

English Prepositions as an Interface between Embodied Cognition and Dynamic Usage:

Proposal of a Dynamic View of Grammar

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Abstract

This thesis proposed a dynamic view of grammar by examining the behavior of English prepositions in discourse contexts. While the meanings of prepositions have been studied in the field of cognitive linguistics from its inception (e.g., Brugman 1981; Lakoff 1987; Dewell 1994; Tyler and Evans 2001, 2003), these studies have mainly attempted to uncover the cognitive motivation(s) for their semantic extension based on structured examples, i.e., based on sentences created by the researchers. These studies seem to assume that the senses of a given ‘word’ can be defined, and that the ‘word’ is the basic unit of meaning. This assumption is reflected in their attempts to describe the meanings of individual prepositions (e.g., in describing the prototypical sense of *over* as ‘ABOVE + ACROSS’) and their semantic networks, without examining contextual or discourse factors in detail. However, when actual language use is taken into account, the meanings of an individual preposition can differ depending on its co-occurring words; furthermore, its grammatical behavior is determined based on the environment in which it occurs. However, the relationship between words and their co-occurring environments has not been examined in previous studies on prepositions.

In light of this situation, this thesis analyzed the natural use of prepositions embedded in discourse contexts, showing how dynamic factors in natural discourse can interact with cognitive processes in determining the behavior of each preposition. This thesis includes four case studies using data extracted from corpora – some data are extracted from the genre of formal written text, others from conversational data between children and their parents.

Based on the case studies, this thesis quantitatively demonstrated that (i) the meanings of linguistic expressions tend not to be conveyed by the ‘word’ unit but rather by larger constructions embedded in specific communication environments, (ii) our linguistic knowledge is not necessarily stored in ‘word’ units, and (iii) the behavior of individual words is determined and heavily conventionalized depending on their naturally occurring contexts. Through examining the meaning of the ‘word’ unit based on natural language data, this thesis suggested that not only cognitive but also contextual factors play an important role in the usage of prepositions (or of constructional patterns including prepositions) and in organizing our knowledge of prepositions.

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Chapter 1

Introduction

1.1 Background and Scope of this Study

What is the meaning of a word, and how are various senses of words associated with each other? The answers to these questions have been explored in many studies, including studies based on the framework of cognitive linguistics. To examine the meanings of linguistic expressions, the theory of cognitive linguistics has highlighted two important notions: *cognition* and *usage*.

Langacker (1987: 12), in the very first part of his book proposing the theory of Cognitive Grammar, claimed that “language is an integral part of human cognition” and “an account of linguistic structure should therefore articulate with what is known about cognitive processing in general.” As presented here, cognitive linguistics assumes that our cognitive tendencies (i.e., our way of perceiving and conceptualizing the world) are reflected in, and further motivate, language structure.¹ This assumption has also been applied to the analysis of the polysemous nature of words; many researchers have examined the meanings of polysemous words based on this assumption and demonstrated that their ‘concrete’ or ‘basic’ senses are extended to more abstract senses through general cognitive processes such as metaphor and metonymy. These analyses have greatly contributed to the development of the theoretical framework of cognitive linguistics, which emphasizes the close relation between human cognition and language.

¹ This assumption represents a clear difference between the background philosophy of cognitive linguistics and that of generative linguistics, which claims that language constitutes an autonomous mental ‘organ’, separate from other cognitive phenomena.

At the same time, Langacker (1987: 46) also claimed that Cognitive Grammar is a usage-based theory. The usage-based view of grammar, which has also been proposed by Bybee (1985, 1995, 2003, 2006), Traugott (1988), Langacker (2000), and Bybee and Hopper (2001), assumes that speakers establish schematic constructions based on concrete utterances in language use, and that the degree of entrenchment of linguistic expressions reflects their frequency of occurrence. This usage-based view can shed light on the social and interactional bases of language, because people usually use language to communicate with others. In everyday interaction, we adjust our ways of speaking/writing depending on the usage context and communicative environment; for instance, we tend to produce different types of words and constructions in everyday talk versus in academic papers, and thereby a large number of conventionalized expressions are developed uniquely in one of these environments. This implies that the meanings of a word (i.e., the meanings conventionally expressed by the word) and the patterns/constructions in which it frequently occurs can differ depending on the mode and genre of communication.

As briefly introduced above, cognitive linguistics suggested that two important concepts, cognition and usage, form the basis of linguistic expressions. Although both are considered to be essential, these two terms apparently express contrastive notions, or focus on very different aspects of language – the cognitive system belongs to individual bodies, whereas usage occurs interpersonally in social contexts. Moreover, the cognition system is relatively universal and generally shared by human beings, while usage can vary widely depending on communities or communicative environments. If they have such contrastive characteristics, then how do they interact with each other and determine the behavior of lexical items, and how do they motivate language structure? Although Langacker (1987, 1997, 2008) theoretically suggested the notions cognition and usage, the relation between them has not been demonstrated based on detailed analyses of specific lexical items. Studies of

polysemy in the field of cognitive linguistics have had a tendency to analyze structured examples (i.e., sentences created by the authors), and thereby examine only the ‘static’ meanings associated with individual words rather than dealing with their varieties as observed in ‘dynamic’ usage. Therefore, while many studies have demonstrated the cognitive process of the semantic extension of polysemous words, they have not explained how the contexts of occurrence dynamically influence the meanings and conventionalized usage of words. In light of this situation, this thesis will propose a dynamic view of grammar and will provide a highly context-dependent analysis for the meanings and usage of words. As the research target, this thesis examines the usage of English prepositions in spoken and written discourse in detail. By closely examining the behavior of prepositions in actual use, this thesis attempts to reveal how cognition and usage interact with each other and thereby propose an answer to the question ‘what is the meaning of a word, and how are various senses of words associated with each other?’ in terms of not only general cognition but also the local contexts in actual language use.

1.2 Why Prepositions?

The lexical category of prepositions plays a key role in illustrating the interaction between cognition and usage for several reasons. The field of cognitive semantics has generated many analyses of the meanings of English prepositions from its inception (e.g., Brugman 1981; Lakoff 1987; Taylor 1988; Dewell 1994; Boers 1996; Tyler and Evans 2001, 2003; Deane 2005). Prepositions tend to be selected as a research target mainly because (i) they are generally highly polysemous, (ii) their meanings tend to be extended from spatial senses to more abstract ones, and (iii) the semantic extension seems to have a cognitive basis. The spatial senses of prepositions, which represent physical locations or paths of movements, are

considered to reflect how we perceive and conceptualize the spatial relations of the world based on our embodied experience. Moreover, prepositions can express not only spatial but also various abstract senses, so the process of their semantic extension can illustrate to us how we understand abstract concepts based on our spatial cognition.

Compared with the cognitive explanation, the explanation focusing on usage has not been applied as frequently to studies of English prepositions. However, prepositions are traditionally categorized as functional words and to a large extent their meanings are determined depending on the context in which they appear. For instance, compared with the meanings of content nouns such as *dog*, *teacher*, *love*, or verbs such as *walk*, *write*, *push*, the meanings of the prepositions *of*, *on*, *by*, or *over* dynamically change according to their co-occurring words, and can hardly be defined without any contextual information. Although previous studies have explored the meanings of prepositions themselves based on structured examples, prepositions have a highly context-dependent nature and therefore require a framework to analyze the relation between their meanings and their contexts of occurrence.

To sum up, the senses of English prepositions are considered to be extended based on our embodied experience through cognitive processes, and at the same time, they have a highly context-dependent nature. These characteristics of prepositions will allow us to examine how cognition and usage work together to organize speakers' knowledge of words, and motivate various senses and uses associated with polysemous words.

1.3 Outline of the Study

This thesis is composed of three parts. Part I is made up of two chapters (Chapters 2 and 3), which provide the theoretical background and outline of previous studies of English prepositions. Part II is composed of four chapters (Chapters 4–7), which provide four case

studies to discuss how cognition and usage interact with each other in motivating the behavior of prepositions. Part III is made up of one chapter (Chapter 8), which describes how cognition and usage work together to organize speakers' knowledge of English prepositions, and to motivate various senses and uses of each preposition. Following Part III, Chapter 9 presents a conclusion summarizing this thesis. The following paragraphs introduce a more detailed outline of each chapter.

Part I is made up of Chapters 2 and 3. Chapter 2 addresses the theoretical framework of this study, with reference to the symbolic view of language proposed in Cognitive Grammar (Langacker 1987, 1990, 2008), the concept of linguistic embodiment (Lakoff 1987; Evans and Green 2006; Tyler and Evans 2003) and the usage-based perspective (Traugott 1988; Langacker 1987, 2000, 2008; Bybee 1985, 1995, 2003, 2006, 2007, 2015; Bybee and Hopper 2001; Tomasello 2003; Taylor 2012). Chapter 3 outlines previous studies on English prepositions, referring to some research on categorization and cognitive factors that motivate polysemy. First, section 3.2 summarizes the classical view of polysemy, introducing the objective view of linguistic categorization (Katz and Fodor 1963; Katz and Postal 1964; Collins and Quillian 1969), and section 3.3 explains the prototype approach (Rosch 1975) as an alternative to the classical one. Then, section 3.4 summarizes the approach of cognitive linguistics to polysemy and the meanings of English prepositions (e.g., Brugman 1981; Lakoff 1987; Dewell 1994; Tyler and Evans 2001, 2003). Section 3.5 identifies some deficiencies in previous studies and explains the methodology of this study.

Part II, composed of Chapters 4, 5, 6, and 7, presents case studies that demonstrate how both cognition and usage, or embodied conceptualization and social context, can integrally motivate language structure. All of the case studies analyze the natural use of prepositions, focusing on their contexts of occurrence, based on data extracted from corpora. The term 'context' can actually indicate various kinds of elements: for instance, co-occurring

words, constructional patterns or fixed expressions in which prepositions occur, prior and subsequent parts of discourse, the relationship between the speaker and listener (or the writer and reader), non-verbal cues such as gestures or movements, types of communication or genres, or interactional goals. Among these factors, this thesis focuses on and examines different factors in each case study.

As the first case study, Chapter 4 analyzes the differences between the synonymous prepositions *on* and *over* when they are used with the noun *influence*, as in the following examples.

- (1) a. man's *influence on* the earth's surface seems incommensurate with his scale
[ODE2]
- b. He will retain some *influence over* the company. [OBED]

While the prepositions *on* and *over* sometimes seem interchangeable in collocations with *influence*, it is not clear how the speaker/writer chooses between these prepositions. This study carries out quantitative research using the British National Corpus (BNC), demonstrating that the phrases *influence on* and *influence over* tend to co-occur with different types of nouns and occur in different grammatical patterns. Chapter 4 then discusses the motivations for the differences observed in their usage, from the viewpoint of the spatial senses of *on/over* and also from the constructional meanings which come to be conventionalized through their usage.

Chapter 5, the second case study, examines the abstract senses of the preposition *under*, identifying the factors that determine the grammatical tendencies of prepositional phrases headed by *under* (*under* phrases).

- (2) Under these services, revenues would be shared among the participating

companies.

[BNC]

The results of this quantitative study using the BNC show that *under* phrases tend to occur as a clause-level modifier and in the clause-initial position when representing some conditions or presupposed circumstances under which an event occurs, as in (2). On the other hand, when *under* phrases express a spatial meaning (e.g., The cat is *under* the table), they rarely appear with such a grammatical status. This fact cannot be explained by the theory of metaphor, in which the abstract senses of prepositions are considered to be derived from spatial senses. As an alternative approach, Chapter 5 suggests that the grammatical tendencies observed in *under* phrases are motivated by semantic characteristics of the metaphorical use of *under* phrases, and by the contexts in which they occur (e.g., typical way of organizing a discourse), rather than from cognitive factors as previously proposed in the literature.

Chapter 6 presents the third case study, which examines the discourse-deictic uses of *above/below* as in (3) to argue how the characteristics of a specific genre influence the behavior of these prepositions.

