琉球大学学術リポジトリ

目標言語による授業運営の影響：アカデミックライティングにおける日本人EFL学習者の定型表現(formulaic sequences)使用の変化

Influence of the Target Language Exposure in EFL: What do Learner Corpora Tell about Change of Formulaic Sequences in Academic Writing

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Introduction

Knowledge of formulaic sequences or phraseological competence (Wray, 2002) is indispensable to second language (L2) acquisition, especially in regard to successful communication (Pawley & Syder 1983). Frankly speaking, formulaic sequences construct nearly half of written as well as oral discourse (Erman & Warren, 2000). In this sense, to be native-like or achieve fluent use of L2, it is necessary that learners recognize formulaic sequences rapidly and accurately (Jiang & Nekrasova, 2007). Despite such significance, however, developing competence in this area takes a longer period of time than developing other competences, especially in the area of proper usage (Laufer & Waldman, 2011). For this development, many studies have emphasized the importance of exposure to the target language (Boers & Lindstromberg, 2012; Ellis, 2008, 2012; Meunier, 2012). With respect to the rich exposure in L2, studies in English as a medium of instruction (or EMI) found a significant effect on the development of language skills in L2. Given that formulaic sequences are prevalent and essential in language use (Erman & Warren, 2000) and development of the phraseological competence is not in parallel with that of lexical competence (Bahns & Eldaw, 1993), it is necessary to shed more light on to what extent a linguistically rich environment influences development of phraseological competence. Thus, the goal of the present study is to investigate a possible influence of EMI lessons on changes of formulaic sequences in use.

Literature Review

Importance of formulaic sequences in SLA

In recent years, a growing body of research has investigated frequently co-occurred word-strings, also known as "formulaic sequences" (Siyanova-Chanturia & Van Lancker Sidtis, 2019). Formulaic sequences is a broad term that encompasses various types of word-strings, regardless of its continuity of co-occurrences, such as multiword units (e. g., *catch up*), prefabricated expressions (e. g., *what's up?*), collocations (e. g., *spread news*), lexical bundles and n-grams (e. g., *in the mean time, I don't know*), idioms (e. g., *it came straight from the horse's mouth*), irreversible binominals (e. g., *bride and groom*), proverbs (e. g., *A rolling stone gathers no moss*) (Siyanova-Chanturia & Van Lancker Sidtis, 2019), and more.

Findings from studies in formulaic sequences have advanced our understanding of its significance in a language. For instance, Foster (2001) aptly analyzed written discourse and found that 52.3% of our language use contains formulaic sequences. Foster (2001) concluded that we make considerable use of recurrent expressions in language, and that contributes to fluent use of the language in general.

Knowledge of formulaic sequences allow language users to process a language quickly. This aspect is well documented in studies of using a frequency-based approach. In this approach, formulaic sequences are considered as word combinations that are statistically co-occurred with a greater chance as indicated by statistical association measures (Hoey, 1991). Jiang and Nekrasova (2007) investigated whether L2 learners would process formulaic sequences faster than other types of word-string. The study confirmed its processing advantage; the formulaic sequences were processed significantly faster (Jiang & Nekrasova, 2007). Such an advantage is obvious among native speakers (Arnon & Snider, 2010) and advanced L2 learners (Durrent & Schmitt, 2010).

In addition to the rapid processing of formulaic sequences among native speakers and advanced L2 speakers, some studies set apart the other idiosyncratic dimension of native-like phraseological competence: Sensitivity to native-like phraseological units.

Siyanova and Schmitt (2008) examined phraseological competence qualitatively and quantitatively. The word combinations investigated in their study were adjective-noun collocations. They compared the amounts of the collocations used by both EFL learners and native speakers of English in their writings as well as the accuracy and speed of the speakers' judgements on whether the presented collocations would be native-like or not. The analyses revealed that, although the two groups generated similar amounts of adjective-noun collocations in their writings, their judgements in the given task showed differences in terms of speed and accuracy; the two groups processed adjective-noun collocations differently in quality.

What is illustrated in the aforementioned studies is that although L2 learners may recognize a large size of phraseological units, this does not assume their native like phraseological competence unless how these units were used is probed. Nevertheless, it seems not so difficult for L2 leaners to develop a receptive knowledge of formulaic sequences as part of the native-like phraseological competence in L2.

