Functional Analysis of Lexical Bundles in Doctor Talks in the Medical T.V. Series *Grey's Anatomy*

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Abstract

Lexical bundles, or recurrent word strings, are one of the key elements in increasing fluency of linguistic production and in mastering second language learning. In most previous works, lexical bundles were analyzed in specific disciplines. Little research paid attention to spoken discourse, particularly in doctors' conversations (hereby referred to as "Doctor Talks"). This study aimed to investigate four-word lexical bundles in Doctor Talks and their operationalized functions. A Doctor Talk corpus was compiled from a famous medical TV series, *Grey's Anatomy*, consisting of approximately one million running words (269 episodes from 12 seasons over 11 years). Four-word lexical bundles were identified, using *WordSmith Tool* version 7.0, and their discourse functions were analyzed, using Biber et al.'s (2004) functional taxonomy as a framework. The results reveal that 99 bundle types are present in the Doctor Talk corpus. Stance bundles are common in this spoken conversation corpus while lexical bundles articulating with special conversation features show the least proportion. The results also show some particular functions used in Doctor Talks as discourse organizers.

Keywords: Lexical Bundles, English for Medical Purposes, Functional Analysis

Introduction

English plays a crucial role as the official language of the ASEAN community (Kirkpatrick, 2010, 2013). All ASEAN countries are mandated to learn English at all levels of education and fields of study (Kirkpatrick, 2012). One of the most important and dynamically evolving field of study in these countries is medicine (Iredale, Turpin, Stahl, & Getuadisorn, 2010). English is commonly used by medical staff, especially doctors, in their medical training as well as learning to professionally communicate with international patients and doctors (Maher, 1986). Thus, it is very important for doctors to be proficient in English for professional purposes.

English for Medical Purposes (EMP) is one sub-discipline of English for Specific Purposes (ESP), aiming to circulate effective communication in the workplace (Basturkmen, 2014; Dudley-Evans & St John, 1998). For a deeper understanding of medical discourse, several studies focused on different aspects of the discourse, e.g., analysis of conversation between nurses and patients (Jones, 2003), analysis of conversation during mental health nursing (Crawford, Johnson, Brown &Nolan, 1999), doctor-patient interaction analysis (Thomas & Wilson, 1996), conversation analysis of National Health Service (NHS) Servic (NHS) consultation (Adolphs, Brown, Carter, Crawford & Sahota, 2004), healthcare professional and institutional discourse practices (Sarangi & Roberts, 1999), pronouns used

in consultation (Skelton, Wearn & Hobbs, 2002), and features of expressing empathy between doctors and patients (Cordella & Musgrave, 2009).

Nevertheless, another crucial but rarely investigated area of EMP is the analysis of conversation among medical professionals. Doctor-doctor communication is necessary for the medical profession because poor communication can worsen patients' symptoms or lead to death (Baggs et. al., 1999; Lingard et. al., 2004; Wadhwa & Lingard, 2006). Pryor and Woodward-Kron (2014), for example, examined the doctor-doctor talk on telephones and found that doctor-doctor communication is distinctive; Pryor and Woodward-Kron thus proposed generic structures used for such communication. These EMP studies have emphasized the importance of effective communication among doctors.

Effective communication has a strong relationship with lexical bundles (Schmitt & Carter, 2004). Lexical bundles contribute to becoming communicative by bridging the discourse between speakers and listeners (Wray, 2005, 2013; Wray & Perkins, 2000). In other words, they function as the building blocks in discourse (Biber, Conrad & Cortes, 2004; Biber, Johansson, Leech, Conrad, & Finegan, 1999) to enhance successful communication (Wray, 2013) and improve the fluency of learners (Hyland, 2012). In psycholinguistics, it is believed that lexical bundles were stored as a whole in long-term memory (Ellis, Simpson-Vlach & Maynard, 2008; Wray, 2002, 2013; Wray & Perkins, 2000). For this reason, lexical bundles should be worth investigating and provided to L2 learners, especially novices, in order to increase communication fluency (Hyland, 2008a, 2008b; Pawley & Syder, 1983) and to master second language learning (Wray, 1999). Linguistics has emphasized the lexical bundles of written discourse from many perspectives such as register (see Biber, 2006; Biber & Barbieri, 2007; Biber et al., 1999 Biber et al., 2004), disciplines (e.g. Cortes, 2004; Hyland, 2008a, 2008b), comparative works between L1 and L2 writers (Chen & Baker, 2010), the connection with other areas such as language assessment (Chen & Baker, 2016; Staples, Egbert, Biber & McClair, 2013), move analysis (Cortes, 2013), and translation (Lee, 2013). Incidentally, research on spoken discourse is extensively rare. Any contribution is still limited within the cycle of academic disciplines (see Biber & Barbieri, 2007; Csomay, 2013; Heng, Kashiha, & Tan, 2014; Hernández, 2013; Neely & Cortes, 2011; Nesi & Basturkmen, 2006; Wang, 2017). Among these, a few shed lights on lexical bundles in the medical discipline.

