Discourse Functions of Formulaic Sequences in Academic Speech across Two Disciplines

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ABSTRACT

Formulaic sequences play a crucial role in building academic discourse. From among the variety of formulaic expressions, lexical bundles have been shown to serve particular facilitative functions in academic discourse. Defined as strings of word forms that commonly co-occur in natural discourse, lexical bundles are characterized statistically by their frequency of occurrence and they contribute significantly to fluency in speech and writing. While previous research had focused on the use of these expressions in academic research articles across disciplines or on the difference between spoken and written registers, little research has been carried out to find out the language use of academic lectures from different disciplines in terms of the use of these bundles, orally. Taking into account this consideration, the present study aimed to investigate how lexical bundles are used by academic lecturers from different disciplinary communities. With the aim of comparing their language selection, the most frequent four-word lexical bundles in academic lectures of two disciplines, namely politics and chemistry were identified and categorized. The procedure adopts Biber et al.'s (2004) functional categorization of lexical bundles to investigate the communicative purposes that lexical bundles convey in the lectures of the two groups and to see whether there were any disciplinary differences with regard to the bundles used. Based on the findings, there were some marked variations found across the two disciplines in terms of discourse functions of the lexical bundles. It seemed that academic lectures rely heavily on the use of specific word combinations to fulfill those functions related to their discipline.

Keywords: academic lecture; discourse function; formulaic sequences; lexical bundles; spoken discourse

INTRODUCTION

Achieving the knowledge of idiomaticity has always been a major concern in academic discourse, especially for those who belong to a specific discourse community. Idiomaticity refers to the knowledge of conventionalized sequences of words (Adel & Erman, 2012). A concrete realization of idiomaticity is achieved through frequent use of formulaic word combinations which specify particular discourse or register, as they play an important role in identifying membership in different disciplinary communities. According to Wray (2002), language users can identify with a specific group such as a disciplinary community through the use of formulaic sequences. In view of this, a disciplinary community will share common goals and purposes which will help to direct the meaning of specific languages. In addition, utilizing formulaic combinations could signal the speakers' language fluency and competence. Cortes (2006) argues that, frequent use of these sequences in a particular register or discipline is a sign of proficient language use. Therefore, ignorance of such expressions

could be a characteristic behavior of a novice writer or speaker in their communities. On this note, Haswell (1991, p. 236) pinpoints:

> "there can be little doubt that as writers mature they rely more and more on collocations and that the lesser use of them accounts for some characteristic behaviour of apprentice writers. Gaining control of a new register therefore requires a sensitivity to experts' preferences for certain sequences of words over others that might be equally possible".

For the past 40 years, applied linguists have realized the significance of lexical knowledge and formulaic sequences in contributing to fluency in language production (Hakuta, 1974; Kaur, 2013; Nattinger & DeCarrico, 1992; Peters, 1983; Wray, 2002; Yeganehjoo & Yap, 2012). In fact, recent years have witnessed an increasing body of corpus research on the use of such sequences in language. It is widely realized that a large proportion of discourse is constituted through the use of these expressions. Erman and Warren (2000) analyzed different types of word combinations, and they found that these expressions accounted for 52.3% of the written corpus and 58.6% of the spoken corpus.

These argumentations can be translated into the analysis of a particular kind of formulaic word combinations called lexical bundles. Biber and Conrad (1999, p. 183) defined lexical bundles as the most frequently occurring strings of "three or more words that show a statistical tendency to co-occur". Lexical bundles were first studied across two registers of conversation and academic prosein *The Longman Grammar of Spoken and Written English* (Biber, Johansson, Leech, Conrad &Finegan, 1999). Since then, studies on lexical bundles have multiplied. In essence, the term 'lexical bundle' refers to a string of more than two words which co-occur more frequently than we expect, and they are identified empirically by their frequency in a corpus of language. The bundles could be identified through running a specially designed computer program to make a list of the most frequently occurring three or more words (Cortes, 2006; Hyland, 2008). Some examples of lexical bundles are combinations such as *on the other hand, I don't know if, as a result of*, and *in terms of the*.

