Research Article

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Connecting Formulaic Sequences and Moves in Applied Linguistics Research Article Results

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Abstract

The current research examined the use of lexical bundles in the result sections of research papers by Iranian non-native writers in the field of applied linguistics. The WordSmith Software was applied to identify lexical bundles. In addition, the two analytical frameworks Biber et al. (2004) and Ruiying and Allison (2003) were used to categorize the bundles with regard to their structural features and their moves and steps. Moreover, with the aid of concordance, the identified clusters were analyzed and categorized according to their communicative functions. The results of the current research showed that Iranian writers relied heavily on the use of specific formulaic bundles to perform the communicative functions associated with the moves and steps. The findings also revealed that four moves out of six moves were mostly used by Iranian authors. Moreover, the researchers found that the extensive range of formulaic clusters used to demonstrate Move 2, *Reporting results*, the least bundles occurred in Move 4, *Summarizing results*, and also no clusters were used in Move 5, *Evaluating the study* along with Move 6, *Deductions from the research* by Iranian writers. The findings of this study boost the awareness of formulaic sequences usage for novice writers in particular discourse and communicative function.

Keywords: formulaic clusters, move analysis, research article result section, Applied Linguistics

Introduction

The concept of genre has been a focus in various linguistics research studies for decades. Genre is defined as the language in use in a communicative context so as to gain specific communicative goals of a discipline (Bhatia, 2004; Nwogu, 1997; Swales, 1990). Genre refers to texts that represent how writers produce and use language in recurring situations (Hyland, 2008). Genre contains a group of communicative events that share communicative purposes (Swales, 1990).

A research article (RA) is a genre in academic writing; it is a medium where a researcher is able to spread knowledge and information, and to involve in discourse with the academic community (Musa, Khamis, & Zanariah, 2015). Much research has been devoted to the notion of analyzing the research article genre applying the move-based approach. The background research on the genre include examining various conventional research article sections by a number of scholars, for instance, Samraj (2002) analyzed the introduction sections of the articles while Lim (2006) and Peacock (2002) had analysis on the methods sections, and the results sections were examined by Thompson (1993) and Williams (1999). At the same time, the discussion sections of the target articles were under investigation by Amirian, Kassaian and Tavakoli (2008), and Ruiying and Allison (2003). Similarly, Kanoksilapatham (2007) and Pho (2008) examined the conventional sections (introduction, methods, results, and discussion-IMRD) of the articles. Hence, it is observed that doing analysis on RA sections using a move-based approach has appealed a number of scholars.

As emphasized by Nwogu (1997), move analysis has focused on the hierarchical schematic structures of texts. As defined by Nwogu (1997), move is "a text segment made up of a bundle of linguistic features (lexical meaning, propositional meanings, illocutionary forces, etc.) which give the segment a uniform orientation and signal the content of discourse in it" (p. 122). Recurring word combinations, as part of a linguistic feature analysis, were also examined in several RA studies with the application of the corpus linguistic approach (e.g., Cortes, 2013; Gledhill, 2000; Marco, 2000; Saber, 2012). They have applied a number of terms linked with word combinations, for instance 'clusters', 'lexical bundles', and 'patterns'. They

have nevertheless emphasized the significance of word combinations by presenting that these structures are prevailing in RAs and comprise lexico-grammatical qualities that are able to reveal the discourse functions of the explored genres.

As for lexical bundles, lexical bundle identification and classification in spoken and written registers have been the focus of several linguists and scholars. A Lexical bundle is defined as a combination of three or more words co-occurring in a specific register (Cortes, 2004) and "the most frequent sequences of words in a register" (Biber, Conrad, & Cortes, 2004, p. 371). It is useful for non-native learners to understand the structures of a target discourse and gain success in university contexts (Biber & Barbieri, 2007). Being exposed to frequent use of target lexical bundles does not lead to the acquisition (Cortes, 2004). However, the awareness of lexical bundles (Biber, Johansson, Leech, Conrad, & Finegan, 1999) can play a significant role in helping non-native learners to master a language and understand its pedagogical implications. Learners should master the use of lexical bundles since the appropriate use of lexical bundles signifies a language competency level in a specific register (Bamberg, 1983; Biber & Barbieri, 2007; Cortes, 2004; McCulley, 1985). According to Schmidt (1990), students should be familiar with lexical bundles and be aware of their functions and contexts.