Development of phraseological competence

Widely acknowledged in the above studies, the recognition of formulaic sequences is less problematic in L2 than learning how to use them appropriately (Laufer & Waldman, 2011). In order to investigate formulaic sequences in use, many studies employed learner corpus, electronic collections of language data produced by L2 learners, to investigate a variety of issues related to the process of language acquisition (Granger, Gilquin & Meunier, 2015). In studies of lexical bundles, for instance, they showed qualitative differences of formulaic sequence usage. The types of formulaic sequences L2 participants tend to use differ according to the speaker's proficiency levels in L2. Yoon (2016) examined this aspect by examining to what extent association strengths differ among verb-noun combinations in English writing produced by English as second language (ESL) learners. The study compared the writings of L2 learners with that of native speakers. The analyses showed that, while both ESL learners and native speakers of English heavily relied on high frequent collocations in their writings,

the ESL learners showed underuse of low frequent collocations. Similarly, Nesselhauf (2005) conducted a study of learner corpus consisting of essays written by German English as foreign language (EFL) learners. The study demonstrated that L2 users' production of collocations was less varied compared to that of native speakers. Moreover, they found a small number of repeatedly used high frequent phrases or as known as "phrasal teddy bears" (Ellis, 2012).

Another notable atypical use of formulaic sequences dividing L2 learners, besides the frequency of formulaic sequences, is their contexts or registers. Biber et al. (2004) compared registers where multi-word strings, or lexical bundles, were described and categorized according to their functions. As a result, Biber, et al. (2004) sorted them into three categories; stance, discourse organizers, and referential. In particular, stance bundles often deliver speaker's knowledge or attitude (e.g., *I don't know what, to be able to*); discourse organizers often connect information before and after the bundles (e.g., *I would like to, as well as the*); and referential bundles show direct reference (e.g., *one of the things, as a result of*). Furthermore, Chen and Baker (2016) examined whether lexical bundles generated by L2 learners across a range of proficiency would show the register mismatch in their use. The analyses indicated that lower-proficiency participants showed more colloquial use of lexical bundles when discourse was more personal. However, participants of the counterpart produced more formal language containing more impersonal expressions and sentences created with nominal construction.

Chen and Baker (2016) further pointed out a qualitative difference in terms of personal involvement. Specifically, it is often discussed in literature that academic writings generated by EFL learners tend to show more writer visibility when compared with native speakers. Chen and Baker's findings are not exceptional; lower-proficiency participants used more overt expressions of writer visibility such as *I hope I can* or *I think this is*, while more proficiency participants used more impersonal stance bundles such as *it is obvious that* or *it is believed that*. Furthermore, in a comparative study of learner corpora between native speaker (NS) students' writing and non-native speaker

(NNS) students' writing in an academic context, Chen and Baker (2010) found an overuse (e. g., overstating expressions such as *all over the world*) as well as underuse (e. g., noun or prepositional bundles such as *the extent to which or in the context of*) of certain types of lexical bundles. Such underused bundles are commonly used in academic writing.

Along with register-inappropriate use of formulaic sequences, the other qualitative idiosyncrasy found among EFL learners equally deserves attention: the syntactic feature of formulaic sequences' construction. A study of metadiscursive expressions according to proficiency levels of ESL writers (Granger, 2017) employed six subcorpora from the International Corpus of Learner English (ICLE) and found that the participants overused typical expressions in speech such as verb-based combinations (e. g., *I would like to, we can say that*) and underused frequent and typical expressions in academic writing such as noun-based combinations (e. g., *in the case of, on the issue of*) (Biber, et al., 1999, p.991). As seen in the studies, the qualitative difference in the use of formulaic sequences is quite notable, and the register-appropriate use of formulaic sequences requires relatively higher L2 proficiency; otherwise, the difference between speech and writing remains less marked among L2 learners (De Cock, 2000).

