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

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Abstract--Considering the importance of Lexical Bundles (LBs) in Applied English Linguistics, several studies had been conducted in the recent years. The previous studies mainly compared the LBs between genres and between native speakers 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 focuses on the types and structures of LBs in each section of academic articles published in an international journal. This study also compares the LBs found in two related disciplines, i.e., Communications and Linguistics. This study found that the variation of LBs is not only different by disciplines but also by the sections. The co-occurrence 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. Linguistics, meanwhile, 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 findings of this study are expected to highlight the importance of LBs in academic writing.

Keywords— *Keywords: academic writing; communications; lexical bundle; linguistics; corpus linguistics*

Abstrak--Mengingat pentingnya Bundel Leksikal (LBs) dalam Linguistik Bahasa Inggris Terapan, beberapa penelitian telah dilakukan dalam beberapa tahun terakhir. Penelitian sebelumnya terutama membandingkan LBs antargenre dan antara penutur asli dan non-penutur asli. Belum ada penelitian yang menggabungkan LBs dari setiap bagian dari tulisan akademis yang sama dan LBs dari dua disiplin ilmu terkait. Penelitian ini berfokus pada jenis dan struktur LBs di setiap bagian artikel akademis yang diterbitkan dalam jurnal internasional. Penelitian ini juga membandingkan LBs yang ditemukan dalam dua disiplin ilmu terkait, yaitu Komunikasi dan Linguistik. Penelitian ini menemukan bahwa variasi LBs tidak hanya berbeda menurut disiplin ilmu tetapi juga menurut bagiannya. Kemunculan LBs dalam Pendahuluan dan Metode Komunikasi lebih sedikit dibandingkan dengan Linguistik. LBs dalam Komunikasi menyarankan metode yang lebih lugas dan jelas untuk menyampaikan informasi. Sementara itu, Linguistik menunjukkan kompetensi kompleksitas dan keterlibatan yang lebih besar dengan 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 penulisan yang lebih tinggi. Temuan penelitian ini diharapkan dapat menyoroti pentingnya LB dalam penulisan akademis.

Kata Kunci— *kepenulisan akademis; komunikasi; bundel leksikal; linguistik; linguistik korpus*

1. 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 to refer to it, such as Lexical bundles (Biber et al., 1999), lexicalized sentence stem (Pawley & Syder, 2013), formulaic sequences or chunks (Schmitt & Carter, 2004), clusters (Scott, 1997; Mahlberg, 2007), n-gram (Stubbs, 2007; Banerjee & Pedersen, 2003) . Biber (2006) defined lexical bundles as an extended lexical expression or the most frequent multi-word sequences. Put it simply, LBs are a group of words that are usually larger than two-word sequences (Kwary et al., 2017). These word sequences are evidently important for the language and literacy fields.

Given the importance of LBs in academic writing, it is necessary to conduct a study on the LBs found in academic texts, particularly in academic journal articles. Most of 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 fields , such as in Psychology (Esfandiari & Fatima, 2017), telecommunications (Fan et al., 2016), pharmacy (Grabowski, 2015), applied Linguistics (Qin, 2014), and history and biology (Cortes, 2004).

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 (2008) compares the LBs between English and Spanish, Zipagan & Lee (2018) differentiate the writing of Korean English learners, Beng & Keong (2015) analyze Malaysian undergraduates, while Ucar (2017) and Güngör & Uysal (2016) analyze Turkish Non-native Writers. Most of the studies come 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.

A further exploration finds that a few of the researchers have tried the LBs of the section in journal articles as an academic text. Once, Cortes (2013) conducted research on the structural and functional of LBs in the Introduction section of the research article on various disciplines of the Published Research Article Corpus (PRAC). In order to obtain a more complete picture of the use of LBs in academic journal articles, all the main sections need to be analyzed.

Swales and 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, we can draw a conclusion that the main sections of the content of academic articles are Introduction, Methods, and Results & Discussion. These three main sections will be the focus of this current study.

Realizing that there could be some differences in the LBs of one discipline to another, this study take 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 levels . 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., Cortes, 2008; Grabowski, 2015; Bychkovska & Lee, 2017; Pan et al., 2016; Zipagan & Lee, 2018; Ucar, 2017; Cortes, 2008; Kwary et al., 2017; Fuster-Márquez, 2014; Durrant, 2015). 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). To fulfill this gap, the purpose of this contrastive study was to identify the most frequent 4-, 5-, and 6-word lexical bundles in three sections of research articles (RAs) across two specific science

disciplines (i.e., 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 wider range of both structure and functions for analysis (Hyland, Bundles in Academic Discourse, 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., Zipagan & Lee, 2018; Kwary et al., 2017; Fuster-Márquez, 2014). Third, 4-word lexical bundles are more common than other longer lexical bundles (Durrant, 2015). In conclusion, this 4-word structure of LBs can be called "The standards of LBs" since many previous studies usually use these structures.

Most researchers focus on 4-word LBs, while the other longer LBs were ignored. However, longer LBs like 5- and 6-word LBs, are also important, particularly for non-native learners. Longer LBs (i.e., 5- and 6-word LBs) can be considered as an extended unit of meaning. This is because, firstly, these longer phrasal constructions are important as "extended units of meaning" (Stubbs, 2007). In terms of details, the longer LBs, such as 5-word and 6-word, are able to help learners understand four purposes : 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 & Fatima (2017) state, "For one thing, just as not all meanings of units are represented by individual words, not all lexical bundles are of the standard 4-word ones". These 4-standard LBs will be fully understandable with longer LB constructions (Greaves & Warren, 2010). Appel and Wood (2016) recently also assert that longer LB formulation will be much clearer since it is able to develop a more complete picture of how this aspect of language is 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.