Lexical bundles are known by empirical measures, as these contiguous combinations of words are repeatedly extracted from a certain corpus by means of a computer program. In order to identify them in the language, certain criteria are needed. *Frequency of occurrence* is the first feature for lexical bundles. A bundle must frequently occur (10 or 20 times) in a million words in a certain register so as to be considered as a lexical bundle (e.g., *in the present study*) while an idiom such as (e.g., *Kick the bucket)* occurs rarely (0.5 times) in a million words (Cortes, 2004). However, such cut-off point criteria are arbitrary and different from one research to another. For example, to Biber, Johansson, Leech, Conrad, and Finegan (1999), those strings which occur more than 10 times in a million words are called formulaic clusters. Cortes (2004) selected a different cut-off point criterion and set the cut-off point at 20 times per million words. Another criterion is called *dispersion*, that is, a string had to be used in at least five different

texts so as to guard against a single writer's idiosyncratic effects (Biber et al., 1999). *Semantic transparency* and *syntactic composition* are the second and third characteristics of lexical bundles (Cortes, 2004) that distinguishes them from idioms, which are obscure and non-commotional in terms of semantic transparency and syntactic composition. Lexical bundles most frequently occur in an academic discourse and their meanings in most cases are understood easily from their components; however, they are not always complete in terms of structure.

However, little is known about the role of this linguistic feature in moves and steps of RA results, especially those written by L2 writers, to see how they report and interpret the findings of their study. Therefore, the present research attempts to investigate and highlight the use of the most commonly used formulaic clusters in the moves and steps of RA result sections written by Iranian L2 writers in order to provide insights into how such result sections are organized and what expressions are the most formulaic. Writing the result section has found to be challenging for non-native authors since, as noted by Sawales (1990),"Results and Discussion sections are sometimes coalesced, and refers briefly to additional or substituted sections labeled Conclusions, Implications or Applications and so on"(as cited in Ruiying and Allison, 2003, p.366). Giving such significant elements would provide researchers with the privilege they need to have academic voice in their disciplinary communities. Achieving this academic voice is one of the fundamental purposes that L2 learners of English pursue in order to contribute to knowledge and publish in esteemed journals. To qualify as such, it is widely realized that the frequent use of formulas such as lexical bundles contributes non-native writers to attain native-like fluency and competence they need to establish themselves as credible researchers. The present study was an attempt to answer the following questions:

RQ1: What are the most frequently used lexical bundles in the result section of the research articles written by Iranian non-native writers in the field of Applied Linguistics?

RQ2: How are the identified lexical bundles in the research articles' result section classified structurally?

RQ3: What are the rhetorical moves and steps in the research articles' result section in terms of the use of lexical bundles?

Method

Corpus

The current research is based on a corpus of 150 research articles result sections in the field of applied linguistics. They were selected to represent the publications of each of the journal covering from the recent years. The research articles were selected from the leading and high ranking journals from public universities in Iran. For the purpose of the present research, the data-based research articles were chosen. More specifically, the form of (AIMRaD), the abstract-introduction-materials and methods-results and discussion format was considered in this study. Specifically, each result section used in the present research was a section that stood alone. RAs with combined sections of Result and Discussion sections were left out. The result sections extracted from the articles in HTML or PDF format by copying and pasting them into plain text files to be ready for analysis. The actual corpus size was 208,818 running words. The details of the corpus are presented in Table 1.

Table 1

The Details contents of the corpus

Journals	Year	Number of texts for each journal
Iranian Journal of Language Teaching Research		50
Iranian Journal of Applied Linguistics	2016-2019	50
Journal of Modern Research in English Language Studies		50
Total		150
Number of words		

Instruments

WordSmith Tools

The first step in the analysis was to identify lexical bundles from the corpus. In the present study, WordSmith Tools version 0.5 developed by

Scott (2008) was used to search the corpus of the study for the potential lexical bundles.

