

**An Investigation of Prepositions in the Fixed Frame
[PREP *the NOUN of*]: A Corpus-based Study of *from*,
against, *among*, *above*, *onto*, and *beside***

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Abstract

Most previous studies on prepositions have largely been discussed from the perspective of a polysemy network or have focused on featuring the geographical representations of individual prepositions. This study analyzed data containing [PREP *the NOUN of*] patterns with six different prepositions (PREP) retrieved from the British National Corpus. In the sequences of words retrieved quantitatively from the corpus, we found the NOUNs shared by different prepositions and the semantic concepts denoted by these nouns. More importantly, we also showed the different degrees of literal and metaphorical uses, which increase one's understanding of different prepositions when they appear under the same parameter.

Keywords: Prepositions, Semantic Concept, Literal, Metaphorical, Fixed Frame, Corpus

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1. Introduction

It is often said that very common words just waste space in a dictionary, that their proper place is in a grammar, and that no one would ever look them up in a dictionary.... [W]ords like, *the*, *of*, *and*...are frequently said to lack semantic meaning altogether. (Sinclair, 1991: 81)

When it comes to prepositions, the statements in the excerpt above are considered “common practice,” and Sinclair (1991:81) used them as counterexamples in introducing the analysis of *of*. Those who have invested time in preposition research would disagree that prepositions contain no meanings or that prepositions are altogether understudied. Many (e.g., Lindstromberg, 1998; Tyler and Evans, 2003) have analyzed prepositions and provided the meaning extensions of individual prepositions. Researchers who have worked on prepositions have proven that prepositions are not only rich in meanings, they also have complex constructions. In what follows, we will review the different dimensions of prepositions, some aspects of which have been a source of difficulties for many researchers.

Despite being a long-established grammatical category, the English preposition and its functions have always stimulated controversial discussions. Sinclair (1991: 85) stated that most of the uses of *of* are “in nominal groups,” such as in *this kind of problem*, *the axis of rotation*, etc.; however, “[a]round twenty per cent of the occurrence of *of* is not part of the regular structure of nominal groups” (e.g., *of course*, *in spite of*, *made up of*, *capable of*, etc.). In the latter, the roles of *of* are sometimes hard to pinpoint because *of* is not treated individually but as part of the constituent. In our study, we specified a particular construction, [PREP *the* NOUN *of*], to examine the single prepositions that appeared in multiple configurations, including whether these prepositions appeared in or outside nominal groups. Because prepositions form too many possible constructions, parameter-setting was a priority in our current work. We will further justify the selection of the fixed frame used in this study in the following discussion.

Analyzing prepositions can be a difficult task, one of the reasons being that although prepositions are individual function words, their meanings are often completed by other words. For example, *up* has many uses that refer to ‘direction’; however, *make up* (either ‘to invent an explanation’ or ‘to put make-up such as powder and lipstick on someone’s face’, meanings taken from the *Macmillan Phrasal Verbs Plus Dictionary*) does not necessarily contain the direction meaning, although one could still argue that it is related to direction in some metaphorical way. Furthermore, *up* in *make up* is closely adhered to the verb, but *up* in *fly up in the sky* might be different because it is closer to the nominal group *the sky*. The distinction between these two examples is often said to be the difference between particles and prepositions, which can be distinguished by testing criterion to find out whether the prepositions form a constituent with verbs or with nearby words such as noun phrases.

From the above, it is clear that prepositions do not appear alone but as a constituent, as Jakendoff (2002) has emphasized. We will also show that prepositions are polysemous in meanings and complicated in syntactic structure. Due to the various meanings and combinations of prepositions, they have raised considerable interest in the past. Some have looked at specific prepositions, while others have looked at various prepositions with similar combinations. Among many, Dirven (2001) provided a network for [*walk/get/put/come + across*], Ishii (2003) analyzed P-NP (e.g., *in year, between parties*) and V-PP (e.g., *come in, distinguish between*) for a group of English prepositions, and Rudzka-Ostyn (2003) provided the image schema and visualization of almost every preposition. These approaches differed in that some aimed to explain specific prepositions and others aimed to explain the patterns found when specific prepositions are present. Analyzing the semantic network of prepositions is also a process of understanding the meaning extensions of a preposition, and thus many studies that provided the semantic network of each preposition also included a discussion of metaphorical meanings.

Ishii’s (2003: 21) study analyzed the verbs preceding the prepositions, as well as the nouns following them, as it was observed that these are constructions of “spatial metaphors.” Although Ishii (2003: 22) shared some similar ideas with the current work when he stated that “the complement nouns of these prepositions...constitute a semantic category sharing some aspects of meaning,” unfortunately, he did not calculate the

literal-metaphorical patterns. Moreover, metaphorical instances were discussed qualitatively by reading through the list of verbs and nouns extracted from the corpus.

In our study, we used the fixed frame [PREP *the* NOUN *of*] to retrieve the different combinations of the six prepositions under study—*from*, *against*, *among*, *above*, *onto*, and *beside*—based on its advantages. First, this frame has two free variables, which are PREP and NOUN. In other words, these two slots could be filled with possible candidates from the corpus. Under each type of preposition, we found various NOUNs and by grouping these NOUNs, we found information on their semantic concepts, as well as their denotation of literal and metaphorical meanings. Second, because our data were analyzed quantitatively, the fixed frame allowed us to collect distributional information on the literal and metaphorical meanings, as well as the proportions of different prepositions and noun types that fit this frame, which facilitated a syntagmatic analysis of the frame (i.e., a literal-metaphorical analysis of the words in the horizontal combinations), as well as a paradigmatic analysis of the PREP and NOUN (i.e., an analysis of the variety of the two free variables in the frame).¹

For the metaphor analysis, our study distinguished the literal from the metaphorical and further divided the metaphorical into temporal and non-temporal categories, as time is also a prominent concept of the fixed frame. Quoting Lakoff (1987), Zelinsky-Wibbelt (1993: 5) stated that “all abstract concepts are metaphorizations and metonymies of semantically concrete spatial predications” and that “every thought is ultimately linked to the structure of spatial concepts which grow out of our preconceptual structure of experience.” Thus, distinguishing spatial from non-spatial is a plausible way to categorize prepositional concepts.

We aimed to answer the following questions:

- (1) (a) What kind of information is embedded in the fixed frame [PREP *the* NOUN *of*]?
(b) What are the distributions of the literal and metaphorical meanings of the six prepositions found in the fixed frame [PREP *the* NOUN *of*]?

¹ Our fixed frame is unlike Biber, Conrad, and Cortes’s (2004) lexical bundles, since works on lexical bundles usually do not specify the words to be examined.