Despite the significance of learning to use formulaic sequences appropriately, however, competence needs a prolonged time to develop. Laufer and Waldman (2011) investigated EFL learners' erroneous formulaic sequences in use by examining a self-compiled corpus of written language produced by Israeli EFL leaners across different proficiency levels. The study compared their data with the Louvain Corpus of Native English Essays (LOCNESS), a corpus of essays written by young adult native speakers of English. In addition to the quantitative investigation, they also sought causes of such erroneous use of formulaic sequences. The analyses revealed that, regardless of the participants' levels of proficiency, the EFL learners tended to use far fewer collocations. Furthermore, they found persistent errors in use of formulaic sequences even among the participants at the advanced proficiency level. Collectively, the study concluded that reaching the full-fledged development of phraseological competence

requires a long period of time, which can be partially attributed to impact from their first language as a source of persistent errors among L2 learners (Granger, 2017; Laufer & Waldman, 2011).

It is a growing consensus that achieving native-like phraseological competence among L2 learners is a daunting challenge. Yet, many studies stived for to overcome the challenge. Some suggested, in this regard, that rich exposure of the target language might attenuate such challenges among L2 learners (Boers & Lindstromberg, 2012; Ellis, 2008, 2012; Meunier, 2012). In an extensive review of studies in formulaic sequences done by Boers and Lindstromberg (2012) suggested, for example, that despite the complexity and diverse nature of formulaic sequences reviewed in studies, L2 learners must receive rich input in L2 in order to raise the chances of encountering not only high frequent formulaic sequences but also low frequent items. Doing so would entrench traces of formulaic sequences in their memory so that subsequent retrievals would become cognitively easier and quicker (Ellis, 2008). Likewise, Ellis (2012) emphasized the importance of considerable L2 exposure since accumulated processing experiences would contingently increase the chances of implicitly learning formulaic sequences. Meunier (2012), taking it a step further, construed "the quantity and quality of the input" (p.115) as significant elements since both would essentially foster L2 learners to become more familiar and fluent in the use of formulaic sequences. Given that extensive exposure in L2, as suggested in the aforementioned studies, would play a significant role in development of phraseological competence, this deserves much more research attention than it has received in the past.

Importance of extensive exposure to L2 input in EFL

English as a medium of instruction (EMI) has been globally drawing much pedagogical attention, especially among English language instructors (Dearden, 2014). Despite their enthusiasm in EFL education, many researchers question to what extent EMI lessons would impact L2 development. A growing consensus is that that EMI lessons would result in better pedagogical consequences in comparison to traditional

styles of EFL lessons (Admiraal, Weshoff, & de Bot, 2006; Jimenez, Catalan & Ruiz de Zarobe, 2009). More specifically, in many studies investigating the overall effect of EMI, EMI learners outperformed their counterparts in receptive skills (e.g., Admiraal, Weshoff, & de Bot, 2006; Jimenez Catalan & Ruiz de Zarobe, 2009) and were less effective in productive knowledge, especially in terms of lexical development (e.g., Goya, 2016). Speaking of the little development of productive knowledge in EMI, Storch (2009) examined whether there would be any change in the learners' academic writing as a result of EMI exposure in a semester-long study. Again, their analysis revealed the underdeveloped productive knowledge of L2 in terms of accuracy and complexity. What is worth mentioning is that the study had observed the qualitative development of writing, such as essay structures, writing invention, and formality, but little development of lexis. Likewise, Knoch, Roushad, Oon and Storch (2015) found a similar result. Their participants showed improvement in the fluent use of lexis but not in accuracy or grammatical and lexical complexity. Furthermore, Goya (2018) examined the deficit of productive knowledge development in a college-level EMI writing course. The participants across different levels of proficiency had produced easier lexical items in terms of the frequency level measured on a basis of a reference corpus. It was construed that EMI lessons might have provided rich input to L2 learners for the fluent use of lexis. Taken together, EMI lessons seem to be effective both on qualitative and quantitative change in academic writing in EFL contexts. In particular, the increase of high frequency words in use, which can be regarded as fluent use of language, is a noticeable change among L2 learners.

Research Question

As seen in the previous section, phraseological competence is indispensable for native-like production in L2. Many studies pointed out the importance of rich exposure to the target language for L2 competence development (Boers & Lindstromberg, 2012; Ellis, 2008, 2012; Meunier, 2012). As aptly suggested in previous studies (e.g., Goya, 2018), EMI lessons would effectively develop language skills in general. However,

almost all studies to date have found a limited range of productive knowledge development in L2. Given that L2 exposures may be beneficial, it is reasonable to investigate the impact of EMI lessons towards the productive development of phraseological competence. Yet, such an aspect lacks substantial empirical supports to date. This empirical as well as pedagogical paucity motivated the present study to investigate to what extent knowledge of formulaic sequences in L2 would change through EMI lessons. More specifically, the study addressed the following research question:

In what way does EFL learners' use of formulaic sequences change in academic writing over a semester-long college-level EMI writing course?

