A Corpus-Based Analysis of Lexical Bundles in Non-Native Post Graduate Academic Writing and a Potential L1 Influence

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Article information	Abstract
	This study was conducted to examine the lexical bundles used by non-native speakers of English and explore any potential L1 influence on L2 lexical bundle use. Following a corpus-based approach, the frequency and types of English four-word lexical bundles in the postgraduate academic writing of Turkish and American students were analyzed, and the bundles unique to the Turkish students were compared with Turkish lexical bundles produced by Turkish post-graduate students. For this purpose, three sub-corpora were compiled: English MA/PhD theses by Turkish, English MA/PhD theses by American, and Turkish MA/PhD theses by Turkish students, all from the area of language teaching. Data analysis showed that the Turkish students used twice as many types of four-word lexical bundles in their English theses (N = 125) as the American students (N = 69). Moreover, 62 lexical bundles were significantly overused by Turkish students, and 37 of these lexical bundles never occurred in the theses of American students. With respect to cross-linguistic influence, the findings showed that Turkish postgraduate students were likely to transfer 24.8% of lexical bundles from their native language, Turkish, to a foreign language, English. Moreover, four-word lexical bundles that were very frequent in Turkish theses were also found to be very frequent in English theses of Turkish students. These findings are discussed in light of previous studies, and pedagogical implications are offered.

INTRODUCTION

For some time now, English has been the lingua franca of most academic disciplines and has played an important role in the dissemination of knowledge and science (Bennet, 2013; Björkman, 2013). A consequence of this situation could be that scholars and students all around the world need to write in English to publish their academic work or complete their postgraduate studies. Especially in a 'publish-or-perish' academic culture, this situation creates a significant challenge for non-native speakers of English (Chang & Kuo, 2011; Steinman, 2009). This is not only because they need to have a high proficiency in English, but they also need to know the features of academic genre (Steinman, 2009). In fact, academic genre has various distinguishing features, such as its vocabulary, norms, and set of conventions (Zamel, 1998).

One feature that distinguishes academic writing from academic spoken discourse or spoken discourse in general is the use of lexical bundles (Biber & Barbieri, 2007). Lexical bundles (LBs) are recurrent multi-word expressions of three or more words (e.g., *I don't know what or have a look at* in conversation, and *as a result of* or *the nature of the* in academic prose) that show a certain frequency and distribution in a corpus (Conrad & Biber, 2005, p. 64). Lexical bundles are extremely frequent in both spoken and written discourse, and they constitute a significant element of fluent linguistic production as well as being an important indicator of native-like proficiency (Hyland, 2012; Simpson-Vlach & Ellis, 2010).

As they are argued to have "an important role in signifying fluency, accuracy and idiomaticity in academic writing" (Li, 2016, p. 28), lexical bundles have been the focus of a number of studies. Most of the previous studies have shown that non-native speakers of English differ from their native counterparts in their use of lexical bundles in academic register (Ädel & Erman, 2012; Chen & Baker, 2010; Cortes, 2004; Hyland, 2008b). However, few of them investigated the underlying reasons for the difference in the frequency and distribution of lexical bundles L2 writers use.

Considering that non-native speakers frequently tend to employ strategies from their L1 writing (Connor, 1996; Cumming, 1989), it can be hypothesized that one aspect that affects the lexical bundle choices of L2 writers could be their L1. In fact, several studies (Allen, 2009; Rica-Peromingo, 2009) explained the misuse, underuse, or overuse of some lexical bundles by learners' L1. For example, Allen (2009) attributed Japanese learners' overuse of *it can be said* to their L1 because its translated equivalent was frequently used in Japanese academic language. Similarly, Rica-Peromingo (2009) referred to L1 influence when explaining Spanish learners over- and under-use of certain lexical bundles. However, few studies, except Güngör and Uysal (2020), Pérez-Llantada (2014) and Paquot (2013), actually examined data in learners' L1s to dig for evidence supporting these arguments.

In this context, the current study aims to examine the lexical bundles used by non-native speakers of English and explore any potential L1 influence on the L2 lexical bundle. In this scope, lexical bundles that were overused by L1 Turkish postgraduate students and never used by native English speakers were identified in their English theses. Consequently, those L2 lexical bundles unique to L1 Turkish postgraduate students were determined and compared with lexical bundles that appeared in COCA and an L1 corpus of MA/PhD theses in Turkish to dig for potential L1 influence.

LITERATURE REVIEW

Lexical bundles

Lexical bundles are combinations of sequences of words that tend to frequently co-occur in a particular genre and that are identified using a dispersion or cut-off criteria (e. g., at least 20 times per million words) (Biber et al., 1999, p. 991). Lexical bundles have certain characteristics that distinguish them from other types of word combinations, such as collocations and idioms. For

instance, Biber and Barbieri (2007) emphasized that "most lexical bundles are not idiomatic in meaning" (p. 269). In this sense, unlike idioms, which can require more than the literal meanings of the items, the meaning of a lexical bundle can easily be understood only by looking at its individual items. Moreover, lexical bundles are usually incomplete structural units and part of longer structures, contrary to collocations. However, they play an important role in spoken and written registers and are accepted as "important building blocks of discourse" (Biber & Barbieri, 2007, p. 263) and a sign of language competency in a specific register (Chen & Baker, 2010; Cortes, 2006). Correspondingly, the lack of lexical bundles indicates the lack of fluency of the learner in any particular register (Hyland, 2008b), because lexical bundles are extremely common in a particular genre. For example, 21% of all the words in Biber et al.'s (1999) academic prose corpus occurred as lexical bundles, which shows that lexical bundles are indeed very common.