In what follows, we will first look at the approaches to studying prepositions, and then present the methodology and findings to answer these questions.

2. Prepositions and Related Approaches

In the past, several main approaches to preposition analyses have been used. These approaches are summarized below. Some approaches are rather similar, but they often identify the different elements of the prepositions.

Many preposition discussions have made use of Langacker's (1998) ground-figure concept. This concept explains two important elements linked by a preposition—the trajectory (TR) and the landmark (LM). The TR, according to Langacker (1998:10), is a moving entity or “the primary figure in the scene,” while the LM is where this entity moves or is located, and it is the secondary figure. The LM thus acts as a reference point for the TR; it can be a surface, a container, etc. that serves as the background (Langacker, 1987; Herskovits, 1988). In Langacker's (1998) example, *The knob is above the keyhole*, *the knob* is the TR and *the keyhole* is the LM. This approach is not tailor-made for prepositions, but it can be used to explain many function words in a language. To apply this approach to preposition research, one needs to annotate the ‘figure’ and the ‘ground’ for each occurrence of a preposition. However, some abstract concepts might be a little challenging when annotated using this approach. Since the fixed frame [PREP *the* NOUN *of*] was the kind of construction needed for our study, but it may not contain complete information on the TR or LM in the frame, this approach would not work well in our study.

The second approach makes use of different semantic elements in examining the prepositions. Semantic elements come in many kinds, but the most acceptable types are those such as ‘goal’, ‘source’, ‘path’, ‘figure’, ‘ground’, etc. In one study, Taylor (1993) explained the meaning extension of English prepositions via the polysemization process of ‘place’, ‘path’, and ‘goal’. In this approach, we also found Talmy's (2000) discussion of prepositions (and particles) based on their relationships with motion verbs in a model called motion events. Talmy suggested that six cognitive components are responsible for the conceptual structure of a motion event, namely four essential components (i.e., ‘figure’, ‘ground’, ‘motion’, and ‘path’) and two optional components (i.e., ‘manner’

and 'cause'). These components were found to correspond with verbs, which we did not include in the fixed frame [PREP *the* NOUN *of*].

The annotation of the semantic elements of nouns can also be seen in De Vega et al.'s (2002) work, which analyzed the semantics of the nouns before and after the prepositions in a model called the Integration Hypothesis. For a sentence such as *The girl is in front of the mirror, the girl* (Noun 1) is the 'figure' noun while *the mirror* (Noun 2) is the 'ground' noun, which is similar to the terminology used in Langacker (1998: 121). Noun 1 and Noun 2 were analyzed according to 'animacy', 'partitivity', 'countability', 'solidity', 'mobility', 'relative size', 'figure-ground contact', and 'speaker's projected point of view'. De Vega et al.'s (2002) study provided a different dimension of the annotation of semantic elements, not of the prepositions but of the nouns appearing before and after the prepositions. Some of the elements were in a 'relative' relationship (e.g., 'relative size', 'figure-ground contact', etc.), but these elements do not work well with constructions of prepositions that contain one noun only.

The third approach is the establishment of a semantic network of prepositions. Some of the representative works include Tyler and Evans (2001, 2003), which postulated that there is a primary sense associated with a preposition, based on which the other related senses (called "distinct senses" by Tyler and Evans, 2001) extend from in a principled way. For example, the use of *in* in *A note written in pencil* is a distinct sense that denotes a method; it is not a primary sense, which is often spatial in meaning. The semantic network approach has gained popularity because it is able to link all the different uses of a preposition to provide a complete picture of how a meaning evolves from one another. The representation of meanings using a geographical representation of a semantic network is in some ways similar to the image schema approach, to be explained below, although this approach focuses more on finding the core concept of related meanings.

The use of image schema has become the main interest of many cognitive linguistic studies on prepositions. Among many prepositions, the preposition *over* has been extensively studied (cf. Brugman, 1981; Lakoff, 1987; Tyler and Evans, 2003). In particular, Brugman (1981) examined the different senses of the preposition *over* by using image schema, which are spatial constructs such as CONTAINER, PATH,

PART-WHOLE, POINT, SURFACE, etc., following Johnson's (1987) and Lakoff's (1987) conceptual metaphor theory and cognitive model of embodiment. Some image schema are the basis of human embodiment. In every image schema, there is a schematic pattern with an internal structure. For example, in the PATH schema, Johnson (1987) claimed that it involves a starting point and an end-point. To link the two points, a sequence of locations is found. The CONTAINER image schema is related to the use of *in* and *out* in expressing emotions in English in metaphorical systems, such as PEOPLE ARE CONTAINERS FOR EMOTIONS, ABSTRACT ENTITIES ARE CONTAINERS, and EMOTIONS/EMOTIONAL STATES ARE CONTAINERS (Peña, 1998).

Working similarly on metaphor identification, our approach was not based on image schema, but individual image schema of different prepositions can be found in Boers (1996), Lindstromberg (1998), and many others. We aimed to distinguish literal meanings from metaphorical meanings, as well as the temporal from the non-temporal, for all expressions that were found in our fixed frame. Compared to previous researchers' approaches, our goal was different because we aimed to deal with multiple prepositions that combined with different NOUNs. These prepositions were not analyzed individually as in most studies. In terms of definitions, many others have provided the distinction between literal and metaphorical meanings, but we particularly referred to Tyler, Mueller, and Ho's (2011) definitions. If a pattern refers to the physical relationships of things in space, it has a literal meaning; if it refers to a non-spatial idea, it is metaphorical. We will discuss examples of these patterns in the methodology section.

As can be seen from the review of approaches above, most of the studies discussed so far have tried to deal with prepositions by either explaining the positions between the figure and the ground, or between the trajectory and the landmark, or the relationship between primary and extended meanings. Studies that incorporated a semantic analysis of prepositions, such as Boers (1996), Lindstromberg (2001), and Tyler and Evans, (2003) were mainly based on individual prepositions. Other studies include Schulze's (1993) work on *(a)round*, etc.; Peña's (1998) inspection of *in* and *out*; Otani's (2006) conceptual investigation of *up* and *down* in English; and Owen's (2009) reanalysis of Sinclair's *of*. These are all interesting works on prepositions, but they did not compare several prepositions under the same parameter. To enable the observation of multiple

prepositions that were collected under the same parameter, we resorted to using a fixed frame. In this way, we could observe the changes of PREPs and NOUNs in the slots. Previous studies on prepositions have paid more attention to schematic geometric figures, but our study combined construction, semantic annotation, and metaphorical analyses in analyzing six prepositions.

