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A Note on *Above* and *Below* for Discourse Reference: From the Perspective of Collocation*

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1 Introduction

This paper examines the English prepositions *above* and *below* used for discourse reference. In the written text, *above* and *below* are frequently used to refer to a unit of discourse as in (1).

- (1) a. ... the question mentioned *above*
b. ... the arguments given *below*
c. ... the picture *above*
d. The diagrams *below* illustrate... (Quirk et al. 1985: 1462)

Above in the example (1a) or (1c) is an anaphoric expression which refers to the question/picture in the preceding context. *Below* in (1b) or (1d), on the other hand, is a cataphoric expression indicating the arguments/diagrams in the subsequent part of the discourse. In the studies by Boers (1996), the aforementioned examples are regarded as metaphorical use of *above* and *below* expressing the relationship not in the spatial but in the discourse or textual domain.

As expressions of discourse reference, *above* and *below* have some common characteristics; for example, they usually occur in formal written texts, and can refer to units of varying length, even to illustrations (Quirk et al. 1985: 1462; Fillmore 1997: 103-104). However, their differences or asymmetric behaviours tend not to be examined closely. This study, in contrast, mainly analyzes their differences from the perspective of collocation, i.e. the tendency of words to be biased in the way they co-occur (Hunston 2002: 68). To be more

specific, this study investigates the nouns and verbs which tend to co-occur with *above* or *below*, using the British National Corpus (BNC).

The aim of this paper is twofold: the first aim is to show that *above* and *below* used for discourse reference actually possess differing characteristics, while the previous studies tend to have focused on their common characteristics. As explained above, this study attempts to show the differences based on their collocational pattern. The second aim is to explain that such differences are derived from a typical structure of written discourse, that is, they are motivated by an asymmetry between the preceding and subsequent discourse. Since an English text is usually written and read from the top (i.e. the beginning) to the bottom (i.e. the end), the information referred to by *above* is already known to the reader, and hence, it is easy to find. The information referred to by *below*, in contrast, is unknown to the reader when the word *below* occurs in written discourse. This paper considers how such differences motivate the asymmetric behaviour of *above* and *below*, and attempts to reveal one aspect of communication between the writer and the reader in a written discourse.

The organization of the rest of this paper is as follows. Section 2 introduces the previous studies of *above* and *below* for discourse reference. After reviewing several studies showing their common characteristics, I summarize a study indicating their differences and point out the problems that lie therein. Section 3 explains the methodologies of the research using the BNC and section 4 shows the results. Based on this, section 5 discusses the motivation of the differences between *above* and *below* from the viewpoint of typical structure of written discourse. Section 6 presents concluding remarks.

2 Previous Studies of *Above* and *Below* for Discourse Reference

2.1 Symmetric Aspect

Above and *below* are generally considered to be an antonymic pair (cf. Quirk et al. 1985: 678; Tyler and Evans 2003: 127; Murphy 2010: 120), and they can occur in the same syntactic position to express the opposite meanings. The following sentences exemplify this:

- (2) He berthed {*above* / *below*} me.
- (3) My height is {*above* / *below*} average.
- (2)

In these examples, *above* and *below* occur in the same position and indicate the opposite location along the common scale; the spatial scale along the vertical axis in (2), and the height scale in (3).

This symmetric relationship is also observed in (4), in which *above* and *below* are used for discourse reference.

(4) See {*above* / *below*}.

In this example, *above* and *below* indicate the preceding and subsequent parts of the discourse respectively. They are both peculiar to written as opposed to spoken discourse (Fillmore 1997: 103-104), especially formal written text (Lindstromberg 2010: 117). Furthermore, both of them can refer to units of varying length, even to illustrations, and the units referred to need not precede or follow immediately (Quirk et al. 1985: 1462). It is also recognized that *above* and *below* in this use usually occur without nominal complement, that is, without a linguistically expressed landmark, since “the present location in the text” can be the implicit landmark (Boers 1996: 76). Thus, they are commonly regarded as a symmetric pair and previous studies have mainly discussed their common features.