Related studies

Studies of lexical bundles as used by L2 English speakers have had varying foci, ranging from comparing texts produced by native and non-native speakers (Ädel & Erman, 2012; Allen, 2009; Chen & Baker, 2010; Rica-Peromingo, 2009) to investigating bundles in different languages comparatively (Paquot, 2013; Pérez-Llantada, 2014). For example, Chen and Baker (2010) compared three types of data: native expert, native student, and non-native (i.e., Chinese) student writing. The findings revealed that although non-native writers had some control over lexical bundles, they did not "demonstrate it as diversely and robustly as native writers did" (p. 43). In other words, non-native writers relied on a limited number of bundles. Moreover, the researchers concluded that the types and tokens of lexical bundles increased with proficiency. Ädel and Erman (2012) examined a corpus of essays produced in English by non-native (L1 Swedish) students and native English (British) students and compared their findings with those of Chen and Baker (2010). Ädel and Erman (2012) revealed that native English students used a larger number and wider variety of lexical bundles compared to non-native students. Differences in corpora and context (EFL-ESL) and the L1 backgrounds of the students were attributed to the discrepancy between their findings and the findings of Chen and Baker (2010). In a similar vein, Öztürk and Köse (2016) compared four-word lexical bundles used by Turkish and native English students in their MA and PhD theses with those by native scholars in published research articles. The study showed that Turkish postgraduate students used different lexical bundles compared to their native peers and scholars. Such a finding was attributed to an L1 transfer effect. In his study, Rica-Peromingo (2009) investigated lexical bundles in argumentative essays by Spanish learners and native English students, along with professional editorial writing. The study found that the Spanish learners significantly overused or underused certain lexical bundles, which was argued to be related to the teaching effect and possible influence of L1. In a similar study, Allen (2009) compared the use of lexical bundles in final research papers by Japanese students and published research articles by native speakers of English. He retrieved some features of use unique to the learners, including the bundle types *it can be said* and *can be said that*, and argued that such uses could be attributed to the learners' L1.

Although the differences in the frequency and variability of lexical bundles used by native and

non-native students in these previous studies were attributed to L1 influence, these studies did not investigate L1 lexical bundles produced by non-native speakers and did not compare them with L2 lexical bundles produced by non-native speakers. Among the studies that specifically focused on L1 transfer effects by examining and comparing lexical bundles in three corpora (L1 lexical bundles produced by L1 French students, L2 lexical bundles produced by L1 French students, and lexical bundles produced by native English students), Paquot (2013) revealed that transfer effects were in play for a considerable number of lexical bundles. In another study, Pérez-Llantada (2014) examined lexical bundles in a corpus of published research articles in L1 English, L2 English, and L1 Spanish. The findings showed that L2 English retained a small stock of bundles transferred from L1 Spanish (17% of all the bundles in L2 English) and exhibited a considerable percentage of idiosyncratic bundles (the remaining 36% of its bundles). Kostromitina (2022) sought evidence on the cross-linguistic influence on the use of L2 lexical bundles in academic writing by Russian writers. The result suggested an overlap in the use of lexical bundles between L2 English writing produced by Russian speakers and L1 Russian writing, which emphasized the possible L1 transfer. Cao and Badger (2023) focused on the cross-linguistic influence on the use of L2 collocations by Vietnamese learners and concluded that 40% of the collocations used by Vietnamese learners were affected by the first language. Similarly, Güngör and Uysal (2020) investigated the L1 transfer effect by scrutinizing four-word lexical bundles used in education science research articles. The researchers compiled three specialized corpora and compared lexical bundles. The study showed that Turkish researchers were likely to transfer 45% of their lexical bundles from their L1 Turkish to their L2 English. Table 1 below presents a summary of major studies conducted to compare native and non-native lexical bundles, that are relevant to the present study.

Table 1

Comparison of native and non-native English lexical bundles in previous studies

Study	Sub-corpora	Length	N types	N tokens
Ädel & Erman (2012)	English Essays by Natives English Essays by Swedish L1	Four-word	130 60	unknown
Bychkovska & Lee (2017)	Argumentative Essays by Natives Argumentative Essays by Chinese L1	Four-word	23 52	1530 3846
Chen & Baker (2010)	Journal/Book Section (English L1) Essays (English L1) Essays (Chinese L1)	Four-word	108 104 80	704 667 507
Güngör & Uysal (2020)	English RA by Natives English RA by Turkish L1	Four-word	79 119	12140 30288
Shin (2019)	Argumentative Essays by Natives Argumentative Essays by Korean L1	Four-word	146 156	2783 3434
Uçar (2017)	English RA by Natives English RA by Turkish L1	Three-word	10 7	513 523
Wei & Lei (2011)	Research articles PhD theses (Chinese L1)	Four-word	87 154	4245 7548
Pang (2009)	Louvain Corpus of Native English Written English Corpus of Chinese	unknown	861 263	unknown
Hyland (2008b)	English RA by Natives English PhD theses by Cantonese L1 English MA theses by Cantonese L1	Four-word	71 95 149	3.1% 3.8% 5.1%

