

AFTER AND ITS USES: A CORPUS-BASED STUDY

Siaw-Fong Chung

ABSTRACT

This paper explored a less-studied preposition, *after*, and its uses in a corpus. The analysis included an inspection of dictionary senses, followed by the distributional patterns of parts-of-speech, the co-appearing verbs of *after*, the contextual uses of [-ly *after*] and [-ly *after*+NOUN], and finally a pre- and post-teaching investigating the effectiveness of using a corpus. The goal was to see what semantic information is embedded in *after* in each of these analyses and to explain the contextual uses of *after* that are not often realized. We used probes and corpus techniques to search for instances in the British National Corpus to retrieve expressions of *after* that appear in certain contexts. Based on the data, two conceptualizations of *after*, comprising the relations of two events, were postulated. For the uses of *after* and its two constructions [-ly *after*] and [-ly *after*+NOUN], we also tested their production by EFL students before and after a corpus workshop was introduced to EFL learners. The results showed that the workshop not only was effective, but also helped accelerate students' speed of generating expressions of *after*. This paper could serve as a sample work for research on function words, and it also imposes pedagogical implications on the effectiveness of using a corpus for EFL learners.

Key Words: *after*, preposition, collocations, corpus

INTRODUCTION

Prepositions have been greatly studied. Many have shared the consensus that prepositions have polysemous meanings, i.e., several meanings being realized by one single lexicon. In the literature, there was extensive coverage of the terminoglogy distinction between prepositions and particles; development of non-spatial meanings from spatial meanings; calculation of probability of a preposition filling a slot such as [* *the*

NOUN *of*], and many others. Terminology clarification includes distinguishing prepositions from participles, usually differentiating the two in different fixed phrases under the topics of phrasal verbs (e.g., *run away*, *show up*, *grew up*) (among many, Balwin, 2005; Hampe, 2002, et al.) or verb-particle constructions (*brought back*, *send (someone) away*) (Fraser, 1976; Bannard, 2005; Cook & Stevenson, 2006; Dikken, 1995).

As for the development from spatial to non-spatial meanings, studies of polysemy and literal-metaphorical senses (e.g., Boers, 1996; Boers & Demecheleer, 1998) of prepositions were identified. Within this broad scope, there were also studies which claimed that polysemy meanings of a word form a semantic network (mainly, Tyler & Evans, 2003), and the related meanings could be derived from single or multiple geometrical representations, while some scholars used image schemata to explain the polysemy of prepositions (Johnson, 1987; Lakoff, 1987).

In this study, we looked at the use of *after* for two reasons: First, the literature proved that *after* was not greatly discussed. Few studies have discussed *after* because its meanings were expected to be straightforward and they did not vary greatly, even in dictionary entries; second, *after* has a high connection with verbs (*look after*, *go after*) and that makes it less interesting to be seen as an individual preposition. It was more often listed under the heading 'phrasal verb'. Yet, in a phrasal verb construction, *after* was also not greatly interesting because uses such as *look after* and *go after* dominate the instances, and this left little room for discussion.

Yet, our analysis of *after* in the corpus showed that *after* marks some important events. It serves some 'timely' function that exceeds our understanding of its uses. Hunston (2011), citing Hunston and Francis (1999), claimed that "words which regularly occur with similar co-texts [...] tend to share aspects of meanings" (p. 119). It is the 'aspects' of meaning of *after* that we aimed to identify in this paper. We referred to it as the 'contextual meaning' of *after*. This contextual meaning is often not listed in dictionaries. We intended to see if EFL English major students knew about *after* and its constructions before and after they were equipped with corpus knowledge. The following research questions are postulated:

- (1) (a) What kinds of linguistic and contextual information are embedded in the preposition *after*?
- (b) How can the different uses of *after* in a corpus be presented using geometrical representations?
- (c) How effective is the use of corpus in assisting Taiwan EFL

students to know more about *after* and to generate different constructions of it?

In order to answer the above research questions, we looked into dictionary meanings and corpus collocation, as well as several significant constructions containing *after*. We also conducted pre- and post-tests to examine the effectiveness of using a corpus by EFL learners. In the following section, we first review previous studies on prepositions.

AFTER IN PAST LITERATURE

Prepositions are high frequency function words. Yet, studies on prepositions are very often focally known for certain meanings only, mostly the physical and spatial ones. Among the different prepositions, *on*, *at*, and *in* are some of the prepositions that have been greatly studied. Examples are the works by Fernando and Tricker's (2000) and Wierzbicka's (1993) study of *at*, *in*, and *on*; Vandeloise's (1994) study on *in*; and Goddard's (2002) study of *on*. Comparatively, some prepositions, one of which is *after*, were less studied. However, we emphasized in this paper that these prepositions deserve better attention because they carry equally important typological information. Tyler and Evans (2003) stated that *after* "derives from a comparative form of *af*, which was apparent in Old English and meant 'off' and 'away'. Hence the comparative 'af + ter' meant 'farther off' or 'farther away'" (p. 173). *After* is also a universal concept that exists in many cultures. Heine and Kuteva (2004) provided at least four grammaticalization paths for *after* – (a) BACK (body part) > AFTER (p. 46); (b) BEHIND (SPATIAL) > AFTER (pg. 52); (c) NEAR ('near', 'close to' > AFTER (p. 214); and (d) PASS ('to pass (by)'/ 'pass through') > AFTER (p. 228). Using examples from different languages, Heine and Kuteva observed that one or more languages in the world shared a similar development. As an important shared concept, the preposition of *after* deserves careful scrutiny and in-depth exploration.

The following are some mentions of *after*, especially in comparison to its related prepositions such as *behind* and *before*. Tyler and Evans (2003) was the only work that devoted a sub-section to discuss *after*. For its meanings, *after* is defined with a "notion of sequence": "The functional element associated with *after* is that of following or pursuit." (Tyler & Evans, 2003, p. 156). In addition to the sequence meaning,

Tyler and Evans also said that *after* “has developed a goal sense, as in *Lou went after some ice-cream*” (p. 156). Even in Lindstromberg’s (1998) book *English Prepositions Explained*, *after* was not discussed in detail. Some scattered information is gathered below. First, *AFTER* is a converse of *BEFORE*: “*BEFORE* is somewhat akin to *IN FRONT OF*, but is almost always used to refer to chronological sequence (as the converse of *AFTER*)” (p.106). Second, in another mention, it said “[*B*]EFORE (and/or *AFTER*) will be used to speak of the order of events,” as in “*14 horses crossed the finish line before Mr. (not so) Hot [did]*” (p. 107). Lindstromberg’s (1998) definition of ‘event’ was explained with examples (p. 8). In one of the examples, *The bomb went off near a guest house*, they explained that “what is near the Landmark (‘a guest house’) is not ‘the bomb’ or ‘went off’, but overall event ‘the bomb went off[.]’” (p. 8). Therefore, *the bomb went off* as an event is happening *near a guest house*.