Biber and Barbieri (2007) proposed three main characteristics for lexical bundles. First is frequency of occurrence which is considered as the determining factor that distinguishes lexical bundles from other types of word combinations such as idioms. Another characteristic is that they normally haveincomplete structures that are usually limited to the clause or phrase (e.g., *in terms of the, I don't think that, in the case of*). The last characteristic is that they are not idiomatic in meaning, but transparent in acceptability and recognition. Biber et al. (2004) argued that lexical bundles serve as functional frames in spoken discourse that help the audiences realize forthcoming information. The case is even more evident in academic settings in which a variety of multi-word expressions areused in order to frame discipline-specific information. Despite their frequent occurrence, lexical bundles cannot always be easily recognized by the audiences or speakers. This is because, in most cases, they have more than one function or meaning specific to a discipline.

The use of lexical bundles could have an effect on the audiences' comprehension in listening to university lectures. In fact, lack of understanding with regard to lexical bundles could give miscues or lead to breakdowns in communication. The main reason partly comes from the fact that students may not recognize the discoursal relations that exist between the word elements. One way to overcome this problem is to raise the students' awareness towards the language use conveyed by lexical bundles. This can be accomplished by providing them with the discourse functions that these expressions serve, and in particular relate them to the specific disciplines in question. In spite of great emphasis on the use of these bundles in English for academic purposes, an important question still remains about the degree to which they may differ in use in university lectures with respect to discipline-

specific discourse functions. In this vein, the need is felt to conduct a corpus-based research to explore the use of lexical bundles in order to arrive at a clearer picture of discourse use within communities. With this concern in mind, the present study attempts to identify the most frequently occurring lexical bundles in academic lectures ofchemistry and politics, in order to compare the functions of the bundles which are apparent in each discipline. In other words,, the research seeks to explain how the lecturers convey disciplinary messages by usinglexical bundles..

THE STUDY OF LEXICAL BUNDLES IN ACADEMIC DISCOURSE

As mentioned, multi-word sequences constitute a large section of academic discourse, both oral and written (Biber et al., 1999). Recently, corpus-based research in the area of lexical bundles has been increasing in the EAP domain due to advances in computer technology. Several researchers have explored the manifestation of these expressions in a variety of academic registers, both spoken and written. Biber, Conrad and Cortes (2004) investigated the use of lexical bundles in university teaching and textbooks and compared them to those of conversation and academic prose in their previous research. They found that lexical bundles play an important role in framing discourse. Unlike previous findings which showed the higher occurrence of lexical bundles in speech, a study by Biber and Barbieri (2007) on a different range of spoken and written university registers found that lexical bundles were more prevalent in written discourse management disciplinary (Cortes, 2004; Hyland, 2008) and linguistic (Adel & Erman, 2012) variations of lexical bundle use in academic writing have also been examined by a number of scholars. Adel and Erman (2012) compared the use of bundles in the writing of native and non-native learners and found that non-native writers are more inclinedto the use of these expressions. The main focus of the majority of these studies was to explore the use of lexical bundles in academic written discourse. From the review, it can be said that academic speech has not received much attention from the scholars. Among the very few studies on spoken discourse, Nesi and Basturkmen (2006) attempted to highlight the cohesive role of lexical bundles in academic lectures and concluded that many of these bundles are used to signal discursive relations. However, the variation of lexical bundle use in academic speechacross disciplines has hardly been studied. In order to fulfill this gap, the present research intends to highlight the possible similarities and variations in academic speech of two disciplines in terms of the way they deploy lexical bundles to communicate their disciplinary functions. Within the confines of this study, two disciplines of politics and chemistry are chosen because they belong to different category of sciences based on Becher's (1989) taxonomy of disciplines. Politics belongs to the category of soft fields and is chosen because it deals with issues regarding people. Chemistry, on the other hand, is representative of hard fields and is more concerned with experimentation and observation of things. In addition, only a few studies have focused on the comparison between the language production of these disciplines as representative of soft and hard fields (Kashiha & Chan, 2014). Therefore, such a comparative study could provide insights into accentuating cross-disciplinary characteristics of different fields of studies. In general, the following research questions are addressed:

1. What are the most frequent lexical bundles found in politics and chemistry lectures?
2. How are the discourse functions of the identified bundles similar or different in the lectures of the two disciplines?