The polysemy of English prepositions has been studied in the field of cognitive linguistics since its inception (e.g. Brugman 1981; Lakoff 1987; Boers 1996; Tyler and Evans 2003), and some of these studies have also dealt with *above* and *below* used for discourse reference. They mainly focus on how their meanings are extended from the spatial senses. Boers (1996: 75) explained the semantic extension of *above* and *below* from the spatial to the discourse domain based on the metaphor “TOWARDS THE BEGINNING OF WRITTEN DISCOURSE IS UP; TOWARDS THE END IS DOWN”, which is derived from a unidirectional structure of a written text in English. This metaphor suggests that *above* and *below* usually express a symmetric location in the spatial senses and it motivates the symmetric aspect of their discourse-referential senses.

2.2 Asymmetric Aspect

As shown in the previous section, *above* and *below* as discourse-deictic elements basically

share their characteristics and behave symmetrically. However, Boers (1996) pointed out that they also have some different characteristics; *above* more often occurs as discourse-deictic element than *below*, and it has more grammatical variations as shown in (5) and (6).

(5) The *above* statement

(6) From the *above* it follows that ... (Boers 1996: 108)

While *above* in (5) and (6) occurs as an adjective and a noun respectively, *below* cannot occur in these syntactic positions. Boers (1996: 108) summarized their differences as “[i]n short, ABOVE appears even more common than BELOW in the domain of written discourse”, and explained the reason as “It is probably easier to use a known piece of information as reference point than something unknown or still to be written”.

His explanation implies that the differences in frequency and grammatical variety of *above* and *below* might be motivated by the differences between referring to known and unknown information. It suggests that the behaviour of *above* and *below* is motivated not only by the characteristics of their spatial senses but also by a typical structure of written discourse. However, their differences have still not been discussed in detail. For example, it has not been made clear whether their discourse functions are different or not, and how they reflect the structure of written discourse specifically. To reveal their differences in detail, this paper carries out quantitative research using the BNC data, and then discusses how these differences are derived from the discourse structure.

3 Data and Methods

To compare the behaviour of *above* and *below* closely, this study examined words that regularly co-occur with them, which are called collocates (cf. Firth 1957). In the field of corpus linguistics, it is assumed that the distributional pattern of a word shows its semantic and functional characteristics, as Firth (1957: 11) stated “[y]ou shall know a word by the company it keeps”. Based on this assumption, this paper used the collocational information in an attempt to reveal the characteristics of *above* and *below*.

This study extracted the data using the BNC, which is comprised of over 100 million

words of written and spoken British English, via Shogakukan Corpus Network. The interface provided by Shogakukan has a function for collocation search in which we can specify a core word, *above* or *below* in this case, and search for its collocates by specifying their grammatical categories (i.e. parts of speech). When conducting this research, I first set the grammatical category of collocates as “nouns” to investigate the nouns which tend to co-occur with *above/below*. Then, as the second search, I specified it as “verbs” to reveal the verbs which tend to be used with them.

Though the significance of each co-occurrence can be calculated in several ways, this study used *t*-score, which is a measure of the certainty of a collocation (Hunston 2002: 73), based on a comparison of the actual frequency of a lexical item with the expected frequency of that item. I sorted the co-occurring nouns and verbs by the *t*-score, and compared the highly ranked nouns and verbs between *above* and *below*.

4 Results and Discussion

This section presents the results of the research using the BNC data to quantitatively demonstrate the characteristics of *above* and *below* used for discourse reference.

4.1 Co-occurring Nouns

First, we focus on the nouns that tend to co-occur with *above* and *below*. Before showing the tendencies based on the corpus data, let us review the examples in the previous studies (Quirk et al. 1985; Boers 1996):

- (7) a. ... the question mentioned *above*
 b. ... the arguments given *below*
 c. ... the picture *above*
 d. The diagrams *below* illustrate ... (=1))
- (8) The *above* statement (=5))

Observing the nouns that co-occur with *above* or *below* in these examples, we notice that

they can be roughly classified into the following two types:

- (i) Type I : Nouns indicating the types of content or information (e.g. *question, arguments, statement*)
- (ii) Type II : Nouns indicating the formal aspects of the referents (e.g. *picture, diagrams*)¹

Furthermore, looking at where these nouns are likely to occur, they tend to appear one or two words before *above/below* as in (7), or immediately after *above* as in (8). Based on these typical examples in previous studies, this study examined the nouns occurring one or two words before, or immediately after *above* and *below*² in terms of the types of the nouns.

