. <https://doi.org/10.1016/j.jeap.2015.11.003>
- Pan, F., Reppen, R., & Biber, D. (2016b). Comparing patterns of L1 versus L2 English academic professionals: Lexical bundles in Telecommunications research journals. *Journal of English for Academic Purposes*, 21, 60–71.

<https://doi.org/10.1016/j.jeap.2015.11.003>

- Pang, W. (2010). Lexical bundles and the construction of an academic voice: A pedagogical perspective. *Asian EFL Journal* , 10–11.
- Pawley, A., & Syder, F. H. (2013). Two Puzzles for linguistic theory. In J. C. Richards & R. W. Schmidt (Eds.), *Language and Communication* . Routledge.
- Qin, J. (2014). Use of formulaic bundles by non-native English graduate writers and published authors in applied linguistics. *System*, 42, 220–231.
<https://doi.org/10.1016/j.system.2013.12.003>
- Salazar, D. (2014). *Lexical Bundles in Native and Non-native Scientific Writing: Applying a Corpus-based Study to Language Teaching*. Amsterdam: John Benjamins Publishing.
- Schmitt, N., & Carter, R. (2004). Formulaic sequences in action: An introduction. In *Formulaic Sequences: Acquisition, processing and use* (pp. 1–22). John Benjamins.
- Scott, M. (1997). PC analysis of key words – and key key words. *System*. 233–245.
- Stubbs, M. (2007). An example of frequent English phraseology: distributions, structures and functions. In F. Roberta (Ed.), *Corpus linguistics 25 years on* . Rodopi.
- Swales, J. M. (1990). *Genre analysis: English in academic and research settings*. Cambridge University Press.
- Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd). University of Michigan Press.
- Ucar, S. (2017). A Corpus-based Study on the Use of Three-word Lexical Bundles in the Academic Writing by Native English and Turkish Non-native Writers. *English Language Teaching*, 10(12), 28.
<https://doi.org/10.5539/elt.v10n12p28>
- Wei, Y., & Lei, L. (2011). Lexical bundles in the academic writing of advanced Chinese EFL learners. *RELJ Journal*, 155–166.
- Xu, F. (2012). Research on the Use and Development Characteristics of English Academic Lexical Bundles by Chinese Learners. *Foreign Languages in China*, 4, 51–56.
- Zipagan, M. N., & Lee, K. R. (2018). Korean English Learners' Use of Lexical Bundles in Speaking. *The Journal of Asia TEFL*.