- (3) a. The explanation outlined *above* (Boers 1996: 108)
b. In paragraph 53 *below* (ibid.: 75)

The result of this quantitative study using the BNC demonstrates that *above* and *below* used for discourse reference behave asymmetrically; that is, they tend to appear in different grammatical constructions and co-occur with different kinds of nouns and verbs, though they are generally considered to be an antonymic pair. Moreover, such asymmetric behavior is not observed in their spatial uses. Based on the results, Chapter 6 attempts to show how the asymmetric behavior of *above/below* has come about, based on the characteristics of formal

written texts, i.e., genres in which their asymmetric behavior is usually observed.

As the last case study, Chapter 7 examines children's use of prepositions based on conversational data accessed through the CHILDES databank. The analysis of this case study uses the framework of dialogic syntax developed by Du Bois (2001, 2014). In this framework, the phenomenon called *resonance*, which is explained as "the catalytic activation of affinities across utterances" (Du Bois 2014: 372), is considered to play a key role in the emergence of grammatical patterns. Chapter 7 explores children's use of prepositions from the perspective of resonance, demonstrating that children's knowledge of prepositions is built up dialogically through utterance sequences in daily interaction to achieve their communicative goals. This case study focuses on communicative/interactional contexts, and thereby attempts to shed light on the dynamic aspects of grammar. This case study provides strong support for the claim that not only the cognitive factors but also the social and contextual factors in usage are essential in shaping the grammatical patterns shared in a community, and also in organizing our knowledge of lexical items in a bottom-up way.

Part III, including Chapter 8, reviews the results of the four case studies, attempting to account for how speakers' knowledge of English prepositions is organized based on cognition and usage, and suggesting an answer to the question of how we can define the meanings of words. Moreover, this chapter discusses the theoretical, descriptive, and methodological importance of this thesis.

Chapter 9 summarizes the discussion of the thesis, suggesting that the results of this study also contribute to other fields of linguistics, such as discourse-functional linguistics, interactional linguistics, genre studies, and language acquisition.

Part I

Chapter 2

Theoretical Framework

2.1 Introduction

Chapter 2 provides a theoretical framework for this thesis – an analysis of the meanings and usage of English prepositions from a dynamic view of grammar, focusing not only on cognitive but also contextual factors in language use. The analysis of this thesis is mainly based on the framework of cognitive linguistics, so sections 2.2 and 2.3 first explain the symbolic view of grammar, which is one of the most basic notions characterizing the theory of cognitive linguistics (Langacker 1987, 1990, 1991, 2008; Taylor 2002).

Then, section 2.4 will introduce some cognitive factors that are assumed to motivate linguistic structures. In 2.4, I will mainly explain the concept of embodiment (Lakoff 1987; Tyler and Evans 2003; Evans and Green 2006), which is essential to demonstrating the process of the semantic extension of words as a cognitive phenomenon.

After that, section 2.5 provides an overview of the usage-based approach to grammar (Bybee 1985, 1995, 2003, 2006; Traugott 1988; Langacker 2000; Bybee and Hopper 2001). Usage-based theory assumes that the establishment of schematic constructions is the result of language use, which includes concrete utterances, and it predicts that the degree of entrenchment of a form in speakers' minds is related to the token frequency. Section 2.5 will demonstrate how contextual factors motivate language structure.

Finally, the last section in Chapter 2 provides a summary and explains the perspectives emphasized in this thesis.

2.2 The Symbolic View of Language

This section first provides an overview of the symbolic view of language, which can be considered one of the most fundamental ideas of cognitive linguistics (Langacker 1987, 1990, 1991, 2008; Taylor 2002). As is widely known, Generative Grammar regards grammar as a purely formal system, separate from meaning. This theory claims that syntax is autonomous and is considered to constitute an independent module or component, which is separate from other cognitive abilities. In contrast, Cognitive Grammar, a grammatical theory based on cognitive linguistics proposed by Langacker, regards grammar as meaningful; that is, the grammatical system and semantic components cannot be separated from each other; this is further explained as follows:

“The elements of grammar – like vocabulary items – have meanings in their own right. Additionally, grammar allows us to construct and symbolize the more elaborate meanings of complex expressions (like phrases, clauses, and sentences). It is thus an essential aspect of the conceptual apparatus through which we apprehend and engage the world. And instead of being a distinct and self-contained cognitive system, grammar is not only an integral part of cognition but also a key to understanding it.” (Langacker 2008: 3–4)

“Two roughly synonymous sentences with the same content words but different grammatical structures – including, in particular, sentences generally analyzed as being transformationally related – are claimed instead to be semantically distinct by virtue of their different grammatical organization *per se*” (Langacker 1987: 39).

Based on this assumption, Langacker claims that not only lexical items such as words or

morphemes but also more complex expressions or grammatical patterns such as phrases or clauses have a symbolic nature; the notion ‘symbol’ here is defined as “a pairing between a semantic structure and a phonological structure, such that one is able to evoke the other” (Langacker 2008: 5). This view of grammar leads to the idea of lexicon-grammar continuity, which will be explained in the next section.

2.3 Continuum of Lexicon and Grammar

As mentioned in the previous section, Cognitive Grammar assumes that grammatical patterns have a symbolic nature, and this assumption is developed into the idea that a language consists of an inventory of linguistic units, which become entrenched as a consequence of usage. Langacker (1987: 29) claims that some complex expressions or patterns are stored in a speaker’s knowledge as a whole even though they can be explained based on a grammatical rule, citing examples of English plural forms. English plural forms such as *beads*, *shoes*, *toes*, and *walls* would be assumed to be formed/retrieved by a rule like ‘N (noun) + -s’. However, when speakers produce these forms in natural language use, it is unlikely that they combine each noun with ‘-s’, applying a grammatical rule each time. Rather, the entire unit such as *beads* or *shoes*, is stored as a whole, and speakers usually access these whole units and produce them without thinking about general combination rules. This example implies that, even though some general rules contribute to the predictability of these patterns and the patterns can be analyzed into smaller parts, it is plausible that not only rules but also specific plural forms such as *beads* and *shoes* exist in speakers’ knowledge. Based on the symbolic nature of complex expressions, Langacker proposed the notion of lexicon-grammar continuity, as the “lexicon and grammar form a gradation consisting solely in assemblies of symbolic structures” (Langacker 2008: 5). This view of language contrasts with the idea highlighted by

Generative Grammar, which assumes that complex expressions are always produced through combining smaller elements based on general grammatical rules.

The symbolic view of grammar and the idea of lexicon-grammar continuity are essential to explanations of the fact that there are thousands of conventional expressions, such as familiar collocations, formulaic expressions, and standard usages of linguistic elements, and knowing them is essential to using a language fluently. Langacker (1987: 35) provides some examples of conventional expressions: *great idea, answer the phone, mow the lawn, turn the pages, in the context of, underlying assumptions, I don't care*. Generative Grammar, which is concerned with general syntactic rules rather than specific combinations of lexical items, has paid little attention to the role of these conventional expressions. However, Langacker (1987) argued that English speakers usually use these conventional expressions as a unit, without combining the individual lexical items based on general syntactic rules. That is, they are considered to be stored as a whole in speakers' knowledge, even though some of them are grammatically regular and predictable from general rules of English grammar.² Langacker (1987: 47) also pointed out that English speakers usually say *I am cold* rather than *I have cold* or *It is cold to me*, which cannot be fully predicted by the meanings of the lexical items and general grammatical rules alone. These conventional expressions are neither purely lexical nor purely syntactic characteristics. Taylor (2012) also described the conventional nature of language (or "idiomaticity" in Taylor's term) as follows:

"A person armed only with the dictionary and the grammar book could well come up with expressions which are fully grammatical and with meanings which can easily be worked out but which happen not to correspond to what speakers of a language would normally say." (Taylor

² Taylor (2012: 130) explained this point as well, in the following statement: "frequently used items tend to be accessed as wholes, even though, in principle, they can be analyzed into their component parts."

2012: 100)

“The idiomatic way of saying something need not be syntactically or semantically unusual in any way at all. The idiomaticity of an expression resides in its conformity with native speaker norms.” (ibid.: 101)

As mentioned earlier, Cognitive Grammar assumes that the lexicon and syntax form a continuum of symbolic units (i.e., constructions), and this view of grammar is compatible with the existence of a huge set of conventionalized patterns; based on these notions, Cognitive Grammar claims that specific combinations of lexical items and general grammatical rules coexist in speakers’ knowledge and are not mutually exclusive.

2.4 The Cognitive and Embodied Basis of Language

As shown in the previous section, cognitive linguistics views language as an inventory of linguistic units of form-meaning pairs. This section outlines how the form-meaning pairs are considered to be organized through our perceptions and conceptualization of the external world. To that end, this section introduces the concept of linguistic embodiment (Tyler and Evans 2003; Evans and Green 2006) and the cognitive basis of linguistic structure.

The notion of embodiment is essential to accounting for the semantic extension of words as a cognitive phenomenon. Langacker proposed that “in cognitive semantics, meaning is identified as the conceptualization associated with linguistic expressions” and claimed that “though it is a mental phenomenon, conceptualization is grounded in physical reality: it consists in activity of the brain, which functions as an integral part of the body, which functions as an integral part of the world” (Langacker 2008: 4). Tyler and Evans also emphasized the significance of embodiment and its relation to language structure as follows:

“Embodied experience constitutes the notion that human experience of the world is mediated by the kinds of bodies we have, and hence is in large measure determined by the nature of the bodies which mediate how we experience the world.” (Tyler and Evans 2003: 23)

As implied here, the theory of cognitive linguistics assumes that linguistic structures emerge through our daily lives, based on the interactions between our body and our external environment. To be more specific, humans may perceive and then conceptualize the world through our embodied experience, and our ways of conceptualizing the world are reflected in language structure. This view of language emphasizes that language structure is not autonomous but is closely associated with the characteristics of our environment, and with our cognitive tendencies to construe it subjectively.

Based on this view, many studies of English prepositions have been conducted in the field of cognitive linguistics; this might be because one of our most fundamental embodied experiences of the world is spatial experience, which is associated with axes such as up-down, in-out, or near-far, and such spatial relations can generally be expressed with prepositions in English. According to the Oxford English Dictionary, the oldest sense of most English prepositions is the one expressing spatial relations; for instance, the oldest meanings of the prepositions *over* and *under* express vertical relations between two things. If one thing is at a higher or lower position than the other, we can perceive their relative physical positions along a vertical axis based on our visual sense. Furthermore, our embodied experience regarding the vertical axis is associated not only with this type of visual perception but also with other physical perceptions of our bodies. For instance, if we are covered with a blanket, we can feel its weight and warmth, and thereby we can sleep comfortably. If we are under an umbrella, it may protect us from the rain. As in these

examples, we can interact with the external world through our body using various perceptions in our daily lives, and all of them can be reflected in our conceptualizations, and then our language structure.

In addition, the other essential nature of English prepositions is that their meanings are usually extended to various abstract/metaphorical senses. In metaphorical semantic extension, it is assumed that basic organizational features of one conceptual domain that is more directly grounded in our bodily experiences are projected onto another (Lakoff and Johnson 1980, 1999; Lakoff and Turner 1989). The preposition *over*, for instance, can be used in various senses such a temporal sense (e.g., *over the years*), control sense (e.g., *She has great influence over me*), and excess sense (e.g., *A captain is over a sergeant*). These abstract senses are considered to be derived through metaphorical semantic extension from the word's spatial senses. That is, some features of the source domain, in which physical relations between concrete objects are expressed, are projected metaphorically onto the target domain such as the temporal domain, control domain, or excess domain. Metaphorical semantic extension is motivated by our ability to perceive similarities or analogical relationships between two domains, or based on the co-occurrence of a physical location and an abstract relation between things (metaphor and metaphorical semantic extension will be discussed further in Chapter 3 below). That is, our embodied experience of the external world is reflected not only in the spatial senses but also in the abstract senses of prepositions, and thus works as a source of creativity of language. Examining the senses of English prepositions contributes to a deeper understanding of our tendencies of perception and conceptualization, as well as their relations to language structure. Chapter 3 will provide a more detailed review of some studies of the semantics of English prepositions, i.e., highly polysemous items.