To bridge the gap between lexical bundles in spoken discourse and English for medical purposes, the present study aims to investigate four-word lexical bundles and their functions in a Doctor Talk corpus. The study was guided by the research questions below.

Research Questions

1. What are the four-word lexical bundles in the Doctor Talk corpus?
2. What are the functions of four-word lexical bundles in the Doctor Talk corpus?

Review of Literature

Lexical bundles are frequently co-occurring words serving as building blocks in discourse production (Biber et al., 1999). It is evident that lexical bundles are stored as a whole in long-term memory (Ellis et al., 2008; Wray, 2002, 2013; Wray & Perkins, 2000). When speakers use lexical bundles in their communication, this reflects the extent to which the speakers have mastered a language. In other words, lexical bundles are usually used to bridge the discourse between speakers and listeners (Wray, 2005, 2013; Wray & Perkins, 2000) to enhance successful communication (Wray, 2013) as well as to improve the fluency of language learners (Hyland, 2012).

Lexical bundles tend to be incomplete structural units which function at pragmatic levels rather than serve semantic meaning. For example, *in a nutshell* is not considered a

lexical bundle since it works semantically. In academic writing, lexical bundles are seen as phrases such as *on the other hand, the result of the,* and *in relation to the* (Hyland, 2008b). On the other hand, lexical bundles in conversation are clausal bundles such as *I want you to, if you want to,* and *I don't know how* (Biber et al., 2004). These incomplete structural patterns pragmatically function in the discourse through multiple ways.

Since lexical bundles serve the discourse function, several taxonomies were developed (e.g., Biber et al., 1999; McCarthy & Carter, 2006). These early function taxonomies, however, contained a small number of functions that can be used to capture discourse functions of target bundles. Later more sophisticated functional taxonomy was invented by Biber et al. (2004) from empirical research focusing on both written and spoken discourses in various genre (e.g., classroom teaching, conversation, and university textbooks). This taxonomy covered a wider range and more specific subtypes of discourse functions (see Table 1). The first type is stance markers, showing the speaker's status of knowledge or state of being. Furthermore, the researchers introduce five subtypes: epistemic stance, desire, obligation/ directive, intention/prediction and ability. The second type of functional taxonomy is discourse organizers signaling both before and after discourse. This type contributes to two functions including topic introduction (raising the conversation) and topic elaboration (clarifying the discourse). Referential expressions are regarded as the third type, providing support to contextual things such as physical objects, abstract ideas, places, or multifunction. The last type is the special conversational function. This is composed of three sub-types which are politeness, simple inquiry and reporting clauses.

Table 1. Functional Taxonomy (Biber et al., 2004)

Functions	Sub-functions	Examples
1. Stance bundles	1.1 Epistemic stance	*I don't know if* *I don't know how*
	1.2 Attitudinal/modality stance	
	a. Desire	*if you want to* *do you want a*
	b. Obligation/directive	*I want you to* *you need to know*
	c. Intention/prediction	*I'm going to* *it's going to*
2. Discourse organizers	2.1 Topic introduction	*what do you think* *going to talk about*
	2.2 Topic elaboration/clarification	*has to do with* *you know I mean*
3. Referential expressions	3.1 Identification/focus	*that's one of the* *those of you who*
	3.2 Impression	*or something like that* *and stuff like that*
	3.3 Specification of attributes	
	a. Quantity specification	*there's a lot of* *the rest of the*
	b. Tangible attributes	*the size of the* *in the form of*
	c. Intangible attributes	*the nature of the* *in case of the*

Functions	Sub-functions	Examples
	4. Time/place/text reference	
	a. Place reference	*the United States and of the United States*
	b. Time reference	*at the same time at the time of*
	c. Text deixis	*shown in figure N as shown in the figure*
	d. Multi-functional reference	*in the middle of the end of the*
4. Special conversational functions	4.1 Politeness	*thank you very much*
	4.2 Simple inquiry	*what are you doing*
	4.3 Reporting	*I said to him/ her*