Third, the end of the book listed a function of imitation for *after* with a short explanation and a couple of examples of *after*: “Imitation is often spoken of as if it were following, e.g., *follow in sb’s footsteps*.” The two examples are “*The girl...models herself after her academic mother*” and “*My daughter takes after her father*” (p. 256).¹ Not much discussion was given on this in the rest of the book.

From the above we again proved that *after* did not evoke as much interest as the other prepositions did in the literature. In what follows, we first discuss some of the cognitive approaches to studies of prepositions.

Cognitive Approaches to Studies on Prepositions

One of the important directions on prepositions are the works by Tyler and Evans (2003) and Lindstromberg (1998) which reviewed groups and individual prepositions and discussed the core meaning or primary sense of each. Tyler and Evans called the core meanings ‘proto-scene’, while Lindstromberg focused more on the prototypical meanings and the metaphorical meanings of the prepositions. Literal

¹ Vendler (1957/1967) distinguished event types (states, activities, achievements, and accomplishments) according to the verb classification, taking into consideration the temporal and aspectual information denoted by the verbs and other properties that the verbs carry. (Detailed linguistic distinctions of event types will not be given here. For more on this topic, see Dowty (1979), Mourelatos (1978), or an overview in Rothstein (2008)).

meanings of a preposition refer to the locative meaning describing the physical items in space, while metaphorical meanings refer to those describing non-spatial concepts (Tyler, Mueller, & Vu, 2011). Tyler and Evans used semantic networks that assume polysemy senses could be related to the proto-scene. They further claimed that the proto-scene “involves not only a conceptual spatial relation between a TR [trajector, or the moving entity] and LM [landmark, or the reference point] (at least one of which is oriented) but also a functional element” (p. 134). The ‘functional element’ explains how different meanings, which are “grounded in the nature of our interaction with spatial scenes, give rise to non-spatial meanings [...] enriching the semantic network” of a particular preposition.²

Although trajectory (TR) and landmark (LM), briefly defined above, are commonly seen in many works, it is important to recognize the work of Langacker (1987, 1986) or Talmy’s ‘figure’-‘ground’ concept (1978, 1983) who used these concepts to explain not only prepositions but also cognitive grammar. Here, we briefly introduce Langacker’s TR and LM. Langacker (2010) stated that trajector and landmark are “characterized respectively as primary and secondary figures within a profiled relationship” (p. 182). A trajector is a moving entity while landmark is where this entity moves to or locates. Landmark thus acts as a reference point for the trajector; it can be a surface, a container, etc. that serves as the background. Langacker (1986) used trajectory and landmark to explain the meaning of a verb sense. For example, for the *go* sense, Langacker said that “[w]ith the passage of time, one individual, referred to here as the “trajectory” (*tr*) moves from a position within the neighborhood of another individual, the “landmark” (*lm*), to a final position outside that neighborhood” (p. 7). This explained how a person moves away from another person to go to a different place not in the scope of the second person. This view of cognitive grammar is related closely to the development of Johnson’s (1987) and Lakoff’s (1987) image schema, as the TR, LM, and path can be represented using geometrical figures.

Johnson (1987) defined ‘image schemata’ (the plural form of ‘image schema’) as “gestalt structures, consisting of parts standing in relations and organized into unified wholes, by means of which our experience manifests discernible order” (xix). These schemata “function primarily as abstract structures of images” and one understands these schemata

² Tyler and Evans (2003) called them ‘particles’ in this part.

through bodily experience. The spatial constructs provided by Johnson (1987) are such as CONTAINER, PATH, PART-WHOLE, POINT, SURFACE, etc., from which both physical and abstract concepts are projected. In every image schema, there is a schematic pattern with an internal structure. For example, in the PATH schema, Johnson claimed that it involves a starting point, an end-point, and a sequence of locations that link the starting point to the end-point. When one begins at the starting point and arrives at the end-point, one would pass through these locations that connect these points. Expressions with the preposition *to* correspond to this PATH schema, as in *Your brother drives his car to the hospital fast*. In this sentence, *your brother* does the motion of driving from a starting point to reach the goal of this path, or the end-point, *the hospital*. These internal structures can be conceptualizations because one “can perform mental operations on image schemata that are analogs of spatial operations” (Johnson, 1987, p. 25).

As for the image schema theory, it has been greatly adopted in research on prepositions. Examples of studies that adopted this model are such as the work on *over* by Brugman (1981) and Lindner’s (1983) classic analysis of *out* and *up*. The image schema theory allows one or more senses to be derived from a basic image schema. Sometimes, more than one preposition can be derived from a single image schema. Sometimes, different schemata are also related in a network. For instance, the *covering* sense of *over* was discussed in Lakoff (1987, p. 428). In one of the uses of *over* (*he has freckles over most of his body*), the *covering* has a ‘multiplex’ and ‘mass’ relation – whether to see the *freckles* as individual ‘multiplex entities’ when viewed close-up or as the mass when seen from far above. This same schema was used by Chung (2004) to explain the uses of *dalam* in Malay (‘in’ or ‘among’) when one sees the multiplex entities as physical groups of entities or abstract image schemata from which individuals could still be identified. In this paper, we also made use of this concept when we interpreted the meanings of *after* using geometrical representation.

Despite the existence of many references that showed the possibility of identifying a core concept of a preposition, it might not be a practical step for EFL learners. It takes more strength to establish the relation between the different meanings for highly frequent words such as prepositions. Furthermore, there might be far more meaning entries for a single preposition that require deeper processing by EFL learners. The learners oftentimes refer to dictionaries for the explanation of meanings

of lexical words. Yet, for prepositions, it is not a convention that learners would refer to a dictionary for meanings. One reason for this is because the dictionary meanings could be a long list (cf. *in* in the *Merriam-Webster Learner's Dictionary* returned seventeen senses; *on* has twenty-three senses).³ Using *on* as an example, Lindstromberg (2001) examined how *on* is presented in five advanced learner's monolingual dictionaries. The author observed the following problems: "(1) sense information is sometimes vague or misleading; (2) sense information is often mismatched to examples; (3) coverage of similar uses is often dispersed throughout an entry; and (4) paradigmatic semantic contrasts are ignored" (p. 79). Although dictionaries are written with a target audience, they often do not contain all the information required for a complete understanding of a word. From the above and the other studies focusing on the meaning and semantic structure of prepositions (cf. Kaufmann, 1993; Kristoffersen, 2001; Lindstromberg, 1998; Sandra & Rice, 1995; Schulze, 1993), the difficulty of interpreting the senses is obvious and thus different perspectives are required to stimulate the understanding of the various senses of prepositions.

The second reason why identifying a core concept might not work for learners is because learners are more accustomed to memorizing expressions containing prepositions rather than remembering the senses or even core meanings of a preposition. In this paper, we showed that by the use of a corpus and conceptual representations of *after*, a better understanding of *after* could be obtained. We also posited that *after* and its construction contain contextual uses that are oftentimes unrealized by most users, let alone EFL learners who lack a comprehensive method to observe linguistic data.