Structural Classification

In the present study, in order to classify all identified bundles in terms of structure, the researcher categorized the structures of the bundles in the corpus based on Biber, Conrad, and Cortes's (2004) taxonomy. The bundles identified in this study mostly belonged to the three main groups previously defined in the literature as follows:

a. Lexical bundles that incorporate noun phrases or prepositional phrase fragments, such as *in the present study, the objective of this paper, in the next section, one of the most important*

b. Lexical bundles that incorporate verb phrase fragments, in expressions such as *little is known about, is related to the, it has been shown that, it is necessary to, it has been suggested that*

c. Lexical bundles that incorporate dependent clause fragments, *as in that there is a, was to determine the, we show that the*

Move Analysis

The analysis of the moves was carried out to identify the functions that lexical bundles convey in each move and its related step. The current study is based on Yang and Allison's (2003) move organization of RA results so as to provide insight into functional analysis of the bundles used. They found three main moves and some related steps in analyzing the RA results of their study, as illustrated in Table 2.

Table 2

Ruiying and Allison's Model of Result Section

Moves	Steps
M1- Preparatory information	
M2- Reporting results	
M3- Commenting on results	
	S1. Interpreting results
	S2. Comparing results with literature
	S3. Evaluating results
	S4. Accounting for results
M4 -Summarizing results	
M5- Evaluating the study	
	S1. Indicating limitations
	S2. Indicating significance/advantage
M6 - Deductions from the research	
	S1. Recommending further research

Data analysis Procedures

This study only analyzed four-word formulaic clusters as a unit of analysis since previous studies have found that four-word sequences are the most frequent recurrent sequences in a register or genre (Biber & Barbieri, 2007; Biber et al., 2004; Cortes, 2004). Hyland (2008) indicated that four-word lexical bundles were more observed than 5-word lexical bundles, and proposed a more transparent range of structures and functions than 3-word sequences. A computer software, WordSmith Tools version 0.5 (Scott, 2008), was applied to find and make a list of the most recurrent four-word clusters. Since the size of the corpus was small, a normalization procedure to one million words was used. A cut-off frequency criterion of 7 times was set to the software as a threshold for the identification of bundles. This decision is consistent with the previous research on formulaic clusters and also based on the small size of the corpus. Furthermore, to guard against an individual writer's idiosyncratic influences, another criterion was set, that is, a four-word cluster need to take place in at least 5 different texts to be called formulaic. Much of the prior studies were considered the cut-off points five or more texts or ten percent of texts in order to avoid individual speakers or writers idiosyncrasies (e.g., Biber et al., 1999, Biber et al., 2004; Cortes, 2004; Hyland, 2008).

The target clusters retrieved from the software were first categorized according to their structure using the taxonomy by Biber et al. (2004). Based on this categorization, formulaic clusters have three main structures, namely dependent clauses, noun and prepositional phrases, and verb phrases. In the final phase of the qualitative analysis, each move and its related steps of RA results were   found   in   order   to see what communicative functions formulaic clusters convey in each move and step. For this purpose, Ruiying and Allison's (2003) move organization of RA results was used as an analytical framework in this study.

As shown in Table 2, RA writers apply move 1, *Preparatory information*, to introduce the methodological procedures and also direct the reader to tables and/or graphs that display results in the RA. Move 2, *Reporting results*, is used to present the findings of their study, and support the results with the data in the form of tables, graphs and examples and also by description (Ruiying & Allison, 2003). Move 3, *Commenting on results*, is applied to assess the research at large in line with the four related steps as illustrated in Table 2. They are used as subjective judgments about the research results, interpreting findings, and examining the consistency or inconsistency of the results with background studies. Move 4, *Summarizing results*, provides a summary of their major results in the research. Move 5, *Evaluating the study*, is used to indicate the limitations of the methodology and significance of the research. Move 6, *Deduction from the research*, is the move that detects gaps for further study or pedagogical implications of the study. Once formulaic clusters were recognized in the corpus, they passed through analysis in their context to find out to what extent and how they were manifested in the moves and steps of the results. In order to better arrive at the communicative aims conveyed by the clusters, all the tokens of each cluster were tested manually in their environment. To enhance the reliability of explanation, a second rater helped the researcher in identifying the discursive and communicative meaning of the clusters used in the moves and steps.