To summarize, previous studies have shown that non-native learners differ in their use of lexical bundles in academic writing from native speakers, and some of these different uses could be influenced by learners' L1s. Since few studies (i.e., Güngör & Uysal, 2020; Paquot, 2013; Pérez-Llantada, 2014) have specifically focused on L1 interference and have compared English lexical bundles produced by native and non-native speakers with the lexical bundles in non-native English speakers' L1, there is a need for studies both to contribute to the growing literature on the use of lexical bundles in L1 and L2 non-native texts and to extend this literature to Turkish learners in terms of MA/PhD theses. To address this issue, the present study examines the lexical bundles used in English MA/PhD theses by Turkish and American students and Turkish MA/PhD theses by Turkish students and addresses the following guiding research questions:

1. What lexical bundles are statistically significantly overused and underused by Turkish postgraduate students when compared to L1 English postgraduate students?
2. How much of Turkish learners' use of L2 lexical bundles can be attributed to L1 influence?

METHOD

Corpus material

The present study provides a corpus-based approach. In accordance with the research aims, the corpora used for this examination consisted of three sub-corpora: Turkish students' MA/PhD theses in English (TMPE), Turkish students' MA/PhD theses in Turkish (TMPT), and native English-speaking American students' MA/PhD theses in English (AMPE). TMPE and AMPE were developed in another research study aiming to reveal the lexical bundles used by postgraduate students in comparison to native English scholars (Öztürk & Köse, 2016), whereas TMPT was compiled for the purposes of this study. The reasons for focusing on these genres (i.e., MA/PhD theses) were that they are argued to "represent the key research genres of the academy" and they are different from research articles (Hyland, 2008b, p. 47).

The first sub-corpus, TMPE, included theses written by postgraduate students at different Turkish universities in the field of English language teaching. The second sub-corpus, TMPT, contained theses produced by postgraduate students at different Turkish universities in the field of Turkish language teaching (either as a foreign or as a first language). The texts for these two sub-corpora were taken from the Turkish Higher Education Council theses network. Lastly, the third sub-corpus, AMPE, consisted of theses on topics related to language teaching submitted by native English-speaking American students at different American universities. The American students' theses were collected from the *ProQuest* theses database. The American students and, in some cases, their thesis supervisors were contacted to make sure the theses were written by native English speakers. The statistics regarding the whole research corpus are presented in Table 2.

Table 2
Research corpus statistics

		No. of Texts	No. of Words	Total
TMPE	MA	30	612,379	1,346,396
	PhD	20	734,017	
TMPT	MA	30	457,594	1,239,392
	PhD	20	781,798	
AMPE	MA	30	421,880	981,928
	PhD	20	560,048	
		150	Total	3,567,716

TMPE: Turkish students' MA/PhD theses in English

TMPT: Turkish students' MA/PhD theses in Turkish

AMPE: American students' MA/PhD theses in English

The whole corpus comprised 150 texts, which yielded around 3.5 million words. Each sub-corpus included 30 MA theses and 20 PhD theses, considering that PhD theses are generally longer than MA theses. The selection of texts was done in a way to make the three sub-corpora include texts on similar topics (i.e., related to language teaching) and research methodologies (i.e., quantitative/qualitative), in other words to make them as comparable as possible. After the research corpus was compiled, direct quotations, tables/figures and other similar elements were manually excluded from the texts since the focus was on the own uses of the writers whose texts were included in the corpus.

Data analysis procedures

Three issues had to be considered before conducting a lexical bundle analysis and comparing lexical bundles across groups. The first issue was the length of lexical bundles. As described in the definition of the term, lexical bundles include three or more words. We decided to analyze four-word lexical bundles because the literature on four-word bundles is richer and they are manageable in size (Chen & Baker, 2010). In addition, four-word lexical bundles are "over 10 times more frequent than five-word sequences and offer a wider variety of structures and functions to analyze" (Hyland, 2012, p. 151). And last, they "hold three-word bundles in their structures" (Cortes, 2004, p. 401).

A second important issue is the criteria for identifying lexical bundles. Lexical bundles are identified based on a standardized cut-off point in a particular corpus. This cut-off point is standardized and described in 'per million words' to be able to compare two or more corpora with different sizes. In this regard, cut-off points vary from 10 times (Biber et al., 1999) to 40 times (Biber & Barbieri, 2007) per million words in the literature. The cut-off point is usually decided depending on the size of the corpus. Considering the size of the research corpus used in this study and the cut-off points adopted in the literature, 25 times per million words was chosen for this criterion.

Distribution is another criterion used to avoid the idiosyncrasies of individual writers (Biber et al., 2004). In the literature, researchers usually prefer to set this criterion to five texts (e.g., Biber et al., 1999; Cortes, 2004). Therefore, appearance in five texts was also adopted in this

study as the distribution criterion. Consequently, four-word combinations that occurred 25 times per million words and appeared in at least five texts were identified as lexical bundles in this study.