In this paper, the discussion covered (a) an analysis of *after* and its constructions in the corpus; (b) an analysis of the contextual uses of *after*; (c) the meaning representations of *after*; and (d) a comparison of pre- and post-tests to show how students could retrieve information about *after* if they knew how to use a corpus. We used both a quantitative method and qualitative analysis to look at the contextual uses of *after*. We first used corpus data to retrieve the frequency of *after* and its constructions; we then analyzed the possible meaning of the constructions. In the final section, we showed in a corpus workshop the

³ <http://www.learnersdictionary.com/definition/in> (accessed August 6, 2018)
<http://www.learnersdictionary.com/definition/on> (accessed August 6, 2018)

difference between the performances of students in pre- and post-tests. The tests showed how a corpus could assist in retrieving expressions containing *after* after the corpus workshop.

METHODOLOGY AND RESULTS

This study utilized methodology that started from a single word and extended to pattern analyses. This section first examined the senses of *after* from dictionaries to see how this preposition is defined. We then inspected the parts-of-speech distributions and its collocations. As a preposition, *after* has three senses in the *Merriam-Webster Online Dictionary*, shown in (2) below.⁴

- (2) Sense 1: a: behind in place <people lined up one *after* another>
b (1): subsequent to in time or order <20 minutes *after* 6>
b (2): subsequent to and in view of <*after* all our advice>
Sense 2: —used as a function word to indicate the object of a stated or implied action <go *after* gold> <was asking *after* you>
Sense 3: so as to resemble: as
a: in accordance with
b: with the name of or a name derived from that of <named *after* his father>
c: in the characteristic manner of : in imitation of <writing *after* the manner of Hemingway>

This dictionary lists the ‘behind’ meaning in sense 1a; the ‘time or order’ meaning in sense 1b(1); and an extension of the ‘order’ sense in 1b(2). Sense 2 is vague because *after* is termed as a ‘function word’ following the verb. Sense 3 provides the semantics of some constructional combinations such as *named after* and *write after*. In a learner’s version, the *Merriam-Webster Learner’s Dictionary*, the meanings of *after* are more extensively covered:⁵ *after* is defined as ‘time order’ in sense 1; as ‘order of things or person’ in sense 3; and as ‘an order of some events’ in sense 2. Like most dictionaries which aim to provide the most frequently seen language patterns to their users, these two dictionaries list a selective, usually frequent combinations of words with *after* as separate senses. Senses 4 to 8 refer particularly to certain combinations of words

⁴ <https://www.merriam-webster.com/dictionary/after> (accessed August 6, 2018)

⁵ <http://www.learnersdictionary.com/definition/after>

with *after* such as *go after/BE after* (sense 4), *call after/clean after* (sense 5), *name after/pattern after* (sense 6), *put something after something* (sense 7) and *ask after/inquire after* (sense 8).⁶

In order to see the parts-of-speech (POS) distributions of *after* in a corpus, the British National Corpus was consulted through the BNCWeb platform (Hoffman et al., 2008). The results are shown in Table 1 below. When two tags were given (e.g., PRP-CJS), a word was ambiguous between these two tags but the first one was most probable. Thus, PRP-CJS which means a preposition or a conjunction is different from CJS-PRP because the one with the stronger possibility will be placed in front.⁷ We presented the results verbatim from the corpus.

Table 1

After and its Parts-of-Speech in the British National Corpus (BNC)

POS	Instances	Percentages
Prepositions (PRP)	73,014	64.20%
Either Prepositions or Conjunctions (PRP-CJS)	16,986	14.94%
Conjunctions (CJS)	16,303	14.33%
Either Conjunctions or Prepositions (CJS-PRP)	6,351	5.58%
Adverbs (AV0)	936	0.82%
Adjectives (AJ0)	126	0.11%
Truncated speeches (UNC)	13	0.01%
Total	113,729	100.00%

From Table 1, we can see that *after* as a general preposition constitutes the majority of the instances (64.20%, with another 14.94% from PRP-CJS). *After* as a conjunction constitutes 14.33% (and another 5.58% of CJS-PRP) of the total 113,729 instances. *After* as an adverb or adjective each constitutes less than 1% of the total instances. The final

⁶ Most dictionaries list *look after* under *look*, depending on the degree of idiomaticity, an issue already mentioned in the introduction of this work.

⁷ Preposition-Conjunction: *Usually after one or two turns these gliders will unstick themselves and build up speed rapidly in a spiralling dive.* (A0H 875)
Conjunction-Preposition: *It was a rather rickety affair that creaked embarrassingly when I sat down in it and ever after when I moved.* (A0F 859)

category is truncated speeches in the spoken part of the BNC.

- (3) (a) Preposition
*Isidro Caballero, a 33-year-old teacher, 'disappeared' **after** being detained on 7 February 1989 by an army patrol. (A03 394)*
- (b) Conjunction
*They took what was left **after** the church schools had creamed off the more academic pupils and the upper classes. (A07 1353)*
- (c) Adverb
*He refused to say whether seven or eight voting slips had been handed to him, and said they were all destroyed soon **after**. (AHA 51)*
- (d) Adjective
*Festivals aren't only about fishing, most feature an **after** match disco and for the less energetic there's pool, darts competitions and singalongs in the local bar. (A6R 652)*
- (e) Truncated Speech
*...to give a real round of applause to these beautiful British people have come, have come out this **after**-- this after-- th-- this afternoon. (K66 2)*

The results in Table 1 showed that *after* as a preposition dominates the overall instances of *after*, followed by conjunctions. Adverbs and adjectives of *after* are not so frequent.⁸

In the next analysis, we extracted all the verbs that appear on the left five positions of *after* (thus, minus five positions of *after*). By doing so, we ignored any preposing constructions such as *Up it rises* and *Up the tree it raises* (cf. Cappelle, 2002) in which the preposition is moved before the subject or object.

Through using the designated parameter, the top twenty verbs, arranged in descending T-score values (the last column of Table 2), are displayed. A T-score was used instead of the commonly used Mutual Information (MI) value because we intended to measure the certainty of collocation, not the strength of the collocations (Hunston, 2002). An MI-score "measures the amount of non-randomness present when two words co-occur" (p. 71), or the association between A and B words: if an A word occurs, the possibility of a B word also occurs. Thus, an

⁸ It is worth noting that the BNC tagsets do not distinguish between a phrasal verb and a prepositional verb. The adverbs are not necessarily phrasal verbs.

MI-score could be extremely high for an A word that occurs once or twice, but every time A occurs, B also occurs. This strength of association is more suitable for the measurement of association between lexical words. A T-score, on the other hand, is a normalized score that takes into account “the amount of evidence” collected and is a more suitable score for measurement of the overall performance of a word, reducing a high score for low frequency collocations (p. 72). It is thus a more suitable score for function words.