2. Method

The corpus of this study was taken from journal articles on Plos One. The journal articles were downloaded in AntCorGen (Anthony, 2019). AntCorGen is a freeware discipline-specific corpus creation tool (Anthony, 2019). With this freeware, researchers are 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 chosen as corpus data; those are Communications and Linguistics.

Since the aim of this study is 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. The recapitulation of this corpus data can be seen in Table 1.

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

From the corpus data shown in Table 1, we then extracted the lexical bundles using Antconc (Anthony, 2024). Antconc is a freeware corpus analysis toolkit for concordancing and text analysis (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 co-occurrence and range are

also taken   into account. 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.

3 Result
The Types of LBs in Linguistics and Communications

LBs can be considered as 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. Esfandiari & Fatima, 2017; Fan, Reppen, & Biber, 2016; Grabowski, 2015; Qin, 2014; Cortes, 2004). 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 can be seen in the Table 3.1.

Table 3.1.
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 3.1 shows the LB's co-occurrence in the Communications and Linguistics fields in three sections 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. These results are 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).

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. This result is consistent with studies by Chen dan 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 et al., 2011; Cortes, 2004). Second, longer LBs in Linguistics show a clear and fuller understanding (Stubbs, 2007; Esfandiari & Fatima, 2017; Greaves & Warren, 2010; Appel & Wood, 2016).

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 across disciplines (Biber et al., 2011; Hyland, 2008). This shows that both disciplines substantially rely on 4-word bundles for describing findings and presenting outcomes. Interestingly, Communications usually 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, 2004; Biber et al., 2011).

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, Franken, & Wu (2020) explain that noun-based LBs refer to any 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 (h

ereafter, others) to replace other bases, such as adverb-based and conjunction-based, found in this study.

Table 3.2.

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 3.2); 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 of Communications and Linguistics

In introduction section, the structural forms classify into three categories based on Biber et al. (1999) those are: noun-based, preposition-based, and verb-based bundles. However, this result found another LBs with different based such as adverb-based, and conjunction based are also classified into other-based. The tabulation of the structural forms in Introduction section is presented in Table

3.3.
Table 3.3.
Tabulation of LBs in Introduction of Communication and Linguistics

LBS-BASED	STRUCTURES	WORD
Noun based	Noun phrase with of-phrase fragment	**one of the most (C, L); a large number of (C, L); a wide range of (C, L)**
	Noun phrase with other post-modifier fragment	**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	Other prepositional phrase (fragment)	**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 present study (L); in the current study (L); in the United States (C); of the present study (L)
	Prepositional phrase with embedded of-phrase fragment	**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 3.3, 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. However, the second rank and the third of them are switched, respectively. The distribution of different LBs in academic writing usually indicates different

communicative goals and contextual needs (Biber, 2006; Cortes, 2004; 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.

The highest rank of LBs in the introduction section in both science disciplines is preposition-based. The current findings are in line with those of other previous studies, such as those by Qin (2014) and Kwary, Ratri, and Artha (2017), who examined journal papers in various science disciplines. Qin (2014) and Kwary, Ratri, and Artha (2017) explain that LBs in academic journal articles in their finding show that they are mostly prepositional-based, followed by verb-based bundles and noun-based bundles. In this current study, we found that both science disciplines (i.e., Communications and Linguistics) use prepositional-based LBs to structure their introduction sections.

In Communications discipline, the writers use Prepositions to describe their research by using in the Context of, and in the case of. Moreover, in the Communications introduction, it is also commonly used in this paper, and in this study, we as structuring signal. Meanwhile, the function of Prepositions based on Linguistics is also research-oriented. Linguists usually provide a broad description of the research, including the time and place of the research.

In both science disciplines, the use of noun-based and verb-based 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 the number of Noun-based LBs and Verb-based LBs. On the other hand, the number of 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 3.4.

Table 3.4.
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)**
Conjuction 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); participants were instructed 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 results of 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 connected with the grammatical complexity of academic writing (i.e., Biber, 2009; Biber & Gray, 2016; Biber et al., 2011). 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 the results or conclusions, aim or purpose, analysis, and limitations of their research. 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) describes that passive verb phrases (e.g., can be found in) and anticipatory-it patterns (e.g., it is important to, it was found that) are the most common patterns of LBs 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, it can be concluded that Communications tend to use simpler language rather than Linguistics.

Lexical Bundles in Results & Discussion of Communications and Linguistics

Many experts show that the use of LBs varies across science disciplines, such as in Psychology (Esfandiari & Fatima, 2017), telecommunications (Fan et al., 2016), pharmacy (Grabowski, 2015), applied Linguistics (Qin, 2014), and history and biology (Cortes, 2004). 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 the current 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 3.6). These 57 shared LBs is mutual LBs as guidance to learn in writing academic article.

Table 3.5.
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)

Table 3.5 shows 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 academic prose, however, noun phrases (e.g. the use of the) and prepositional phrases (e.g. in the present study)

comprise over 60% lexical bundles (Biber, 2006; Biber et al., 1999).

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 were correlated with the grammatical complexity of academic writing (Biber, 2009; Biber & Gray, 2010; Biber et al., 2011). 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 and Discussion section is different from the introduction and method sections. 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 were rarely found in low-level L2 students' writing (i.e., Chinese and Swedish university writing) (Ädel & Römer, 2012;

Chen & Baker, 2010), but frequent in high-level Chinese students' writing (i.e., masters and PhD theses) (Hyland, 2008; Wei & Lei, 2011).

4. Conclusion

This study set out to determine the usage of LBs in three journal sections (i.e., Introduction, Material & Method, Results and Discussion) 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 importance of LBs in academic writing.

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