3. Methodology

We searched for the pattern [PREP *the* NOUN *of*] using the British National Corpus on the web (BNCweb) (Hoffmann et al., 2008), a platform that allows searches of corpus data from the written section of the BNC, and found 373,258 hits in 3,108 different texts (i.e., 4,246.22 instances per million words). Then, from the results we selected six prepositions to insert into the fixed frame [PREP *the* NOUN *of*]. These six prepositions were selected because they have been less discussed in the past in terms of their uses. The prepositions in the fixed frame and the number of instances retrieved from the corpus are shown in Table 1 below, which shows the total instances in the corpus and the frequencies per million, as well as the number of instances we analyzed for this study².

As shown in Table 1, there were a total of 21,239 instances of the six prepositions selected. However, to collect selective data for analysis, we only collected the collocates from the top 100 collocates, resulting in a total frequency of 9,386 for analysis. The meanings of these six prepositions taken from the Merriam-Webster Learner's Dictionary online (<http://www.learnersdictionary.com/>) are given in Table 2 below:

² Thanksto Yen-Yu Lin and Min-Chien Lee, who contributed to the early stage of this project. The previous version of this paper was presented at the 2013 ACE Conference, co-authored by Lee, who has expressed no interest in participating in the revision of this paper. The author would like to thank the Ministry of Science and Technology (project grants 101-2410-H-004-176-MY2 and 106-2410-H-004-109-MY2) for supporting the research herein.

Table 1: The Number of Instances Found in the BNCweb and the Number of Instances Analyzed

The Fixed Frame [PREP <i>the</i> NOUN <i>of</i>]	Number of Instances	Per Million	Top 100 Collocates
[<i>from the</i> NOUN <i>of</i>]	16,994	193.33	7,132
[<i>against the</i> NOUN <i>of</i>]	2,819	32.07	1,287
[<i>among the</i> NOUN <i>of</i>]	600	6.83	347
[<i>above the</i> NOUN <i>of</i>]	555	6.31	364
[<i>onto the</i> NOUN <i>of</i>]	198	2.25	189
[<i>beside the</i> NOUN <i>of</i>]	73	0.83	67
Total	21,239	241.62	9,386

Table 2: Dictionary Meanings

<i>from</i>	<i>against</i>	<i>among</i>
1 used to indicate the starting point of a physical movement or action	1 a: in opposition to (someone or something) b: in competition with (someone or something)	1 in or through (a group of people or things)
2 used to indicate the place that something comes out of	2 used to indicate the person or thing that is affected or harmed by something	2 in the presence of (a group of people)
3 used to indicate the place where someone lives or was born	3 not agreeing with or allowed by (something, such as a law)	3 used to talk about the opinions, feelings, etc., of a group of people
4 used to indicate the starting or central point of any activity	4 a: not helping or favoring (someone)	4 used to indicate the group of people or things involved in or affected by something
5 used to indicate the starting point in measuring something	b: as a reason for disliking (someone or something)	5 used to say that a person or thing is part of a larger group
6 used to indicate a physical separation between two things	5 used to say that one thing is being compared with another	6 used to indicate the group of people or things being considered, compared, etc.
7 used to indicate something that is removed, released, blocked, or prevented	6 a: as a defense or protection from (something)	7 in shares to each of (a group of people)
8 used to indicate change to a different state or condition	b: in preparation for (something)	8 used to describe someone who is unusual or excellent in some way
9 used to indicate the material that is used to make something	7 used to describe hitting or touching something or	
10 used to indicate the source of something		
11 used to indicate the basis		

or cause of something 12 used to indicate the lowest point, amount, etc., in a range 13 used to indicate the group or number of people or things out of which someone or something is chosen or selected	someone 8 in a direction opposite to the movement of (something) 9 with the background of (something) 10 as a charge on (something)	
<i>above</i>	<i>onto</i>	<i>beside</i>
1: in or to a higher place than (something) : OVER 2: greater in number, quantity, or size than (something) : more than (something) 3 a: to a greater degree or extent than (something) b: in a higher or more important position than (something) 4 having more importance or power than (someone) : having a higher rank than (someone) 5 too important for (something) : not able to be affected by (something) 6 too good for (some type of behavior, work, etc.) 7 more loudly and clearly than (another sound)	1 to a position that is on (something, such as a surface, area, or object) 2 in a direction that allows you to get to or see (something) 3 a: used to say that someone knows about what someone is doing or has done b: used to say that someone is becoming aware of or is finding something 4 chiefly British : in the process of talking to (someone) usually to tell or ask something	1 by the side of (someone or something) : next to (someone or something) 2 in comparison with (something)

Among these six prepositions, [*from* the NOUN *of*] was the most frequent pattern, which corresponds to the highest number of senses in Table 2. It is interesting to observe that the frequency of the six prepositions in the corpus (see Table 1) corresponds to the sense number in the dictionary, indicating that the number of meanings possessed by the prepositions may affect their frequency of use.³

³ Yet in our data collection, we collected slightly more instances of *among* compared with *above*. This might be due to the high number of collocate types with a lower frequency for *among* than for *above* (i.e., the top 100 collocates are not especially higher in frequency for *among* than those for *above*).

For the analysis of the NOUNS, we retrieved the collocate list of all six prepositions. The results were saved and processed in Microsoft Excel. The following Table 3 shows the most frequent combinations of PREPs and NOUNS, with the frequency above 500 instances:

Table 3: Top 10 Combinations of PREPs and NOUNS in [PREP *the* NOUN *of*]