CORPUS AND METHOD

This study explored and compared the use of lexical bundles in university lectures of politics and chemistry by adhering to some methodological procedures. Firstly, the corpus was set up, which included eight university lecture transcripts sourced from British Academic Spoken English (BASE). BASE is an online corpus which was developed at the Universities ofWarwickandReadingunder the directorship of Hilary Nesi and Paul Thompson. Corpus development was assisted by funding from BALEAP, EURALEX, the British Academy and the Arts and Humanities Research Council.The politics material consisted of four lecture transcripts ranging from 5000 to 7000 words, while the four chemistry lecture transcripts ranged from 4000 to 8000 words. The total number of running words in the corpus was 50291 and the two disciplines were comparable in terms of word count. Table 1 gives a summary of the corpus used for this study.

TABLE1.Corpus of the study

Disciplines	No. of lectures	Word count
Chemistry	4	25106
Politics	4	25185
Total	**8**	**50291**

ANALYTICAL PROCEDURE

In order to make the research more manageable, this study only focused on four-word lexical bundles, which is also in line with previous studies that had found the four-word range as being amenable to more academic analysis (e.g. Adel & Erman, 2012; Biber & Barbieri, 2007; Biber, Conrad, & Cortes, 2004; Chen & Baker, 2010; Cortes, 2002, 2004; Hyland, 2008). In addition, Cortes (2004, p. 401) noted that "many four-word bundles hold three-word bundles in their structures" (e.g., *as a result of* contains *as a result*). Hyland (2008) also agreed that four-word bundles are the most frequently used strings and as far as the function is concerned, they provide the researcher with a clearer range of functions than other sequences.

In order to identify and make a list of the most frequently used lexical bundles, the text analysis software AntConc3.2.4 was used. This is considered a useful tool for identifying different types of word combinations, especially lexical bundles which can be identified after imposing the criterion of cut-off frequency point. For the purpose of this study, the cut-off frequency was set at occurring 10 times per hundred thousand words which represents a raw frequency of 5 occurrences. In addition, in line with previous studies on lexical bundles (Adel & Erman, 2012; Biber & Barbieri, 2007; Biber, Conrad, & Cortes, 2004; Cortes, 2002, 2004; Hyland, 2008), and in order to avoid the individual speaker's idiosyncratic effects, another criterion was set;a four-word combination had to occur in at least three different lectures to be called a lexical bundle. Then, the identified bundles in the list were checked manually to exclude overlapping bundles or those including proper nouns. Finally, the retrieved bundles were classified according to their functions. The functional classification proposed by Biber, Conrad and Cortes (2004) was used as the analytical framework in this study to decide on the discourse function of the bundles in the two disciplines. If a lexical bundle had multiple functions, only its main function was considered for the analysis. In their functional classification, Biber, et al. (2004, pp.386-388) argue that lexical bundles serve three main discourse functions in spoken and written registers. Stance bundles convey expressions of assessment and attitude such as *I don't think so*. Discourse organizers make a logical

association between different parts of the speech such as *on the other hand*. Bundles in referential expressions make a direct reference to physical or abstract entities, such as time or place, or single out some important features of an identity to be important such as *is one of the*. Each of these main functions has some sub-categories related to more specific functions which are exemplified in Table 2 below. Finally, the obtained results of the two groups of lectures were compared in terms of communicative functions of the bundles to arrive at possible disciplinary variations.

TABLE 2. Discourse functions of lexical bundles (Biber, et al., 2004, p.384-388)

Functional categories	Sub-categories	Sample bundles
1. Stance bundles	A. Epistemic stance	*the fact that the*
	B. Attitudinal/modality stance	
	B1)Desire	*I want you to*
	B2)Obligation/ directive	*it is important to*
	B3) Intention/ Prediction	*we are going to*
	B4) Ability	*to be able to*
2. Discourse organizers	A. Topic introduction	*in this chapter we*
	B. Topic elaboration/ clarification	*on the other hand*
3. Referential bundles	A. Identification/ focus	*one of the things*
	B. Imprecision	*or something like that*
	C. Specification of attributes	
	C1) Quantity specification	*a little bit of*
	C2) Tangible framing	*in the form of*
	C3) Intangible framing	*on the basis of*
	D. Time/ Place/ Text reference	
	D1) Place reference	*in the United States*
	D2) Time reference	*at the same time*
	D3) Text-deixis	*as shown in table*
	D4) Multi-functional reference	*at the end of*