Method

The purpose of the present study was to investigate changes of collocation in use among EFL leaners studying at a mid-sized university in Japan. The study employed a diachronic learner corpus whose data collected at different points of time in a college level EFL writing course over a semester (i.e., 16 weeks). The classes, including instructions, contents, materials, and activities, were carried out exclusively in the target language (i.e., English) unless linguistic comparison between Japanese and English was necessary for the purpose of learning particular writing principles.

Participants

The participants ($n = 33$) were recruited from a college-level EFL writing courses in a mid-sized university in Japan. All course contents were delivered, explained, and taught exclusively through English, their target language. A main objective of the course was to help college-level EFL learners develop their academic writing skills (e.g., sentence construction, paragraph structure, and essay structure for different topics). All of the participants were majoring in English or English Education, and they were in their second year of the undergraduate program at the time of investigation.

Their first language is Japanese, and none of them claimed to be bilingual speakers of Japanese and English. The background questionnaire revealed that their formal English learning program started from the 5th grade in elementary school, and their English proficiency levels were self-reported as high-intermediate.

Materials and procedure

The study constructed three learner corpora whose data were collected from two different college-level EFL writing courses. Data collection was carried out based on writing tasks whose topics were adopted from the writing section of the Test of English as a Foreign Language (TOEFL). Three prompts were provided at discrete points of time with careful topic selection criteria. The assigned topics were as follows: 1) Opinion towards children's household tasks, 2) Necessity of playing video games among adults, and 3) Comparison of transportations for travel. Each of the writings took 20 minutes.

At first, the participants were instructed in prompt writing exercises at the beginning of each data collection day (i.e., Class 3, 9, and 15). A learning management system (LMS) used for course management allowed participants to work on the exercise for 20 minutes. All of the written texts were loaded to AntConc (https://www. laurenceanthony.net), a free concordance tool available online. AntConc can analyze complied text-formatted data with tagged information. The texts were separately compiled according to the prompt types. The descriptions of collected data were compiled as a learner corpus labeled as Data 1, Data 2, and Data 3. The size of the corpora was 2875 words ($n = 27$, $M = 106.48$), 4257 words ($n = 27$, $M = 157.67$), and 5681 words ($n = 27$, $M = 210.41$) for Data1, Data 2, and Data 3, respectively. The size of the corpora are illustrated in Table 1.

Table 1.

Description of Three Learner Corpora

Corpus	Corpus size (Token)	Number of essays	Mean length of essay
Data 1	2,875	27	106.48
Data 2	4,257	27	157.67
Data 3	5,681	27	210.41
Total	12,813	81	

The targeted formulaic sequences extracted from the compiled learner corpus by running AntConc were lexical bundles, especially 2- to 5-gram bundles. Examples of each type of lexical bundles were, *to help, have to, I agree, able to* for2-gram, *to do so, are able to, as they are,* for 3-gram, *to travel from my, do not have to, should be required to* for 4-gram, and be *required to help with, my home to a place* for 5-gram bundles. Table 2 shows part of the bundles extracted from the corpora.

Table 2.

Examples of Lexical Bundles Extracted from Corpora

Size of Lexical Bundles	Examples
2-gram bundles	*to help, have to*, *I agree*, *able to*, etc
3-gram bundles	*to do so*, *are able to*, *as they are*, etc
4-gram bundles	*to travel from my*, *do not have to*, *should be required to*, etc
5-gram bundles	be *required to help with*, *my home to a place*, etc