Research on lexical bundles has gained popularity over time and has contributed a great deal to the body of knowledge of applied linguistics. There have been many works exploring lexical bundles in written discourse, especially at the university level (Biber, 2006; Biber et al., 2004; Byrd & Coxhead, 2010; Cortes, 2002, 2004, 2008). Much attention was also paid to general academic discourse to certain academic disciplines such as engineering (Chen, 2010; Wood & Appel, 2014), biology and history (Cortes, 2004, 2008), medicine (Abdollahpour & Gholami, 2018; Jalali & Moini, 2014; Jalali, Moini, & Arani, 2015; Mbodj-Diop, 2016), pharmacy (Grabowski, 2015), journalistic discourse (Dastjerdi & Rafiee, 2011), law and its sub-disciplines (Breeze, 2013), and empirical research on second language discourse (Ädel & Erman, 2012; Ahmadi, Ghonsooly, & Fatemi , 2013; Chen & Baker, 2010; Hyland, 2008b; Wei & Lei, 2011). Until now, the knowledge of lexical bundles was enhanced by being bridged with other theoretical concepts such as move analysis (Cortes, 2013; Kashiha, 2015; Wongwiwat, 2016), language testing (Biber & Gray, 2013; Chen & Baker, 2016; Huang, 2015; Staples et al, 2013), and translation study (Lee, 2013).

Rarely has the light been shed upon spoken discourse, despite the fact that lexical bundles are the key element in communication of spoken language (McCarthy & Carter, 1997) and such bundles occur in daily communication (Conrad & Biber, 2005; O'Keeffe, McCarthy, & Carter, 2007). To date, the studies of lexical bundles are not as extensive as written discourse since lexical bundles are still viewed in relation to academic discourse. Among a few studies on spoken discourse, a number of lexical bundle research focused on classroom teaching and lectures (e.g., Biber, 2006; Biber & Barbieri, 2007; Biber et al., 2004, Csomay, 2013; Heng, Kashiha & Tan, 2014; Hernández, 2013; Neely & Cortes, 2011; Nesi & Basturkmen, 2006; Wang, 2017) and others emphasized British conversation (McCarthy & Carter, 2006) and conversation in a business context (Handford, 2007; McCarthy & Handford, 2004;).

Since lexical bundles in spoken discourse vary from genre to genre and from discipline to discipline (Wang, 2017), it is important to explore lexical bundles in each discourse genre to supplement effective communication (Cortes, 2004; Hyland, 2008a, 2008b, 2012; Koester, 2012). Thus, an investigation of lexical bundles in an important yet under-researched genre, e.g., medical discourse, is crucial.

In medical discourse, research on lexical bundles was conducted in many perspectives. Some studies investigated lexical bundles in medical research articles. Jalali et al. (2015) and Mbodj-Diop (2016) focused on four-word lexical bundles in medical research articles. Similarly, Panthong and Poonpon (2020) explored four-word lexical bundles in Thai medical research articles. For specific sections of research articles, Abdollahpour and

Gholami (2018) explored the structure and function of lexical bundles in abstracts of medical research articles. Jalali and Moini (2014) also investigated the structure of lexical bundles in an introduction part. Yet, little attention was paid to lexical bundles in the spoken register especially conversations between doctors.

Methodology

This section describes the design and compilation of the Doctor Talk corpus, research instruments, and data analysis.

The Doctor Talk Corpus

In this study, the Doctor Talk corpus consists of 269 episodes (12 seasons for 11 years) from the famous medical T.V. series *Grey's Anatomy*, covering approximately one million running words. The rationales for building the Doctor Talk corpus from this TV series are as follows. First, medical ethics dictate extreme sensitivity in doctor conversation study as it may violate patient privacy (Hope, Savulescu & Hendrick, 2008). Even though several international hospitals in Thailand are eligible to record conversations between doctors, previous studies have shown that either written or spoken discourse was differently produced by native and non-native speakers (Ädel & Erman, 2012; Chen & Baker, 2010; Salazar, 2014; Wei & Lei, 2011). Besides, film language offers a benefit primarily for research methodology and EFL learners. They can, for example, supplement the specific language use in a particular setting where some speakers may twist their discourse (Evans, 2007), and such languages retrieved from media were encouraged to be performed in the L2 classroom (Quaglio, 2009). ESL/EFL speaking materials failed to provide informal integrative conversation (Basanta & Martín, 2005), while film language mimics everyday conversation (Al-Surmi, 2012; Bednarek, 2010, 2011; Quagiol, 2009). Another reason is due to the popularity of *Grey's Anatomy* itself. Not only is this medical T.V. series world-famous and has earned many awards, it also has been used in a number of applied linguistics research studies focusing on, for example, doctor-patient conflict talk (Wenting, 2016), pragmatic analysis of humor using medical vocabulary (Rosanita, 2017), and content analysis (Lacko, 2011).

