

Lexical Bundles and Keywords in Psychology Research Articles

Rika Mutiara

Esa Unggul University, Jakarta

Bioprofiles:

Rika Mutiara teaches English for academic and business purposes at Esa Unggul University. Her research interests include corpus linguistics and language acquisition. She can be reached at rika.mutiara@esaunggul.ac.id.

Abstract

As two components of discourse, lexical bundles and keywords have prominent roles in discourse. This study aims at investigating discourse functions of lexical bundles, keywords, and the co-occurrences of lexical bundles and keywords in psychology research articles. The study of collocations and concordance lines were conducted. It was found that the discourse functions of lexical bundles are attitudinal/modality stance (directive), quantity specification, impersonal stance, and tangible framing attribute. Based on the keywords investigation, the main issues are gender, interaction, theory/hypothesis prediction, social event, nervous system, and individual perception. Co-occurrences of lexical bundles and keywords exist in particular research articles or across several ones.

Keywords: lexical bundle, keyword, discourse, corpus

Introduction

As a study of academic discourse, the current study focuses on discourse in social psychology research articles. Discourse is built by word choices that convey functions of the language. Some words tend to frequently occur together that result in lexical bundles. Lexical bundles are “the most frequent recurring lexical sequences” (Biber and Conrad, 1999, p.168).

Besides lexical bundles, keywords have important roles in discourse. Keywords are words that are more significant in a corpus being studied than in a reference corpus. The results of keywords analysis uncover what topics or issues the writers mostly concern about (Baker, 2004).

Even though lexical bundles and keywords are two different things, they can be complement to each other in discourse study (Partington in Flowerdew, 2012). They can be the basis to identify moves in the texts. When they co-occur, they carry specific contexts (Thornbury, 2010).

To the best of my knowledge, there has not been a study dealing with lexical bundles and keywords in academic discourse. Therefore, the study sought to answer the following questions:

1. a. What four-word lexical bundles do occur?
 - b. What are the discourse functions of the lexical bundles?
2. What are the keywords and their collocations?
3. What lexical bundles do co-occur with keywords?

Literature Review

Lexical bundles

Lexical bundles are primary elements in discourse construction (Biber and Conrad, 1999). Biber, Conrad, and Cortes (2004) explored discourse functions of lexical bundles in academic register and categorized them as can be seen in the table below.

Table 1: *The categorization of discourse functions of lexical bundles by Biber et al. (2004)*

Categorizations	Subcategorizations	Units
Stance bundles	Epistemic stance Attitudinal/modality stance	Desire Obligation/directive Intention/prediction Ability
Discourse organizers	Topic introduction/focus Topic elaboration/clarification	
Referential bundles	Identification/focus Imprecision Specification of attributes	Quantity specification



Time/place/text reference



Tangible framing

Intangible framing

Place reference

Time reference

Text-deixis

Multi-functional reference



Biber and Barbieri (2007) argued that lexical bundles were rarely found in academic texts but they are common in course management and institutional writing. According to Hyland (2008), lexical bundles in biology and electrical engineering texts mainly focus on passing on research results while the ones in applied linguistics and social science are characterized by texts as the center in which the writers built their point of views.

Keywords

The function of keywords to analyze a discourse is as the starting points. Textual approach influences most discourse studies that use keywords (Flowerdew, 2012). Describing patterns by studying collocation of the keywords and semantic preferences becomes essential (Hyland, 2009). It can be used to discover the ideas of the texts.

Methodology

The study is a combination of text and corpus analyses. The study corpus consists of 50 social psychology journal articles written in English and published in 2009-2010. The size is 312,860 words. All sections of the articles except references were included in the corpus.

Four-word lexical bundles were found through running the texts into Antconc. The minimum frequency of the bundles is 20 in at least 16 research articles. They were categorized based on classification developed by Biber et al., (2004) to identify the discourse functions.

To obtain the keywords, the study corpus was run into Lextutor online and compared to the Brown corpus that only consists of written texts. Among the top 100 keywords, only those that have at least 13 occurrences in at least 6 research articles were analyzed. By using Antconc, the collocations of selected keywords were examined to see the topics commonly discussed. The



span of the collocations is 4 words to the left and right. The concordance lines of keywords were scrutinized to see whether the lexical bundles co-occur with the keywords in the sentence level.