2.5 The Usage-Based Approach

The previous section dealt with the cognitive motivations for language (in a narrow sense), focusing especially on the embodied view and the relations between our perception, conceptualization, and language structure. This section, in turn, sheds light on usage. In the theory of cognitive linguistics, conventionalized patterns, i.e., constructions,³ are considered to have emerged and then become entrenched based on the frequency of the expressions in natural language use. This section explains the usage-based view of grammar (Traugott 1988; Langacker 1987, 2000, 2008; Bybee 1985, 1995, 2003, 2006, 2007, 2015; Bybee and Hopper 2001; Tomasello 2003; Taylor 2012), which assumes that natural language use is the main source of grammatical patterns in a language, and is also a source of speakers' linguistic knowledge. The first part, section 2.5.1, provides an overview of the basic concept of this approach proposed by Langacker (1987, 2000), focusing especially how he considers grammar has emerged from usage and the role of contexts in facilitating it. Section 2.5.2 mainly summarizes the studies of Bybee (1985, 1995, 2003, 2006) and Taylor (2012),

³ The term 'construction' has been used in a number of different ways in the literature (cf. Langacker 2005; Taylor 2004, 2012). That is, different studies have proposed different definitions of the construction, and more specifically, they have defined the term focusing on different aspects of complex entities. Taylor (2012: Ch.6) briefly summarized the two most important approaches to constructions. In the first one, constructions are viewed as internally complex entities. This view was widely spread during the middle of the twenties, especially among the studies influenced by Bloomfield. In this approach, a construction is viewed as any linguistic form which can be analyzed into smaller parts. For instance, the word *singer* can be thought as a construction from this perspective because it can be analyzed into [*sing*] and [*-er*]. The second approach was mainly developed in Goldberg (1995), which is one of the most influential and authoritative studies of Construction Grammar. It regards constructions as form-meaning pairings whose properties cannot be derived from the properties of any other constructions. This approach thus would not regard the word *singer* as a construction because it can be predicted from the elements that constitute the word, while the word *sing* would be a construction because we cannot predict its meaning solely based on its components. After summarizing these different approaches, Taylor (2012) combined both approaches in a sense and proposed a third approach to constructions, similar to the idea of the 'unit' in Cognitive Grammar. In his definition, a construction is "any element of a language that has been learned and that forms part of a speaker's knowledge" (Taylor 2012: 126). Under this definition, the word *singer* or phrases such as '*How old are you?*' have the status of constructions because they are likely to be learned and accessed as a whole; that is, speakers can use them without applying any combination rules nor considering any abstract schemas. The present thesis uses the term construction following Taylor's definition: any element of a language that has been learned and that forms part of a speaker's knowledge.

demonstrating the importance of frequency in usage-based approaches to grammar. The last part of this section will present studies of language acquisition based on usage-based theories, referring mainly to Tomasello (2003).

2.5.1 Cognitive Grammar as Usage-Based Theory

As is widely known, Generative theory assumes that a grammatical pattern arises by applying general syntactic rules (e.g., the rule for transformation or that for combining lexical elements to organize a phrase). In contrast, Cognitive Grammar (Langacker 1987, 2000, 2008) is a usage-based theory, which assumes that rules can only arise as schematizations of overtly occurring expressions in natural language use in a bottom-up way. That is, rules are viewed simply as a schematic characterization of the units which actually occur in discourse contexts — both in written and spoken discourse. Speakers can organize a schematic pattern based on concrete utterances, and these patterns come to be conventionalized units of the language.

Langacker (2005: 144) explained the idea of the usage-based view of grammar by referring to the importance of contexts, as “all linguistic units are abstracted from usage events, i.e., actual occurrences of language use in their full phonetic detail and contextual understanding.” Cognitive Grammar thus assumes that a speaker’s understanding of a particular context can be reflected in his or her utterances, which can help shape conventionalized units in the language. The term *contextual understanding* here includes not only the understanding of purely linguistic contexts such as co-occurring words, but also that of the social, cultural, and interactional environment; for instance, how a speaker understands the prior utterances/sentences in a particular discourse, and how a speaker construes the interaction itself, as Langacker (2008: 4) claimed that “linguistic meanings are also grounded in social interaction, being negotiated by interlocutors based on mutual assessment of their

knowledge, thoughts, and intentions.” Langacker (1997) also argues for the significance of describing and analyzing linguistic phenomena while taking their occurring contexts into account, because such contextual information plays a key role in forming linguistic units based on usage.

Moreover, this view of grammar regards usage as a source of speakers’ linguistic knowledge, as well as a source of shaping conventionalized units in a language. In this view, speakers of a language are considered to know the natural way to use a linguistic element, and have knowledge of the frequently observed patterns in which a word or a construction occurs. For instance, English speakers might have knowledge that the verb *turn* is frequently followed by noun phrases with head nouns such as *attention* and *page* based on actual usage. Thus, the usage-based view of grammar regards concrete utterances as the basis of speakers’ knowledge of linguistic patterns, which represent abstractions from specific forms occurring in natural discourse. This view is supported and elaborated by other researchers as well, and its validity has been demonstrated by corpus research and studies of language acquisition; I will provide an outline of these studies starting in the next section, providing more explanation of this usage-based view and thereby showing why this thesis regards dynamic discourse contexts as essential in analyzing the meanings of words.

2.5.2 The Role of Frequency

As explained in the previous sections, Cognitive Grammar defines grammar as a structured inventory of conventional linguistic units (Langacker 1987: 73). This section reviews the role of frequency in forming conventional linguistic units or chunks in speakers’ knowledge, and discusses the way these are formed in particular discourse contexts.

2.5.2.1 Frequency as a Source of Forming Chunks

Bybee (1985, 1995, 2003, 2006, 2015) developed the usage-based approach along with Langacker, and pointed out the crucial role of frequency in forming chunks. Bybee (2006: 711) defined grammar as “the cognitive organization of one’s experience with language,” and explained that:

“certain facets of linguistic experience, such as the frequency of use of particular instances of constructions, have an impact on representation that we can see evidenced in various ways, for example, in speakers’ recognition of what is conventionalized and what is not, and even more strikingly in the nature of language change.”

Bybee (2015: 238–239) provides a list of mechanisms which are operative when language is being used, including essential notions such as chunking and semantic change by inference.⁴ Bybee has pointed out that the repetition of strings of elements leads to their forming chunks in cognitive representation, which are stored and accessed together, and the chunks are assigned a meaning based on their contexts of use. Frequency and occurring contexts are closely associated with semantic changes by inference as well. Bybee suggested that “language users often make inferences that flesh out the meaning gleaned from what the speaker said. When the same inferences are repeated, they can become part of the meaning of the words, phrases, or constructions” (Bybee 2015: 239). As described here, chunks are

⁴ Bybee (2015: Ch.11) discussed the possible internal and external sources of linguistic change. Bybee listed the following seven factors as internal factors: (1) the automation of production, (2) the tendency to associate meaning directly with form, (3) replacement of minor patterns with major ones, (4) resistance to change by items with high token frequency, (5) chunking, (6) semantic generalization, and (7) semantic change by inference. Although every one of these mechanisms plays an important role in forming an aspect of grammar, this thesis specifically focuses on the notions (5) and (7), which are closely associated with the emergence of new grammatical patterns.

formed through the repetitions in use, and the contexts in which they occur can assign meaning to them. This claim implies that prepositions also construct chunks (or units) with other frequently co-occurring words in particular contexts, and speakers' knowledge of prepositions is stored and accessed as chunks.

Recent studies using corpus data have shown a number of interesting phenomena regarding the interaction between linguistic elements and the contexts in which they occur. These studies analyzed corpora data using statistical methods, and the results suggest the effectiveness of examining the distributions of linguistic patterns quantitatively using corpora. The following subsections will present some concrete examples shown in these studies, which demonstrate the relation between the frequencies of specific linguistic elements and the contexts in which they occur. Concretely, section 2.5.2.2 will explain studies of the relations between co-occurring words based on the notion of collocations. Section 2.5.2.3 will describe studies focusing on the relations between individual words and the larger constructions they are part of, by introducing the concept of a 'collostruction'. Section 2.5.2.4 will present studies showing that the behavior of a word can differ depending on the type of discourse in which it occurs, which shows that various factors in context are able to influence the behavior of words.

2.5.2.2 Relations between Words

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) noted, "you shall know a word by the company it keeps." Based on this assumption, the relations between words that regularly co-occur have been closely examined in the research field. The tendencies of words to be biased in the way they co-occur are called "collocations" (Hunston 2002: 68). To

calculate the certainty or the strength of a collocation, various kinds of statistical methods have been proposed in the literature (cf. Stubbs 2001; Sinclair 1991, 2004; Hunston 2002; Ishikawa 2012); for instance, studies of collocations frequently use scores such as the *t*-score or MI-score, and more general statistical methods such as the chi-squared value or log-likelihood score.

Corpus-based studies have shed light on various interesting facts regarding the collocational relations between words. For instance, even though the words *big* and *large* are considered to be near synonyms in general, they actually have different collocational preferences; for example, whereas the phrases *a big surprise* and *a large amount of money* can be naturally used, *a large surprise* and *a big amount of money* cannot (Taylor 2012: 108). Moreover, it has often been argued that collocational preferences may reflect subtle semantic differences between the words. In the case of *big* and *large*, according to Taylor, *big* tends to carry affective and evaluative connotations, while the word *large* tends to refer only to the size of a thing. As suggested by this example, collocational preferences can help us identify the detailed characteristics of linguistic elements.

2.5.2.3 Relations between Words and Constructions

In addition to collocations, the notion of the “collostruction” – which blends the words *collocation* and *construction* – has been conceived in the field of corpus-based studies (Stefanowitsch and Gries 2003; Gries, Hamp and Schonefeld 2005; Gries and Stefanowitsch 2004). Studies of collostructions aim to identify the items that are able to occur in the open slot positions of constructions, estimating the degree of attraction between individual items and the construction. In other words, whereas the studies of collocations examine the relations between words, studies of collostructions analyze the relations between individual

words and the preferred syntactic environments in which they frequently occur.

Below I consider some examples of collocation analyses, provided by Gries and Stefanowitsch (2004). They have examined the frequency of words occurring in past tense constructions, demonstrating that some verbs such as *say*, *become*, and *tell* tend to occur in the past tense form, while other verbs such as *hope*, *remember*, and *work* are biased towards occurring in the present tense. Moreover, some verbs are choosy with regard to the constructions in which they occur. The verb *give* is one such case; the use of the verb *give* is biased towards the ditransitive [V NP NP] construction, and the construction itself also attracts the verb *give*. Goldberg (2006: 92) has also pointed out that such skewed input, i.e., the dominance of a single verb in the construction, facilitates the association of the meaning of the verb in the construction with the construction itself, allowing children to get a fix on the meaning of the construction. To sum up, specific words tend to occur in specific types of constructions, and these tendencies are assumed to be conventionalized and included in speakers' knowledge of a language.

2.5.2.4 Relations between Words/Constructions and Discourse Types

As mentioned earlier, the formation of a chunk and its assigned meaning is determined based on the contexts in which it occurs. 'Contexts' are not limited to sequences of words within a sentence, nor to the relations between words and constructions. Rather, contexts may include various factors of the discourse in which a given linguistic element occurs. Register and genre are two such factors, as Biber (1996) has suggested that different registers typically show distinctive frequency profiles. Johansson and Hofland (1989: 23) demonstrated that the relative pronoun *that* is more frequent in the imaginative texts of the LOB corpus, while

another relative pronoun *which* dominates in informative texts. Different frequencies of expression depending on genres are observed not only at the lexical level but also at the clausal level. For instance, it was reported that past tense forms are likely to occur in historical narratives, while passive clauses are more common in scientific reports than in telephone conversations (Biber, Conrad and Reppen 1998).