<i>from</i> (16,994)			<i>against</i> (2,819)			<i>among</i> (600)		
Patterns	Freq.	%	Patterns	Freq.	%	Patterns	Freq.	%
<i>~ the point of</i>	498	2.93	<i>~ the background of</i>	176	6.24	<i>~ the members of</i>	36	6.00
<i>~ the rest of</i>	411	2.42	<i>~ the side of</i>	75	2.66	<i>~ the ranks of</i>	14	2.33
<i>~ the top of</i>	277	1.63	<i>~ the wishes of</i>	62	2.20	<i>~ the peoples of</i>	12	2.00
<i>~ the end of</i>	273	1.61	<i>~ the use of</i>	49	1.74	<i>~ the people of</i>	11	1.83
<i>~ the Department of</i>	225	1.32	<i>~ the wall of</i>	47	1.67	<i>~ the highlights of</i>	9	1.50
<i>~ the beginning of</i>	212	1.25	<i>~ the interests of</i>	41	1.45	<i>~ the majority of</i>	8	1.33
<i>~ the date of</i>	204	1.20	<i>~ the advice of</i>	36	1.28	<i>~ the mass of</i>	6	1.00
<i>~ the centre of</i>	203	1.19	<i>~ the forces of</i>	31	1.10	<i>~ the leaders of</i>	6	1.00
<i>~ the sale of</i>	198	1.17	<i>~ the backdrop of</i>	28	0.99	<i>~ the group of</i>	6	1.00
<i>~ the back of</i>	181	1.07	<i>~ the back of</i>	28	0.99	<i>~ the rest of</i>	6	1.00
<i>above</i> (555)			<i>onto</i> (198)			<i>beside</i> (73)		
Patterns	Freq.	%	Patterns	Freq.	%	Patterns	Freq.	%
<i>~ the level of</i>	57	10.27	<i>~ the surface of</i>	15	7.58	<i>~ the bed of</i>	4	5.48
<i>~ the noise of</i>	32	5.77	<i>~ the end of</i>	14	7.07	<i>~ the mouth of</i>	2	2.74
<i>~ the surface of</i>	23	4.14	<i>~ the back of</i>	13	6.57	<i>~ the pile of</i>	2	2.74
<i>~ the rate of</i>	16	2.88	<i>~ the top of</i>	11	5.56	<i>~ the Loch of</i>	2	2.74
<i>~ the sound of</i>	14	2.52	<i>~ the front of</i>	9	4.55	<i>~ the statue of</i>	2	2.74
<i>~ the heads of</i>	13	2.34	<i>~ the side of</i>	6	3.03	<i>~ the dictums of</i>	1	1.37
<i>~ the age of</i>	13	2.34	<i>~ the streets of</i>	4	2.02	<i>~ the count of</i>	1	1.37
<i>~ the top of</i>	11	1.98	<i>~ the roof of</i>	4	2.02	<i>~ the river of</i>	1	1.37
<i>~ the rest of</i>	8	1.44	<i>~ the floor of</i>	4	2.02	<i>~ the crates of</i>	1	1.37
<i>~ the roar of</i>	7	1.26	<i>~ the sides of</i>	3	1.52	<i>~ the truth of</i>	1	1.37

Table 3 shows the most frequently appearing patterns in the corpus. We then analyzed the semantic meanings of the NOUNS in the fixed frame, followed by the top 100 types of NOUNS for each preposition one by one by mapping them to the NOUNS' senses. For example, [*from the top of*] was searched in the dictionary for its meaning

and its uses in the corpus. One of the examples is given in (2) below, where *top* was annotated as ‘refer to sites, locations, point in space’:

- (2) [**From the top of**] *the dome of St Paul’s Cathedral the view is no longer dominated by City church steeples but by an intrusive cacophony of drab, characterless Sixties boxes.*

In (2), the steps cannot be replaced by matching the meanings of the prepositions to the senses in Table 2. We had to search and categorize each NOUN according to its semantic type, which shows the significance of this work.

In the next step, all noun types for each preposition in the [PREP *the* NOUN *of*] fixed frame were then analyzed for meaning, either literal or metaphorical. To use Tyler, Mueller, and Ho’s (2011) definitions, if the NOUN referred to a physical relationship or something spatial and concrete, it was coded as having a literal meaning; if it referred to a non-spatial idea, it was coded as metaphorical. All categorizations were made by reading each instance to avoid the confusion of meanings.⁴ For example, the instance in (3) below was coded as metaphorical:

- (3) *The impression that several Northampton players were suffering [**from the effects of**] last Tuesday’s victory at Leicester was endorsed afterwards, and rarely could Olver, Bayfield and Shelford have had such ineffective games.*

All of the numbers and percentages for the [PREP *the* NOUN *of*] fixed frame were calculated and presented, and the analysis process was applied to all Excel files for the six prepositions. An additional category, Others, was added because some NOUNs were proper nouns or nouns with a general meaning such as *use, meaning, rest*, etc. Some of these nouns were shell nouns (cf. Schmid, 2000) that carried a general meaning (Mahlberg, 2005), such as (4) below⁵:

⁴ The brackets in the sentences only highlight the pattern of interest. The actual constituent may extend beyond the brackets.

⁵ Naming them shell nouns with a general meaning does not lower their importance in discourse, as argued in Schmid (2000) and Flowerdew (2010), among many others.

(4) *Douglas Adams' Mostly Harmless (Pan, £4.99) stands head and shoulders [above the rest of] the pack.*

The others category also contained uncategorized items. In other words, its members could also include NOUNs that did not form any patterns with other NOUNs for the same preposition.

4. Results and Discussion

After coding the data, we calculated the instances of different meanings of the [PREP *the* NOUN *of*] pattern for each preposition. The meanings of [PREP *the* NOUN *of*] were categorized into three groups: Literal, Metaphorical, and Others. The results are shown in Table 4 and Figure 1, arranged from the most literal on the left to the most metaphorical on the right:

Table 4: Instances and Percentages of Literal and Metaphorical Uses

[PREP <i>the</i> NOUN <i>of</i>]	Instances (%) of the Meaning of the Pattern	Literal (%)	Metaphorical (%)	Others (%)	Total (%)
	[<i>from the</i> NOUN <i>of</i>]		3446 (48.32%)	2707 (37.96%)	979 (13.72%)
[<i>against the</i> NOUN <i>of</i>]		171 (13.29%)	874 (67.91%)	242 (18.80%)	1287 (100.00%)
[<i>above the</i> NOUN <i>of</i>]		141 (38.74%)	193 (53.02%)	30 (8.24%)	364 (100.00%)
[<i>among the</i> NOUN <i>of</i>]		161 (46.40%)	159 (45.82%)	27 (7.78%)	347 (100.00%)
[<i>onto the</i> NOUN <i>of</i>]		157 (83.07%)	13 (6.88%)	19 (10.05%)	189 (100.00%)
[<i>beside the</i> NOUN <i>of</i>]		52 (77.61%)	13 (19.40%)	2 (2.99%)	67 (100.00%)