RESULT AND DISCUSSION

Table 3 shows the distribution of target bundles in the two corpora. As can be seen, out of the total of 225 individual cases of four-word lexical bundles which met the identification criteria, 131tokens belonged to the corpus of politics, whereas, chemistry only accounted for 94 tokens of the bundles. A similar pattern of use was reported regarding the number of bundle types. Politics used 32 different bundle types, while lecturers in chemistry only used 26 types of lexical bundle. The bundles *I mean that the, the way in which, are not going to, come up with a, not going to be,* and *at the local level* were only found to be used in politics lectures. The higher occurrence of lexical bundle types and tokens in the politics lectures is indicative of the fact that descriptive disciplines like politics may use more elaborations to give their views, and this requires the lecturer to use more multi-word combinations in order to give cohesion to those ideas and make the topic as comprehensive as possible for the audiences. This kind of 'bonding' may be seen to be less common in experimental disciplines such as chemistry.

TABLE 3.Lexical bundles in politics and chemistry lectures

Disciplines	Bundle types	Total No. of bundles	% of total words
Chemistry	26	94	0.18
Politics	32	131	0.26

The comparison of lexical bundles and their discourse functions in the politics and chemistrylectures revealed a number of remarkable variations in the language use of the two disciplines. Tables 4, 5, and 6 indicate the distribution of lexical bundles across the three main functional categories (stance bundles, discourse organizers and referential bundles) and their sub-categories in the two disciplines. The information in the following sections can be used to interpret how lexical bundles are used in the context of their discourse functions and together contribute to the shaping of the academic lectures in politics and chemistry.

STANCE BUNDLES IN POLITICS AND CHEMISTRY LECTURES

Stance bundles in the two disciplines expressed the attitudes and assessment of the lecturers towards the propositions listed in Table 4. As can be seen, these bundles comprised 26% of the bundle types in politics and 28% in chemistry. The two groups of lecturers made use of stance bundles in a fair amount to show a variety of propositions such as certainty, uncertainty, lack of knowledge, intention and direction. The main category has two sub-functions, epistemic and attitudinal/modality. The epistemic stance bundles in this study showed the lecturers' degree of knowledge towards the coming information. Most of the epistemic bundles were personal expressions such as *I don't know how, I don't think that*, and *I think that the*, especially in politics lectures, signaling the lecturers' preference to involve a personal evaluation or opinion about the state of knowledge given before or after the bundle, as in:

> Ex. 1) some analysts had also begun to speak about the importance of third track diplomacy, ***I don't know if*** you have heard of this term. (*Politics*)

This kind of usage seems to be in contrast with previous findings on written materials such as textbooks (Conrad, 1996; Reppen, 2004), whereby authors preferred not to use personal stance in their claims and arguments in order to have more control over the readers by keeping text objectivity (Hyland, 2002). Chemistry lecturers, on the other hand, used personal epistemic bundles such as *we see that the* to draw the audiences' attention towards the procedures:

> Ex. 2)***we see that the*** water appears not to give any reaction to radiation. (*Chemistry*)

TABLE 4.Stance bundles in chemistry and politics lectures

Functional category	Subcategories	Chemistry	Politics
	A. Epistemic stance	7%	16%
1. Stance Bundles	B. Attitudinal/modality stance		
	B1)Desire	3%	4%
	B2)Obligation/ directive	12%	4%
	B3) Intention/ Prediction	6%	2%
	B4) Ability	-	-
Total		**28%**	**26%**

The second sub-function of stance bundles isattitudinal/modality which generally shows the speaker or writer's attitudes towards the propositions including that of desire, obligation/directive, intention/prediction and ability (see Table 4). In this study, the identified lexical bundles in the two disciplines appeared to serve all these functions except for ability. In view of this finding, lecturers in chemistry used desire bundles to clarify the instruction or task (example 3), while these bundles were used mostly as a point of departure in the politics lectures, as in example 4:

Ex. 3) ***What I'd like to*** do now is turn to how you actually make the things in ... (*Chemistry*)

Ex. 4) ***I would like to*** speak briefly about problem solving or the integrated approach (*Politics*)

Results in Table 4 show that obligation/directive was markedly more popular in chemistry, with the lecturers dedicating almost three times as many lexical bundles to this function than those in politics.This higher occurrence was more evident in the use of obligation markers which seems to be typical of hard science fields such as chemistry, in which the lecturer was required to notify the students of the possible consequences of an experiment or task being conducted, as in example 5:

Ex. 5)the air certainly in this climate always contains substantial amounts of water so if something is sensitive to water ***you have got to*** keep out air because otherwise it's just going to go off. (*Chemistry*)

In contrast, no bundle functioned as obligation in the politics lectures. Instead, the directive bundle *you can see that* was used to engage the students in the process of learning:

Ex. 6) military power is the tangible power that ***you can see that*** states actually have, but power is much more significant than … *(Politics)*

This bundle was also used in chemistry to indicate the lecturer's stance of guiding students to a particular procedure:

Ex. 7) here you've got W-O-three and tin oxide and ***you can see that*** by far the best two are the T-I-O-two and the Z-N-O which …. (*Chemistry*)

With regard to intention/prediction bundles, findings indicated that these expressions were also more favored by chemistry lecturers. In general, these bundles were used personally (*we are going to*) or impersonally (*are going to be*) in chemistry lectures as a way to explain the experiment in steps taken, as in the following examples, in which the lecturers use the personal pronoun (*we*) to help engage the students in the task and make them feel that they are part of the lesson:

Ex. 8) we need to have a hydrogen, obviously ***we are going to*** eliminate H-two-O we need to have a hydrogen in an antiperiplanar arrangement and that means that …(*Chemistry*)

Ex. 9) because that's the bond into which ***we are going to*** insert something… (*Chemistry*)

Lecturers in politics, on the other hand, used the personal intention bundle *I am going to*, to point to something important which would be discussed later in the lecture:

Ex. 10) the kind of informal facilitation that ***I am going to*** speak about later on in context with second track diplomacy. (*Politics*)

Ex. 11) the barriers to overcome here are usually of two kinds psychological and strategic, ***I am going to*** get to that in a moment. (*Politics*)

DISCOURSE ORGANIZER BUNDLES IN POLITICS AND CHEMISTRY LECTURES

Discourse organizer bundles were used in the disciplinary lectures to serve two different functions, topic introduction and topic elaboration/clarification. Table 5 illustrates the

distribution of discourse organizer bundles in the lectures of the two disciplines. As can be seen, politics accounted for more types of these bundles than chemistry. This can reflect the greater inclination of politics lecturers to the use of formulaic expressions to make a connection between prior and forthcoming discourse. Such interest may result from the need for more discussion of ideas in this discipline, which calls for logical connections to ease students' comprehension. That could account for why topic elaboration/clarification bundles were more favored by the politics lecturers (18% as compared with 11% in chemistry). For example, the bundle *on the other hand* was used to represent the distinction between coming and prior information in the following example:

> Ex. 12) there is order in which states at the top dispense what they regard as justice or there is anarchy. Others, ***on the other hand*** would argue that it is an anarchy because there is no justice ... *(Politics)*

TABLE 5.Discourse organizers in chemistry and politics lectures

Functional category	Subcategories	Chemistry	Politics
2.Discourse organizers	A: Topic introduction	14%	13%
	B. Topic elaboration/clarification	11%	18%
Total		**25%**	**31%**

Another variation included the exclusive occurrence of the bundles *the way in which* and *come up with a* in politics lectures, for the purpose of trying to elaborate on a topic and provide further information in the sentence following the bundle:

> Ex. 13)the Cuban Missile Crisis was an important turning point in ***the way in which*** nuclear deterrence between the Soviet Union and the U-S. *(Politics)*

> Ex. 14) there must be of course heads of states that ***come up with a*** formal agreement that translate the second track diplomatic initiatives into official policy. *(Politics)*

Topic introduction bundles such as *like to talk about* or *I would like to* were used with a similar frequency across the two disciplines and were mostly found at the beginningof the sentence to initiate a lecture or a new topic. The desire bundle *what I'd like to*, served a dual function in chemistry and was also used to introduce a topic, as in:

> Ex. 15) ***what I'd like to*** talk about today is something which is related but different and that is the use of irradiated catalyst that absorbs the U-V components of sunlight *(Chemistry)*

The intention bundle *I am going to* also served as a topic introduction in politics, trying to establish the focus:

> Ex. 16) ***I am going to*** give some examples of how it could operate. *(Politics)*