Results

The descriptive statistics of three leaner corpora collected at different points of time (i.e., tokens of Data 1, 2, and 3) are presented in Figure 1. The overall token of Data 1 was 3421 (*Mean* = 106.48, *SD* = 34.54); that of Data 2 was 4836 (*Mean* = 157.67, *SD* = 43.06); and that of Data 3 was 6098 (*Mean* = 210.41, *SD* = 86.72).
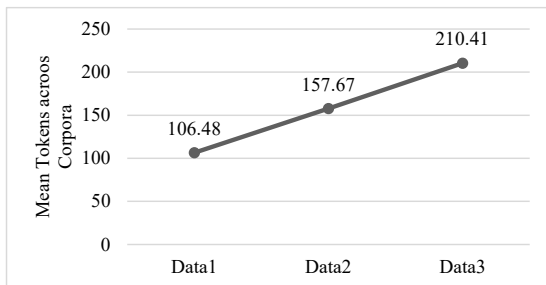
Figure 1. Mean numbers of tokens across three corpora

To determine whether differences across the corpora were statistically significant, a repeated measure one-way analysis of variance (ANOVA) was carried out. The result indicates that there was a significant difference between the corpora, $F(2, 52) = 36.42$, $p < .01$, $\eta_p^2 = .58$. A post hoc Bonferroni multiple comparison test was performed to locate the site of the significant effects. The analysis reveals that there were statistically significant differences between all of three corpora (i.e., Data 1, 2, and 3). As such, the participants had produced more tokens in Data 3 than they did in Data 1 ($p < .01$, $d=1.57$) and Data 2 ($p < .01$, $d=.78$) and more in Data 2 than Data 1 ($p < .01$, $d=1.31$).

In order to compare word-level proportions within a corpus as well as between corpora, another descriptive statistic of lexis (mean ratios of K1 to K3 level words) are presented in Figure 2. According to the figure, the mean ratio of K1-level tokens across different points of time (i.e., Data 1, 2, and 3) were 88.65 ($SD = 3.09$), 91.70 ($SD =9.95$), and 91.00 ($SD =3.82$); that of K2-level tokens were 3.53 ($SD = 1.77$), 7.25 ($SD = 2.62$), and 4.04 ($SD = 2.12$); and that of K3-level tokens were 6.66 ($SD = 2.54$), 3.04 ($SD = .87$), and 2.24 ($SD = 1.29$), for Data 1, 2, and 3, respectively.
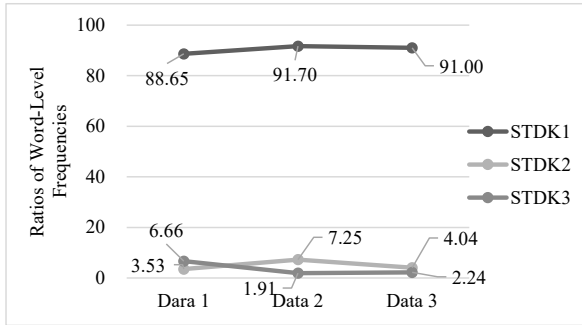
Figure 2. Mean ratios of K1- to K3-level of words

To determine if any statistically significant difference would exist, a repeated Two-way ANOVA was conducted. The analysis yielded a main effect for word-levels (i.e., K1, K2, and K3 word-level), $F (2, 78) = 11875.71$, $MSE = 17.02$, $p < .01$, $\eta_p^2 = .997$, but not for Data ($p = .163$). In order to identify where significant differences existed between these word-levels, a pairwise comparison was carried out. The results of Bonferroni showed significant differences between K1 word-level and K2 word-level ($p < .01$, $d = 20.07$), and between K1 word-level and K3 word-level ($p < .01$, $d = 21.05$), as such the participants produced more K1 level of words than K2 and K3, but they produced similar amount of K2 and K3 level of words.

As for interactions, the result indicated a significant interaction between word-levels and corpora, $F (4, 156) = 10.68$, $MSE = 169.80$, $p < .01$, $\eta_p^2 = .215$, which suggests that the corpora had different distribution ratio among K1 to K3 level of words. In order to identify where significant differences existed among these corpora in terms of the word-levels, a pairwise comparison test was carried out. The results of Bonferroni indicated a significant difference for K1 level of words between Data 1 and 2 ($p < .05$, $d = .41$), as well as Data 1 and 3 ($p < .01$, $d = .68$), as such that participants produced more K1 level of words in Data 2 and 3 than Data 1, but there was no difference between Data 2 and Data 3. As for the K2 word-level, the differences between Data 1 and 2 ($p < .01$, $d = 1.67$) as well as Data 2 and 3 ($p < .05$, $d = 1.35$) were

significant. The participants produced more K2 level of words in Data 2 than Data 1 and 3, but the latter corpora had no difference in terms of K2 level of words. As for the K3 word-level, the comparison showed significant differences between Data 1 and Data 2 ($p < .01$, $d =1.91$) as well as Data 1 and Data 3 ($p < .01$, $d =2.19$), as such that participants produced more K3 level of words in Data 1 than they did in Data 2 and 3, but they produced similar amount of K3 words at Data 2 and Data 3.