Results and Discussion

There were 68 target clusters in the corpus of RA results. Among them, the most frequent was *the results of the* with 130 occurrences, followed by

significant difference between the and *a significant difference between*, with 80 and 60 occurrences. The great tendency toward the use of the most frequent bundles in the result sections such as *the results of the*, *on the other hand*, and *as shown in table* suggests that Iranian applied linguistics writers were familiar with using the set of prefabricated expressions. This means that they were able to simply use such expressions to present, report, and comment on their results in the result section. Table 3 depicts the list of top ten most frequent four-word clusters in the corpus.

Table 3
The Top 10 most Frequently Applied Formulaic Clusters in the Corpus

Clusters	Raw frequency
the results of the	130
significant difference between the	
a significant difference between	
the mean scores of	
on the other hand	
as shown in table	
the second research question	
the first research question	
are presented in table	
there was a significant	

Structural classification of formulaic clusters

   The structural analysis of the identified clusters showed that most of them were in the form of a phrase. Academic discourse has previously been found to use such a structure in the construction of formulaic clusters (Ädel & Erman, 2012; Biber et al., 2004; Hyland, 2008). The most prevalent structure of this type used by Iranian L2 writers was noun and prepositional phrase, comprising almost 66% of the total clusters. It seems that in the field of Applied Linguistics, writers rely most on the combination of noun and prepositions to summarize their study in the Result section of RA. Moreover, 22% of the clusters were made up of verb phrases and the least attention was dedicated to dependent clause clusters with only 12% of use. Such percentages of use can be translated into the fact that Iranian L2 authors may have found the use of verbs in the form of phrases more

coherent and lucid in summing up their findings of their study than those of dependent clauses. Another way to justify this usage comes from the influence from their first language, Farsi.

Formulaic clusters and moves

Once the structural characteristic of the clusters was identified, the concordancer tool was used to help the qualitative analysis to examine the identified clusters' corresponding contexts and establish the certain communicative functions they perform in each move and steps of the results. It is worth noting that some of the bundles observed in more than one move and step in a particular incidence in different text. The list of clusters which occurred in moves and steps of RA results are presented in Table 4, the bundles marked in bold are those bundles that were seen in only one move or step. Those bundles marked both in italicized and superscript number are those that appeared in more than one move or step.

Table 4

Formulaic Clusters in the Moves and Steps of RA Results

Moves and Steps	Cluster	Move Types No.
Move 1 - Preparatory information		**16**
the results of the³		
as shown in table²		
the second research question		
the first research question		
the participants in the²		
the analysis of the³		
the descriptive statistics of²		
descriptive statistics of the²		
in the present study³		
as can be seen²		
shown in table the²		
the end of the²		
as table shows the²		
at the end of²		
the significance of the		
presented in table the²		
Move 2- Reporting results		**58**
the results of the³		
significant difference between the		
a significant difference between		
the mean scores of		
on the other hand²		
there was a significant		
no significant difference between		
the participants in the²		

the performance of the
with regard to the[2]
that there was a[2]
the analysis of the[3]
was a significant difference
that there is a[2]
there is a significant
the difference between the
with respect to the[2]
significant differences among the
in terms of the[2]
was no significant difference
is a significant difference
it was found that[2]
that there was no
a statistically significant difference
in terms of their[2]
significant difference among the
the results of this[3]
difference between the two
significant difference in the
the majority of the
the mean score of
mean scores in the
difference between the mean
in the case of[2]
the mean of the
are shown in table
in table the mean
scores of the two
statistically significant difference between
statistically significant differences between
of the use of
of the variance in
as shown in table[2]
are presented in table[2]
the descriptive statistics of[2]
descriptive statistics of the[2]
as can be seen[2]
the use of the[2]
before and after the
shown in table the[2]
the end of the[2]
at the end of[2]
as table shows the[2]
in the use of[2]
in the present study[3]
are presented in table
presented in table the[2]
of the present study
Move 3 - Commenting on results   **16**