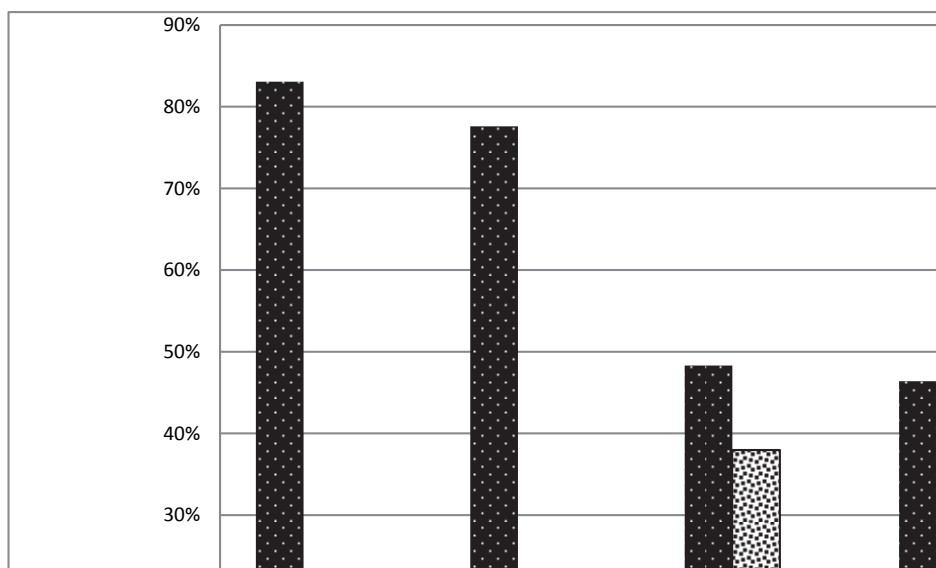


Figure 1. Literal and Metaphorical Instances of [PREP *the* NOUN *of*]

On the left-hand side of Figure 1, it can clearly be seen that for the PREPs *onto* and *beside*, more than 70% of the instances conveyed literal meanings. Four examples in (5) are listed as follows:

- (5) (a) *The kinetic treatment of crystallization from the melt is based on the radial growth of a front through space and can be likened to someone scattering a handful of gravel [onto the surface of] a pond.*
- (b) *...and sharp pointed yellow crocuses spiked through [beside the roots of] the tree.*
- (c) *Darwin is important in any history of the environmental sciences because his theory focused attention [onto the problem] of how species become adapted to their environment.*
- (d) *Even mistakes which diminish reputation will not count if they pale into minor significance [beside the truth of] major charges.*

More than 80% of the examples for [*onto the* NOUN *of*] refer to a location in space; [*onto the surface of*] in (5a) is a very typical example. As for *beside*, many of the

instances stated the physical relationship of things in space, and thus led to a literal, spatial meaning. Even though *onto* and *beside* have many literal meaning instances as shown above, there was still some data that conveyed a non-spatial, metaphorical meaning (e.g., [*onto the problem of*] in (5c), [*beside the truth of*] in (5d), etc.).

On the right-hand side of Figure 1, for the PREPs *against* and *above*, more than half of the instances conveyed a metaphorical meaning. Two typical examples are listed in (6) below:

- (6) (a) *Peter's explanation of his actions is [**against** the background of] conflict and prejudice.*
(b) *...wages rose by 9 per cent in 1990—well [**above** the level of] inflation.*

Despite the many metaphorical instances of [*against the NOUN of*] and [*above the NOUN of*] conveying a non-spatial meaning, a small number of these prepositions that denoted literal uses was also seen (e.g., *against the wall of the lobby* and *above the surface of the water*).

Finally, the center of Figure 1 shows that for the PREPs *from* and *among*, with co-appearing NOUNs, there was a balance between literal and metaphorical meanings, four examples of which are listed in (7) below:

- (7) (a) *He climbed to the upper level, and [**from** the top of] the stairs he could see a wide slice of moonlight....*
(b) *What matters is the appraisal of the outcomes of their behavior [**from** the point of] view of economic efficiency.*
(c) *The seeds of the forest lay [**among** the bones of] the vole and the owl and the wolf and the man.*
(d) [**Among** the hundreds of] *pre-programmed sound effects, custom cursors, custom icons and animated wallpapers are a talking clock,....*

Examples (7a) and (7b) show that when the PREP is *from*, the fixed frame [PREP *the* NOUN *of*] refers to a space, as in (7a), and a non-spatial viewpoint meaning, as in (7b). Example (7c) shows that [*among the NOUN of*] has a literal meaning, while *among* in (7d) has a non-spatial and metaphorical meaning.

As part of the metaphorical meanings, some collocates of [PREP *the* NOUN *of*] were either temporal expressions (e.g., [*from the date of*]) or non-temporal expressions (e.g., [*against the refusal of*]). We further categorized the metaphorical uses into two groups, the results of which are shown in Table 5 and Figure 2 below:

Table 5. Temporal and Non-temporal Uses of All Metaphorical Meanings

Preposition	Temporal	%	Non-temporal	%	Total
<i>beside</i>	0	0.00%	13	100.00%	13
<i>from</i>	627	23.16%	2080	76.84%	2707
<i>against</i>	20	2.29%	854	97.71%	874
<i>above</i>	0	0.00%	193	100.00%	193
<i>among</i>	0	0.00%	159	100.00%	159
<i>onto</i>	0	0.00%	13	100.00%	13

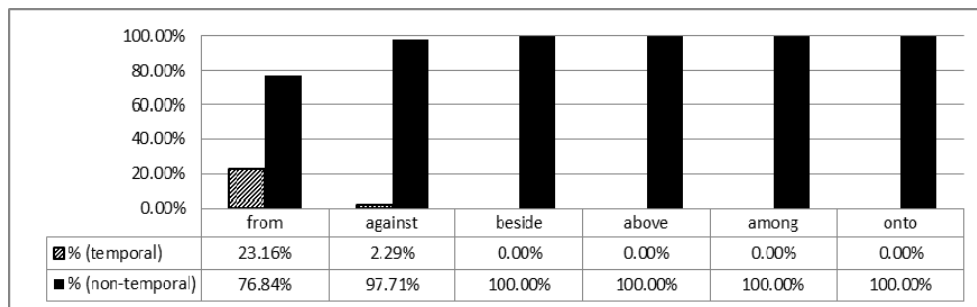


Figure 2. Temporal and Non-temporal Uses of all Metaphorical Meanings

Figure 2 shows the percentages of the prepositions functioning as temporal and non-temporal phrases. Most of the prepositions did not have a temporal use, except for *from* and *against* on the left-hand side of Figure 2. Comparing Figure 1 and Figure 2, a majority of the metaphorical meanings in Figure 1 did not have temporal meanings, and the temporal meanings in Figure 2 constituted very little of the overall metaphorical uses. For instance, *among* and *above* showed high metaphorical use but their metaphorical instances were non-temporal in their entirety. Thus, not all prepositions have temporal meanings, and not all of them have a similar proportion of literal and metaphorical meanings. Moreover, the various patterns of the six prepositions could

only be revealed by counting their instances in the corpus. In what follows, we also collected the types of nouns shared by the six prepositions.