To examine amounts of lexical bundles participants produced at different point of data collected, AntConc extracted 2- to 5-grams of n-grams across three corpora. In order to eliminate an impact of corpus size, the study divided their raw frequencies by its corpus size (i.e., tokens). The analysis indicates that occurrences per thousand for 2-gram bundles across the corpora were 237.07, 208.85, and 216.30 for Data 1, 2, and 3, respectively. As for 3-gram bundles, participants produced 116.63, 58.11, and 41.49, and for 4-gram bundles, they produced 77.17, 18.20, and 24.43, and for 5-gram bundles, they produced 63.14, .9.1, and 17.05, respectively. Figure 3 illustrates normali3ed occurrences of 2- to 5-grams lexical bundles across three corpora.
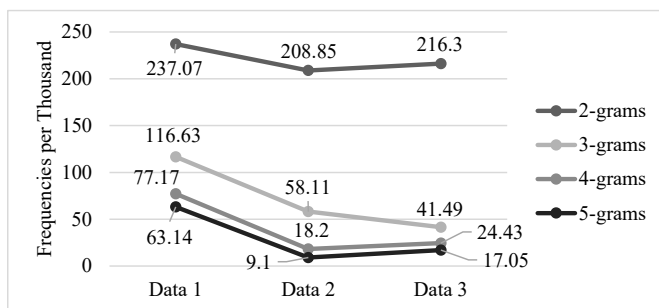

Figure 3. Normalized occurrences of 2-to 5-grams lexical bundles across three corpora

To examine if participants had produced more tokens than expected for each type of lexical bundles within the corpus, a Chi-square test was performed. The results determined that significant differences existed between portions of each of the n-grams within the corpora, X^2 (6, $n = 1086$) $= 76.16$, $p <.01$, $Cramer's V=.19$. This indicates

that the participants produced different amounts of lexical bundles at different points of time in EMI lessons.

In order to spot statistically significant differences among four types of lexical bundles(i.e., 2-gram, 3-gram, 4-gram, and 5-gram bundles)across three learner corpora (i.e., Data 1, Data 2, and Data 3), pairwise comparisons were carried out. The results showed that the participants produced significantly fewer 2-gram bundles in Data 1 ($p<.01$). However, they produced significantly more of them in Data 2 ($p<.01$) and Data 3 ($p<.01$). As for 3-gram bundles, their production was significantly more in Data 1 ($p<.01$), but significantly fewer in Data 3 ($p<.01$). As for 4-gram bundles, they produced significantly more in Data 1 ($p<.01$), but significantly fewer in Data 2 ($p<.01$), which was similarly observed among 5-gram bundles. That is, the participants produced significantly more in Data 1 ($p<.01$) while they were significantly fewer in Data 2 ($p<.01$).

Discussion

Let us consider the research question. That is, we explored learner corpora to examine in what way EFL learners' use of formulaic sequences changed in academic writing over a semester-long college-level EMI writing course. The present study investigated lexical bundles, a type of formulaic sequences defined as multiple-word sequences which frequently occur in a text (Siyanova-Chanturia & Van Lancker Sidtis, 2019). Frankly speaking, the present study found that EMI lessons might have an impact on the increasing use of shorter word-strings as well as decreasing use of longer word-strings, and the extensive use of easy lexis. According to our data, the participants showed a greater use of K1-level words while their use of K2 and K3-level words decreased with continuous exposure in EMI lessons. As for lexical bundles, the number of 2-gram bundles had increased quickly from Data 1 and remained high for the rest of the semester while those of 3-, 4-, and 5-gram bundles, frankly speaking, decreased and stayed infrequent. Taken together, EFL leaners' continuous exposure to the target language might have impacted both lexical competence as well as phraseological

competence in particular ways.