The third column of Table 2 shows the total frequency of each individual verb; the fourth column shows the collocated frequencies, and the fifth column shows the number of texts in which each collocated pattern was found.

Table 2

The Verbs Appearing in the -5 Window Span of After

No.	Word	Total No. in whole BNC	Observed collocate frequency	In No. of texts	T-score value
1	<i>look</i>	41,524	2355	1084	44.1879
2	<i>looking</i>	25,130	1146	674	30.0871
3	<i>looked</i>	32,194	951	601	25.5427
4	<i>was</i>	881,425	6508	1888	25.2494
5	<i>named</i>	4,272	649	417	24.6249
6	<i>died</i>	13,585	670	346	23.2221
7	<i>came</i>	44,701	901	585	22.4626
8	<i>left</i>	31,981	612	459	18.1811
9	<i>returned</i>	9,818	303	249	14.5458
10	<i>were</i>	313,113	2249	1079	13.9322
11	<i>arrested</i>	3,380	203	115	13.0444
12	<i>went</i>	45,738	520	386	12.6293
13	<i>looks</i>	9,947	237	198	12.1173
14	<i>return</i>	7,533	201	165	11.4822
15	<i>released</i>	4,934	177	118	11.4229
16	<i>comes</i>	15,662	257	192	11.0755
17	<i>resigned</i>	2,014	141	92	11.014
18	<i>called</i>	32,288	374	301	10.8701
19	<i>sought</i>	5,182	166	134	10.8439
20	<i>retired</i>	1,809	133	96	10.7369

From Table 2, *look after* (in different grammatical forms) seems to be the most frequently appearing collocation. The following content words (thus ignoring *was* as in *She was after everything in trousers* (A0D 1504)) are *named after* (#5), *died after* (#6), *came after* (#7), *left after* (#8) and so on. By going through the list, we realized that *after* in many combinations (e.g., *died after*, *left after*, etc.) denotes a literal temporal sequence rather than that of the more figurative ones such as *look after* and *named after*, in which *after* in the latter two examples identifies an extended ‘sequence’ meaning.

Apart from this, the results in Table 2 explain our observation of senses in the dictionaries—*look after* is listed separately under *look* in dictionaries because of its high idiomaticity. Other uses of *after*, especially those in terms of time and order (*named after*, *died after*, *came after*, *arrested after*, etc.), were also found among our top twenty collocates.

CONTEXTUAL FUNCTIONS OF *AFTER*

In this section, we analyzed the contextual use of *after* that was not immediately realized as part of its meanings. We found that *after* is often used to point out a time whereby something happened or changed dramatically. When we searched for [**ly_AV0 after*] in the BNCWeb, we found the results in Table 3. The top twenty types are listed. In total, there are 3,318 (2.92%) such instances from a total of 113,729 instances of *after*. Among the list, *only after* was not in our expectations because we intended to find adverbs that end with the suffix *-ly*. However, we kept it because its co-occurrence is strong.

Table 3

[*-ly After*] Construction

No.	Lexical items	No. of occurrences	Percent
1	<i>shortly after</i>	1210	31.60%
2	<i>immediately after</i>	781	20.40%
3	<i>only after</i>	720	18.80%
4	<i>especially after</i>	210	5.48%
5	<i>particularly after</i>	108	2.82%
6	<i>quickly after</i>	42	1.10%

Table 3 (Continued)

7	<i>usually after</i>	37	0.97%
8	<i>directly after</i>	36	0.94%
9	<i>rapidly after</i>	34	0.89%
10	<i>sharply after</i>	17	0.44%
11	<i>apparently after</i>	16	0.42%
12	<i>probably after</i>	16	0.42%
13	<i>really after</i>	16	0.42%
14	<i>certainly after</i>	15	0.39%
15	<i>considerably after</i>	13	0.34%
16	<i>dramatically after</i>	11	0.29%
17	<i>finally after</i>	9	0.24%
18	<i>possibly after</i>	9	0.24%
19	<i>significantly after</i>	9	0.24%
20	<i>slightly after</i>	9	0.24%

From Table 3, we can see that *shortly after* (31.60%) appears on top, followed by *immediately after* (20.40%). From here, some meanings of [-ly after] construction can be derived: (a) the top two dominating collocated patterns emphasize the swiftness of the follow-up event or action. Other uses with the similar meanings are *quickly after*, *rapidly after*, *sharply after*, and *dramatically after*; (b) some (*especially after*, *particularly after*) indicate manner or preciseness, whereas (c) others (*probably after*, *possibly after*, and *presumably after*) indicate prediction of a sequence of events. Examples like *directly after* and *significantly after* can be ambiguous in terms of being swiftness or to indicate manner.

In Figure 1 below, we show the conceptualization of [**ly_AV0 after*]. We supposed *after* uses an event (Event 1) to mark the reference point after which something else (Event 2) happens. Event 2 may appear immediately after Event 1 or at a later time (see dotted Event 2) depending on the type of adverbs that appear before *after*.

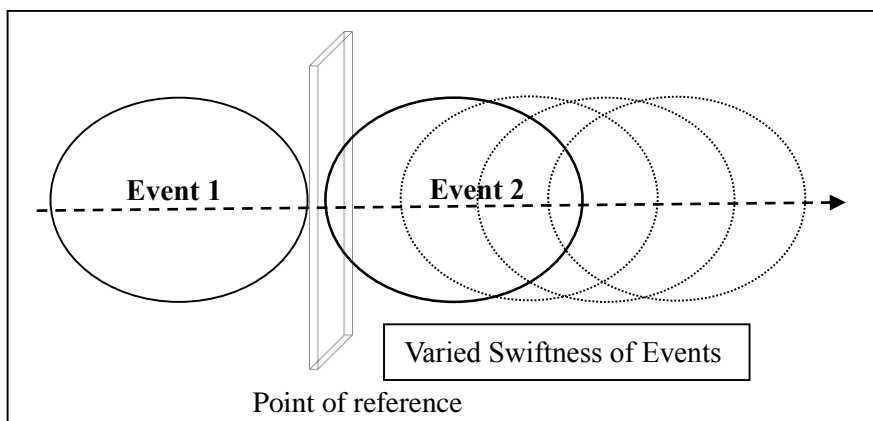


Figure 1. Conceptualization of [**ly_AV0 after*] 1

In the examples that follow, we show how *after* is used.

(4) *He was arrested **shortly after** his arrival and was detained without trial until September when he was sentenced to ten years' hard labour for alleged espionage.* (A03 667)

In (4), Event 1 will be 'his arrival' and Event 2 will be 'his arrest'. Event 2 happens quickly after Event 1.