The results are shown in Tables 1 and 2 below, in which the nouns co-occurring with *above/below* are grouped by lemma and sorted along the *t*-score, and the top 30 nouns are displayed. The raw frequency of each co-occurrence is shown in brackets next to the *t*-score in each line. The numbers from “-2” to “1” in the column headings of the tables express the occurring positions of the collocates; that is, the collocates appearing just before *above/below* are in column “-1” and the one following immediately after *above/below* are in column “1”. Type I nouns are in bold and shading has been added behind the text. Type II nouns are shown in bold and underlined.

Table 1 shows the nouns which tend to co-occur with *above*.³ This table shows that *above* is more likely to co-occur with Type I nouns (e.g. *example, model, reason, procedure, method, principle, problem*) than Type II nouns. The following are examples in which *above* is used with Type I nouns:

- (9) a. In addition to the **above problem**, I discovered another. [BNC]
- b. The **methods** described and **examples** outlined ***above*** demand a certain amount of expertise on the part of the collaborator ... [BNC]

Above in (9a) modifies *problem*, and in (9b), it co-occurs with the nouns *methods* and *examples*. The referents of *above*, as in these examples, tend to be defined based on their contents.⁴

In contrast, the nouns used with *below* show different tendencies as in Table 2.^{5,6}

Table 1: Nouns Co-occurring with *above*

	-2		-1		<i>above</i>	1	
	collocates	<i>t</i> -score (freq.)	collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)
1	<u>paragraph</u>	9.74(96)	foot	15.78(258)		example	11.24(135)
2	<u>section</u>	6.56(53)	sky	10.61(115)		ground	10.61(119)
3	example	6.14(46)	per_cent	7.86(78)		sea	10.50(115)
4	model	5.62(39)	example	7.78(69)		average	7.38(56)
5	<u>para</u>	5.44(30)	inch	7.76(62)		address	7.27(55)
6	reason	5.44(41)	head	7.53(72)		water	6.75(60)
7	<u>chapter</u>	4.87(30)	wall	7.47(63)		board	5.87(40)
8	voice	4.71(30)	floor	7.46(61)		discussion	5.29(33)
9	temperature	4.52(23)	room	7.45(70)		<u>equation</u>	5.24(29)
10	level	4.36(33)	hill	7.37(58)		right	5.13(38)
11	<u>page</u>	4.20(22)	cm	7.08(51)		inflation	4.69(24)
12	point	4.16(35)	flat	6.57(46)		argument	4.68(27)
13	procedure	4.16(22)	metre	6.49(44)		list	4.64(27)
14	head	3.93(30)	air	6.34(48)		sea-level	4.47(20)
15	arm	3.91(23)	height	5.83(36)		extract	4.30(19)
16	wall	3.90(22)	arm	5.82(42)		account	4.15(25)
17	method	3.84(22)	cut	5.82(36)		analysis	4.06(22)
18	light	3.82(22)	window	5.75(40)		criterion	3.78(16)
19	principle	3.66(19)	shoulder	5.61(35)		passage	3.78(16)
20	problem	3.56(33)	shelf	5.37(30)		definition	3.66(16)
21	price	3.54(23)	way	5.13(61)		planning	3.63(16)
22	criterion	3.51(14)	level	5.07(40)		quotation	3.54(13)
23	case	3.50(34)	point	4.90(42)		information	3.53(27)
24	pressure	3.49(18)	tower	4.71(24)		tape	3.50(14)
25	question	3.33(25)	slope	4.69(23)		method	3.45(19)
26	cloud	3.24(12)	cliff	4.60(22)		subsistence	3.43(12)
27	income	3.24(16)	space	4.60(27)		factor	3.37(15)
28	argument	3.17(15)	hillside	4.44(20)		suspicion	3.36(12)
29	condition	3.16(19)	mile	4.43(25)		category	3.34(14)
30	evidence	3.11(18)	degree	4.31(24)		consideration	3.31(12)