WordSmith Tools 6 (Scott, 2011) was used to identify the lexical bundles in each sub-corpus based on the set criteria. After automatically retrieving the four-word bundles, two further interventions were implemented on the initial list of lexical bundles. Firstly, context-specific or context-dependent lexical bundles such as *foreign language learning process* or *in second language teaching* were excluded since they have different discourse functions and are not the "building blocks" of the texts (Chen, 2009, p. 58). Secondly, overlapping lexical bundles such as *it can be said* and *can be said that*, which could be combined into a five-word bundle as in *it can be said that* are combined in order to avoid inflated results (Chen & Baker, 2010).

The retrieval and analysis of lexical bundles were conducted in three steps based on the criteria discussed above. First, four-word lexical bundles in AMPE and TMPE were identified and compared. The overused four-word lexical bundles that were never used by American students were determined by using the KeyWord function of *WordSmith Tools 6*, which incorporates various statistical tests such as log-likelihood and chi-square (Scott, 2011). In the second step, the frequencies of four-word lexical bundles overused by Turkish students and never used by American students were searched in the 120-million-word academic section of the Corpus of Contemporary American English (COCA) to see if it was about student writing or academic writing in general. The last step was the retrieval and comparison of four-word lexical bundles in TMPT with those that are infrequent in COCA, and overused by Turkish students, and never used by American students. However, in addition to four-word combinations, individual words, two-, and three-word combinations were also identified in the Turkish L1 sub-corpus based on the same frequency and distribution criteria. The reason is that Turkish is an agglutinative language with a more complex morphological structure than English. Consequently, according to Durrant (2013), formulaicity[1] can play an important role at the morphological level in Turkish. This is why the length of the combinations was not kept strict in the analysis of the texts in Turkish, so that the researcher could examine whether any of the varying uses of L1 Turkish texts in English were mere translations from common lexical bundles or shorter strings in Turkish.

RESULTS AND DISCUSSION

Lexical bundles in TMPE and AMPE

The number of four-word lexical bundle types was observed to differ considerably across the two sub-corpora of English academic writing. There were 125 lexical bundles in the theses of Turkish students in English and 69 lexical bundles in those of American students. The total

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[1] Formulaicity is a term that refers to the phenomenon that some linguistic sequences (including lexical bundles) which could potentially be analyzed into smaller units are, for one reason or another, better treated as wholes (Durrant & Mathews-Aydınlı, 2011).

token frequency of the 125 lexical bundles in the Turkish students' theses was 9,927 times, while it was 3,862 times for the 69 lexical bundles in the American students' theses. Thirty-nine lexical bundles were shared by both groups, which corresponds to 31% of the bundles that were retrieved in the Turkish students' theses, and 56% of those in the American students' theses. Despite the overlap in the use of some of the lexical bundles, the Turkish students tended to make more frequent use of four-word lexical bundles when tokens were considered. In other words, only based on the types and tokens of the four-word lexical bundles, Turkish students' theses differed from those of American students to a large extent and were quite repetitive in nature.

The findings of this study are consistent with the findings of some previous studies (Bychkovska & Lee, 2017; Güngör & Uysal, 2020; Hyland, 2008b; Shin, 2019; Uçar, 2017; Wei & Lei, 2011), albeit not all of them (cf. Chen & Baker, 2010; Ädel & Erman, 2012). For example, Bychkovska and Lee (2017) revealed that L1-Chinese writers used 2.3 times more bundle types than native-writers, and the normalized frequency of these bundles was more than double in their English argumentative essays. Similarly, Shin (2019) found that Korean students used more bundle types and more frequently in their English argumentative essays. Wei and Lei (2011) and Hyland (2008b) reached similar findings, and these studies are more comparable since they included postgraduate theses. These studies revealed that the number of lexical bundles in L1 Chinese and L1 Cantonese researchers' English theses was higher than the number of lexical bundles in native English-speakers' research articles. Another remarkable finding was that non-native students used lexical bundles in a more repetitive way, which was in line with the findings of the current study. Since these studies focused on theses or articles, as in the current study, it can be claimed that non-native students, along with Turkish L1 writers, have a tendency to use a considerably higher number of lexical bundles in a more repetitive way than native English writers in advanced academic texts. Similarly, Güngör and Uysal (2020) revealed that non-native Turkish researchers used 50% more lexical bundles than native speakers of English did in their research articles. In her study, Kostromitina (2022) also revealed that L2 English (227) and L1 Russian (264) writing contained more than twice the number of bundles in L1 English writing (83). These finding may be explained by the fact that learners might have utilized bundles with greater frequency in an attempt to produce texts that bore resemblance to academic discourse. The utilization of established idiomatic expressions may have assisted L2 writers in ignoring the use of unfamiliar or nontraditional academic English phrases. It appears that learners exhibit a tendency to rely excessively on commonly used linguistic forms when writing within the academic register (Durrant & Schmitt, 2009).