Step 1. Interpreting results
on the other hand[2]
that there was a[2]
the analysis of the[3]
in the present study[3]
that there is a[2]
was found to be
in other words the
it was found that[2]
the results of this[3]
that is to say
revealed that there was
the use of the[2]
in the use of[2]
it can be concluded[2]
S2. Comparing results with literature   -
S3. Evaluating results   -
S4. Accounting for results   **to the fact that**
                                    in the case of[2]
Move 4 -Summarizing results   **1**
                                    It can be concluded[2]
Move 5- Evaluating the study   **0**
S1. Showing limitations   -
S2. Showing significance/advantage   -
Move 6 - Deductions from the studies   **0**
S1. Recommending further studies

As shown in Table 4, the quantity of clusters which occurred in more than one move or step (e.g., *the results of the*, *as shown in table*) is relatively high in the corpus of L2 results. It is commonly realized that there are some fixed expressions that we keep in our mental lexicon which are retrieved from our memory at the time of use. The high repetition of some of these expressions in the corpus can depict how L2 writers lack the knowledge of prefabricated expressions and have a small mental lexicon. Such a small range could simply drive the authors to repeat the same expressions when serving other purposes in other moves and steps. Another probable explanation might arise out of L2 writers' inclination to make use of the same typical and 'ready-made' expressions which they realized to be the most recurrent and therefore needed no processing. Discussion on this particularity can be made on the grounds that linguistic experience of writers can guide their making language choices and selecting lexico-grammatical characteristics.

Not surprisingly, the results plotted in Table 4 indicate that L2 authors used the largest number of formulaic clusters to serve move 2, *Reporting Results*. This signals that providing the outline of the conducted study is an obligatory move in writing the RA results. Iranian authors employed a number of formulaic clusters to report findings of their study. Further analysis of the clusters indicated that numerous words of *results*, *shown*, *presented, significant and difference* were used in most of the clusters of this move such as the "*the results of the* and *as shown in table*" and worked as a trigger to start the move:

(1) "**_The results of the_** study indicate that personality has significant impacts on teachers' teaching activities preferences (F= 504.769, Sig. = .000)."

(2) "**_As shown in Table_** 3, the most frequently used CF type was explicit correction, which was used 953 times (i.e. 48.5% of all CF types provided)."

The findings of the present study have shown that L2 writers used the next largest number of formulaic clusters to serve Move 1(*Preparatory information*) and Move 3 (*Commenting on results*). As illustrated in Table 4, the equal number of clusters was used in these two moves by Persian writers. As can be seen in Table 4, most of these clusters were used in other moves as well. Such a reliance on the use of similar expressions and a lack of diversity could reflect the L2 writers' immaturity in the choice of formulaic combinations to serve several communicative purposes relating to the result section. In terms of the Move 1, L2 writers used them to describe and introduce the methodological and statistical procedures (see examples 3 and 4 below). Moreover, this move also directs the reader to graphs and/or tables that illustrate findings in the RA (see examples 5 and 6 below). The following concordance lines can show the use of some bundles of this move:

(3) "This section presents the thematic patterns regarding the doctoral students? conceptions of research publication purpose, process, and product that emerged from **_the analysis of the_** transcribed interview data (See Table 1)."

(4) "In order to examine ***the significance of the*** differences between the frequencies of the types of errors and their expected frequencies, a chi-square goodness-of-fit test was run."

(5) "***As can be seen*** in Figure 6, the three prominent participants (the two women and the man who are shown in a sit-in, according to the caption) are arranged in a symmetrical position: their orientation towards the vertical/horizontal axes and their distance from each other are almost similar."

(6) "***As shown in Table*** 1, the mean percentage scores of the experimental groups on the TDCOM posttest were better than those of the control group."

As for Move 3, the formulaic sequences were used to indicate the interpretation and explanation of the findings of the study. They also served to elaborate the results posed in Move 2 (*Reporting Results*) concerning the purposes of the research. It should be, however, noted that only step 1 "Interpreting results" and step 4 "accounting for results" were employed by L2 writers. In other words, no cluster in this move was found in other steps, that is, "*comparing results with literature*", and "*evaluating result*". This scarcity of use is likely due to the fact that the discussion and conclusion sections of RA may be the suitable place where researchers mostly provide the comparing and evaluating of results of their study. The following contextual examples show the use of some clusters in this move, step 1:

(7) "With respect to ungrammatical items of the untimed GJT, too, the effect of time ***was found to be*** significant."