Table 2: Nouns Co-occurring with *below*

	-2		-1		<i>below</i>	1	
	collocates	<i>t</i> -score (freq.)	collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)
1	<u>para</u>	10.38(108)	foot	9.43(94)		ground	9.23(89)
2	<u>section</u>	7.11(55)	<u>table</u>	8.23(73)		par	7.13(51)
3	temperature	6.37(42)	<u>example</u>	7.89(67)		deck	6.83(47)
4	<u>chapter</u>	6.11(41)	per_cent	7.60(67)		average	6.09(38)
5	price	5.80(40)	floor	7.48(59)		sea	5.33(31)
6	<u>paragraph</u>	5.67(33)	detail	7.26(57)		expectation	4.99(26)
7	level	5.06(34)	street	7.04(53)		stairs	4.02(17)
8	<u>page</u>	4.95(28)	<u>address</u>	6.99(50)		subsistence	3.59(13)
9	<u>table</u>	4.63(26)	<u>coupon</u>	6.23(39)		target	3.38(13)
10	income	4.33(22)	valley	6.14(39)		market	2.94(15)
11	rate	4.01(23)	metre	5.74(34)		p.	2.90(11)
12	<u>figure</u>	3.84(21)	income	5.72(36)		inflation	2.81 (9)
13	river	3.65(16)	court	5.47(38)		capacity	2.75 (9)
14	ph	3.41(12)	rock	5.47(32)		show	2.62 (8)
15	front	3.25(12)	level	5.34(37)		£2	2.61 (7)
16	valley	3.17(11)	water	5.34(37)		£10,000"	2.42 (6)
17	<u>address</u>	2.98(10)	temperature	5.25(29)		analyst	2.39 (6)
18	<u>coupon</u>	2.98(9)	<u>chart</u>	4.83(24)		budget	2.26 (7)
19	charter	2.74(8)	<u>diagram</u>	4.75(23)		tg	2.23 (5)
20	rock	2.65(9)	<u>list</u>	4.66(25)		magnitude	2.18 (5)
21	nikkei	2.64(7)	point	4.49(31)		replacement	2.09 (5)
22	<u>p.</u>	2.60(10)	room	4.37(27)		cost	2.06 (8)
23	<u>example</u>	2.58(11)	inch	4.36(20)		base	2.01 (6)
24	wage	2.54(8)	<u>question</u>	4.29(27)		water	2.01(11)
25	sea	2.47(9)	sea	4.29(21)		10°C	2.00 (4)
26	scale	2.45(8)	ground	4.25(23)		5°C	2.00 (4)
27	<u>clause</u>	2.41(7)	hall	4.16(20)			
28	<u>note</u>	2.38(8)	way	4.15(37)			
29	<u>pp.</u>	2.38(7)	rate	4.12(24)			
30	water	2.35(13)	degree	3.99(19)			

Table 2 shows that *below* frequently co-occurs with Type II nouns, such as *para* (=paragraph), *section*, *chapter*, *page*, *table*, *figure*, or *chart* as in (10), rather than Type I nouns.

- (10) a. The chart ***below*** shows the number of units of alcohol in different amounts of a range
of drinks. [BNC]
b. ...including the detailed disclosure requirements (see page 42 ***below***). [BNC]

In (10a), *below* refers to the location of the chart and helps the reader to identify the referent. *Below* in (10b) co-occurs with *page*, which is followed by a concrete number 42; in this case, the location of the referent itself can be easily identified even without *below*. Thus, compared with the data of *above* in Table 1, *below* tends to be used with Type II nouns.

4.2 Co-occurring Verbs

The previous section focused on the nouns co-occurring with *above* and *below*. This section, then, examines the tendencies of co-occurring verbs along the *t*-score. The procedure of extracting the data was basically the same as in the case of nouns, except for the following two points.

First, the *t*-score of each verb was measured based on their surface form (not lemma). For instance, if *see* and *seen* were both included in the data, they were distinguished and counted separately. This distinction might be useful to investigate the constructions in which *above* and *below* usually occur; for example, if *above* and *below* frequently co-occur with the verbs in bare form, that would suggest that they tend to be used in imperative sentences.

The second point is related to the scope of observed data. This study extracted the verbs just before *above* and *below* based on the following examples, which are presented in Quirk et al. (1985: 1462). In (11), both the verbs *mentioned* and *given* immediately precede *above* and *below*:

- (11) a. ... the question mentioned ***above*** (=1a))
b. ... the arguments given ***below*** (=1b))

Although it is possible to expand the span for more detailed research, this paper focused on

the verbs occurring in this position based on the typical cases as in (11).