In Table 6, we selected the NOUNs shared by at least two out of the six prepositions, with a frequency above 10. In this table, the singular and plural forms were treated separately.

Table 6: Shared NOUNs by Different PREPs (Freq. > 10; No. of PREP ≥ 2)

Shared NOUNs	PREPs	Freq.	%	Shared NOUNs	PREPs	Freq.	%
<i>age</i>	<i>above</i>	13	0.06	<i>members</i>	<i>among</i>	36	0.17
	<i>from</i>	155	0.73		<i>from</i>	11	0.05
<i>back</i>	<i>against</i>	28	0.13	<i>possibility</i>	<i>against</i>	27	0.13
	<i>from</i>	181	0.85		<i>from</i>	17	0.08
	<i>onto</i>	13	0.06	<i>ranks</i>	<i>among</i>	14	0.07
<i>cost</i>	<i>against</i>	15	0.07		<i>from</i>	61	0.29
	<i>from</i>	14	0.07	<i>rest</i>	<i>against</i>	12	0.06
<i>creation</i>	<i>against</i>	13	0.06		<i>from</i>	411	1.93
	<i>from</i>	35	0.16	<i>risk</i>	<i>against</i>	15	0.07
<i>decision</i>	<i>against</i>	15	0.07		<i>from</i>	26	0.12
	<i>from</i>	15	0.07	<i>side</i>	<i>against</i>	75	0.35
<i>edge</i>	<i>against</i>	15	0.07		<i>from</i>	57	0.27
<i>edges</i>	<i>from</i>	116	0.55	<i>sides</i>	<i>against</i>	20	0.09
		14	0.07		<i>from</i>	18	0.08
<i>effect</i>	<i>from</i>	24	0.11	<i>sound</i>	<i>above</i>	14	0.07
<i>effects</i>		112	0.53		<i>from</i>	28	0.13
		<i>against</i>	16	0.08	<i>surface</i>	<i>above</i>	24
<i>end</i>	<i>from</i>	273	1.29	<i>from</i>		48	0.23
<i>ends</i>		13	0.06	<i>onto</i>		15	0.07
<i>end</i>	<i>onto</i>	14	0.07	<i>threat</i>	<i>against</i>	17	0.08
<i>idea</i>	<i>against</i>	24	0.11		<i>from</i>	28	0.13
	<i>ideas</i>	<i>from</i>	32	0.15	<i>top</i>	<i>above</i>	11
11			0.05	<i>from</i>		277	1.30
<i>level</i>	<i>above</i>	57	0.27	<i>onto</i>		11	0.05
	<i>from</i>	16	0.08	<i>tops</i>	<i>from</i>	12	0.06
<i>likes</i>	<i>against</i>	17	0.08	<i>use</i>	<i>against</i>	49	0.23
	<i>from</i>	63	0.30		<i>from</i>	113	0.53
<i>people</i>	<i>among</i>	11	0.05	<i>wall</i>	<i>against</i>	47	0.22
<i>peoples</i>		12	0.06		<i>from</i>	10	0.05
<i>people</i>	<i>against</i>	12	0.06	<i>walls</i>	<i>against</i>	14	0.07
	<i>from</i>	21	0.10		<i>from</i>	17	0.08

Table 6 shows that *from* and *against* shared many similarities in terms of the NOUNs both collocated with: *cost, creation, decision, edge(s), effect, idea, possibility, rest, risk, side(s), threat, use, likes, and wall(s)*. The NOUNs, *back, surface, top, and people(s)* were shared by three out of the six prepositions, indicating their flexibility in meaning to accommodate several prepositions. Among the six prepositions, only *beside* did not occur in Table 6. This could be due to one of two reasons: (a) *beside* behaved differently than the other five prepositions; or (b) *beside* was too low in frequency to appear in this table (i.e., its collocates were not above 10 in frequency). When we took a closer look at the collocates of *beside*, we found one phenomenon—its collocates were often literal, indicating locations most of the time. Although its frequency was low, *beside* did not behave too differently than the other prepositions, especially in its literal meanings. Thus, the first reason was rejected in favor of the second reason, that *beside* was too low in frequency to appear in Table 6. To observe which prepositions also behaved similarly to *beside*, we looked at *beside* in particular,⁶ the list of which is provided in Appendix Table A. We found that *beside* also shared many NOUNs with other prepositions. The collocates shared by at least four out of the six prepositions were *ability, arm(s), back, bank, bed, body, door, edge(s), figure, head, House, kind, knot, name(s), pile, result, river, root(s), sea, statue, trunk, and wall(s)*. The NOUNs that appeared with five out of the six prepositions were *wall(s), back, edge(s), arm(s), and bank(s)*, although there might also have been some other ones with a lower frequency that collocated with all the prepositions except *beside*. Thus, none of the NOUNs were shared by all of the prepositions because, having looked at all the NOUN collocates of *beside*, none of them appeared with all six prepositions.⁷ Five examples of *wall(s)* shared by five prepositions are given below in (8):

(8) (a) *After placating the hounds, Lorimer jumped up [onto the wall of] the house with surprising agility and began to climb the ivy.*

(b) *The sound that had made O look up came from a man who was sitting on the*

⁶ We treated *beside* separately because it had the lowest frequency, and we wanted to observe which other prepositions also collocated with the NOUNs that appeared in the list for *beside*.

⁷ Because the NOUNs shared all the prepositions except *beside*, the maximum number of shared prepositions was five.

floor, leaning [against the wall of] the tunnel, looking not much like a beggar.

- (c) *She sat in an envelope from which air was removed. This lifted the atmospheric pressure—fifteen pounds per square inch, as you may know—[from the walls of] the uterus and thus allowed the maximum free passage of blood through the maternal and infant blood vessels.*
- (d) *The tower still stands [above the walls of] the old Hindu fortress.*
- (e) *Mrs Zamzam agreed to let me photograph her and she sat a little unsteadily [beside the wall of] her home just in front of the cherry tree.*

In the next analysis, we summarized the concepts usually denoted by a group of prepositions under the fixed frame [PREP *the* NOUN *of*], as shown in Table 7 below. These concepts did not constitute the entire list, but they were shared by several prepositions in the fixed frame.

Table 7 shows that although the NOUNs vary to a great extent, we could still generalize the kinds of NOUNs that appeared with a certain group of prepositions. The semantic concepts could be adjusted to more fine-grained or more general levels, and our methodology allowed the observation of groups of prepositions, not an individual semantic network. This is one of the advantages of our work.