Data Collection

To build the corpus, the first step was to download the series from the iTunes store. After that, the conversations between doctors related to medical discussion, case transfer, medical order, and medical surgery were collected based on the Lu and Corbett (2012)'s definition of doctor talks. The transcripts were checked for accuracy by a native speaker who has experience in teaching L2 students. All files were saved as *.txt* files and stored in folders separated by episode and season.

Concordancer

WordSmith Tool version 7.0 (Scott, 2019) was employed as the program provides more precise results than others (Ari, 2006). Moreover, this program can render the contraction such as *'I'm', 'can't'* and '*you're*' counted as one-word unit; this matches the characteristics of lexical bundles defined by Biber et al (1999). In contrast, AntCont (Anthony, 2014), another corpus software, counts the contraction as two-word units.

In order to retrieve the lexical bundles from the Doctor Talk corpus, two functions of the computational program were used to analyze the text. First, the wordlist function was employed to assign cluster size and the high frequency of lexical bundles in order to generate wordlists. Second, the concordance function was used to generate concordance lines which were examined for how the lexical bundles functioned.

Data Analysis

The analytical process can be divided into three stages. In the first stage, all text files were uploaded into *WordSmith Tool* and the wordlist function was used to retrieve four-word lexical bundles, the identification of which was targeted to four-word bundles that occurred more than 40 times per 1 million words. This criterion was based on evidence from previous research: two- up to six-word bundles used in studies by Ang and Tan (2018), De cook (2004), and McCarthy and Carter (2006), which proved to be a very ambitious goal. Three-word bundles prevalently occur and collapse on four-word bundles while five and six words are too rare to occur in the corpus, and four-word bundles accidentally collapse those words (Biber, 2006; Biber & Barbieri, 2007; Biber et al., 1999; Biber et al., 2004; Csomay, 2013; Hyland, 2008a, 2008b). In addition to that, solid evidence of these four-word lexical bundles proved that they have the positive impact of both high and low proficiency learners' fluency (Shin & Kim, 2017). Therefore, four-word bundles are chosen to explore the discourse structure of the Doctor Talks in this study. Apart from the cluster size, a frequency-driven approach was also counted to analyze the valid bundles. Theoretically, lexical bundles become more articulate with frequency, so highly frequent occurrences of lexical bundles can be considered the fingerprint representing language use in spoken discourse (Farr, 2007). Therefore, setting a high cut-off point of lexical bundle occurrences can validate lexical bundles in a corpus (Biber & Barbieri, 2007; Csomay, 2013). The cut-off point embedded with text range can also avoid idiosyncratic styles of speakers (Biber et al., 1999). In this study, the cut-off point criterion was set at 40 occurrences per one million words with a minimum of five texts.

The second stage was bundle exclusion. Lexical bundles with proper nouns (e.g., *Merdeith what are you*) and expletive and emotional language (e.g., *the hell is going on*) were eliminated from the analysis because they were beyond the purposes of the present study.

The final stage was to analyze the target bundles. The concordance lines of target bundles were analyzed to investigate their functions based on Biber et al.'s (2004) taxonomy. The total number of each type and subtype was then calculated. How lexical bundles pragmatically function in the Doctor Talk corpus were also extracted.

Results and Discussion

Results

The results of the present study are presented in two parts. The first part reports the four-word lexical bundles in the Doctor Talk corpus and the second part reports the discourse functions of these lexical bundles.

Four-word Lexical Bundles in the Doctor Talk Corpus

The investigation of four-word lexical bundles in the Doctor Talk corpus reveals 99 bundles occurring more than 40 times per one million words with a minimum of five texts. As seen in Table 2, the most frequent lexical bundles are *what are you doing*, occurring 371 times in 181 texts, followed by *I don't want to*, occurring 356 times in 169 texts. The least frequent bundle is *there's a lot of*, occurring 40 times in 19 texts.