Previous studies have put an emphasis on the importance of exposure to the target language (Boers & Lindstromberg, 2012; Ellis, 2008, 2012; Meunier, 2012) for language development, especially, for the proper use of formulaic sequences which is believed to take a prolonged period of time to master (Laufer & Waldman, 2011). This is important when considering that the present study found an accelerated use of high frequent lexis. This is not surprising, however, that the previous studies also indicated a consistency of the EMI effect. For instance, Goya (2018) found that his participants across different levels of proficiency had produced significantly more of the easier lexical items in academic writing where their class was conducted exclusively in the target language. Likewise, Knoch, Roushad, Oon, and Storch (2015) found that their participants showed improvement in the fluent use of lexis while in EMI lessons. Such consistent findings can collectively indicate that EMI lessons might have not only provided L2 learners with rich input for their fluent use of lexis, but also narrowed the range of their use.

Given that more frequent use of easier words might be accelerated by extensive exposure to L2, an essential question necessary to consider is in what way exposure to the target language would associate with the development of phrasal competence for which lexical competence can presumably serve as a basis. According to our data, the proportions of EFL learners' use of lexical bundles in three corpora compiled at different times differed from one another in terms of 4 types of lexical bundles. In particular, the participants showed more use of 2-gram lexical bundles in Data 1 as shown in Figure 3. Yet, as they proceeded with the EMI exposure, their use of 2-gram lexical bundles further increased while that of 3-, 4-, and 5-gram bundles decreased all together. Such growing reliance of 2-gram bundles and less use of longer word-string bundles may extendedly imply the limited effect of EMI lessons. That is, rich exposure to the target language could drive L2 participants to extensively use high frequent words so that such use of the particular lexis might result in more use of 2-gram bundles, which may consist of those easy words. Yet, such an interpretation needs to be

empirically confirmed carefully in future studies.

What may deserve more careful consideration is that the quantitative growth of lexis might have influenced the qualitative change of lexical bundles in use. More specifically, when comparing their descriptive variation of 2-gram bundles in our data, a noticeable change was the growing number of "first-person pronoun + verb" (or auxiliary verb) combinations. In Data 1, for example, our participants used this type of bundles less frequently such as *I agree* ($n = 24$) and *I think* ($n = 23$). However, as they were exposed to the target language in the classroom, they began using the construction more frequently and widely such as *I think* ($n = 28$), *I have* ($n = 14$), *I agree* ($n = 13$), and *I disagree* ($n = 13$) in Data 2. In Data 3, this trend became more noticeable in the use of phrases such as *I can* ($n = 41$), *I would* ($n = 26$), *I will* ($n = 22$), *I choose* ($n = 18$), *I have* ($n = 18$), *I think* ($n = 18$), *I want* ($n = 16$), *I could* ($n = 12$), *I travel* ($n = 12$), *I do* ($n = 11$), and *I use* ($n = 11$). As seen in the data, their use of 2-gram lexical bundles became more various and frequent as they were exposed to the target language.

This can lend support to the previous studies. Particularly, Chen and Baker (2016) found that their lower-proficiency participants used more overt expressions of writer visibility (e.g., *I hope I can* or *I think this is*). In the same vein, Chen and Baker (2010) found an underuse of certain types of lexical bundles commonly used in academic writing (e.g., *the extent to which* or *in the context of*). Taking the change of variation and frequency of lexical bundles in our data as well as the previous findings into account, what can be implied is that the identified limited growth of phraseological competence may be persistently pessimistic; that is, EFL learners in EMI lessons continuingly showed growing writer visibility in writing, which can often be considered a sign of incompetency in the academic context.

As seen in our data, as well as widely acknowledged in the previous literature, development of the phraseological competence does not occur in parallel with that of lexical competence (Bahns & Eldaw, 1993); however, use of fewer word-string lexical bundles may be facilitated by the growth of lexical competence. Our data indicated the qualitative change of lexical bundles usage, which may possibly be a part of the

developmental sequence of phraseological competence among L2 learners. Others also emphasized such tendency and called them "Phrasal teddy bears" (Nesselhauf, 2005). More specifically, Nesselhauf (2005) found that L2 users' production of formulaic sequences were less varied compared to that of native speakers. Similarly, Yoon (2016) found that their ESL participants heavily relied on high frequent formulaic sequences in their writings. Taken together, the present study may theoretically extend the previous findings with another description of phraseological teddy bears in terms of lexical bundles size; L2 learners' use of formulaic sequences, not only less varied in types but also shorter in size.