Taylor (2012) discussed another interesting phenomenon which is associated with the frequency of a word in a specific genre. Taylor pointed out that the plural form of the word *process*, which is regularly pronounced [ˈprəʊsesəz], is sometimes pronounced as [ˈprəʊsesiːz], with a tense [iː] vowel in the final syllable rather than the expected [ə]. What is interesting here is that this replacement frequently occurs especially in academic discourse. According to Taylor, this irregular form resembles the plurals of Greek-origin nouns, such as *theses* (plural of *thesis*), *hypotheses*, *analyses*, and *parentheses*, which are frequently used in academic contexts. Taylor explained the motivation for the emerging innovative pronunciation of *processes* based on the common characteristics of the plurals of Greek-origin nouns and their discourse contexts, as follows:

“The innovative plural resembles the plurals of ‘Greek’ nouns, such as *theses* (plural of *thesis*), *hypotheses*, *analyses*, *parentheses*, and several more. These plural forms share several properties. Apart from the fact that they all end in [siːz], they consist of at least two syllables, often more, in which case word stress mostly falls three syllables from the end. The regular plural of *process* almost conforms with the plural schema for these nouns. The innovation consists in the plural being made to fully conform with the schema. That *process* comes under the influence of the schema may well be due to the fact that words such as *hypothesis*, *thesis*, and others are associated with scholarly academic discourse; the innovative plural of *process* seems to be largely restricted to this context. ... The pattern seems to be being extended to other plurals, such as *biases* and

premises. These are forms which, once again, tend to be restricted to academic contexts.” (Taylor 2012: 134)

We tend to assume that the form of a word is fixed and stable, compared with forms of more complex units such as clauses or sentences. However, Taylor’s explanation here suggests that even the forms of words can differ depending on discourse contexts; in this case, the innovative pronunciation of *processes* comes to be used through analogy based on other words which frequently occur in the same type of discourse. This example shows that the type of discourse in which linguistic elements occur, and the way that speakers construe the discourse contexts, have influence on (i) the way schemas are formed based on usage, and (ii) which schemas are applied to a linguistic element when it is used in a specific context. This implies that the usage of linguistic elements is determined in dynamic ways, influenced by the external environments in which the elements occur.

Moreover, Taylor (2012) proposed the idea of a “mental corpus”, proposing that “speakers know, at least implicitly, the relative frequencies of the words, constructions, collocations, and all the other elements of their language” (Taylor 2012: 148; see also Diessel 2007), Ellis (2002), and Robinson and Ellis (2008)). As shown here, the frequencies of each linguistic element in a particular discourse are considered to be stored in a speaker’s implicit knowledge.

To sum up, studies based on the usage-based view of grammar have proposed that the frequency of a specific word (or a string of multiple words) can differ depending on the type of discourse (e.g., genres, spoken/written, communication styles depending on social relations between interlocutors), and speakers have implicit knowledge of that skewed distribution. The difference in the frequency of specific words (or strings of words) might reflect which kinds of chunks tend to be organized and activated in particular types of discourse, and thereby are reflected in speakers’ knowledge of conventionalized language and

language use.

2.5.3 Usage-Based Approach to Language Acquisition

The last topic addressed by this section is language acquisition, – an area that tends to reflect the differences between linguistic theories clearly. Generative theory assumes the existence of an innate capacity that specifies the grammatical principles guiding language acquisition, i.e., Universal Grammar (UG). Generative theory claims that the language input (i.e., the actual utterances that children hear) is too messy and insufficient to be the sole source for the acquisition of language. Chomsky (1959) referred to this so-called insufficiency as the poverty of the stimulus. Based on this assumption, generative theory claims that an innate cognitive capacity is necessary for children to learn language. As shortly summarized in Hilpert (2014: 156-158), the generative view of grammar assumes that children’s language is mentally represented by the same syntactic rules and categories as that of adults (Pinker 1984), even though their realization of the grammatical schemas is not perfect in early stages. According to studies of generative grammar, children innately have implicit knowledge of formal schemas, and produce utterances by inserting lexical words into these schemas. This process requires children to understand the parts-of-speech of words when learning new words.

In contrast, the usage-based view of grammar, or “constructional account” in Hilpert’s (2014) term, assumes that children acquire formal schemas as intimately connected with the concrete lexical items that occur in them. That is, this view of grammar assumes that children first acquire concrete phrases and gradually start using more abstract ones, by recognizing similarities across different phrases based on their experience of usage events. The usage-based account thus considers children’s language to be mentally represented in a

different way from that of adults. From the perspective of the usage-based account, children acquire abstract schemas as a result of hearing many utterances that have similar structure (Hilpert 2014: 157), and this way of acquiring generalizations is called item-based learning of linguistic schemas (Tomasello 2000). Goldberg (2006: 92) also claimed that “grammatical constructions may arise developmentally as generalization over lexical items in particular patterns,” based on empirical studies of children’s construction learning. Her study showed that the skewed frequency of a single verb in a grammatical construction facilitates children’s process of learning the construction. This implies that the frequencies of specific items in actual usage are structured in such a way as to help children make generalizations, which facilitates the item-based learning of linguistic schemas (for more detail, see Goldberg 2006: Ch.4).

The other main difference between generative and usage-based theories is how they view the role of communication in language learning. While generative theory is not concerned with the socio-cognitive foundations of language acquisition, the usage-based approach assumes that language learning significantly depends on general socio-cognitive abilities that are specific to humans, but not to language (Tomasello 2003: 3). Tomasello proposed that two sets of social-cognitive skills are of particular importance for language learning: intention-reading (i.e., theory of mind) and pattern-finding (i.e., categorization). The skills of intention-reading include the ability to share attention with other persons towards objects and events of mutual interest (cf. Bakeman and Adamson 1984) and also include the ability to culturally learn the intentional actions of others (cf. Tomasello, Kruger and Ratner 1993; Tomasello 1998). Regarding socio-cognitive abilities, Tomasello (2003) claimed that:

“these skills are necessary for children to acquire the appropriate use of any and all linguistic symbols, including complex linguistic expressions and constructions. Indeed, they basically define the symbolic or functional

dimension of linguistic communication – which involves in all cases the attempt of one person to manipulate the intentional or mental states of other persons.” (Tomasello 2003: 3)

“This functional dimension enables certain kinds of abstraction processes, such as analogy, that can only be effected when the elements to be compared play similar functional (communicative) roles in larger linguistic expressions and/or constructions.” (ibid.: 3–4)

These explanations emphasize the importance of the functional/communicative dimension of language use in forming conventionalized units from concrete utterances through abstraction processes. Hilpert (2014: 160) also explained that “intention reading is crucial for language learners because they have to interpret utterances as expressions of what other people think, want, like, or dislike.” He then suggested that the association of linguistic sounds with communicative intentions leads to the early use of phrases like *more juice*, which expresses what speakers want; children gradually get familiar with phrases of this kind as a whole (e.g., *more apple, more noodles*), and later start analyzing these phrases into their component parts. Children thus acquire productive schemas including open slots such as *more-X* in an item-based way.

The second set of skills identified by Tomasello (2003), pattern-finding, is closely associated with abstraction processes as well. This set of skills includes, for instance, the ability to perform statistically based distributional analyses on various perceptual and behavioral sequences (cf. Saffran, Aslin and Newport 1996; Gomez and Gerken 1999; Ramus et al. 2000) and the ability to create analogies across two or more complex forms, based on their similarities in terms of their functional roles (cf. Gentner and Markman 1997). These skills are thought to facilitate children’s process of finding patterns in adults’ use of linguistic symbols and thereby constructing the grammatical dimensions of linguistic competence.

In sum, in the usage-based approach, children are thought to learn language based on concrete utterances that are produced in order to achieve specific communicative goals. Moreover, general socio-cognitive abilities such as intention-reading and pattern-finding enable children to find patterns and to construct formal schemas based on similarities across different utterances. This view of the language learning process suggests that similar kinds of things occur in the history of a language as well. That is, conventional units, which emerge based on our social-cognitive abilities, are gradually formed from concrete utterances, which are produced by speakers for communicative purposes.

2.6 Summary

This chapter has explained some essential notions proposed in cognitive linguistics: the symbolic view of grammar, lexicon-grammar continuity, the concept of embodiment, and the usage-based approach to grammar. What is important here is that these ideas are supported not only by studies in the field of cognitive linguistics but also by those in other fields as well. For instance, the usage-based view of grammar is empirically supported by corpus-based studies, and by research on language acquisition. Furthermore, as shown in Chapter 3 below, the psychological studies by Rosch (1975) support the cognitive basis of lexical categories. Thus, the notions presented in cognitive linguistics are compatible with those of, or shared by, studies in other related fields.

However, these notions are not necessarily integrated effectively into analyses of specific lexical items such as prepositions, and the relations between these notions are not clear. Although many studies in the field of cognitive linguistics have analyzed the semantics of English prepositions, most of them have focused on spatial cognition and the cognitive processes of metaphor and metonymy motivating the semantic extension; in other words,

they have examined the embodied dimension of language in detail, yet the usage-based perspective is not reflected in their analyses. The dynamic aspect of language use in actual communicative contexts and the conventionalized nature of language has not been a central focus of these studies, even though they are regarded as theoretically important. When the dynamic aspect is taken into account in analyses of prepositions, it becomes more clear how the embodied cognition and usage contexts work together to motivate the prepositions' behavior, and this will facilitate the development of studies of the meanings of lexical items and will have implications for the theoretical framework of cognitive linguistics.

In light of this situation, this thesis aims to present a dynamic view of grammar, in which not only the embodied view but also a usage-based perspective is applied to analyses of prepositions. This study attempts to show how our spatial experience of the world and the actual contexts of language use are associated with each other, and how they integrally shape the behavior of English prepositions, by showing how linguistic patterns including prepositions emerge, how they are stored in speakers' minds, and furthermore, how they are conventionalized and come to constitute part of the grammar shared in a community. This integrated view will also help us to consider how we can define the meanings of words, which always occur in specific contexts. Before starting to present the case studies on the usage of specific English prepositions, the next chapter will examine some previous studies of prepositions in detail. Chapter 3 will illustrate some of the problems of previous studies more clearly, and will explain why the dynamic view is needed.

Chapter 3

Previous Studies of English Prepositions

3.1 Introduction

Before delving into case studies, Chapter 3 discusses the polysemous nature of English prepositions and how this has been analyzed in previous studies. Whereas a monosemous lexical item has a single sense, polysemy is the association of two or more related senses with a single linguistic form (Taylor 2003a: 102–103, see also Tuggy 1993; Ravin and Leacock 2000). In other words, a polysemous word organizes a lexical category consisting of two or more senses. This chapter will introduce some different approaches to such lexical categories or polysemy, and will also provide an overview of previous studies on English prepositions in the field of cognitive linguistics.

Chapter 3 is composed of three parts. The first part, section 3.2, will briefly introduce the classical approach to lexical meanings, which represents the meanings of words based on combinations of their features. After that, section 3.3 will provide an overview of the prototype approach as an alternative to the classical one, referring in particular to studies by Wittgenstein (1978) and Rosch (1975). Section 3.4 will explain the cognitive approach to polysemy, and will also summarize previous studies of English prepositions in the field of cognitive linguistics. Finally, the last part of Chapter 3 (section 3.5) will point out the deficiencies of these past studies and explain the methodology of this one.

3.2 Classical Views of Linguistic Polysemy

Polysemy is the association of two or more related senses with a single linguistic form (Taylor 2003a: 102–103, see also Tuggy 1993; Ravin and Leacock 2000), so various senses of polysemous words share a single form and organize a category associated with the form. The classical approach to semantic categories was mainly proposed in the 1960s and 1970s by Katz and Fodor (1963), Katz and Postal (1964), and Collins and Quillian (1969). This section explains the classical theory of categorization, which is based on the objective view of science first developed by Aristotle. The basic idea of this theory is that combinations of features can define a category, and hence this approach is sometimes called the feature approach. Taylor (2003a: Ch.2) summarizes the basic assumptions of this approach as follows.