Table 3 shows the verbs co-occurring with *above*. The underlined ones are related to the use of *above* for discourse reference.

Table 3: Verbs Co-occurring with *above*

	collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)
1	<u>described</u>	22.75(524)	11	<u>shown</u>	9.97(106)	21	<u>defined</u>	6.39(43)
2	<u>mentioned</u>	21.42(462)	12	rose	9.46(92)	22	heard	6.25(47)
3	<u>see</u>	19.22(420)	13	<u>cited</u>	8.22(68)	23	<u>seen</u>	6.07(52)
4	<u>outlined</u>	16.10(260)	14	<u>pictured</u>	8.18(67)	24	towering	5.91(35)
5	<u>discussed</u>	15.78(252)	15	rising	8.12(67)	25	<u>explained</u>	5.72(34)
6	<u>noted</u>	13.54(186)	16	<u>indicated</u>	8.07(67)	26	hung	5.55(32)
7	rise	11.20(127)	17	<u>suggested</u>	8.03(69)	27	towered	5.38(29)
8	<u>listed</u>	11.13(125)	18	<u>stated</u>	7.82(62)	28	hanging	5.20(28)
9	<u>given</u>	10.81(133)	19	rises	6.75(46)	29	shouted	4.99(26)
10	<u>quoted</u>	10.54(112)	20	raised	6.48(46)	30	<u>presented</u>	4.86(27)

This result indicates that *above* often co-occurs with verbs of speaking (e.g. *mentioned*, *discussed*, *stated*, *explained*), or verbs of specifying a particular way in which information is provided (e.g. *described*, *outlined*, *noted*, *quoted*, *cited*, *indicated*, *suggested*, *defined*). The verbs basically occur in the past participle form as in (12):

- (12) a. Three of the studies described *above* and five others have been the subject of meta-analysis ... [BNC]
- b. As explained *above*, some students may be perfectly well able to discriminate between tones, but have difficulty in labelling them. [BNC]

In (12), the verb phrases including *above* express how information has been introduced in the preceding discourse. As in these examples, *above* serves to remind the reader of the preceding contents and makes the following discourse more comprehensible.

Now let's turn to the list of verbs co-occurring with *below*. The underlined ones are

Table 4: Verbs Co-occurring with *below*

	collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)		collocates	<i>t</i> -score (freq.)
1	<u>see</u>	31.32(1010)	11	<u>considered</u>	6.42(44)	21	<u>pictured</u>	4.46(20)
2	<u>discussed</u>	13.66(188)	12	<u>explained</u>	5.41(30)	22	<u>reproduced</u>	4.34(19)
3	<u>described</u>	12.62(162)	13	<u>summarised</u>	5.19(27)	23	<u>mentioned</u>	4.24(19)
4	<u>listed</u>	12.18(149)	14	<u>detailed</u>	4.99(25)	24	<u>indicated</u>	3.94(16)
5	<u>shown</u>	11.97(147)	15	lies	4.80(24)	25	<u>presented</u>	3.94(17)
6	<u>given</u>	10.98(129)	16	drop	4.72(23)	26	<u>examined</u>	3.93(16)
7	falls	9.35(88)	17	living	4.70(24)	27	<u>illustrated</u>	3.93(16)
8	fall	9.18(86)	18	falling	4.68(23)	28	<u>provided</u>	3.82(17)
9	fell	8.22(70)	19	drops	4.67(22)	29	<u>noted</u>	3.73(15)
10	<u>outlined</u>	7.92(63)	20	fallen	4.49(21)	30	<u>seen</u>	3.71(22)

related to discourse-deictic usage of *below*, just as in Table 3. One of the most distinct characteristics of this data is that the verb *see* shows an extremely high *t*-score and co-occurrence frequency (*t*-score: 31.32, frequency: 1010), and it usually appears in the imperative form.