Table 2. Top 50 frequency of lexical bundles in the Doctor Talk Corpus

No.	Lexical bundles	Frequency	Text	No.	Lexical bundles	Frequency	Text
1	*what are you doing*	371	181	26	*take a look at*	72	57
2	*I don't want to*	356	169	27	*I don't want to*	71	52

No.	Lexical bundles	Frequency	Text	No.	Lexical bundles	Frequency	Text
3	*I need you to*	295	149	28	*am I supposed to*	70	54
4	*you want me to*	230	149	29	*I just need to*	69	56
5	*I don't know what*	182	116	30	*what do you want*	69	51
6	*you don't have to*	175	112	31	*you want to do*	67	56
7	*I want you to*	165	110	32	*do you know how*	67	55
8	*do you want to*	144	96	33	*and I don't want*	67	53
9	*what do you think*	139	99	34	*do you have any*	64	55
10	*what do you mean*	124	90	35	*know what to do*	64	49
11	*if you want to*	122	92	36	*I can't do this*	64	47
12	*I don't know how*	119	89	37	*I don't know why*	62	57
13	*in the middle of*	119	85	38	*we're gonna have to*	62	50
14	*I have to go*	116	85	39	*talk to you about*	62	48
15	*are you doing here*	112	77	40	*you can do this*	59	46
16	*I just want to*	105	81	41	*to take care of*	59	45
17	*I thought you were*	87	69	42	*keep an eye on*	59	39
18	*I just want to*	84	68	43	*I have no idea*	58	50
19	*I want to be*	83	70	44	*need to talk to*	58	47
20	*do you want me*	83	64	45	*I would like to*	57	48
21	*you don't get to*	80	58	46	*I need to know*	56	39
22	*I didn't want to*	74	56	47	*I don't even know*	55	49
23	*we need to get*	73	60	48	*thank you so much*	55	42
24	*want to talk about*	72	59	49	*don't want you to*	54	43
25	*you want to be*	72	57	50	*I was trying to*	54	42

Functions of the Four-Word Lexical Bundles in the Doctor Talk Corpus

The analysis of the lexical bundles in the Doctor Talk corpus, based on the functional taxonomy (Biber et al., 2004), reveals that each of the 99 bundles can serve more than one function. The most common function of lexical bundles in the Doctor Talk corpus is stance markers (68.32%) while the lexical bundles articulated with special conversation show the least frequency (3.96%) (see Table 3).

Table 3. Functions of lexical bundles in the Doctor Talk Corpus

Function	Sub-function	Frequency	Percentage
1. Stance bundles		**69**	**68.32%**
	1.1 Epistemic stance	13	12.87%
	1.2 Attitudinal/modality stance		
	a. Desire	27	26.73%
	b. Obligation/directive	15	14.85%
	c. Intention/prediction	3	2.97%
	d. Ability	11	10.89%
2. Discourse organizers		**21**	**20.79%**
	2.1 Topic introduction		
	a. Ask questions and check fact and procedures	6	5.94%
	b. Open discussion	9	8.91%
	2.2 Topic elaboration/clarification		
	a. Request clarification	4	3.96%
	b. Ask for justification	2	1.98 %

Function	Sub-function	Frequency	Percentage
3. Referential expressions		**8**	**7.92%**
	3.1 Identification/focus	1	0.99%
	3.2 Impression		
	3.3 Specification of attributes		
	a. Quantity specification	2	1.98%
	b. Tangible attributes	-	-
	c. Intangible attributes	-	-
	4. Time/place/text reference		
	a. Place reference	-	-
	b. Time reference	3	2.97%
	c. Text deixis	-	-
	d. Multi-functional reference	2	1.98%
4. Special conversational functions		**3**	**3.96%**
	4.1 Politeness	1	0.99%
	4.2 Simple Inquiry	2	1.98%
	4.3 Reporting	-	-
Total		**101**	**100%**

A closer look at discourse functions of the lexical bundles in the Doctor Talk discourse is reported below.

1) Stance Bundles

Stance bundles can signify the speaker's knowledge and attitude towards certain topics (Biber, 2006; Biber et al., 2004). As seen in Table 3, stance bundles account for the highest proportion (68.32%) of bundles in the Doctor Talk corpus. That is, there are 13 epistemic stances, 27 desire bundles, 15 obligation/directive bundles, three intention/prediction bundles, and 11 ability bundles found to function as stance bundles.

Stance bundles serve epistemic stance and attitudinal/modality bundles. For epistemic stance in this Doctor Talk corpus, there are, for example, *I don't know what, I don't know how, I thought you were, this is not a*. In Example 1, lexical bundles '*I thought it was*' function to express uncertainty during the case discussion between junior and senior doctors. On the other hand, attitudinal/modality bundles outnumber the epistemic stance due to the inclusion of many sub-types. The examples of lexical bundles found in these sub-types are 1) desire bundles: *I just need to* (see Example 2), *do you want me to, I don't want to, do you want to,* , 2) obligation/directive: *I need you to* (see e Example 3), *we need to do* (see Example 4)*, you don't have to*; 3) intention/prediction: *we're gonna have to* (see Example 5), *I was trying to* (see Example 6), *I'm gonna have to*; and 4) ability bundles: *I can do this, you can do this, to make sure that* (see Example 7), *I can do it*.