- (a) Categories are defined in terms of a conjunction of necessary and sufficient features.
- (b) Features are binary.
- (c) Categories have clear boundaries.
- (d) All members of a category have equal status.
- (e) Features are primitive.
- (f) Features are universal.
- (g) Features are abstract. (Taylor 2003a: 21–24)

This approach of Aristotle's, which has mainly been developed by phonologists who attempted to analyze phonological categories known as phonemes into sets of features (e.g., features of [VOCALIC], [HIGH], and [BACK]), came to be adapted for use in studies of semantic category by Katz and Fodor (1963), Katz and Postal (1964), and Collins and

Quillian (1969). They adopted this classical theory to represent the meanings of lexical items. Katz and Postal (1964), for instance, represented the meaning of *bachelor* with the set of features [HUMAN], [MALE], [ADULT], and [NEVER MARRIED]. The classical approach was adopted by studies of syntactic categories as well; for instance, Chomsky (1981) attempted to define the differences among major syntactic categories (i.e., nouns, verbs, adjectives, and prepositions) based on the binary features [\pm N] and [\pm V]. In his study, nouns are defined as [+N, -V], verbs as [+V, -N], adjectives as [+N, +V] and prepositions as [-N, -V].

On the basis of these feature approaches, the members of a category are assumed to be defined based on a set of features, and hence categories are considered to have clear boundaries. However, it has been pointed out that the classical approach, which attempts to define the meanings of words objectively, cannot explain all characteristics of lexical items. The following section will explain this criticism in more detail and give an alternative approach.

3.3 Prototype Approach to Categorization

Wittgenstein (1978) pointed out that the classical approach fails to predict the referential range of some words such as the German word *spiel*, which roughly means ‘game’. He claimed that various members are included in the category represented by *spiel* and there are actually no attributes which are commonly shared by all members, even though some members share some attributes with each other. In addition, Wittgenstein also claimed that there are no clear boundaries that determine the set of members belonging to a category; that is, we cannot necessarily distinguish things counted as a game and things not counted as a game. Based on these facts, Wittgenstein proposed that the members of the category *spiel*

consist of a family resemblance network; just like a family, there are no common features shared by all members but each member shares some properties with others and has some similar aspects. Wittgenstein argued that not only the category of *spiel* but also other categories in the world tend to consist of family resemblance networks. The partial similarities between members and the unclear lack of clear boundaries, both of which characterize this type of network, cannot be fully explained based on the classical feature approach.

Another alternative approach to the classical theory was proposed in the field of psychology. As I explained above, the classical approach considers all members of a category to have equal status. In contrast, Rosch (1975) claimed that the members of a category actually tend to have different status: some members of a category are prototypical or central to the category, while others are more peripheral. For example, in the category of ‘furniture’, chairs and sofas are central but ashtray, fan, and telephone are not. Similarly, if we consider the category of ‘bird’, penguins must be a peripheral member because penguins do not have the characteristics of ‘being able to fly’, which is assumed to be a characteristic that is basic to the category. Moreover, Rosch pointed out that we tend to recognize prototypical and non-prototypical members in different ways. For instance, if we are asked whether telephone is a member of the category of furniture, it is difficult to judge and hence takes a relatively long time to answer to the question, compared with if we are asked whether chair is included in the category of ‘furniture’ or not. In addition, children tend to acquire the prototypical members of a category earlier than the peripheral ones. The differences between our mental representations of the central and the peripheral members imply that the organization of prototype categories is not determined arbitrarily but rather reflects our cognitive tendencies.⁵

⁵ Labov (1973) examined the role of the prototypical members of a category based on a series of experiments. He studied the linguistic categorization of household receptacles such as cups, bowls, and vases and demonstrated that there are no clear boundaries between these categories; rather,

Ravin and Leacock (2000: 15) have explained that “prototypical approaches emphasize meaning as part of a larger cognitive system and relate it to mental representations, cognitive models and bodily experiences.” If this is the case, how do our cognitive systems facilitate the organization of a prototype category? How is the prototypical sense determined and connected to more peripheral ones based on our cognitive processes? Studies in cognitive linguistics have addressed these questions, so I will explain them in the next section.

3.4 Cognitive Linguistics Approach to English Prepositions

Numerous studies based on the prototype approach have examined prepositions, which are generally polysemous, in the field of cognitive semantics (e.g., Brugman 1981; Lakoff 1987; Taylor 1988; Dewell 1994; Boers 1996; Tyler and Evans 2001, 2003; Deane 2005). These studies have commonly demonstrated that the process of category extension is not arbitrary/random but is a cognitively motivated process. This section will provide an overview of these studies.

3.4.1 Analysis based on Image-schemas

In studies on English prepositions, especially those in the 1980s, image-schemas were one of the key concepts used to explain their polysemy. Image-schemas were defined as representations of recurring aspects of bodily sensory-motor experience, such as verticality and containment. They are not just mental pictures but rather abstractions from our rich embodied experience, which are stored in long-term memory (cf. Lakoff 1987).

prototypical members of ‘cup’, ‘bowl’, and ‘vase’ serve as reference points for categorization, and objects are categorized around the prototypical members, i.e., good exemplars. Labov’s study also showed the deficiencies of classical approach.

Metaphorical semantic extension is considered to occur through the mapping of an image-schemas from one domain to another: usually, from a concrete domain to a more abstract one (Lakoff and Johnson 1980; Lakoff 1987, 1993). In the theory of metaphor, the concrete domain perceived through the bodily experience is regarded as the *source domain*, whereas the non-spatial/abstract domain is regarded as the *target domain*. Metaphorical mappings are assumed to occur in a unidirectional way, from the source to the target domain; for instance, the meaning of the preposition *in* is considered to be extended from a spatial domain as in (4a) to an emotional one as in (4b) based on the metaphorical projection of a container schema from the source domain (i.e., spatial domain) to the target domain (i.e., emotional domain).

- (4) a. My sister is *in* high school.
b. My sister is *in* love.

Another important process motivating the semantic extension is the image-schema transformation, which is a metonymic rather than metaphorical process. In a metaphorical semantic extension, the structure of an image-schema is projected onto another domain while keeping its structure. In contrast, image-schema transformation is the cognitive process of changing the structure of an image-schema itself within a domain. One example of an image-schema transformation is ‘end-point focus’, which is frequently applied to the SOURCE-PATH-GOAL image-schema. Prepositions such as *through*, *across*, and *over* can express a path of movement as in (5a), behind which the SOURCE-PATH-GOAL image-schema exists. The usage of *over* as in (5b) is considered to be derived through the image-schema transformation of ‘end-point focus’ applied to the SOURCE-PATH-GOAL schema.

- (5) a. Sam walked *over* the hill. (Dewell 1994: 352)
 b. Sam is *over* the bridge now. (ibid.: 357)

While *over* in (5a) expresses the path of Sam’s physical movement from one side of the hill to the other, *over* in (5b) expresses the static location of Sam. However, the usage of *over* in (5b) is not totally unrelated to that in (5a) because *over* in (5b) represents the end-point of Sam’s fictive motion from one side of the bridge to the other. According to Lakoff (1987), end-point focus image-schema transformations are motivated by our cognitive tendencies to watch trajectories of movement until they end and to focus on the end-points of the movement. Lakoff (1987) claimed that image-schema transformations, as well as metaphor, play an important role in structuring prototype categories, and thereby motivating the polysemous nature of a lexical item.

The senses of the preposition *over* such as those in (5) have been examined by many researchers; I will introduce some of their studies in detail. Brugman (1981) and Lakoff (1987), which analyzed the meanings of *over* based on image-schemas, assumed the central sense of *over* to be ‘ABOVE + ACROSS’. They presented a corresponding image-schema, seen in Figure 3-1, based on usages of *over* such as in (6).

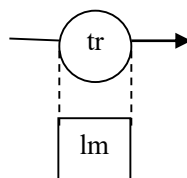


Figure 3-1: Image-schema of ‘ABOVE + ACROSS’ (Lakoff 1987: 419)

- (6) The plane flew *over* the field. (Brugman 1981: 10)

In Figure 3-1, the representation of “tr” means trajector and “lm” means landmark. The trajector is characterized as the figure (i.e., the most salient entity) within a relational profile, whereas the landmark is the other salient entity providing points of reference for locating the trajector (Langacker 1987: 217). The preposition *over* represents the relation between these two elements: *over* in (6) expresses the relation between *the plane* (trajector) and *the field* (landmark). In this example, the trajector (*the plane*) is located higher than but is not in contact with the landmarks (*the field*), which is represented as ‘ABOVE’, and it moves from one side of their landmarks to the other, which is represented as ‘ACROSS’.

Furthermore, Lakoff (1987) explained the motivation for the semantic extension of *over* based on the processes of metaphor and image-schema transformation. He presented another schema of *over*, given in Figure 3-2, which is considered to be derived from the central schema (Figure 3-1) through the process of image-schema transformation. In Figure 3-2, the form of the trajector has been changed to a line.

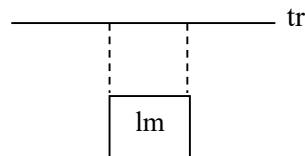


Figure 3-2: Image-schema of One-dimensional Trajector (Lakoff 1987: 426)

This is the image-schema Lakoff posits for examples such as (7).

- (7) The power line stretched *over* the yard. (Lakoff 1987: 426)

Moreover, *over* has a sense of ‘ABOVE’, which expresses the position of a static trajector as illustrated by Figure 3-3.



Figure 3-3: Image-schema of ‘ABOVE’ Sense (Lakoff 1987: 425)

This image-schema corresponds with the usage of *over* in instances such as in (8)

- (8) Hang the painting *over* the fireplace. (Lakoff 1987: 425)

Moreover, Lakoff explained that an abstract sense of *over*, as exemplified in (9), is connected to its ‘ABOVE’ sense through a metaphorical link, based on the metaphor “HAVING CONTROL or FORCE IS UP; BEING SUBJECT TO CONTROL or FORCE IS DOWN” (Lakoff and Johnson 1980: 15).

- (9) She has a strange power *over* me. (Lakoff 1987: 435)

In examples (5) to (8), the preposition *over* expresses physical locations or paths. In contrast, *over* in (9) expresses an abstract relation between the trajector (*she*) and its landmark (*me*); to be more specific, *over* in (9) represents the ‘control sense’, which expresses the relation of the trajector having influence/power over its landmark. As shown here, Brugman and Lakoff analyzed the polysemy of *over* focusing on cognitive processes such as image-schema transformation and metaphor; they showed that various senses of *over* are actually associated with each other.

Furthermore, Dewell (1994) elaborated on Brugman/Lakoff’s analysis by relying more on image-schema transformations. He assumed the central schema of *over* as a curved

arc-trajectory as in the following figure, which he posits for the examples in (10).

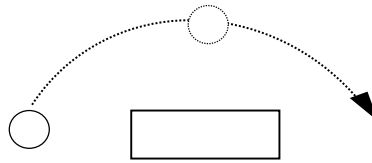


Figure 3-4: Image-schema of Arc-trajectory (Dewell 1994: 353)

- (10) a. Sam drove *over* the bridge. (Dewell 1994: 352)
b. The dog jumped *over* the fence. (ibid.)

Dewell claimed that “the arc-path schema provides the basis for explaining all of the variants of *OVER* using natural image-schema transformations” and that it might eliminate unnecessary features to explain its senses (Dewell 1994: 351).

The analyses by Brugman, Lakoff, and Dewell, which are based on image-schemas, demonstrate that the senses of *over* are associated with each other on the basis of cognitive processes such as metaphor and image-schema transformation. That is, their studies have shown that the semantic network of *over* is motivated by general cognitive factors, which offers a new perspective for the studies on linguistic categorization. Nevertheless, their analyses also include some deficiencies. For instance, they do not explain the limitations of semantic extension; to be more specific, Tyler and Evans (2003) have noted that the preposition *above* can be used in examples like (11a) while *over* is hardly ever used in sentences like (11b).