- (13) a. Ninety three patients fulfilled the entry criteria (see *below*) and were admitted to the trial. [BNC]
- b. Under its constitution West Germany (like Japan — see *below*) could take no part in external military activities, ... [BNC]

As in these examples, the collocation *see below* often occurs within parentheses and is inserted into a sentence. Actually, this phrase does little to help the reader to find the exact location of the referent. Rather, it just gives the reader advance notice, i.e., it lets the reader know that related information will be provided later in the discourse. By using the phrase *see below*, the writer need not offer a detailed explanation in the part where the phrase *see below* occurs, which serves as a deferment device.

Furthermore, *below* often co-occurs with the passive form of verbs which are related to speaking (e.g. *discussed*, *explained*), specifying the forms of information provision (e.g. *listed*, *shown*, *summarised*, *pictured*), and thinking (e.g. *considered*). In these cases, the

discourse function of *below* can be largely classified into the following two subgroups: (i) to provide advance notice (similar to the phrase *see below*), and (ii) to introduce itemized information immediately after *below*. While most of these verbs can be used in both cases, some tendencies are observed in their distribution.

Let us start to consider the first one. When *below* appears with verbs such as *discussed* or *considered* as in (14), it is frequently used to clarify that detailed information will be provided later in the discourse (but not “immediately” after *below*).

- (14) a. Some special pieces are discussed *below* (pp. 12, 23), but there is a big body of early dedications from sanctuaries : animal and human figurines, ornaments. [BNC]
b. Items (2) - (6) are considered *below* in this chapter with the remainder of this book being devoted to takeover offers ... [BNC]

Below in these sentences functions as an advance notice like cases using the phrase *see below*.

The sentences in (15), on the other hand, exemplify the second type: the referents of *below* are itemized and appear immediately after *below*. This type of usage tends to be observed when *below* is used with verbs like *listed*, *shown*, or *summarised*, which co-occur with *below* more frequently than *above*.⁷

- (15) a. The lucky people are listed *below*:
1st Prize: Cupar, Fife
2nd Prize: ... [BNC]
b. An example of each of these kinds of error is shown *below*:
sequencing error: You just count wheels on a light.
(intended: You just count lights on a wheel)
shift error: We tried it making — making it with gravity. [BNC]

In (15), the names of the lucky people and the errors are listed just after *below*. *Below* of this type is often followed by a colon as in these examples, forming a kind of fixed expression

like [verb (passive form) - *below* - colon - sequence of noun phrases]. The writer splits a sentence using *below* and provides the important information as a list, probably to avoid writing a long and complex sentence. This type of usage is frequently observed with *below*; in contrast, the referent of *above* usually occurs in a location separated from *above*.

In sum, *above* and *below* possess some differing characteristics in the co-occurrence with verbs. While *above* usually co-occurs with verbs of speech or to indicate a specific way of providing information, *below* co-occurs with the verb *see* in the imperative form much more frequently than *above*. In addition, *below* tends to be used with verbs like *listed* or *summarised* as well to introduce itemized information immediately after it.

5 Motivation of the Differing Characteristics

Now let's look at why *above* and *below* tend to co-occur with different words in terms of a typical structure of written discourse. Although the meanings of *above* and *below* are commonly viewed as being extended from the spatial to the discourse domain, the locations they refer to actually possess asymmetric characteristics in discourse.

Since an English text is conventionally written and read from the top to the bottom, the information referred to by *above* is already known to the reader, and hence, it is easy to find. Therefore, even though *above* co-occurs with an abstract noun which explains the information content (i.e. a Type I noun like *problem* or *method*), the reader can readily identify what is being referred to. Furthermore, since the reader, and of course the writer as well, also knows how the referents have been introduced in the preceding text (e.g. just outlined, quoted, or discussed in detail), *above* frequently appears with a verb of speaking or specifying the way in which information is provided.

The content referred to by *below*, in contrast, is unknown to the reader when the word *below* occurs in the written discourse. Consequently, to identify the referent, the reader needs a more formal or visual cue such as the format of the information (e.g. *chart* as in (10a)), a specific number indicating a unit of discourse (e.g. page number as in (10b)), or the occurrence of the referent immediately after *below* (e.g. (15)). This is considered to be the reason why *below* tends to be used with Type II nouns, which indicate the formal characteristics of the referent, and with verbs like *listed* or *summarised*, which can naturally introduce itemized

information. In other words, *below* can be used when there are adequate cues for the reader to find the referent without difficulty.