(5) *Many of the residents moved out **shortly after** Mrs Hill announced her intention to sell, and in fact there were only four of us left when the new landlord took possession.* (A0F 1030)

In (5), Event 1 is 'Mrs. Hill's announcement' and Event 2 is 'the moving out of the residents'. Event 1 and Event 2 do not necessarily occur in a short while although *shortly after* is used in (5), as compared to (4). The reason we knew it was not immediately happening in seconds or minutes is because moving house requires time and readers knew that. The use of *shortly after* in (5) therefore is to intensify the significance of the announcement to the moving, rather than to focus on the time between the announcement and the moving. In contrast to (5), readers knew that (6a) happens in a short while because 'going to bed' and 'having dinner' are events that could happen under the same roof and could be carried out with less effort than 'moving out.' In (6b), the two events should occur even faster after one after another because of the 'breaking of the

egg' and its 'consumption' need to be done in an understandably short period of time. These, however, are not embedded in the meaning of *after* or the construction [**ly_AVO after*]. Readers knew these based on world knowledge or the contextual understanding of the words in the 'neighborhood' of *after*.

- (6) (a) *Sara went to bed **immediately after** dinner.* (A0R 2189)
 (b) *The egg industry, in the form of United Kingdom Egg Producers' Association (Ukepra), has submitted a definitive proof to the Richmond Committee, under the umbrella of the Secretary of State for Health, Kenneth Clarke, saying intact eggs, consumed **immediately after** breaking, cannot cause food poisoning.* (A50 80)

Therefore, what kinds of meanings are embedded in *after*? *After* tells the order of a series of at least two events. The way and the swiftness and manner of how the two events take place depend on the information carried by the adverbs or the context in which these two events are realized.

As the two events are often related, *after* can sometimes be used to state a pre-condition that has been met before something else could be carried out when used with *only*, such that in (7a) below. But it could also mean a cause-and-effect sequence, as in (7b). Sometimes, it could both, as in (7c).⁹

- (7) (a) ***Only after** the social formation had been constructed could the evaluation of the role of institutions and values be undertaken in terms of the place of these consciously-realized phenomena in its working.* (A6S 307)
 (b) *It was **only after** he took two bullets in the thigh and wrist and a shotgun blast in the back, and his brother was murdered by rival gangs that he channelled his aggression into baseball.* (A5U 98)
 (c) *It was **only after** the reasonable harvest of 1922 that the spectre of nation-wide starvation receded.* (A64 1042)

In order to further understand the types of nouns that collocate with the [*-ly after*] construction, the most frequently collocated nouns following this construction were also examined.

⁹ Despite the interesting observation, *only after* should be treated with caution as the combination of *only* and *after* might form a connective itself and will require in-depth discussion. The current paper will not deal with this part as it exceeds the current scope of our work.

From the list of nouns in Table 4, we can see that most of the events denoted by *after* are either bounded events with a beginning and an ending (e.g., *war*, *election*, *period*, *meeting*, *appointment*, *event*, etc.) or inchoative events with a distinctive change of states (*birth*, *arrival*, *take-off*, *revolution*, etc.). Bounded events can commonly refer to “[a] situation [that] may be limited in time: for instance, a situation of sunbathing may last for half an hour; it reaches a temporal boundary once the person in question leaves the beach.” (see Depraetere, 1995, p. 2 for a variety of (un)boundedness). Inchoative events contain verbs that express “a change of state” or the change of the original state to a newer status: “Inchoative verbs are generally intransitive” (e.g., *The stick broke* and *The snowman melted.*) (Haspelmath, 1993, p. 90).

Table 4

Nouns Following [-ly After] Constructions in +3 Window Span

No.	Word	Total No. in whole BNC	Observed collocate frequency	In No. of texts	T-score value
1	<i>war</i>	27,205	79	72	8.5814
2	<i>death</i>	19,856	73	62	8.3111
3	<i>birth</i>	5,115	45	41	6.6318
4	<i>world (war)</i>	57,446	52	47	6.4126
5	<i>election</i>	9,662	38	34	6.0073
6	<i>midnight</i>	1,792	29	24	5.3518
7	<i>years</i>	88,571	43	41	5.2035
8	<i>arrival</i>	3,339	25	23	4.9331
9	<i>return</i>	9,522	23	21	4.5968
10	<i>end</i>	42,947	28	23	4.4779
11	<i>period</i>	24,108	24	24	4.4057
12	<i>meeting</i>	15,931	18	16	3.8662
13	<i>appointment</i>	4,382	15	15	3.7596
14	<i>lunch</i>	4,873	14	13	3.6111
15	<i>take-off</i>	337	13	10	3.5962
16	<i>birthday</i>	3,165	13	13	3.5176
17	<i>christmas</i>	8,603	14	13	3.5112
18	<i>publication</i>	3,695	13	11	3.5028
19	<i>event</i>	10,296	14	14	3.4658
20	<i>revolution</i>	4,554	12	11	3.3323

It was found that *war* and *death* are the top two highly collocated nouns with *after*, both of which have almost similar T-score values, and they appear in more than 60 texts collected in the BNC. Among all the 79 instances of [-ly *after* + *war*] construction, about 50% are constituted by *immediately after*, and another 23% by *shortly after*. As for [-ly *after* + *death*], among the 73 instances, 38.36% are *shortly after*; 23.29% are *immediately after*; and 21.92% are *only after*. Therefore, it appears that in the corpus, these two events are the most prominent events **after** which significant changes had been noted.

- (8) (a) *In the period during and **immediately after** the war feminists were confronted by this changing situation across a whole range of sexual issues: venereal disease, birth-control and, crucially for our argument, sex education. (G0D 1803)*
 (b) *Like all the children born **shortly after** the Great War, we knew that to our parents, the war was the great divide. (B1Y 129)*
 (c) *Registration has to be done **very shortly after** the death itself, so the person who goes to the office to do this finds himself alongside people who are celebrating the birth of a baby, or registering a marriage. (ADE 1004)*

In all the examples above, the significance of Event 1 has been focally narrowed down to the reference point, or to its finishing point, rather than to the whole event itself. What happens in Event 1 is not the main concern of the uses of *after*; the focus is on what happens after it, i.e., Event 2. The impact of Event 1 on Event 2 is amplified due to the significance of *death* and *war*. In some examples such as (9), Event 1 is as short as the reference point itself.