- (11) a. The nearest bridge is about half a mile *above* the fall.
b. ??The bridge is half a mile *over* the fall.

(Tyler and Evans 2003: 121)

The reasons why *over* cannot be used in (11b) are not clearly accounted for in the studies of Brugman, Lakoff, and Dewell. Moreover, their explanation of the motivation for the semantic extension sometimes seems to be arbitrary. For instance, Lakoff (1987) explains that the control sense of *over* as in (9) is derived from its spatial sense expressing the ‘ABOVE’ relation (i.e., the trajector is located physically higher than the landmark). However, Tyler and Evans (2003) pointed out that the preposition *above* cannot be used to express the control sense, as shown in (12).

(12) ?She has a strange power *above* me. (Tyler and Evans 2003: 68)

In terms of control reading, the use of *above* in sentence (12) is odd; in other words, sentence (12) cannot express a situation in which the person referred to with *she* influences the person expressed by *me* because the sense of *above* is not extended to the control sense. However, the explanation by Brugman/Lakoff, which suggested that the control sense of *over* is derived from the schema of ‘ABOVE’, cannot provide an explanation as to why *above* does not have a control sense but *over* does. In addition, explanations of the motivation for metaphorical semantic extensions and of the schema considered to be ‘central’ sometimes differ depending on the researchers. For example, while Lakoff explains the motivation for the control sense of *over* based on the ‘ABOVE’ schema, Dewell proposes that it emerged through the image-schema of an arc directed toward the landmark. In sum, the semantic extension process and the central schema of individual prepositions tend to be explained differently depending on the researchers, and their explanations sometimes seem to be based on intuition.

3.4.2 Elaborated Analysis through Comparison of Related Words

The analysis of the preposition *over* by Tyler and Evans (2003) provides a partial solution to the aforementioned problems. Tyler and Evans compared the meanings of *over* with those of the other related prepositions *above*, *below*, and *under*, which each express a spatial relation along the vertical axis of the world. Tyler and Evans presented their primary senses as follows. In Figure 3-5, the dots represent the trajector of each preposition and the central bolded line represents the position of their landmark.

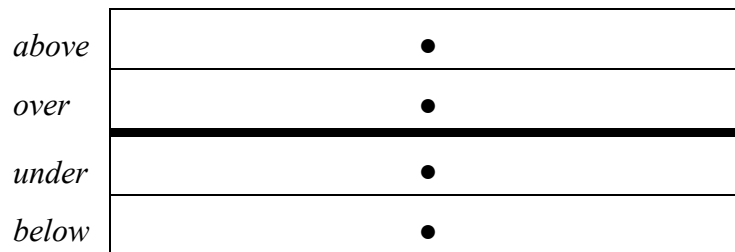


Figure 3-5: Central Senses of *Above/Over/Under/Below* (Tyler and Evans 2003: 130)

Even though all of these prepositions express a spatial relation along the vertical axis of the world, they have different characteristics in terms of the relation between trajector and landmark. The figure shows that the trajectors of *above/below* are distal to the landmark in their primary senses; in contrast, the trajectors of *over/under* are close to and possibly touching the landmark. In addition, Tyler and Evans (2003) also demonstrated that the characteristics of the primary senses of these prepositions are reflected in their extended/metaphorical senses. For instance, they explained that *above* does not have a control sense (as shown in (12)) because it is difficult to exert power when one thing is located far from the other. In contrast, in the primary sense of *over*, the trajector is close to and possibly touching the landmark; this might motivate the semantic extension of *over* to the control sense. As in this example, Tyler and Evans demonstrated the differences between the

prepositions both in their primary and extended senses, clarifying which factor of the primary sense of a preposition is crucially reflected in the extended sense and motivates the metaphorical semantic extension of the word.

In addition, as explained in Chapter 2, the analysis provided by Tyler and Evans emphasizes the importance of embodied meaning. They argue that “embodied experience constitutes the notion that human experience of the world is mediated by the kinds of bodies we have, and hence is in large measure determined by the nature of the bodies which mediate how we experience the world” (Tyler and Evans 2003: 23). They also assume that our embodied experience is reflected in our conceptualization and hence in language structure. To support this point, Tyler and Evans note that the preposition *over* has more meanings than *under*, even though they are considered to be an antonymic pair. According to Tyler and Evans, the asymmetry between *over/under* reflects the asymmetries of the world, and those of our embodied interaction with the vertical axis of the world. They explained that we tend to perceive, pay attention to, or get close to things that are located higher than us, compared with those located lower than us. This might be because we usually do not crawl on the floor but stand up and walk around in our daily lives. That is, the differences between things at higher/lower positions in our everyday experience are assumed to motivate the asymmetric semantic extensions of *over* and *under*. As discussed in this section, Tyler and Evans (2003) have expanded the analysis of *over* based on comparisons with other related prepositions, and from the perspective of an embodied view of language.

3.5 Problems of Previous Studies and the Goals of this Research

As shown in previous sections, the polysemy of prepositions is associated with several important issues such as category structure, the relations among the senses, and cognitive

motivations for semantic extension. Therefore, many researchers have examined the polysemy of prepositions and their studies have contributed to the development of the theoretical framework of cognitive linguistics.

Although the methods of analysis have differed slightly depending on the researchers, there are some common tendencies in the aforementioned studies: all of them seem to assume that the senses of a 'word' can be defined, and that a 'word' is the basic unit of meaning. This assumption may be reflected in their attempts to describe the meanings of prepositions (e.g., describe the prototypical sense of *over* as 'ABOVE + ACROSS') and characterize each preposition by itself, without examining contextual factors in detail. However, if we consider our actual language use, we notice that a word always occurs within a context in a specific discourse, and thereby the meaning of a 'word' sometimes cannot be defined by itself. For example, it seems impossible to extract the meaning of *over* from collocations such as *over there* or *fall over*, because the meanings of these expressions are conveyed by a unit consisting of two words. Although these are examples of conventionalized units, various kinds of linguistic expressions may actually have this type of context-dependent nature. Can we extract the sense of *over* from expressions like *influence over him* or *power over him*? Tyler and Evans (2003) referred to the sense of *over* in these examples as the 'control sense', which is derived from the spatial sense of *over*. However, is it true that the preposition *over* itself has a 'control sense'? In another example, the sense of *over* in expressions such as *over the past few years* is defined as the sense of 'time' or 'duration' of *over*; however, does *over* actually express the sense of time? The sense of 'control' seems to be associated with the combination of *influence* and *over*, and the sense of 'time' might be associated with the collocation of *over* and its complement noun phrase, rather than with *over* itself. These facts might imply that the 'word' is not necessarily the basic unit that conveys meaning, and the importance of conventionalized units/constructions

has been emphasized so far in many studies in cognitive linguistics (see Chapter 2). Nevertheless, previous studies on prepositions have not examined the relationships among co-occurring words and the role of constructions in detail.

Furthermore, not only meanings but also more formal aspects of words are sometimes determined depending on their co-occurring contexts. As touched on in Chapter 2, Taylor (2012) noted that the plural form of the word *process* tends to be pronounced in an irregular way in academic discourse, influenced by the pronunciation of other words frequently occurring in academic context (e.g., *theses*, *analyses*). In this case, the ‘irregular’ way of pronouncing it overrides its ‘regular’ pronunciation; that is, the occurring context determines the phonological form of the word. This example shows that even phonological characteristics are not always statically connected to individual ‘words’, i.e., they can differ flexibly depending on usage and the discourse in which the word occurs. This implies that our ways of producing an individual word is highly dependent on local context in actual use. However, previous studies of prepositions have focused on relatively static aspects of prepositions, instead of examining the dynamic aspects of their use.

Moreover, the grammatical characteristics of individual words are not necessarily fixed to the ‘word’ unit but are sensitive to their usage and co-occurring context as well. The following are examples of the prepositions *above/below*.

[Spatial Sense]

(13) a. The sun moved further **above** the horizon. (Lindstromberg 2010: 110)

b. A car arrived **below** my window. (Boers 1996: 71)

(14) a. Place a quantity of mud in a jar with water **above**.

b. He jumped from the window into the moat **below**. [ODE2]

[Discourse-Deictic Sense]

- (15) a. The explanation outlined *above* (Boers 1996: 108)
b. In paragraph 53 *below* (ibid.: 75)

As shown here, when they express spatial meanings, *above* and *below* can be used both as prepositions with nominal complements (*the horizon* in (13a) and *my window* in (13b)), and as adverbs without any complements, as in (14). In contrast, when they are used to refer to a unit of the discourse in a formal written text, they always occur as adverbs, i.e., without nominal complements, as in (15). These sentences illustrate that the grammatical behavior of prepositions changes depending on usage and the environment in which it occurs; for example, the usage of *above/below* in (15) is observed only in the genre of formal written texts such as academic papers.

Examples (16a) and (16b) are further instances in which the grammatical behavior of a preposition shows some variation. Previous studies on the preposition *over* have focused on the association between its spatial sense (as in (16a)) and its abstract sense (as in (16b)) based on metaphor.

- (16) a. Hang the painting *over* the fireplace. (Lakoff 1987: 425)
b. She has a strange power *over* me. (ibid.: 435)

However, by examining the grammatical patterns in which the preposition occurs, we notice that *over* in (16a) occurs within a verb phrase headed by *hang* while that in (16b) occurs within a noun phrase headed by *power*. Moreover, when *over* expresses spatial meaning, it often occurs as an adverb (e.g., *fall over*, *come over*). In contrast, when it is used in a control

sense, it is hardly ever used as an adverb, i.e., without a nominal complement. A similar phenomenon is observed in the following examples.

[Spatial Sense]

- (17) a. The cat is *under* the table.
b. She dived *under* the water. [OALD7]

[Conditional Sense]

- (18) a. *Under* a Labour government, this committee would become an official inquiry into electoral reform. [BNC]
b. *Under* these services, revenues would be shared among the participating companies. [BNC]

As shown in (17), when the prepositional phrase headed by *under* expresses spatial meanings such as motion path or location, it tends to occur within a verb phrase as a complement or an adjunct. In contrast, when it expresses a more abstract sense which represents conditions under which an event occurs, as in (18), it frequently occurs as a clause-level modifier and in the first position in a clause (explained in detail in Chapter 5). Previous studies have shed light on the common characteristics between the senses of a word, rather than their differences or varieties in actual use, in an attempt to identify cognitive factors which may connect and account for the senses of a word. However, words can be used in various grammatical patterns in natural discourse, and the diversity of the patterns cannot be fully explained by the theory of metaphor, which assumes that the abstract/extended senses of a preposition are just derived from more concrete/basic senses.

To sum up, when considering natural language use, it seems to make better sense to assume that the ‘word’ is not necessarily the basic unit of meaning, and the behavior of each

‘word’ cannot be characterized without examining its occurring context. While previous studies have examined cognitive factors motivating the polysemy of prepositions in detail, they have paid little attention to the dynamic contexts which might determine the behavior of prepositions. In light of this situation, this thesis will examine the interaction between prepositions and their occurring contexts through four case studies using data extracted from corpora: the British National Corpus (BNC) for adults’ language use, and the Providence Corpus accessed through the CHILDES databank for children’s language use.

Based on the case studies, this thesis will quantitatively demonstrate that (i) the meanings of linguistic expressions tend not to be delivered by the ‘word’ unit but rather by larger constructions embedded in specific communication environments, (ii) our linguistic knowledge is not necessarily stored in ‘word’ units, and (iii) the behavior of an individual ‘word’ is determined and conventionalized heavily depending on its naturally occurring contexts. Through examining the meaning of the ‘word’ unit based on natural language data, this thesis will suggest that not only cognitive factors but also contextual factors play an important role in the usage of prepositions (or of constructional patterns including prepositions) and in organizing our knowledge of prepositions. In other words, this study shows that conventionalized patterns and our grammatical knowledge are formed and stored in a bottom-up way from usage. As a result, this thesis attempts to provide an answer to the question of how the notions of embodied cognition and dynamic usage integrally motivate the behavior of prepositions, which is theoretically important to cognitive linguistics.