Furthermore, whereas the reader does not usually know what is going to be written in the subsequent section of discourse, the writer normally does. Therefore, the writer tries to signpost the reader's attention and make the text easier to read by using phrases like *see below* or *discussed below*. These phrases serve to inform the reader that related contents will appear later in the discourse. Moreover, by using expressions like *listed below*, the writer attempts to simplify the sentence to reduce the reader's burden of processing information.

While previous studies have mainly discussed their symmetric aspects, *above* and *below* for discourse reference show asymmetric characteristics, which are derived from the differences between the preceding and subsequent discourse. It suggests that the writer organizes a text in consideration of the reader's cognitive status and attempts to make the text comprehensible. Such a strategy taken by the writer could be reflected in the differences between *above* and *below*.

6 Conclusion

This paper has focused on the characteristics of *above* and *below* used for discourse reference from the perspective of collocation, demonstrating the following two points. First, *above* and *below* tend to co-occur with different types of nouns and verbs. Second, their differing characteristics reflect a typical structure of written discourse, i.e. the differences between the preceding and subsequent discourse. That is, the writer tends to refer to a unit of the discourse in consideration of the reader's cognitive status, and thereby inducing the asymmetric behaviour of *above* and *below*.

This study reveals an interactional aspect of a written discourse (i.e. communication between the writer and the reader), which pertains to the interface between semantics and pragmatics, and also between cognition and discourse.

Notes

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- * I would like to express my sincere gratitude to Professor Ippei Inoue and Professor Ryoko Suzuki of Keio University, and Professor Yoshiki Nishimura of The University of Tokyo for their invaluable comments and suggestions on this paper. This work was supported by Grant-in-Aid for JSPS Fellows Grant Number 15J07850. All remaining errors are my own.
- 1 The differences between Type I and Type II nouns are not always clear-cut. For example, *equation*, *address*, and *coupon* are not prototypical Type II nouns in their intrinsic meanings, but they have some formal peculiarities in written discourse: an equation and an address (often indicating a URL) are written in a fixed, conventionalized way, and a coupon is often boxed and displayed like a figure. In addition, they tend to be separated from the other parts of the text, so are easy to find. Based on such features in their forms, this study considered them as Type II nouns.
- 2 Stubbs (2001: 29) notes that “significant collocates are usually found within a span of 4: 4”. Based on this assumption, it is probably more appropriate to set the span as 4 words before and after *above/below* if we investigate the collocates of *above/below* generally. However, to focus on the collocates related to their discourse-deictic usage specifically, this study limited the span of investigation to that based on typical examples in previous studies.
- 3 Due to the polysemous characteristics of *above/below*, the results shown in the tables in section 4 include words which are not related to the discourse domain. For example, the nouns *sky* and *ground* in Table 1 are used with *above* in the spatial domain, indicating that “(physically) higher”. Even so, a lot of nouns and verbs related to the discourse domain are ranked in the tables, which suggests how frequently *above/below* are used for discourse reference in written texts.
- 4 As shown in Table 1, *above* also frequently co-occurs with some Type II nouns which indicate a unit of written discourse, such as *paragraph*, *section*, or *chapter*. When *above* and *below* are used with these nouns, they tend to behave symmetrically (e.g. *chapter 3 above/below*).
- 5 Although Boers (1996: 108) indicates that *below* used for discourse reference cannot occur immediately before a noun like an adjective (e.g. **the below statement*) (see section 2.2), this study investigated nouns occurring in this position to compare them with the result of *above* and to confirm Boers’s claim. As a result, shown in Table 2, all of the nouns in this position are unrelated to the discourse-referential sense, which supports the study by Boers.
- 6 The *t*-score is considered as having significance if it is 2 or more (Hunston 2002: 72); therefore, column “1” in Table 2 does not include nouns with a *t*-score of lower than 2.
- 7 Compared with typical speech verbs like *mentioned* or *stated*, verbs such as *shown* or *summarised* can naturally co-occur with Type II nouns (e.g. *figure*, *table*, *chart*, *graph*). The tendency of *below* being used with these verbs might be related to the characteristics of its co-occurring nouns as well.

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