- (9) (a) ***Almost immediately after** birth he was sent out to a wet-nurse at the nearby village of Syderstone, where he remained until he was weaned, at about 18 months. (EEK 277)*
 (b) *One of the first two women, who left **shortly after** midnight on Sunday, was identified as Victorine Hollingsworth, 59, a British citizen. (K5M 8962)*

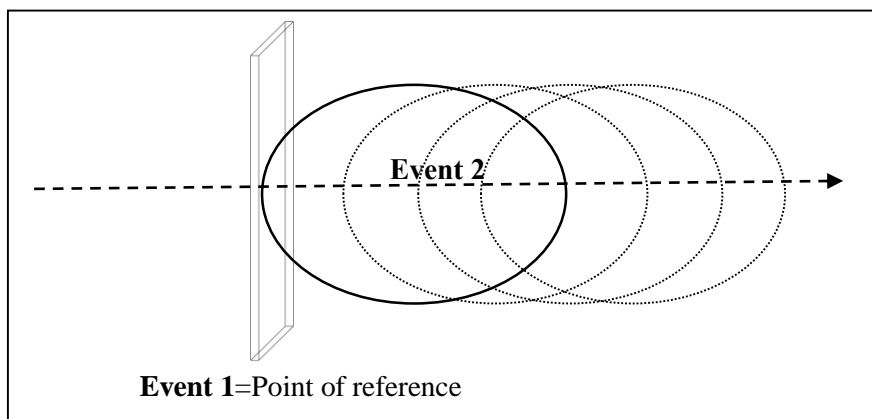


Figure 2. Conceptualization of [**ly_AV0 after*] 2

In these examples, *death*, *birth* and *midnight* are all punctual events (cf. Beavers, 2008; Dowty, 1979). Beavers (2008) defined that “[p]unctual events are composed of two subevents, a beginning and an end” (p.248). These events are the reference points themselves, i.e., their Event 1 is almost non-existent and could be seen as the reference point. The focus is still on the events that happen after it.

PEDAGOGICAL IMPLICATIONS

In order to observe how a corpus can assist learners in learning a linguistic point, we conducted a classroom pre-teaching and post-teaching task (appendix) based on our corpus findings on the preposition *after*. The aim of the task was to see if EFL students responded faster with the use of a corpus, compared to an intuitive or a dictionary-based method of answering questions.

The class consisted of 35 English major freshman students in a general linguistics course in a northern university in Taiwan. Before the introduction of the corpus, the pre-test (appendix) was distributed. Students were told they could look for the expressions in dictionaries if they wanted to.

Among the 35 students, seven students were removed because they only answered one of the pre- or post- tests due to lateness or incomplete answers. The number of students left for analysis was 28. The last question was an open-ended question that asked if students found the exercise easy

or difficult. A majority of the students wrote ‘difficult’ in the pre-test.

After about 20 minutes, before the teaching started, the pre-tests were collected. The teaching involved a two-and-a-half hour corpus hands-on workshop. All the skills needed to retrieve the data of the pre-teaching exercise were taught. In the workshop, the experimenter used different keywords (e.g., *good_N**, *good_AJ0*, etc.) to introduce the corpus functions. Only the collocation section used the same keyword *after*.

After the workshop, students were given about 20 minutes to complete the post-test, which looked exactly the same as the pre-test except for the last question which asked: “Do you now find it easier to provide the answers? Why?” For this question, almost all the students agreed that the corpus provides a faster and easier way to answer all the questions in the test.

Parts-of-speech

For generating sentences (question 1; see appendix) that contain *after* based on parts-of-speech ‘preposition’, ‘conjunction’, ‘adverb’, and ‘adjective’, most students did not answer this part correctly in either test. This is probably due to the misunderstanding of this question or missing information in the instruction. Most students wrote a list of possible prepositions (*on*, *at*), conjunctions (*and*, *or*), adverbs (*beautifully*, *quickly*), and adjectives (*fast*, *fat*) in both tests. For this part, we only discussed the students who answered them correctly.

Two observations were found on this part: First, the number of students who answered the questions correctly improved in the post-test. The number of students is given in Table 5.

Table 5

Number of Students Who Generated the Examples of After Correctly

	Preposition	Conjunction	Adverb	Adjective
Pre-teaching	8	7	6	2
Post-teaching	14	14	14	14

Second, among the four parts-of-speech, students found it harder to generate examples of *after* as an adjective compared to the other three parts-of-speech. The few correct examples given by students in the pre-teaching are as follows.

- (9) (a) *I participated in a lot of **after**-school activities.*
(b) *I want to go to the **after**-party of Bruno Mars’.*

Only a few students knew how to use *after* as an adjective at the beginning but were able to provide the sentences at the end of the workshop.

Phrase Generation

For phrase generation (question 2), students were asked to provide 12 expressions relating to the use of *after*. In Figure 3 below, we calculated the improvement of individual students in answering this part.¹⁰ The bars show the number of expressions students were able to provide at the end of the workshop. If a student wrote zero expressions on the pre-test and wrote 12 expressions on the post-test, their improvement was 12. If a student wrote 12 expressions at the beginning and 12 at the end, their improvement was zero (S10, S21, S24, S25, and S27). No student wrote zero at the beginning and zero at the end (which could also mean they made no improvement).

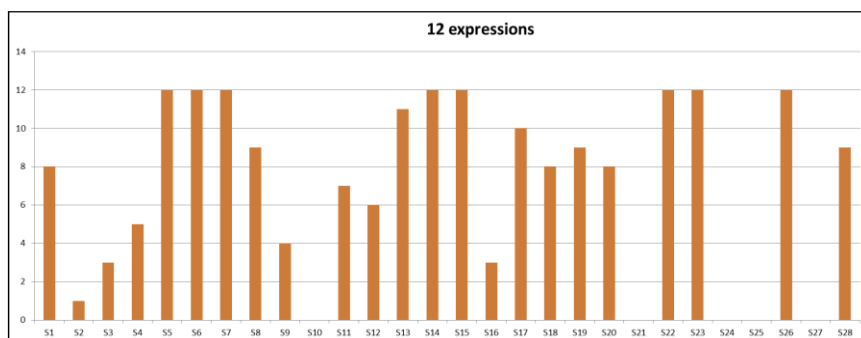


Figure 3. Improvement of students in phrases generation

From the results (see also Histogram in Figure 4) one can see that as many as eight students improved from zero to 12, three students improved by adding eight and nine phrases, respectively. As noted above, five students who initially wrote 12 phrases and who also wrote 12

¹⁰ For improvement, we provided the raw number difference instead of the gain score because the answers were not graded in scores. We thank the reviewer for bringing this up.

phrases at the end showed zero improvement although a qualitative analysis of their answers showed that they improved in the level of vocabulary difficulty probably due to the more formal examples taken from the corpus. The remaining students had a fair distribution in their improvement in number of generated phrases, as shown in the histogram.