Following the studies of Tyler and Evans (2003), this thesis will analyze the target prepositions by comparing them with related prepositions (synonymous prepositions such as *over* and *on*, or antonymic pairs such as *above* and *below*) in an attempt to illustrate the characteristics of each preposition clearly.

3.6 Summary

This chapter provided an overview of previous studies of polysemy and the semantics of English prepositions referring to some factors that motivate semantic extensions of prepositions. As described here, cognitive motivations such as metaphor and image-schema transformations have been proposed in the field of cognitive linguistics from its inception (e.g., Brugman 1981; Lakoff 1987; Dewell 1994). The study of prepositions has been improved by Tyler and Evans (2003), which used the methodology of comparing related prepositions and considering their differences in terms of an embodied view. All of these studies contributed to the development of cognitive linguistics by demonstrating that the structure of semantic categories and the associations among the senses of polysemous prepositions are motivated by our general cognitive abilities.

In contrast, when actual language use is taken into account, the meanings of an individual preposition can differ depending on its co-occurring words, and its grammatical behavior is also determined based on the environment in which it occurs. However, the relationship between words and their co-occurring environments has not been examined in previous studies on prepositions in the field of cognitive linguistics, although the theory has suggested the importance of usage and the notion of conventionalized units (cf. Langacker 1987, 2000, 2008). In light of this situation, this thesis will analyze the natural use of prepositions embedded in a context, showing how dynamic factors in natural discourse can interact with cognitive processes in determining the behavior of each preposition. This research extracts the target data from corpora, and also attempts to elaborate the semantic analysis by comparing prepositions in synonymic or antonymic pairs.

Part II

Chapter 4

Motivation for Selecting a Preposition from a Synonymous Pair: A Case Study of *Influence On* and *Influence Over*⁶

4.1 Introduction

This chapter presents the first case study of this thesis. In English, there are various patterns in the combination between a noun and a preposition. For instance, the nouns like *effect*, *stress*, *emphasis* tend to be used with the preposition *on*, the nouns like *reason* and *wish* are usually used with *for*, and the nouns such as *answer* and *reply* are generally followed by *to*. While most of these combinations are conventionally fixed, some nouns can be used with two or three kinds of prepositions, especially with synonymous ones. The combinations of *influence on/ influence over* is one of such examples. The following sentences exemplify that both of the prepositions *on* and *over* co-occur with the noun *influence*.

- (19) a. man's *influence on* the earth's surface seems incommensurate with his scale
[ODE2]
- b. He will retain some *influence over* the company. [OBED]

In these examples, the complement of *on* (*the earth's surface*) is influenced by *man*, and the complement of *over* (*the company*) is influenced by the referent of *he*; that is, the complements of *on* and *over* have similar characteristics in these sentences. The following sentence, which is taken from a Japanese-English dictionary, also suggests the

⁶ This chapter is based on Horiuchi (2016c).

interchangeability between these prepositions.

(20) have an indirect *influence on* [*over*] X

[KNJED5]

These examples imply the similarity between *on* and *over* in the collocation with the noun *influence*; however, it is not clear how they are different from each other, and how the speaker/writer chooses between these prepositions in language use. This chapter closely examines the semantic and grammatical differences between the expressions *influence on* and *influence over* based on quantitative research using the British National Corpus (BNC), and attempts to show how the speaker/writer uses these expressions. Based on the observation, then, this study attempts to show how their differences are motivated or related with the spatial (i.e., ‘original’ or ‘primary’) meanings of *on* and *over*, which are components of these expressions. Moreover, this research also argues that the differences are not fully predicted from the meanings of *on* and *over* themselves but conventionally connected with the larger units, i.e., the combinations of *influence on* and *influence over*. As described in the previous chapters, the previous studies of English prepositions tend to focus on the meanings of prepositions themselves while tend not to examine the contextual information in which the prepositions occur. The collocational pattern between a noun and prepositions are also one of such contextual information, which are considered to be stored as a linguistic knowledge of language users from the usage-based perspectives (cf. Langacker 2000). Therefore, this study attempts to focus on the semantic and grammatical characteristics that are connected with the whole units, *influence on* and *influence over*.

The organization of the rest of this chapter is as follows. Section 4.2 introduces previous studies about the meanings of the prepositions *on* and *over*. Section 4.3 explains the methodologies of the research using the BNC in this chapter, and section 4.4 shows the

results. Based on the results, section 4.5 discusses how the differences between *influence on* and *influence over* are motivated or can be explained from the viewpoint of the spatial senses of *on* and *over*, and also from the usage-based view. Section 4.6 presents concluding remarks.

4.2 Previous Studies on Semantics of the Prepositions *On* and *Over*

4.2.1 Polysemous Characteristics of *On* and *Over*

As described in the previous chapters, most of English prepositions are highly polysemous, and their polysemy has been studied in the field of cognitive linguistics by many researchers (e.g., Brugman 1981; Lakoff 1987; Dewell 1994; Tyler and Evans 2001, 2003; Deane 2005). These studies mainly examine the relation among the various senses attached to a preposition and demonstrate the motivation for their semantic extensions based on the cognitive processes like metaphor or metonymy.

Just like other prepositions, *on* and *over* have various senses respectively. In the Longman Dictionary of Contemporary English Online (LDOCE), for instance, 30 senses of *on* and 16 senses of *over* are listed.⁷ The examples in (21) and (22) are only a part of their usage listed in the dictionary.

- (21) a. Leave your things *on* the table over there.
b. Matt kissed her *on* the cheek.
c. They'll be here *on* Tuesday.
d. his influence *on* young people
e. Do you have any books *on* India?
f. they live mainly *on* beans, lentils and rice.

⁷ These numbers include only the senses of the prepositional use of *on* and *over*; that is, the number of the senses associated with their adverbial usage is not included here.

g. He played a short piece *on* the piano. [LDOCE]

- (22) a. A lamp hung *over* the table.
b. She wore a large jacket *over* her sweater.
c. a bridge *over* the River Thames
d. Will you be home *over* the summer vacation?
e. He's having problems *over* his income tax.
f. She had great personal influence and power *over* her followers.
g. I heard the news *over* the radio.

[LDOCE]

These examples imply that the prepositions *on* and *over* can be used in various senses, co-occurring with various kinds of words. Among these senses, the similarity between these prepositions is shown in the examples (21a) and (22a), in which *on* and *over* indicate a physical location 'higher than', or (21d) and (22f), in which *on* and *over* co-occur with the same noun *influence*. That is, while *on* and *over* have different semantic networks respectively, we can observe some overlaps between them.

4.2.2 Semantic Extension from Spatial to Control Sense

According to the Oxford English Dictionary (OED), the original (i.e., oldest or primary) senses of *on* and *over* are the one expressing spatial or physical relation as in (21a) and (22a); the original meaning of *on* is defined as "above and in contact with", and the one of *over* is defined as "above, higher up than" in the dictionary.

On the other hand, *on* and *over* in (19) are used to express not spatial/physical but abstract meaning. The studies of the semantics of prepositions, as mentioned above, consider abstract senses of prepositions as being derived from their spatial (i.e., basic or concrete)

senses through metaphors. The usage of *over* as in (19b), or (23b) below, is also thought to be derived from its spatial meaning as in (23a). As explained earlier, the image-schema as in Figure 4-1 is assumed to be projected to control domain through the metaphor “HAVING CONTROL or FORCE IS UP; BEING SUBJECT TO CONTROL or FORCE IS DOWN” (Lakoff and Johnson 1980: 15).

- (23) a. Hang the painting *over* the fireplace. (Lakoff 1987: 425)
 b. She has a strange power *over* me. (ibid.: 435)

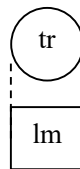


Figure 4-1: Image-schema of ‘ABOVE’ Sense (Lakoff 1987: 425)

In (23b), the referent of the subject noun, *she*, exerts power to the referent of the complement of *over*, *me*. Tyler and Evans (2003) also treated the sentence (23b) and called this usage of *over* ‘control sense’. On this basis, the sense of *on* and *over* co-occurring with the noun *influence* can also be regarded as control sense because they express the relation in which one thing exerts power to the other.

The explanation by Lakoff (1987), using the metaphor “HAVING CONTROL or FORCE IS UP; BEING SUBJECT TO CONTROL or FORCE IS DOWN”, suggested that the control sense of *over* is derived from its spatial characteristics ‘higher’ or ‘up’. On the other hand, as described in Chapter 3, Tyler and Evans (2003) compared *over* with *above* and claimed that the notion of closeness is important as well for the semantic extension to control sense. According to them, *above* is typically used to express a spatial relation in which one thing is higher than and distal to the other, and such characteristics reflect the semantic

extensions of *above* (See Figure 3-5). Tyler and Evans (2003) explained that *above* does not have a control sense because it is difficult to exert power when one thing is located far from the other even if it is in a higher position. They indicated that the meaning of *above* cannot be understood as control sense even in a sentence like (24), in which *above* occurs just after the noun *power*. In this sentence, the meaning of *above* in (24) can be interpreted only as illustrating the physical location of the person referred to by *she*.

(24) ?She has a strange power *above* me. (Tyler and Evans 2003: 68)

In contrast, according to Tyler and Evans (2003), the primary sense of *over* includes the meaning that the upper thing is close to, and possibly touching the lower one, which might be a key factor of the semantic extension to control sense. In (25), for example, *over* is used to express the situation in which something is in contact with the other.

(25) a. She put a blanket *over* the sleeping child. [OALD7]
b. ladle this sauce *over* fresh pasta [ODE2]

Over can express the spatial locations like these, while *above* cannot.

Many studies have argued that the preposition *on* also has the meaning of ‘contact’, as shown in the definition in the OED. For instance, Lindstromberg (2010) claimed that the central meaning of *on* contains the elements of contact and support as shown in the following examples.

(26) a. the book *on* the table.
b. the mirror *on* the wall.

c. the bug *on* the ceiling.

(Lindstromberg 2010: 51-52)

All of the referents of the complements of *on* in (26), the table, the wall or the ceiling are in contact with the book, the mirror or the bug respectively. In (26b) and (26c), the mirror and the bug are not even higher than the wall or the ceiling; however, the meaning of contact is reserved so *on* can be used here. These examples show how tightly the sense of contact is connected with the preposition *on*.

The comparison between *above* and *on/over* clearly shows that the notion of closeness or contact is significant to the semantic extension to control sense. That is, the usage of *on* and *over* with the noun *influence* is motivated by their spatial meaning: one thing is higher than and close enough to the other one. However, if their control sense is derived from similar spatial meanings through the same metaphor, the following questions arise: (i) Aren't there any differences between the expressions *influence on* and *influence over*? (ii) If there are some differences, how are they derived? That is, while the metaphor "HAVING CONTROL or FORCE IS UP; BEING SUBJECT TO CONTROL or FORCE IS DOWN" can explain why the meanings of *on* and *over* are both extended from spatial to control sense, it cannot explain the differences between *influence on/over*.

To answer these questions, this study quantitatively examines the semantic and grammatical characteristics between *influence on* and *influence over* using the BNC, attempting to show how a speaker/writer selects one of the synonymous prepositions in a particular phrase. Based on the results, then, this study attempts to show how they are derived.

4.3 Data and Methods

This study collected the data from the BNC through the following procedure.