Example 1 (Epistemic stance)

- "Ok, look at that. It's a brain herniation. His brain is literally sinking into his skull base."
- "And all along *I thought it was* a cold." (SS_03_EP_21)

Example 2 (Desire)

- "All right. Okay, *I just need to* inspect the S.I. joint, make sure we're ready to amputate the left leg with the hemipelvis." (SS_12_EP_13)

Example 3 (Obligation/directive)

- "Dr. Stevens, *I need you to* check the x-ray in 2103. 2118 needs post-op…" (SS 01_EP_16)

Example 4 (Obligation/directive)

- "… Page cardio. Alex, *we need to do* a subxiphoid pericardiotomy to drain the blood that's squeezing the heart…" (SS_06_EP_15)

Example 5 (Intention/prediction)

- "BP's dropping to 62 systolic."
- *"We're gonna have to* open her up." (SS_03_EP_19)

Example 6 (Intention/prediction)

- "… As *I was trying to* stop the bleeding, she went into heart failure. I had to send her to the I.C.U." (SS_08 _EP_05)

Example 7 (Ability)

- "When I realized my surgery was going long, I sent my intern *to make sure that* Alex could take her for longer…" (SS_09_EP_05)

2) Discourse Organizers

The result shows that 21 lexical bundles (20.79%) function as discourse organizers in the Doctor Talk corpus. This is in line with previous research (e.g., Biber et al., 2004; Biber & Barbieri, 2007; Conrad & Biber, 2005) showing that discourse organizers are less common than stance bundles in spoken discourse. These lexical bundles serve both sub-types of discourse organizers: topic introduction and topic elaboration/clarification. The bundles were used to introduce topics (15 occurrences, 14.85%) more so than elaborating or clarifying topics (six occurrences, 5.94%). A closer look at these bundles, based on Lu and Corbette's taxonomy (2012), reveals two sub-types for topic introduction – asking questions and checking fact and procedures – and two for topic elaboration – requesting clarification and asking for justification. To introduce topics, the lexical bundles used to ask questions and check facts and procedures include *what do you think, what do you want, what do we got, what did you do, am I supposed to,* and *are you gonna do*. Those used to open discussion are *take a look at, do you know how, do you have any, do you know what, do you have a, you know what I, do you think I, where are you going* and *to talk to you*. Apart from this, some lexical bundles were used for two functions. For example, *take a look at* (see Example 8) and *to talk to you* (see Example 9) were used in the corpus to mark stance and introduce the topic of the conversation. Additionally, there were six bundles (5.94%) used for topic elaboration. Four of these (3.96%) were used to request clarification and two (1.98%) were to ask for justification in this spoken corpus. The former group includes *what do you mean, what does that mean, what do we do* and *nothing to do with* (see also Example 11); the latter includes *how do you know* and *what are you gonna* (see also Example 12). The examples

below illustrate how the lexical bundles function as discourse organizers in the Doctor Talk discourse.

Example 8 (Topic introduction – open discussion)

- "Did you *take a look at* the research?" (SS_05_EP_18)

Example 9 (Topic introduction – open discussion)

- "Hey, um, *do you have a* minute? I've got a question."
- "Sure."
- "I wanted *to talk to you* about breast implants." (SS_06_EP_17)

Example 10 (Topic introduction – ask questions and check facts and procedures)

- "Um ... Dr. Webber, *what do you think* about intraoperational dye?"
- "To help determine intestinal viability?" (SS_06_EP_16)

Example 11 (Topic elaboration – request clarification)

- "And *what does that mean*? Yang?"
- "Ah running the bowel entails…" (SS_2_EP_2)

Example 12 (Topic elaboration – ask for justification)

- "It was highly vascularized and had eroded through the pulmonary artery."
- "*How do you know?*"
- "I felt it."
- "What did you feel?"
- "A hole in the pulmonary artery." (SS_8_EP_11)

3) Referential Expressions

Referential expressions are used to identify contexts such as something physical, something abstract, a place or a multifunction. Eight referential bundles (7.92%) were found in Doctor Talk corpus (Table 3). These bundles can be classified into sub-types: identification/focus, quantity specification, place reference, time reference and multi-functional reference.