Findings and discussion

Lexical bundles

There are five lexical bundles which occur as follows:

Table 2: *The occurrence of lexical bundles*

Lexical bundles	Frequency	Range	Discourse functions
participants were asked to	45	22	attitudinal/modality stance (directive)
the extent to which	75	20	referential bundle (quantity specification)
as a function of	53	18	referential expression (identification)
are more likely to	24	16	stance expression (epistemic stance/impersonal)
in the context of	39	16	referential expressions (tangible framing attributes)

The bundles above are the chunks of language that are commonly used in this register. By using *participants were asked to*, participants' involvement to do some tasks in this field of research can be seen. It tells a part of research procedure that the participants did. *The extent to which* shows measurement in the studies. *As a function of* gives more detailed explanation. *Are more likely to* shows writers' personal point of view towards the topics. It illustrates writers' certainty. The use of *in the context of* means the writers set up the scope of the studies. It specifically limits the research.

Keywords

The keywords are *gender, interact, predict, Olympic, perceive, neural, and psychology*. All keywords appear as lemmas. The following is a list of keywords and their collocates.

Table 3: *The collocations of keywords*

Keywords	Collocates
Gender	Differences Social Participant(s) Gender
Interact	Significant Culture Social Way Effect Main
Predict	Hypothesis Theory
Olympic	Games Chinese
Perceive	Individual
Neural	Self
Psychology	Social Cultural

Some words have patterns in their occurrences. When *gender* collocates with *differences*, some are followed by prepositional phrases that begin with *in*. *Gender differences* occur in specific contexts as can be seen in the concordance below.

the fact that there are gender differences in religiosity has obvious implications for research on gender. There would be no gender differences in the relationship between gender and religiosity (Koenig et al., 2008). We also did not find gender differences in relationships between gender and religiosity (Koenig et al., 2008); likewise, gender differences in tentative language use and tentative language use factors induce gender differences in language style, the results of this study (Koenig et al., 2003) argue that gender differences in language use have emerged over time. When significant gender differences in sportscaster talk arise

Figure 1: *Concordance lines of gender differences*

In the collocation of *interaction* and *significant*, some sentences begin with *there was* as can be seen in the following concordance lines.

target. **There was a significant interaction** of target and dimi
riables. **There was a significant interaction** of target and dir
Finally, **there was a significant interaction** between target re
: was qualified by a **significant interaction** between perpetra
s also a marginally **significant interaction** between perpetra
nces to emotion. A **significant interaction** emerged between
ologies. We found a **significant interaction** between participa
event. **There was a significant interaction** with sex and use c
on. **There was not a significant interaction** effect, DR2 = .002

Figure 2: *Concordance lines of significant interaction*

The words *perceive* that collocates with *individual* mostly occur in relative clauses as in the following concordance lines.

-cies are. This result suggests that **individuals who perceive** differences with the
nt opportunities. For instance, **individuals who perceive** race and ethnicity as
ersuasive than shorter, verbal ones. **Individuals perceive** longer written arguments as
claim that they are racist. Therefore, **individuals who do not perceive** situations as
a longer explanation. Hypothesis 2: **Individuals who perceive** the situation as less

Figure 3: *Concordance lines of perceive and individual*

When *neural* collocates with *self*, they tend to form compound nouns *self-...* as occur in the following concordance lines.

revealed that the activation of a **neural circuit for processing self-relevant** verbal
: Han, 2007), suggesting that the **neural correlates of self-perception** (like other
of priming procedures in **neural investigations of the self** circumvents pote
) . Complementing studies on the **neural substrates of self-referential thought** note
rains: fMRI study of their flexible **neural representation of self** and significant othe
lel for understanding the flexible **neural representation of the self** and others

Figure 4: *Concordance lines of neural and self*

Co-occurrences of lexical bundles and keywords

The co-occurrences exist in the very limited scope, i.e. in a research article or in the larger scope, i.e. in several research articles. *Face* and *the extent to which* co-occur seven times in one research article as in ... *cultural differences in the extent to which negative and positive face threats would ...* . It has been discussed *the extend to which* reveals measurement. Therefore, the focus of the research is to measure face threats. There are also co-occurences that appear in five articles those are collocations of *negative* and *the extend to which*.

Conclusion

The use of lexical bundles has particular functions that show the characteristics of psychology research articles. The analysis of the keywords shed light on the issues mainly discuss in this register. Some lexical bundles co-occur with keywords and the co-occurrences reveal how language chunks and single word carry specific meaning that becomes the essence of the discourse.

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