5. Conclusion

In Celce-Murcia and Larsen-Freeman's (1999: 401) grammar book, they stated that "[p]repositions are notoriously difficult to learn," yet they also agreed with Dirven's (1993) and Taylor's (1993) analyses that "the spatial sense of...prepositions is most prototypical, their spatial meanings can be extended metaphorically from physical to mental space" (1999: 407). Lindstromberg (1996) provided both literal and metaphorical schemata of almost all the prepositions, which showed the importance of distinguishing the literal and metaphorical meanings of prepositions. Yet, unlike others' works, we analyzed the NOUNs that appeared with six different prepositions in the fixed frame [PREP *the* NOUN *of*]. Under this parameter, we observed the shared NOUNs and their shared concepts, as well as their literal and metaphorical distributions. The meanings gathered from the NOUNs were not the dictionary meanings of the

Table 7. Semantic Concepts of NOUNs in the Fixed Frame [PREP *the* NOUN *of*]

Semantic Concepts	Prepositions	Examples
AMOUNT	<i>beside, among</i>	[<i>beside the pile of</i>] [<i>among the hundreds of</i>]
AUTHORITY	<i>above, against</i>	[<i>above the law of</i>] [<i>against the authority of</i>]
BUILDING	<i>above, against, beside, from, onto</i>	[<i>above the roof of</i>] [<i>against the wall of</i>]
EMOTION	<i>above, among, from</i>	[<i>among the grievance of</i>] [<i>from the love of</i>]
HAZARD	<i>above, against</i>	[<i>above the wrecks of</i>] [<i>against the risk of</i>]
LANDSCAPE	<i>above, among, beside, from, onto</i>	[<i>among the mountains of</i>] [<i>beside the river of</i>]
LIKE	<i>above, against</i>	[<i>above the likes of</i>] [<i>against the interest of</i>]
LOCATION	<i>above, against, from, onto</i>	[<i>above the surface of</i>] [<i>onto the front of</i>]
MEASURE	<i>above, against, from</i>	[<i>above the rate of</i>] [<i>against the weight of</i>]
PART OF BODY	<i>above, against, beside, from, onto</i>	[<i>above the heads of</i>] [<i>onto the heart of</i>]
PEOPLE	<i>above, against, among, beside</i>	[<i>among the youths of</i>] [<i>against the enemies of</i>]
REMAINS	<i>among, beside</i>	[<i>among the remains of</i>] [<i>beside the rest of</i>]
THOUGHTS	<i>above, against, from, onto</i>	[<i>onto the idea of</i>] [<i>from the viewpoint of</i>]

respective prepositions, but instead the kinds of things they modify under the same condition.

As shown in the continuum of literal-metaphorical meanings and the tendency of the uses of temporal meanings, we observed how a group of prepositions patterned similarly or differently from one another. Dirven (1993: 76) pointed out that the “extensions of meanings of a preposition from physical space via time into more abstract domains do not occur in any haphazard way but follow a path of gradually increasing abstractions.” On the other hand, we showed that the comparisons of prepositions could not be carried out consistently without delimitating their boundaries.

Prepositions have many facets of meanings, including prototypical spatial or temporal meanings and their extended metaphorical ones. These categories were observed under a similar condition.

Most studies in the past and most dictionaries have provided the different meanings of individual prepositions, but not a comparison of a group of prepositions under the same parameter. By comparing several prepositions under the same parameter using a corpus linguistic approach, we were able to see the degrees of “literalness” or “metaphoricity” among them, as well as the concepts shared by them. We did this not by collecting immediate results from the corpus but by tagging each example we collected manually, and this showed the worthiness of a corpus linguistic research. Implication-wise, the teaching of prepositions can also be multifaceted by considering literal and metaphorical uses and authentic exemplification of a corpus. In the future, the application of our analysis could be attested in classroom teaching to help students understand different prepositions better. Metaphorical competence is important but is often neglected (Danesi, 1992; Sabet and Tavakoli, 2016). An awareness of the different degrees of metaphoricity is also encouraged, as the incorporation of metaphor analysis is becoming more acceptable in second language acquisition.

Appendix

Table A: Shared Collocates That Included *beside*

Shared NOUNs	PREPs	Freq.	%	Shared NOUNs	PREPs	Freq.	%
<i>ability</i>	<i>against</i>	1	0	<i>master/Master</i>	<i>beside</i>	1	0
	<i>beside</i>	1	0		<i>from</i>	7	0.03
	<i>from</i>	5	0.02	<i>mountain</i>	<i>among</i>	1	0
	<i>onto</i>	1	0		<i>beside</i>	1	0
<i>arm</i>	<i>against</i>	4	0.02	<i>mountains</i>	<i>from</i>	1	0
	<i>beside</i>	1	0		<i>among</i>	3	0.01
	<i>from</i>	3	0.01	<i>mouth</i>	<i>from</i>	8	0.04
	<i>onto</i>	2	0.01		<i>above</i>	3	0.01
<i>arms</i>	<i>above</i>	1	0	<i>mouths</i>	<i>beside</i>	2	0.01
	<i>beside</i>	1	0		<i>from</i>	29	0.14
<i>back</i>	<i>above</i>	2	0.01	<i>name</i>	<i>from</i>	6	0.03
	<i>against</i>	28	0.13		<i>above</i>	2	0.01
	<i>beside</i>	1	0		<i>against</i>	8	0.04
	<i>from</i>	181	0.85		<i>beside</i>	1	0
	<i>onto</i>	13	0.06	<i>from</i>	14	0.07	
<i>bank/Bank</i>	<i>against</i>	3	0.01	<i>names</i>	<i>against</i>	5	0.02
	<i>among</i>	1	0		<i>among</i>	1	0
	<i>beside</i>	1	0		<i>beside</i>	1	0
	<i>from</i>	44	0.21		<i>from</i>	6	0.03
<i>banks</i>	<i>above</i>	1	0	<i>office</i>	<i>against</i>	1	0
	<i>among</i>	1	0		<i>beside</i>	1	0
	<i>beside</i>	1	0		<i>from</i>	51	0.24
	<i>from</i>	8	0.04	<i>photograph</i>	<i>above</i>	1	0
<i>bed</i>	<i>above</i>	2	0.01		<i>beside</i>	1	0
	<i>against</i>	1	0		<i>from</i>	3	0.01
	<i>beside</i>	4	0.02	<i>photographs</i>	<i>among</i>	1	0
	<i>from</i>	5	0.02		<i>pile</i>	<i>above</i>	1
<i>beds</i>	<i>from</i>	1	0	<i>against</i>		1	0
	<i>body</i>	<i>against</i>	2	0.01		<i>beside</i>	2
<i>beside</i>		1	0	<i>from</i>		3	0.01
<i>from</i>		25	0.12	<i>President</i>	<i>beside</i>	1	0
<i>onto</i>		1	0		<i>from</i>	16	0.08