The examples below illustrate how the lexical bundles function as referential expressions in the Doctor Talk discourse. Example 13 shows only one bundle for identification/focus, *the chief of surgery*. This bundle refers to a senior doctor who works with junior doctors. For the quantity specification, two bundles, *a lot of blood* and *there's a lot of*, were used to explain the quantity of blood in a patient (see Example 14). Furthermore, the multi-functional bundles *in the middle of* and *the middle of the* share similarities to Biber et al. (2004), yet they are used in different contexts (see Examples 15 and 16). Nonetheless, no bundles exist in imprecision, intangible framing text deixis because these types are common in written discourse (Biber & Barbieri, 2007; Biber et al., 2004).

Example 13 (identification/focus)

- "Bailey, when *the chief of surgery* orders you to scrub in on a surgery, you scrub in on that surgery." (SS_09_EP_23)

Example 14 (Quality specification)

- "Lost *a lot of blood* in the field, but vitals are stable." (SS_10_EP_14)

Example 15 (Time reference)
- "I am telling Chief Hunt *as soon as I* get out of surgery." (SS_11_EP_19)

Example 16 (Multi-functional reference - time)
- "I had an intern collapse on me *in the middle of* surgery so if this can wait…" (SS_ 2_EP_3)

Example 17 (Multi-functional reference - place)
- "He's having a reaction. I have to take him off."
- "I'm *in the middle of* his brain." (SS_02_EP_02)

Special Conversational Functions

Special conversational functions are least found (3.96%) in this Doctor Talk corpus. It is shown that only three bundles were used for special conversational functions. Two of them, *what are you doing* and *are you doing here*, were found in a simple inquiry. The other bundle *thank you very much* was found to show politeness of the speaker. The results support the evidence found in the study by Conrad and Biber (2005) that a few numbers of special conversational functions are found in spoken discourse because they are very purposive.

Example 18 (politeness)
- "No. I'm very happy to be working with Dr. Burke. *Thank you very much*." (SS_02_EP_03)

Example 19 (Simple inquiry)
- "*What are you doing* in here?"
- "There were no tests ordered." (SS_01_EP_02)

Discussion

The present study aims to explore lexical bundles in the Doctor Talk corpus from a medical TV series and analyze their functions, using Biber et al.'s (2004) taxonomy. The results of the study show that 99 lexical bundles were used in conversation between doctors. Most bundles were used to show the speaker's status of knowledge or state of being (69%) and to signal the speaker's speech before and after discourse (21%). A smaller number of bundles found in the corpus were used to contextualize expressions (8%) and to show special conversational functions (3%). The results show evidence to support previous studies and are discussed in the following three aspects.

First, the occurrences of lexical bundles in the present study were different from those found in previous studies. The previous studies focusing on lexical bundles in spoken registers, especially in monologues, revealed a larger number of occurrences. For example, in classroom lectures, 1,260 bundles were found in a study by Nesi and Basturkmen (2006), 143 bundles present in both native and non-native lectures (Hernández, 2013), 225 bundles emerging across two discipline lectures (Kashiha & Heng, 2014), and 121 bundles found in science lectures (Kashiha & Chan, 2013). The smaller number of lexical bundles in the present study suggests that it is likely for lexical bundles to occur less frequently in

conversation than in monologue (see Biber et al., 2004; Conrad & Biber, 2005). Moreover, lexical bundles in spoken discourse are likely to be less present in such specific discourse as science and medicine than in general discourse (Biber et al., 2004). When compared with written discourse, the occurrences of lexical bundles in this study outnumber those in written registers of the same discipline (i.e., medical science). Jalali et al. (2015) and Abdollahpour and Gholami (2018) found 30 and 81 bundles, respectively, in their medical corpora. This evidence confirms previous studies (e.g., Biber et al., 1999; Biber et al., 2004) in terms of the greater number of lexical bundles in spoken registers than in written ones.

The second aspect focuses on specific features of lexical bundles in this specific spoken corpus. Similar to previous studies (Biber et al., 2004; Conrad & Biber, 2005; Chen & Baker, 2010), most lexical bundles found in the present study were those embedded with first and second personal pronouns; for example, *I don't know what*, *I want you to*, *I don't want you to*. However, the lexical bundles were found to be used differently in different contexts (Chung & Nation, 2003), particularly when focusing on medical terms or jargon. The present study reveals some lexical bundles that are articulated with medical terms and jargon. For example, *the chief of the surgery* and *a lot of blood* consist of both general and medical vocabulary. These kinds of lexical bundles were also found in previous studies covering lexical bundles in research articles (see Lei & Lui, 2016). Medical vocabulary embedded in lexical bundles are likely to occur in both spoken and written discourse in medical contexts. This phenomenon puts forward the significance of lexical bundles in a variety of disciplines (Hyland, 2008b).