(8) "***That is to say***, there is a significant correlation between cloze test and Ctest with familiar genre."

(9) "***In the case of*** attitude towards Second Language Learning, findings showed significant differences between junior high school and high school levels as well as between high school and university levels."

(10) "This may also be due ***to the fact that*** no matter what teaching style a teacher uses in his/her classes, it is not related to his/her degree of burnout or vice versa."

With regard to Move 4 "summarizing results", Iranian authors used only one cluster (*it can be concluded*) to indicate this move.

(11) "Therefore, ***it can be concluded*** that age does not play a significant role in the relationship between learners' CT and EI."

Table 4 indicates that L2 writers used no clusters to address two moves of 5 and 6, "evaluating the study" and "Deductions from the research", respectively. This proposes that in gauging the study in the result section, Applied Linguistic writers did not feel the need to use much formulaic clusters and might have decided to rely on other non-formulaic expressions to serve this function. Again the lack of such usage in the result section implies the fact that other sections of RA such as the discussion and conclusion sections account for the evaluation and deduction of the research. In addition, writers may find it essential to vary their style of reporting from that of other sections. Therefore, a more mindful attempt to avoid formulaic expressions could be an implicit guide.

In conclusion, through a corpus-driven approach, this study attempted to investigate the application of the most frequent four-words formulaic clusters in RA results written by Iranian L2 writers and find the link between the clusters and the moves in which they occurred. Structurally, it was found that more than half of the clusters were of noun and prepositional phrases, while the least number were of dependent clauses. L2 writers used specific formulaic clusters to serve the communicative functions connected to each move of the RA result. Move 2, *reporting results*, comprised the largest number of clusters, signaling the requisite nature of this move in the RA result section. It was also disclosed that most of these clusters were applied in the initial position of the clause, functioning as trigger to start the move, such as *the results of this*, *it was found that, the analysis of the, in the present study*. Move 4, *Summarizing results*, accounted for the least number of clusters, reflecting the low tendency of L2 writers to use formulaic clusters to indicate the summarization of the findings study in the result section. Moreover, L2 writers used no formulaic expressions in the two moves of 5 and 6, "evaluating the study" and "Deductions from the research". Taken together, the least frequent use of Move 4 and the absence use of the moves 5 and 6 imply that they might have preferred to use other sections of RA such as the discussion and conclusion section. Another interesting outcome was that L2 authors used specific range of clusters

repeatedly in the three moves to serve related functions, such as *the analysis of the*, *the results of the*, *results of this*, and *in the present study*. This high reliance on similar clusters could reflect the L2 writers' control over a narrow variation of prefabricated word combinations in writing the Result section.

The current research has a number of pedagogical implications. Initially, it provides a valuable resource for materials in EAP and ESP, particularly for the students of applied linguistics whose goal is to be able to write and publish research articles. Materials for instruction may also be formed to express how language patterns are controlled by a definite communicative function and discourse. The data give information about the connection between rhetorical organization of RA and the type of formulaic units to be used in the Result section which would help novice writers to have a better picture of the way that RA result is structured. In fact, the research results support the relationship between formulaic expressions and genre, recommending that ESP learning context events need to integrate the analysis of a specific genre of interest to learners with the analysis of the clusters within the given genre. These actions may take learners' attention to clusters in academic writing, promote their consciousness of contextual factors adjacent to a specific phraseology, increase their awareness of the essential explanations for language options and assist learners to arrange for better involvement in their academic discourse community.

Overall, this study presents linguistic and disciplinary perspectives of academic writing skill highlighting formulaic language use in the rhetorical structure of RA result. Investigating the use of bundles in other sections such as introduction, method, discussion and conclusion can furnish scholars with insights into the convention and standards of writing academic RAs. The analysis of the cross-disciplinary and cross-linguistics on the application of lexical bundles in RA result or other sections can also be an inspiring topic for future studies. Such cross-disciplinary and cross-linguistic studies can be a great value for novice writers from the selected disciplines and languages to obtain a mastery over the rhetorical sections of RAs and draw an attention on the linguistic features used to convey the communicative purpose of these sections.

Declaration of interest: none

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