On the one hand, Chen and Baker's (2010) and Ädel and Erman's (2012) studies revealed different results, although it was common that non-native writers, to a large extent, differed from native English writers. The low number of bundles in non-native texts in these studies possibly stems from two reasons. It could be due to the fact that they used the same genre, i.e., argumentative essays or it could be because of the imbalance in the number of native and non-native texts in both studies, though in opposite ways. Ädel and Erman's (2012) corpus contained almost three times more non-native texts than native ones, whereas Chen and Baker's (2010) corpus consisted of 50% more native texts than non-native texts. These two setbacks actually exist in Pang (2009) as well, although this study revealed a different finding,

which is a higher number of bundles in non-native texts. The imbalance in the number of texts in two sub-corpora in Pang's study was extremely large, namely nearly seven times more texts by Chinese L1 students than native students. In an L1 Turkish context, Uçar (2017) showed that English research articles by Turkish researchers included less varied and more frequent lexical bundles than English research articles by native researchers, contrary to the findings of the current study, which may be caused by the very small corpus size.

Although the types/tokens of the bundles employed by the Turkish students in English revealed a repetitive nature of their writing, the present study was to mainly focus on the ones that they used differently when compared to their L1 English peers through a KeyWord analysis conducted in WordSmith Tools. The lexical bundles that were significantly overused and underused[2] by the Turkish students with reference to the American students are presented in Table 3 below.

Table 3

The lexical bundles overused and underused in TMPE with AMPE as the reference corpus (p < .001)

		Lexical Bundles	
TMPF **Overuse**	end of the study (359.99)	**according to the results (76.88)**	**with reference to the (50.82)**
	at the end of (241.46)	**the number of the (71.67)**	**by means of the (50.82)**
	the end of the (206.37)	of the present study (69.74)	**we can say that (49.52)**
	beginning of the study (197.23)	**it is seen that (69.06)**	**order to see the (49.52)**
	on the other hand (189.41)	**it can be claimed (66.46)**	**are considered to be (48.21)**
	in the light of (155.07)	**it was seen that (66.46)**	as can be seen (47.97)
	the beginning of the (133.60)	it can be concluded (65.34)	findings of the study (46,88)
	to find out the (132.91)	a result of the (64.92)	in terms of the (46.77)
	at the beginning of (107.81)	**it can be seen (62.55)**	**be claimed that the (45.61)**
	with the help of (107.23)	**can be claimed that (62.55)**	**with the aim of (45.61)**
	by the help of (106.85)	is considered to be (62.48)	**can be seen from (45.61)**
	in order to find (104.25)	the findings of the (61.74)	in order to see (44.77)
	the analysis of the (101.43)	**be taken into consideration (59.94)**	**whether there was a (44.30)**
	the aim of the (100.34)	**order to find out (58.64)**	**can be regarded as (44.30)**
	as a result of (99.41)	**it was observed that (58.64)**	**as it can be (44.30)**
	to find out whether (99.03)	**the study showed that (58.64)**	in the use of (43.72)
	the results of the (97.59)	**result of the analysis (57.33)**	results of the study (40.00)
	that most of the (88.61)	**it is believed that (56.03)**	on the use of (37.18)
	it can be said (86.00)	**can be concluded that (54.89)**	on the basis of (32.95)
	can be said that (84.70)	**first of all the (54.73)**	
	in addition to this (76.88)	**in line with the (53.74)**	
Underuse	it is important to (-71.80)		

*Log-likelihood (LL) values are given in parentheses.

**The bundles in bold are unique to the Turkish students.

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[2] The terms "overuse" and "underuse" refer to the fact that lexical bundles are found significantly more or less in the learner corpus (TMPE) than in the reference corpus (AMPE).

According to the significance analysis, 62 lexical bundles were significantly overused, and one lexical bundle was significantly underused by the Turkish students when compared to the American students. Moreover, 37 of these 62 lexical bundles, given in bold, never occurred in the theses of the American students; in other words, these lexical bundles were unique to the Turkish students. Some examples of these unique bundles from TMPE are as follows:

> After a three-week implementation, post test was conducted **to find out the** effect of both computer assisted and teacher-led storytelling on vocabulary learning of students. (TMPE-20)

> **By the help of** the information gathered from the pilot study, the researcher determined some problems that students might come across during the actual implementation. (TMPE-30)

> Regarding our study, **it can be said that** there is no place for such a pitfall because from the beginning of the study until the end the researcher was with the student. (TMPE-43)

As in these examples, the problem with the lexical bundles that were unique to the Turkish students was not grammar or comprehensibility; they just did not occur in the texts of the American students. To see if it was about student writing or academic writing in general, the frequencies of these bundles were checked in the 120-million-word academic section of the Corpus of Contemporary American English (COCA).

Table 4
Normalized frequencies of the lexical bundles unique to the Turkish students in
TMPE and COCA (per million words)

	TMPE	COCA		TMPE	COCA
in the light of *	88.38	6.71	it was observed that*	33.42	1.27
to find out the*	75.75	0.90	the study showed that*	33.42	0.64
by the help of*	60.90	0.12	result of the analysis*	32.67	0.16
in order to find*	59.41	1.17	it is believed that*	31.93	1.93
the aim of the*	57.18	2.68	can be concluded that*	47.53	1.03
to find out whether*	56.44	0.76	first of all the*	31.19	0.20
that most of the*	50.50	5.38	in line with the*	46.79	5.03
it can be said*	49.01	1.43	with reference to the*	28.96	1.83
can be said that*	48.27	1.17	by means of the*	28.96	2.52
in addition to this*	43.82	1.46	we can say that*	23.22	1.02
according to the results*	43.82	0.75	order to see the*	23.22	0.14
the number of the*	40.84	1.05	are considered to be*	27.48	2.86
it is seen that*	39.36	0.56	be claimed that the*	25.99	0.06
it can be claimed*	37.87	0.10	with the aim of*	25.99	2.60
it was seen that*	37.87	0.20	can be seen from*	25.99	1.39
it can be seen*	35.65	2.56	whether there was a*	25.25	0.79
can be claimed that*	35.65	0.08	can be regarded as*	25.25	1.60
be taken into consideration*	34.16	1.25	as it can be*	25.25	0.54
order to find out*	33.42	0.17			

*Significant difference at the level of p < .0001.