REFERENTIAL BUNDLES IN POLITICS AND CHEMISTRY LECTURES

Regarding the third main functional category, referential expressions, the two disciplines also recorded some marked similarities and differences. In general, these expressions were considered as the most common functional category in the two disciplines, implying that a large proportion of lexical bundles are used in academic lectures to identify different entities, pinpoint some important characteristics about them, and make reference to place, time and topic. As for the disciplinary variations, Table 6 indicates that the occurrence of these bundles was slightly more dominant in chemistry lectures (47%) than those in politics (43%). Hard science fields such as chemistry deal with a variety of abstract and concrete entities. They

may refer to materials or instruments which need to be identified and explained through a number of specification expressions such as *is one of the, one of the things, is a kind of,* and *a particular kind of.* These bundles are referred to as "identification/focus" bundles and were more frequently used in chemistry to explain or specify a concept or a procedure:

> Ex. 17) *one of the things* that you can do is to make molecules isomerize by shining light on them. *(Chemistry)*

> Ex. 18) It *is a kind of* self-cleaning tile or self-sterilizing tile. *(Chemistry)*

On the other hand, politics lecturers used examples of identification/focus bundles to direct the students' attention to the idea that followed the bundle:

> Ex. 19) you will see that the concerns of the conflict become much more psychological and abstract and much more flexible in terms of how they can be filled *and this is the* level at which the integrative approach operates. *(Politics)*

> Ex. 20) Washington Naval Treaty System did not do its job as intended which *is one of the* reasons why arms control…. *(Politics)*

The only imprecision bundle (*or something like that*) was found in the chemistry lectures to indicate that there are some other types of the reference that may be possible:

> Ex. 21) … which you can do by monitoring the pollutant level by G-C-M-S *or something like that(Chemistry)*

TABLE 6. Referential bundles in chemistry and politics lectures

Functional category	Subcategories	Chemistry	Politics
	A. Identification/focus	15%	10%
	B. Imprecision	2%	-
3.Referential bundles	C. Specification of attributes		
	C1) Quantity specification	13%	10%
	C2) Tangible framing	6%	5%
	C3) Intangible framing	3%	8%
	D. Time/ Place/ Text reference		
	D1) Place reference	3%	3%
	D2) Time reference	3%	4%
	D3) Text-deixis	4%	3%
	D4) Multi-functional reference	-	-
Total		**47%**	**43%**

Regarding the use of specifying attribute expressions,bundles such as *a lot of the, a bit of a, a small amount of,* and *a little bit of* were used with high frequency in the lectures of the two disciplines to quantify amounts and measures related to the noun phrase following the bundle:

> Ex. 22) now *a lot of the* problems associated with nuclear technology *(Politics)*

> Ex. 23) it turns out to be efficient for *a wide range of* pollutants *(Chemistry)*

However, there were some variations in relation to the manifestation of its sub-functions. For example, the quantity bundle *a little bit about* alsofunctioned more specifically as a topic introducer in chemistry:

> Ex. 24) What I'd like to do now is to say *a little bit about* water. Water is probably the most important system ..*(Chemistry)*

Some other attribute specification bundles were used differently across the two disciplines to frame either abstract or concrete features of the following noun phrase, respectively referred to as intangible (*on the basis of*) or tangible (*in the form of*) framing bundles. A closer look at Table 6 reveals that the two disciplines recorded a similar rate of use regarding tangible expressions, while intangible expressions were more favored by politics lecturers and comprised 8% of the bundle types, compared with only 3% in chemistry. Unlike chemistry which dealt with physical and real objects, the main focus of politics was on conceptual properties of entities. In the following example from politics, the intangible framing bundle *in terms of the* signals the importance of national interest in defining argument power:

> Ex. 25) a circular argument power is defined *in terms of the* national interest*(Politics)*

On the other hand, the tangible bundles *in the presence of* and *in the absence of* occurred in chemistry lectures, confirming the materiality of this discipline:

> Ex. 26) it must be minuscule but nevertheless it's enough *in the presence of* a sodium organometallic compound *(Chemistry)*

> Ex. 27) *in the absence of* the organics, the thing will go on it will form oxygen and hydrogen.*(Chemistry)*

Finally, regarding time/place/text/ reference expressions, the two groups of lecturers made use of specific bundles to make reference to particular location information (*in the first place)* in politics or point to specific place in the description of experimental procedure in chemistry. In the following example from chemistry, the lecturer used the place bundle *on the surface of* to indicate where water is located during the reaction of H-pluses:

> Ex. 28) all of these H-pluses will react with the water *on the surface of* the particle and they will be converted to O-H*(Chemistry)*

Time reference bundles were used similarly to show the specific time points in the discussion of topics. As for the disciplinary difference, the bundle *at the end of* served a place function in chemistry (example 29), while politics lecturers used it to make reference to time (example 30):

> Ex. 29) you can imagine a mop with a handle and a whole series of fibres *at the end of* it that you normally use (*Chemistry*)

> Ex. 30)if one for example *at the end of* the Cold War, if the Warsaw Pact exercised or NATO exercised each side NATO would send or .. (*Politics*)

No specific bundle was found to serve multi-functional reference in the two corpora. Rather, the two disciplines used deix is bundles to make reference to different parts of the lecture, linking prior and forthcoming information or raise the students' awareness towards previously mentioned concepts, as in the case of the bundle *as I said before* in the following examples:

> Ex. 31)T-I-O-two *as I said before* is used as a whitener in emulsion paints for getting a white finish on any gloss paints (*Chemistry*)

> Ex. 32)these are a few examples of confidence and security building measures which *as I said before* are aimed at initiating a dialogue and building trust through talking to one another (*Politics*)

CONCLUSION

The comparison of lexical bundles and their discourse functions in the lectures of politics and chemistry revealed some similarities and differences in the language use of the two disciplines. It was found that out of the 32 lexical bundle types identified in the chemistry lectures, only 26 of them were used in politics lectures. In addition, compared with 25% in chemistry, discourse organizer bundles comprised over 31% of the bundle types in politics, showing the politics lecturers' higher dependence on these bundles to make a coherent link between a variety of ideas discussed in this discipline. Examples are topic elaboration/identification bundles such as *the way in which* and *come up with a,* which only occurred in politics lecturers, and they helped build a relationship between the ideas that preceded the bundles and those which came after the bundles. As for the stance bundles, findings revealed that chemistry recorded a slightly higher rate of use by dedicating 28% of the bundles. Referential bundles were considered as the most common functional type in the lectures of the two disciplines, comprising 47% of the bundles in chemistry and 43% in politics.

The results imply that these bundles should be highlighted to novice lecturers using the language, especially when they use it as a second language. Efficient use of these expressions promotes better engagement with the audience and also provides opportunity for mitigation as the audience can identify expressions of reference which may point to instances of focusing on personal attitude. Listeners are given room to disagree if judged inappropriate and unjustified, and in this sense opens doors to more interactive discourse. Introducing referential bundles can also allow learners to realize how these bundles are used to identify abstract and concrete entities especially in chemistry. This would help related language use in the discipline, such as performing laboratory tasks which could involve the need for close listening to the lecturer talk as he introduces and explains details of different materials and procedures.

Lectures delivered without instances of lexical bundles could render them to be too formal and rigid in tone and rhythm. To speak naturally and effectively, speakers have to resort to a variety of lexical bundles which by themselves embed a variety of functions. In ESL situations, a conscious awareness of specific language features, such as those of lexical bundles will facilitate communication. The BASE corpus is used to show exemplary features used by native speakers. In view of this, ESL lecturers, on one hand, will be able to hone their speaking skills and the audience, on the other, will be able to capture nuances of language use which are generally recognized as assumed features in L1 situations. A higher exposure and use of such instances of natural speech will also help develop greater automaticity and confidence in the engagement in speech events between the receiver and the transmitter as the message unfolds in the delivery.

Overall, the data reported in this study will not be directly compared to other studies on spoken discourse. One reason is that very few studies of this nature were carried out. The closest that could be compared would be the study by Nesi and Basturkmen (2006) who analyzed lexical bundles of lectures also from the BASE corpus. However, their focus was on the cohesiveness of speech in relation to the use of lexical bundles. The disciplinary variation was not a consideration and neither was the explanation of the discourse functions of the bundles. Other researchers like Biber and Barbieri (2007), and Cortes (2004) investigated lexical bundles from the angle of a comparison between spoken and written registers or in written production of university students from different disciplines. This study has its own objectives and the data did not lend itself to be directly compared with data from other studies which are based on their own parameters. This also affirms the claim by few scholars that in corpus linguistics, each corpus has its own distinct features and the description therefore

could also be very much particularized. The main gap of such research is to add on insights into individual analysis of an identified corpus depending on the parameters that underlie the analysis.

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