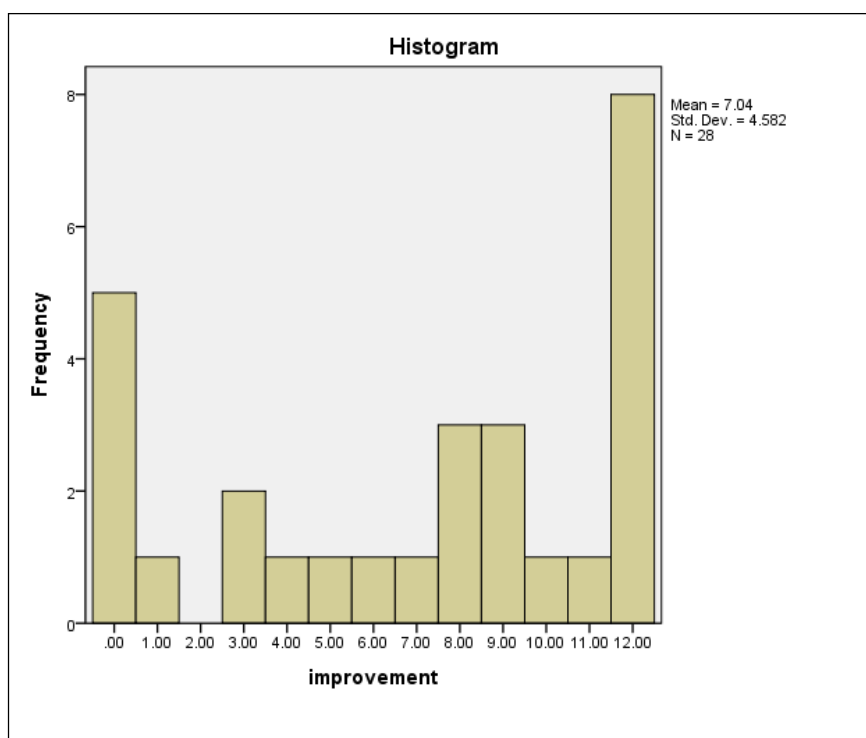


Figure 4. The improved number of phrases generated

[-ly + after]

For the use of *after* that appears after the adverb *-ly* (e.g., *-ly after*) (question 3), the number of improvement is shown in Figure 5. Unlike the generation of phrases, the intuitive generation of [-ly after] was much more difficult. Only one student (S23) provided 12 expressions in both versions (thus, zero improvement).

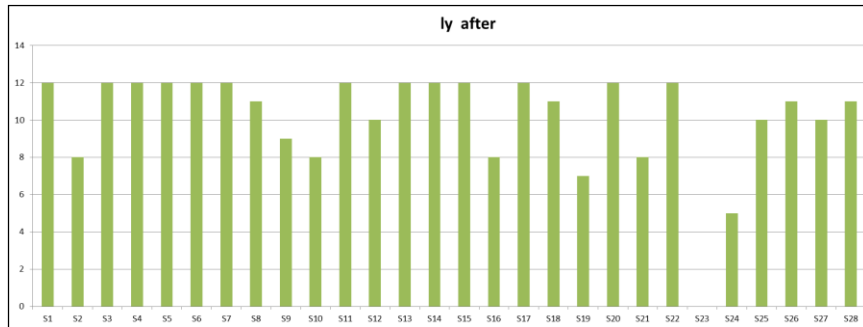


Figure 5. Improvement of students in generation of [-ly after] expressions

From Figures 5 and 6, we noticed that most students were unable to generate [-ly + after] constructions intuitively. A smaller number of students were able to generate up to eight expressions. This shows the effectiveness of using a corpus when students had no idea what to write when they intended to produce uses of a certain construction, even if they might know the expressions. Therefore, the corpus provides a quicker access to examples with precision and effectiveness.

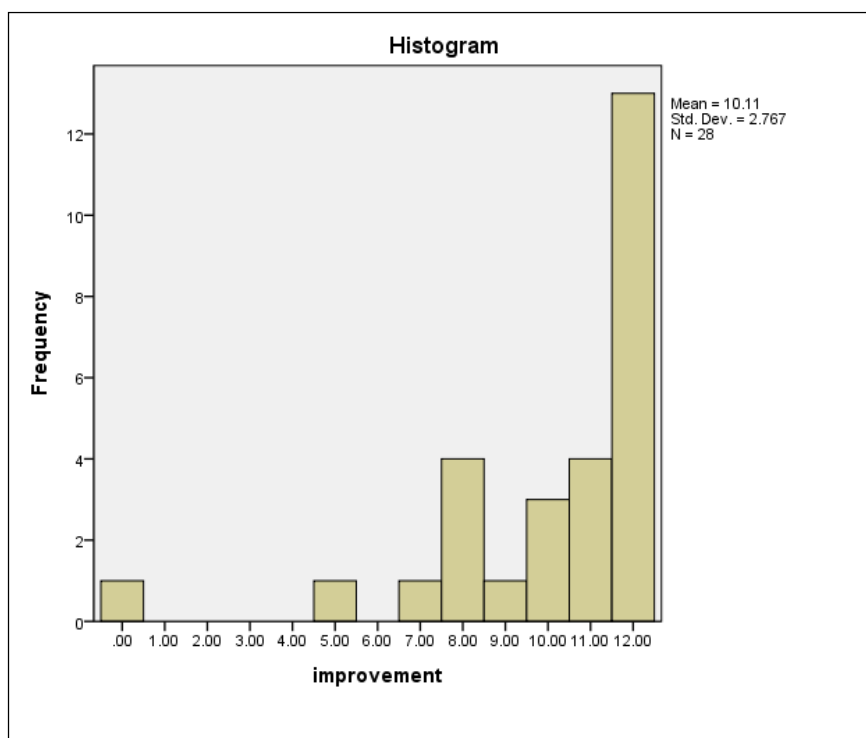


Figure 6. The improved number of [-ly + after] generated

[-ly + after + NOUN]

When the construction became longer and more complicated, intuitive generation became more implausible (question 4). This can be seen in Figure 7, in which a majority of the students had improvements of 12 instances, indicating the improvements from generating zero to 12 expressions.

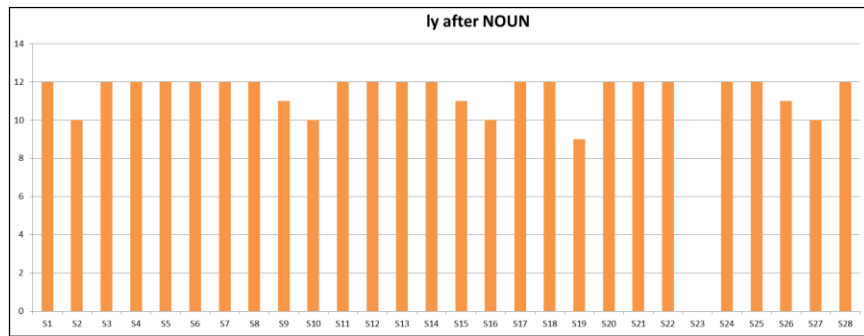


Figure 7. Improvement of students in generation of [-ly + after + NOUN] expressions

From Figure 8, we can see that 19 out of 28 students (68%) generated nothing in the pre-tests but were able to generate as many as 12 expressions at the end with the assistance of the corpus. Only one student was able to generate 12 expressions in both tests. The remaining students were able to generate up to four expressions at the beginning of the workshop.