The lexical bundles that occurred quite frequently in the texts of the Turkish students but never occured in those of the American students appeared in COCA at varying frequencies. The existence of these bundles in the academic section of COCA does not mean that they are frequent in academic prose. As a matter of fact, the difference in the normalized frequencies of these bundles between TMPE and COCA was statistically significant based on the log-likelihood test. In other words, these word combinations do appear in academic writing in general but they are less likely to co-occur and are not prevalent in this genre. Yet, they were significantly overused by the Turkish postgraduate students in their MA and PhD theses.

The only lexical bundle that was found to be significantly underused by the Turkish students when compared to their American peers was *it is important to*. It occurred with a frequency of 45 times in TMPE (33.42 times per million words) and 153 times in AMPE (123.44). Its frequency in COCA is 5,091 times (42.07 times per million words), which reveals no significant difference with TMPE (p > .05) and indicates an overuse by American students. Consequently, the Turkish students did not really show an underuse in any of the lexical bundles they use, which can be interpreted as indicating that they had a good command over the types of lexical bundles their L1 English peers used in academic writing. Nevertheless, they made use of certain bundles that either never or more rarely occurred in the reference corpus and COCA.

The possible reason for the overuse of some lexical bundles is that students may consider these bundles safe options (Kaszubski, 2000). Investigating and comparing the collocational use of *make, do, have, take*, and *give* in native-speaker corpora and different groups of learner corpora, Kaszubski (2000) has shown that a number of frequent English collocations appeared more frequently in his learner corpus than in his native corpus. Therefore, the significant overuse of some frequent lexical bundles by L2 learners, labeled as "collocational teddy bears" (Nesselhauf, 2005, p. 69), may be due to the fact that Turkish students were familiar with them, though not necessarily by any formal training, and saw these bundles as a safe option in academic writing by having over-confidence in them. In other words, non-native speakers may have a tendency to use combinations that include a high frequency of lexical items that align with their first language forms, as is also reported in Kaszubski (2000). As for the L2 lexical bundles unique to Turkish students, considering that these bundles never occurred in the American students' theses, it can be argued that the Turkish students were not able to approximate their native peers with respect to the use of lexical bundles in MA/PhD theses in the area of foreign language teaching. In this regard, whether these different bundles employed by the Turkish students were due to some usages in academic Turkish was investigated by comparing L2 lexical bundles unique to Turkish students with Turkish lexical bundles written by Turkish students in their MA/PhD theses in the next section.

Lexical bundles in TMPE and TMTP: Digging evidence for L1 interference

Nekrasova (2009) noted that "in order to compensate for their lack of awareness, they [L2 learners] often referred to L1 transfer" (p. 652). Similarly, Lu and Deng (2019) attributed the difference between L2 lexical bundle use by Chinese speakers and their native-English counterparts to the transfer of L1 language features or discourse conventions. As one of the aims of the current study is to reveal the amount of Turkish learners' use of L2 lexical bundles

attributed to L1 influence (if any), four-word lexical bundles were identified in the Turkish students' theses in Turkish using the criteria described above. A total of 32 lexical bundles were initially retrieved in the Turkish theses, but these were excluded from the analysis since they were all context/content-dependent bundles such as *ilköğretim ikinci kademe öğrencilerinin [students at second stage of elementary school] and ön test ve son [pre-test and post]*. This may show that in academic Turkish, four-word expressions are mostly related to the context and content of the text and do not have the text organization function that typical four-word lexical bundles have in English. Therefore, three-word bundles as well as two-word expressions were also examined. In addition, frequent verbs were also retrieved from the corpus, and single words were searched to look for Turkish equivalents because Turkish is an agglutinative language and has a far more complex morphological structure than English. As stated by Durrant (2013), languages like Turkish, Hungarian, and Finnish are agglutinative languages, and they build up sometimes complex word forms through an extensive range of suffixes; therefore, a single word in Turkish may represent a multiword sequence in English. After the retrieval of the three-word bundles, two-word expressions, and frequent verbs, they were compared with the L2 four-word lexical bundles produced only by Turkish students.

Nekrasova (2009) stated three ways of realizing L1 transfer of lexical bundles: underuse of certain structures that do not have L1 equivalents; "overuse of certain structures whose L1 equivalents were more common, and misuse of certain structures whose L2 equivalents did not match their L1 counterparts" (p. 652). However, this study adopted another way of realizing L1 transfer by comparing four-word English lexical bundles that were produced by only Turkish students to three-word bundles, two-word expressions, and frequent verbs in Turkish produced by Turkish students.