An Investigation of Prepositions in the Fixed Frame [PREP *the* NOUN *of*]

<i>count</i>	<i>against</i>	2	0.01	<i>presidents</i>		2	0.01
	<i>beside</i>	1	0	<i>queen/Queen</i>	<i>beside</i>	1	0
	<i>from</i>	1	0		<i>from</i>	4	0.02
<i>development</i>	<i>against</i>	6	0.03	<i>results</i>	<i>against</i>	4	0.02
	<i>beside</i>	1	0		<i>among</i>	2	0.01
	<i>from</i>	27	0.13		<i>beside</i>	1	0
<i>door</i>	<i>above</i>	3	0.01	<i>result</i>	<i>from</i>	46	0.22
	<i>against</i>	7	0.03		<i>from</i>	2	0.01
	<i>beside</i>	1	0	<i>river</i>	<i>above</i>	1	0
	<i>from</i>	7	0.03		<i>against</i>	1	0
<i>dream</i>	<i>beside</i>	1	0		<i>beside</i>	1	0
	<i>from</i>	2	0.01	<i>from</i>	1	0	
<i>Duke</i>	<i>beside</i>	1	0	<i>rivers</i>	<i>from</i>	2	0.01
	<i>from</i>	21	0.10	<i>root</i>	<i>above</i>	2	0.01
<i>edge</i>	<i>above</i>	4	0.02		<i>from</i>	3	0.01
	<i>against</i>	15	0.07	<i>roots</i>	<i>among</i>	5	0.02
	<i>beside</i>	1	0		<i>beside</i>	1	0
	<i>from</i>	116	0.55		<i>from</i>	9	0.04
	<i>edges</i>	<i>onto</i>	3	0.01	<i>sea/Sea</i>	<i>above</i>	1
<i>against</i>		1	0	<i>among</i>		1	0
<i>from</i>		14	0.07	<i>beside</i>		1	0
<i>estuary</i>	<i>onto</i>	2	0.01	<i>shore</i>	<i>from</i>	4	0.02
	<i>beside</i>	1	0		<i>beside</i>	1	0
	<i>from</i>	2	0.01		<i>from</i>	3	0.01
<i>figure</i>	<i>above</i>	1	0	<i>shores</i>	<i>from</i>	4	0.02
	<i>beside</i>	1	0		<i>onto</i>	1	0
	<i>from</i>	4	0.02	<i>skill</i>	<i>beside</i>	1	0
<i>figures</i>	<i>above</i>	1	0	<i>skills</i>	<i>from</i>	4	0.02
	<i>among</i>	1	0	<i>statue</i>	<i>above</i>	1	0
<i>glitter</i>	<i>above</i>	1	0		<i>beside</i>	2	0.01
	<i>against</i>	1	0		<i>from</i>	4	0.02
	<i>beside</i>	1	0	<i>onto</i>	1	0	
<i>head</i>	<i>above</i>	2	0.01	<i>Temple</i>	<i>beside</i>	1	0
	<i>against</i>	5	0.02		<i>from</i>	11	0.05
	<i>beside</i>	1	0	<i>temples</i>	<i>from</i>	2	0.01
	<i>from</i>	37	0.17	<i>terrace</i>	<i>from</i>	4	0.02
<i>headquarters</i>	<i>beside</i>	1	0	<i>terraces</i>	<i>beside</i>	1	0

<i>heap</i>	<i>from</i>	6	0.03	<i>tomb</i>	<i>beside</i>	1	0
	<i>among</i>	1	0		<i>from</i>	5	0.02
	<i>beside</i>	1	0	<i>tombs</i>	<i>from</i>	2	0.01
	<i>from</i>	2	0.01		<i>trunk</i>	<i>against</i>	6
<i>House</i>	<i>against</i>	2	0.01	<i>beside</i>		1	0
	<i>beside</i>	1	0	<i>from</i>		3	0.01
	<i>from</i>	73	0.34	<i>onto</i>		1	0
	<i>onto</i>	1	0	<i>truth</i>	<i>against</i>	1	0
<i>Institute</i>	<i>beside</i>	1	0		<i>beside</i>	1	0
	<i>from</i>	28	0.13		<i>from</i>	1	0
<i>Institutes</i>		1	0			<i>truths</i>	1
<i>kind</i>	<i>against</i>	6	0.03	<i>wall</i>	<i>against</i>	47	0.22
	<i>among</i>	1	0		<i>beside</i>	1	0
	<i>beside</i>	1	0		<i>from</i>	10	0.05
	<i>from</i>	36	0.17		<i>onto</i>	2	0.01
<i>kinds</i>	<i>against</i>	1	0	<i>walls</i>	<i>above</i>	1	0
	<i>among</i>	1	0		<i>against</i>	14	0.07
	<i>from</i>	7	0.03		<i>beside</i>	1	0
<i>knot</i>	<i>above</i>	1	0		<i>from</i>	17	0.08
	<i>among</i>	1	0		<i>onto</i>	1	0
	<i>beside</i>	1	0		<i>wives</i>	<i>beside</i>	1
	<i>from</i>	4	0.02	<i>from</i>		2	0.01
<i>loss</i>	<i>against</i>	6	0.03	<i>work</i>	<i>among</i>	2	0.01
	<i>beside</i>	1	0		<i>from</i>	97	0.46
	<i>from</i>	25	0.12		<i>beside</i>	1	0

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介系詞 *from, against, among, above, onto* 和 *beside* 於固定 框架 [PREP *the* NOUN *of*] 的研究：以語料庫為本的研究

鍾曉芳*

摘 要

有關介系詞的眾多研究主要聚焦於討論介系詞的多義性，亦或是其出現位置的特徵描述。本研究利用英國國家語料庫 British National Corpus (BNC) 檢索 [PREP *the* NOUN *of*] 結構中六組不同介系詞的語料。透過大量的語料分析，我們彙整出這六組結構中共現搭配的名詞及這些名詞所表達的語義概念。除此之外，我們也比較六種不同介系詞的字面義和隱喻中所表現不同程度的使用，以期有助於增進對不同介系詞出現在同一個參數下的理解。

關鍵詞：介系詞、語意概念、字面意義、隱喻、固定框架、語料庫

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