Not all empirical research can be free from theoretical as well as methodological caveats; the present study is no exception. First of all, in order to statistically confirm our findings, the present study must employ careful analyses based on inferential statistics with sufficient size of corpora. Although the study drew its conclusion based on inferential statistics; however, to ensure its validity, a large size of corpora complied based on L2 learners from different backgrounds is necessary. Furthermore, in order for a fair comparison to be drawn, the control group with less or no exposure to the target language should be examined and any differences observed. A greater scale of quantitative as well as qualitative data collection would also be imperative to investigate to determine why only the increased use of 2-gram bundles was observed among EFL writers at EMI lessons but no increase in 3-, 4-, nor 5-gram bundles was observed. Lastly, to ensure the pedagogical effect of EMI lessons, operationalizing the targe language exposure is essential.

Nevertheless, in line with other studies, we could conclude that EMI lessons are probably effective to the increasing use of high frequent words that might result in more use of fewer word-string lexical bundles in academic writing. Taking this into account, we suggest the following in order to maximize the effect of EMI lessons for the development of phraseological competence in a foreign language classroom. First of all, foreign language instructors need to explicitly draw their leaners' attention to lexical bundles, especially for longer word-strings. While being exposed to the target

language, the learners are compelled to be fluent by using high frequent words more and fewer longer word-string bundles. Second, since use of a wider variety of lexical bundles is an essential component of native-like competence in L2, foreign language instructors must frequently remind their students of the importance of such kinds of fixed expressions. More specifically, having the learners run corpus investigation of their actual writings for identifying lexical bundles (e.g., N-grams in AntConc) may directly draw their attention to own production.

Another teaching suggestion is to give learners a sufficient amount of time to revise their writing after submission. The learners would be willing to rewrite earlier versions of drafts if allowed to improve their grades as determined by a rubric with an emphasis of lexical bundles for academic context. In doing this, the leaners would recognize the importance of the lexical bundles in academic writing.

Conclusion

Although knowledge of formulaic sequences is essential for successful foreign/second language acquisition. Yet, its development requires a substantial time and effort for EFL learners in general. The present study aimed to elaborate a possible effect of EMI onto productive knowledge development among college-level EFL learners and suggested its limited effect. However, it should be also considered that non-parallel development of lexical competence and phraseological competence is only part of developmental sequence, which might be accelerated by extensive exposure of the target language. This should be addressed meticulously in a well-rounded design. Nonetheless, such view should be a driving force for further investigation to shed more light on developmental sequence of phraseological competence in L2 in future.

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目標言語による授業運営の影響：アカデミックライティングにおける日本人 EFL 学習者の定型表現（formulaic sequences）使用の変化

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"formulaic sequences"（定型連鎖）は重要な言語知識であり (Wray, 2002), 第二言語 (外国語) による円滑なコミュニケーションを行うためには必要不可欠な知識である (Pawley & Syder 1983)。その重要性にも関わらず，その能力の発達，特に適切な定型表現の使用を身につけるまでには長い時間を要する (Laufer & Waldman, 2011) が，多くの研究では学習言語のインプットに十分に触れることで formulaic sequences は熟達すると指摘されている。本研究では，学習言語を教授言語とする教室環境において日本人英語学習者 (n = 27) の "lexical bundles"（単語連鎖）の使用とその変化について調査した。調査は参加者の産出したライティングのコーパスを構築し，AntConc を用いて語彙の分布と頻度，およびサイズの異なる単語連鎖を抽出した。分析の結果，参加者は高頻出語彙を多用するようになり，2 語からなる単語連鎖 (2-gram lexical bundles) の使用が増加するともに，その他のサイズの単語連鎖の使用は減少した。このことから，学習言語を教授言語とする EFL 環境では産出的スキル向上への効果は限定的ではあるが, phraseological competence(定型表現能力) の向上への影響の可能性を示した。