Table 5 presents the findings regarding the Turkish equivalents of the lexical bundles that were unique to Turkish students in English.

Table 5
Turkish equivalents of the lexical bundles used by only Turkish students in English

Four-word LBs overused by the Turkish students in English, and never used by the American students	Equivalent three-word LBs, two-word expressions, verbs, or other word classes used by the Turkish students in Turkish
it is seen that (53)	görülmektedir (1294)
with the aim of (35)	amacıyla (926)
in addition to this (59)	ayrıca (759), ek olarak (47)
the number of the (55)	sayısı (705)
it can be said (66) can be said that (65)	söylenebilir (615)
it was seen that (51)	görülmüştür (506)
the aim of the (77)	amacı (384)
as it can be seen (34)	görüldüğü gibi (301)
in line with the (63)	doğrultusunda (266)
it was observed that (45)	gözlemlenmiştir (183)
whether there was a (34)	olup olmadığını (164)

Four-word LBs overused by the Turkish students in English, and never used by the American students	Equivalent three-word LBs, two-word expressions, verbs, or other word classes used by the Turkish students in Turkish
that most of the (68)	çoğu (160)
the study showed that (45)	(çalışma ...) göstermiştir (125)
by the help of (82)	yardımıyla (109)
according to the results (59)	bu sonuçlara göre (104)
in the light of (119)	ışığında (92)
be taken into consideration (46)	dikkate alınarak (82), düşünerek (69), düşünülmüştür (26)
are considered to be (37)	düşünülmektedir (76), olacağı düşünülmektedir (9)
by means of the (39)	aracılığıyla (66)
result of the analysis (44)	analiz sonuçları (64)
with reference to the (39)	ile ilgili olarak (140), ilişkin olarak (61)
it can be seen (48) can be seen from (35)	görülebilir (53)
to find out the (102) in order to find (80) order to find out (45)	öğrenmek için (43) bulmak (öğrenmek) için (41) bulmak (öğrenmek) için (41)
to find out whether (76)	(olup) olmadığını belirlemek (/saptamak) (36)
we can say that (38)	söyleyebiliriz (34)
order to see the (38)	görmek için (20)
can be regarded as (34)	olarak kabul edilebilir (7), olarak ele alınabilir (4)
it can be claimed (51) can be claimed that (48) be claimed that the (35)	
it is believed that (43)	
can be concluded that (64)	
first of all the (42)	

As mentioned before, there were 37 four-word lexical bundles identified in the Turkish students' theses in English that were never used by the American students. Some of the English bundles, such as *to find out the* (102), *in order to find* (80), and *order to find out* (45), presented in Table 5 with a Turkish equivalent, are actually overlapping. Similarly, some of the Turkish bundles such as *dikkate alınarak* (82), *düşünerek* (69), and *düşünülmüştür* (26) presented in Table 5 with an English equivalent are actually overlapping. Therefore, in order to avoid inflated results, both Turkish and English lexical bundles were combined with overlapping bundles. 27 of the remaining 31 lexical bundles were found to have exact or near equivalents in Turkish. Three of the remaining four lexical bundles that did not have a Turkish equivalent in the Turkish sub-corpus contained the verbs *claim* and *conclude* in passive voice. The remaining bundle that did not have a Turkish equivalent in the Turkish sub-corpus was *first of all the*.

The findings of the current study showed that Turkish MA/PhD students were likely to transfer 31 (before combining) out of 125 (24.8%) four-word lexical bundles from their native language, Turkish to a foreign language, English. The findings of this study were partly consistent with the findings of previous studies (Güngör & Uysal, 2020; Paquot, 2013; Pérez-Llantada, 2014). Investigating cross-linguistic effects in Turkish and English L2 research articles and categorizing lexical bundles according to their structures and functions, Güngör and Uysal (2020) revealed that Turkish authors were likely to transfer 45% of lexical bundles from their native language

Turkish to target language English. Similarly, Pérez-Llantada (2014) attributed 17% of the lexical bundles to the writers' L1. In another study, Paquot (2013) found that L1 transfer was evident in 13% of the lexical bundles in the French learners' texts. This percentage is slightly higher in the context of this study. In other words, considering the percentage of L1 lexical bundle transfer in this study and in the study of Güngör and Uysal (2020), the effect of L1 is more intense for Turkish learners of English compared to Spanish and French learners in the use of lexical bundles in English.