The discourse functions of lexical bundles in this study also reveal some sub-categories, e.g. stance bundles, discourse organizers and referential bundles indicating particular genres of Doctor Talks. This study found that the lexical bundles in the Doctor Talk corpus function as stance bundles to convey a sense of certainty, uncertainty and desire. It could be said that stance bundles are the characteristics of lexical bundles in spoken registers (Biber & Barbieri, 2007; Biber et al., 2004; Csomay, 2013; Kim, 2009). Moreover, the present study found particular functions served by discourse organizers. The lexical bundles used to introduce a topic include those used to (1) ask questions and check fact and procedures and (2) open discussion, while those that (3) request clarification and (4) ask for justification were found in the subfunction topic elaboration/clarification. These new subfunctions of lexical bundles, based on Lu and Corbett (2012), are used to make case consultations between doctors in this specific medical discourse community. These findings confirm the notion that lexical bundles are present in a particular context in each discipline (Cortes, 2004; Hyland, 2008a, 2008b).

There are a few bundles functioning as referential bundles, found in the form of nouns and prepositional phrase fragments (Biber et al., 2004), even though most lexical bundles in this study are composed of personal pronouns. For a few occurrences of this function, it was apparent that lexical bundles articulating with referential bundles, according to past works (see Biber, 2006; Biber & Barbieri, 2007; Biber et al., 2004), are less common in spoken genres, especially in conversation and academic prose. In written registers, particularly academic writing, some scholars (Chen & Baker, 2010; Hyland, 2008a, 2008b) found that writers use referential bundles to describe the research process, quantitative data and other aspects in their writing tasks.

Special conversational function is counted as the least occurring function in this corpus. According to Conrad and Biber (2005), special conversation features happen infrequently because they are very purposive. It is likely that they are the only function found in conversation register; therefore, they are very rare in the corpus.

It is also interesting to discuss another aspect found in this Doctor Talk corpus: informal language. Such informal lexical bundles as *we're gonna have to* and *what are go*

gonna found in this study corresponded with empirical research by Bednarek (2011) expressing that television discourse, including film or series, show informal language in characters' conversations. This may raise a question regarding a pedagogical implication of film conversations: whether informal conversations should be included in teaching speaking to support effective communication as some L2 communicative materials fail to supplement this kind of language (Basanta & Martín, 2005).

Limitations and Recommendations

Given that this study was conducted with a scripted, and therefore not 100% authentic source for a language corpus, future studies may benefit from analyzing recordings from non-fictional doctors. Additionally, further study may be profitably conducted with the analysis of structure, function and relationship of lexical bundles in Doctor Talks. Also, the focus of lexical bundles in conversation should be shifted to other disciplines to examine their effective communication within workplace discourse. Another limitation lies within the data collection process. Although the transcription was proofread by a native English speaker, there is no intercoder to check content accuracy. Further studies may require medical practitioners to check the content accuracy.

Conclusion

This study explored and analyzed four-word lexical bundles and their functional patterns of the conversation between doctors in a medical T.V. series. The Doctor Talk corpus was made up of a transcribed collection of one million running words of doctor conversation. Using *WordSmith Tool* version 7.0 to retrieve four-word lexical bundles and functional taxonomy of Biber et al. (2004) to analyze the discourse function, the present study found 99 bundles types and 101 functional types. To underline the variation of disciplines of lexical bundles, it was found that some of the target bundles are functionally unique in conversational context and some are structurally similar to previous studies. This study has raised a number of different perspectives. What distinguishes this study is that the topic introduction and topic elaboration functions served by lexical bundles as discourse organizers match the characteristics of Doctor Talks found in Lu and Corbett's (2012) work. Also, lexical bundles with informal language were found and may be applicable for L2 classrooms as an option for teachers. With lexical bundles and their function, it is such a hope that both will benefit medical students, doctors, EMP teachers and material developers. Doctor Talks, as suggested by Pryor and Woordward-kron (2014), should be included in EMP teaching materials. Optionally, some teachers may employ lexical bundles retrieved from this study in their classroom, given that famous scholars (e.g. Hyland, 2008a, 2008b; Phoocharoensil, 2014) emphasize the connection between lexical bundles and second language acquisition.

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