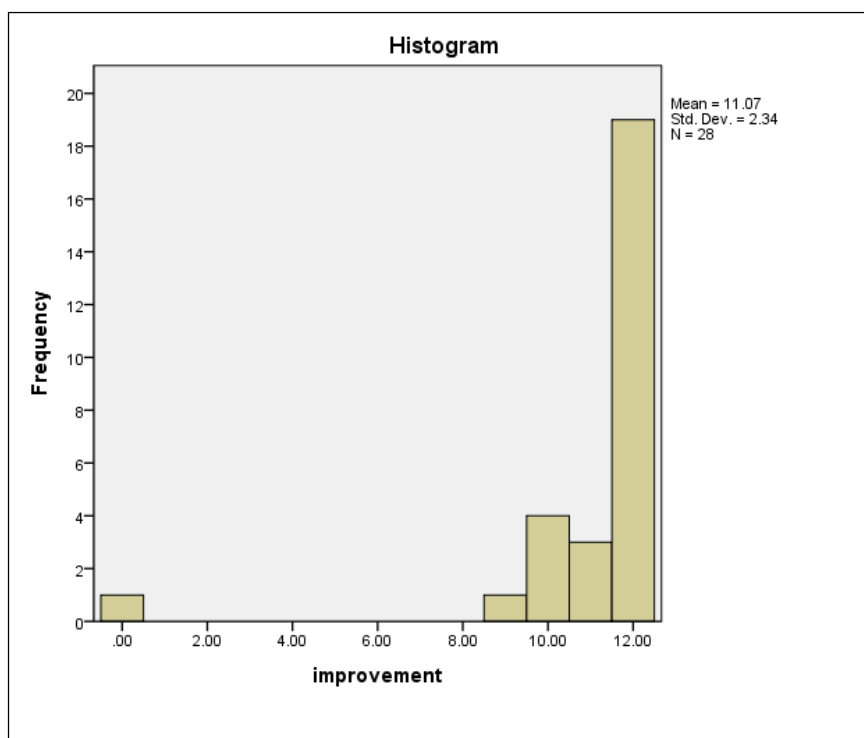


Figure 8. The improved number of [-ly + after + NOUN] generated

Based upon the results above, we can say that, even if *after* is a common preposition, students were not able to generate many uses when it appears in constructions. The patterns that we presented in this paper that have specific meanings can be found through using corpus-based instruction. Students can understand better how to use a construction more effectively if they know how to use the correct tool. This experiment, however, did not test the contextual meanings of *after* as presented in this paper. This is due to the limitation of time within a teaching slot and the need to instruct this in a longer period of time. However, from the above, we can see that by correctly and appropriately using the corpus, we can help students to be autonomous learners as they can discover more from the data they are searching.

CONCLUSION

This paper has demonstrated how a single word can be expanded to its collocations and finally to its pattern analyses. The results showed that the meaning of a word may affect the kinds of collocations it offers, and this can be unveiled through corpus linguistic analysis. The overall results display that the ‘time and order’ senses of *after* enable modifying of the follow-up actions in speed, manner (precision), or probability. This part of the analysis supports the recent corpus-based development from lexical to pattern analysis.

From our analysis of *after*, too, we confirmed the reasons why *after* was less researched: it was thought to be less varied in meanings, and its combination with verbs is also more central. Yet, many did not go beyond these points and looked at its functions in context. We found that, in discourse, *after* serves an important function by relating two events and emphasizing the significance of the second event. We used probes such as [-*ly after*] and [-*ly after* + NOUN] patterns to find the contextual functions of *after* in discourse. We showed the conceptualization and frequent uses in a corpus. It is often the event that occurs later that is the focus of discussion. The event that happens before the reference point is the trigger to the second event. Sometimes, the first event can be durative and as swift as a reference point itself, meaning that the first event can merely be a point of reference. As the impact of the first event on the second event is highlighted, the impact is most of the time negative; otherwise it deserves less attention to be mentioned. Often times, too, the impact means a change has occurred, and this change could be positive, negative, or neutral.

Based on the above, we suggest that further attention should be given to the contextual information of prepositions, rather than on its semantics or syntax only. The correspondence between semantics and pragmatics of a preposition is important to understanding its uses, which will be of great help to learners. By doing so, the relatedness of the collocated terms can be explicated and their motivation of co-appearance can also be explained.

As for pedagogical implications, we showed in the experiment that even a word that looks seemingly easy like *after* can be difficult when we try to use it in constructions. The pre- and post-tests showed that students had difficulty at first when they tried to generate expressions related to *after* even if they knew most of the uses. However, after a workshop on using a corpus, they performed better in producing

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expressions that contain *after*. This showed how a corpus can provide information that the human brain cannot generate easily. Further studies need to be carried out to investigate how an instructor could invite more speculation from students to observe the prosody or underlying meaning of a word in a corpus.

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CORRESPONDENCE

Siaw-Fong Chung, Department of English, National Chengchi University, Taipei, Taiwan

Email address: sfchung@nccu.edu.tw

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APPENDIX

Prepositions have many functions. *After* is a common function word. List one example for each type below.

1. Part-of-speech

(a) Preposition

(b) Conjunction

(c) Adverb

(d) Adjective

2. List 12 expressions in which you will find the use of *after*.

1.	5.	9.
2.	6.	10.
3.	7.	11.
4.	8.	12.

3. *After* can appear after adverbs that end with *-ly* (e.g., *-ly after*). List 12 expressions.

-ly + after

1.	5.	9.
2.	6.	10.
3.	7.	11.
4.	8.	12.

4. Copy the same 12 expressions from the question above but add a possible noun behind each of them. You can add up till three words (including *the*, *a*, and adjectives)

-ly + after + NOUN

-ly after the NOUN -ly after a NOUN -ly after the adj. NOUN

1.	5.	9.
2.	6.	10.
3.	7.	11.
4.	8.	12.

Pre-test: Do you find this exercise difficult or easy? Why?

Post-test: Do you now find it easier to provide the answers? Why?

AFTER 在語料庫的使用情形

鍾曉芳

國立政治大學

本研究目的為探討英語介系詞「*after*」及其在 British National Corpus 中的使用情形。除了檢視其辭典義項外，本研究亦觀察其句型分布、共現動詞以及 [-*ly after*]、[-*ly after* + NOUN] 構式的使用，並藉由語料庫工作坊的教學前、後測分析語料庫與英語教學應用之效益。本研究觀察介系詞「*after*」的使用及其隱含在上下文中，較少被討論的語意信息，並整理出介系詞「*after*」如何呈現兩起事件之間關係的概念。最後，我們亦分析英語學習者參與語料庫工作坊前後的語言產出。結果顯示語料庫工作坊不僅提升了學習效益，也有助於加快學習者應用「*after*」表達的速度。本論文可作為功能詞相關的研究樣本，同時，亦證實語料庫於英語教學之應用是有效的。

關鍵詞：*After*、介系詞、共現詞、語料庫