Another important finding of the current study was that the lexical bundles *görülmektedir* and *görülmüştür* whose English equivalents (*it is seen that* and *it was seen that* respectively) were only used by Turkish students and never used by American students, were the most frequent bundles of the current study occuring 1,800 times in total. Likewise, the lexical bundles *görülmektedir* and *görülmüştür* were the most frequent bundles, occuring 2,255 times in total in the study of Güngör and Uysal (2020). This finding supports the remark of Paquot (2013) that "the more frequent a lexical bundle is in the learners' mother tongue, the more likely learners are to use its congruent form in the foreign language" (p. 410). Moreover, görülmektedir (it is seen that), amacıyla (with the aim of), söylenebilir (it can be said), görülmüştür (it was seen that), *görüldüğü gibi (as it can be seen), doğrultusunda (in line with the), gözlenmiştir (it was observed that), yardımıyla (by the help of), bu sonuçlara göre (according to the results), ışığında (in the light of), düşünülmektedir (are considered to be), görülebilir (it can be seen)* were the common transferred lexical bundles in the current study and in the study of Güngör and Uysal (2020). In other words, 12 out of 27 transferred Turkish lexical bundles were the same, while the remaining 15 transferred Turkish lexical bundles were different in this study compared to Güngör and Uysal (2020). The difference in the transferred Turkish lexical bundles in those studies can be explained by two reasons. First, genre may be an important reason for the divergence between findings of these studies. While Güngör and Uysal (2020) collected research papers in the corpus compilation process, this study adopted MA and PhD theses. Hyland (2008b) found that many multi-word sequences used in master's and doctoral dissertations were not found in research articles or appeared less frequently, and, conversely, many collocations that were used most frequently in published academic articles were never or rarely found in theses. The second reason may be disciplinary variation, which is another concern of corpus research (Cortes, 2004; Hyland, 2008a; Pecorari, 2009). Pecorari (2009) noted that "the decision of how broadly or narrowly to define an area when constructing a corpus is an important one, and one that should be made consciously" (p. 102). In this regard, Güngör and Uysal (2020) compiled research papers in the area of educational science, including mathematics, music, and science education; this study compiled MA/PhD theses in the area of only language education. Therefore, the reason that the lexical bundles such as *anlamlı...olduğu (there was significant), anlamlı...olmadığı (there was no significant), -E katılan (who participated in the), anlamlı bir fark (a significant difference in), -ın güvenirliği (the reliability of the)* which were found as transferred bundles in the study of Güngör and Uysal (2020) but not in the current study may be related to the inter-disciplinary nature of the corpus they created and the number of mathematics and science education research articles.

CONCLUSION AND PEDAGOGICAL IMPLICATIONS

This study aimed to first find out the differences in the use of English four-word lexical bundles between Turkish and American postgraduate students in their MA/PhD theses and then determine if there were any cross-linguistic effects on the L2 lexical bundle use of Turkish students. For these aims, three sub-corpora were compiled: English MA/PhD theses by Turkish (TMPE) and American students (AMPE), and Turkish MA/PhD theses by Turkish students (TMPT). To fulfill the first aim, TMPE and AMPE were compared, and the comparison showed that the Turkish students used two times more types of four-word lexical bundles in their English theses than the American students' usage. In the English theses, the Turkish students were found to significantly overuse a considerable number of lexical bundles. Among these lexical bundles, there were those that never occurred in the American students' theses. To reveal any potential cross-linguistic effects, lexical bundles that were overused by Turkish students and never occurred in the American students' theses were examined in comparison with the Turkish theses by identifying three-word bundles, two-word expressions, and single words, including verbs and other word classes that could be the Turkish equivalents. As a matter of fact, 24.8% of all the lexical bundles identified in the Turkish students' theses had exact or near-equivalents in Turkish, most of which were quite frequent. Moreover, some constructions that were very frequent in Turkish theses were also found to be very frequent as four-word lexical bundles in the English theses of Turkish students.

Based on the results summarized above, it can be concluded that a considerable number of lexical bundles that Turkish speakers of English use in academic writing significantly more than native speakers do might be because of some common usages in Turkish and consequently their knowledge of Turkish. Previous studies also supported this finding. For example, Güngör and Uysal (2020) concluded that "the divergent use of lexical bundles from the native norms and the congruity between L2 English and L1 Turkish refer to crosslinguistic influence" (p. 20). Another important conclusion of this study was that foreign language students tend to overuse some L2 constructions whose L1 equivalents are frequent in L1. These findings signal the deviation from native academic norms and create the "foreign-soundness" (De Cock, 2000, p. 65) of L2 speakers' writing. The overuse of some lexical bundles in English by non-native students may be caused by a lack of knowledge in L2 constructions and may result in a lack of a fluent and native-like production (Hyland, 2008b). Since lexical bundles are "important building blocks of discourse" (Biber & Barbieri, 2007, p. 263) and a sign of language competency in a specific register (Chen & Baker, 2010; Cortes, 2006), postgraduate students need to acquire the distinguishing features (Steinman, 2009), set of conventions (Zamel, 1998), and nativelike norms of academic discourse, one of which is lexical bundles, to become competent participants in the academic community (Hyland, 2008b). In this regard, curriculum developers, coursebook writers, and teachers should focus on differences and similarities in terms of collocations or lexical bundles between native and target language to raise students' awareness. Moreover, those bundles that are frequently used by native speakers of English and not employed by Turkish EFL learners can be included in academic writing courses to make students more aware of native speaker norms.

The present study is limited to Master's and PhD theses that are written in a specific discipline,

language teaching, to control for content-specific bundles. It would be worth to include different genres of academic writing from different disciplines to identify what bundles are specific to those disciplines. In addition, the analysis regarding a potential L1 influence is limited to. These equivalents in Turkish were not necessarily multiword combinations since Turkish is an agglutinative language, and a single word in Turkish may represent a multiword sequence in English. In this regard, 5- and 6-word lexical bundles in English can also be included in further studies to see whether there are more bundles that can be attributed to Turkish students' L1.

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