First, all examples in which *influence* and *on* or *over* co-occur in one sentence were extracted. When extracting the sentences, the part-of-speech of *influence* was set as the ‘noun’ to exclude the data of *influence* being used as a verb. In addition, the option of searching on lemma was set to collect examples of the plural form *influences* as well. As a result, the 1,421 examples of *influence on* and 423 examples of *influence over* were extracted from the corpus. Second, the extracted data were annotated with the semantic and grammatical features as follows:

(i) Semantic type of the entity exerting influence (INF-er)

This feature was annotated based on the semantic type of the entity which exerts influence on something, which is called an influencer (INF-er) in this chapter. To annotate the data, this research uses the following variables.⁸

- (a) Human (e.g., man’s *influence on* the earth’s surface)
- (b) Organization (e.g., Parliamentary *influence over* these appointments)
- (c) Inanimate thing⁹ (e.g., university matriculation still exercises any kind of *influence on* examinations at the age of 16)
- (d) Not occurring in the clause (N/A) (e.g., there was another very important *influence on* policy.)

The category “(a) Human” includes instances in which the INF-er is a human or people (e.g., *man, she, teachers* or *mother*), and “(b) Organization” includes instances in which the INF-er

⁸ All the examples without reference to the literature in this chapter are extracted from the BNC. Underlines, italics, and boldface of the examples have been added by the author.

it is an organization consisting of people (e.g., *family, government, company*). The third category “(c) Inanimate thing” includes the examples in which the INF-er is an abstract notion or an event, and “(d) Not occurring in the clause” includes the instances in which the INF-er is not expressed explicitly within the clause.

(ii) Semantic type of entity being influenced by something (INF-ee)

This feature was annotated in terms of the semantic type of entity being influenced by something, which occurs as a nominal complement of the prepositions *on* and *over*. The examples were annotated with one of the following variables. The criteria to distinguish these categories are the same as above.

- (a) Human (e.g., we are particularly interested in the *influence on* women)
- (b) Organization (e.g., He will retain some *influence over* the company)
- (c) Inanimate thing (e.g., man’s *influence on* the earth’s surface)

(iii) Grammatical status of NP headed by *influence*

This feature was annotated based on the grammatical status of the noun phrase headed by *influence* in a clause. The grammatical status was annotated with the following variables.

- (a) Subject (e.g., man’s *influence on* the earth’s surface seems incommensurate with his scale)
- (b) Object of a transitive verb (e.g., He will **retain** some *influence over* the company)
- (c) Complement of a copular verb (e.g., it **was** the major *influence on* Conservative and Labour)
- (d) Within adjunct (i.e., Complement of a preposition) (e.g., **In view of** this *influence on* patient management, a positive diagnosis of 30.6% in patients with non-cardiac chest pain justifies its use.)

As shown here, “(a) Subject” includes the instances in which the noun phrase headed by *influence* occurs in the subject position in a clause, and “(b) Object of a transitive verb” includes the sentences in which the noun phrase occurs as an object of a transitive verb like *retain*, *have*, *obtain*, or *exert*. The third category “(c) Complement of a copular verb” includes the examples in which the noun phrase occurs as a complement of a copular verb like *be* or *see*. The last one is “(d) Within adjunct”, in which the noun phrase occurs not as an argument of a verb but within an adjunct, i.e., as a complement of preposition. This study examined all the extracted data and annotated them manually with these features.

4.4 Results: Differences between *Influence On* and *Influence Over*

This section shows the results of the quantitative research on the BNC.

4.4.1 The Characteristics of Entity Exerting Influence (INF-er)

To examine the differences between *influence on* and *influence over*, this section first demonstrates the characteristics of the entity exerting an influence, which is called INF-er here. Table 4-1 illustrates the distribution of semantic type of INF-ers.

Table 4-1: Semantic Type of INF-er

	a. Human	b. Organization	c. Inanimate	d. N/A	Others ¹⁰	Total
<i>On</i>	406 (28.6%)	166 (11.7%)	<u>776</u> (54.6%)	69 (4.9%)	4 (0.3%)	1421 (100%)
<i>Over</i>	<u>194</u> (45.9%)	123 (29.1%)	65 (15.4%)	41 (9.7%)	0 (0%)	423 (100%)

As shown in Table 4-1, the expression *influence on* tends to exhibit the influence exerted by something inanimate as in (27)-(29). While the INF-er typically occurs as a subject in the transitive construction (e.g., (27)), it also can occur in the possessive form (e.g., (28)) or in the *of* phrase (e.g., (29)).

- (27) a. Your basal metabolic rate (ie when you are resting) has an ***influence on*** how much energy you expend when you are doing anything that doesn't involve very much physical activity.
- b. But in the absence of high stress they find no reason to conclude that emotional support has any general ***influence on*** mental health.
- c. It will be argued that such factors may have had considerable ***influence on*** what are widely believed to have been exclusively political decisions.
- (28) Tourism and its ***influence on*** the environment is clearly of great interest to CPRW, however no recent work has been done on the subject.
- (29) Yes, we set up a unit affiliated to the University of Salzburg to look into the question of stress in music-making; and also the ***influence of music on*** the mind

¹⁰ The category “others” here includes instances in which the INF-ers are animals (e.g., Many Rottweilers were imported prior to the Second World War but their (=Rottweilers’) ***influence on*** the breed today is negligible...).

and the body, of healthy people and sick people.

When the preposition *over* follows the noun *influence*, on the other hand, it tends to be associated with the situation in which a human (people) or an organization (organizations) has power (human: 45.9%, organization: 29.1%). In other words, INF-ers tend to be agentive, i.e., entities which can act intentionally or decide their behavior themselves.

- (30) a. You have some *influence over* what you use, and so the size of the bill.
- b. America's new attitude towards India may result in its (=America's) having a great *influence over* that country ...

Among the examples of *influence over*, 15.4% of the examples express the influence from an inanimate thing. Even in such examples, however, the INF-er tends to be something constituent to human disposition; for instance, personality, mind, or feelings.

- (31) a. Even in orthodox circles, the idea that our state of mind and personality has an *influence over* our physical health is beginning to gain credence once again.
- b. ...yet such feelings may not exert such a strong *influence over* decisions as to whether to steal from a larger and less personal victim.

As in (30) and (31), the INF-er of *influence over* most frequently occurs as a subject in a transitive construction, just like the examples of *influence on*. It also can appear in the possessive form (e.g., (32)) and in the *of* phrase (e.g., (33)), while such cases are much fewer than the cases occurring in the subject position.

- (32) But something has to be done about his *influence over* Matthew.
- (33) Moreover under William III, who was a foreigner, and Anne, who was a woman and a stupid one, the *influence of Parliament over* foreign policy grew rapidly.

To show the contrasting characteristics of these expressions more clearly, this study reclassifies the semantic type of INF-er in terms of agentivity. That is, “human” and “organization” are grouped into the same category *agentive*, while “inanimate”, “N/A” and “others” are categorized in *non-agentive*. Table 4-2 shows the results of recalculating the data based on agentivity.

Table 4-2: Distribution of the INF-er Based on Agentivity

	Agentive	Non-Agentive	Total
<i>On</i>	572 (40.3%)	849 (59.7%)	1421 (100%)
<i>Over</i>	317 (74.9%)	106 (25.1%)	423 (100%)

As shown in this table, the INF-er of *influence over* tends to be agentive compared with that of *influence on*.

4.4.2 The Characteristics of Entity Being Influenced (INF-ee)

Following the characteristics of the INF-ers, this section then shows the differences observed in the INF-ees, i.e., the entities that are influenced by the INF-ers. The distribution of the semantic type of INF-ees is summarized in Table 4-3.

Table 4-3 : Semantic Type of INF-ee

	a. Human	b. Organization	c. Inanimate	Others ¹¹	Total
<i>On</i>	211 (14.8%)	65 (4.6%)	<u>1145</u> (80.6%)	0 (0%)	1421 (100%)
<i>Over</i>	<u>99</u> (23.4%)	<u>62</u> (14.7%)	<u>259</u> (61.2%)	3 (0.7%)	423 (100%)

The INF-ee, as illustrated in this table, tends to be inanimate regardless of the prepositions.

- (34) Your basal metabolic rate (ie when you are resting) has an *influence on* how much energy you expend when you are doing anything that doesn't involve very much physical activity.
- (35) You have some *influence over* what you use, and so the size of the bill.

However, observing the results in detail allows us to find that the frequencies of “human” and “organization” are higher in the case of *influence over* than the case of *influence on*. The following sentences exemplify the animate INF-ee occurring as a complement of *over* (*her* in (36), and *callow Americans* in (37)).

- (36) ... she bitterly resented the fact that he, Adam Burns should have that kind of *influence over* her .
- (37) Too many smooth-talking foreigners, it was said, were able to exercise an hypnotic and manipulative *influence over* callow Americans.

¹¹ The category “others” in Table 4-3 includes examples in which the complement of *over* is an animal (e.g., Your *influence over* another dog...).

4.4.3 The Grammatical Status of NP Headed by *Influence*

This section then compares the grammatical aspect, focusing on the syntactic status of the noun phrases headed by *influence* in a clause. The following table shows the results.

Table 4-4: The Grammatical Status of NP Headed by *Influence*

	a. Subj.	b. Obj.	c. Copular-Comp.	d. Within Adjunct	Others ¹²	Total
<i>On</i>	207 (14.6%)	793 (55.8%)	185 (13.0%)	216 (15.2%)	20 (1.4%)	1421 (100%)
<i>Over</i>	53 (12.5%)	275 (65.0%)	8 (1.9%)	84 (19.9%)	3 (0.7%)	423 (100%)

These results show that the noun phrase headed by *influence* most frequently occurs as an object of a transitive verb, both in the cases of *influence on* and *influence over*. The transitive verbs tend to be one related to possession or power execution, such as *have*, *obtain*, *exercise*, or *exert*.

- (38) a. This had a direct ***influence on*** elements such as the sloping bonnet line, steeply raked windscreen, curved roof and tapered rear section.
- b. The assumption that university matriculation still exercises any kind of ***influence on*** examinations at the age of 16 should be excised.
- (39) a. ... the firm's managers were able to obtain ***influence over*** the banks, ...

¹² The category "others" in Table 4-4 includes examples such as (i) a noun phrase headed by *influence* is used as an independent phrase as a title or a headline, or (ii) it is just inserted in a clause with commas and the grammatical status cannot be specified.

- b. ... such feelings may not exert such a strong *influence over* decisions as to whether to steal from a larger and less personal victim.

Comparing the results of *on* and *over* more closely, however, some different tendencies have been observed. While *influence over* rarely appears as a complement of copular verbs (1.9%), 13% of the examples of *influence on* occur in that syntactic position. In that case, an adjective such as *important* in (40) frequently precedes the noun *influence*.

- (40) Probably, demand in the loan market and the perceived risk associated with a loan are the two most *important influence on* spread sizes.

The phrase *influence over*, in contrast, appears within an adjunct (i.e., prepositional phrase) more frequently than *influence on*.

- (41) But something has to be done about his *influence over* Matthew.

These results demonstrate that, even though the phrases *influence on* and *influence over* are considered to be a synonymous pair, they tend to express different types of influence and tend to show different grammatical behavior.

4.4.4 Summary of the Differences between *Influence On* and *Influence Over*

This section summarizes the results of the quantitative research and considers them in terms of transitivity (Hopper and Thompson 1980). When the noun *influence* is followed by the

preposition *on*, both of the INF-er and INF-ee tend to be inanimate (i.e., non-agentive). When the noun *influence* is followed by the preposition *over*, on the other hand, the INF-er tends to be agentive, and the INF-ee, which is typically inanimate (i.e., non-agentive), also can be agentive more frequently than is the case with *on*. Regarding its grammatical status, the phrase *influence on* appears in a complement of a copular verb more frequently than *influence over*, while *influence over* tends to occur within a transitive construction as an object of a transitive verb.

As discussed in Hopper and Thompson (1980), agentivity is closely related to high transitivity. An agentive INF-er, which can exert power actively or intentionally, is more transitive than a non-agentive one, which cannot exert power actively or intentionally. This suggests that situations expressed by *influence over* tend to be more transitive than is the case with *influence on*. Furthermore, these semantic tendencies seem to correspond to their grammatical tendencies. In the usage of *influence over*, the noun phrase headed by *influence* tends to occur in a transitive construction, and in that case, the INF-er usually appears in the subject position. On the other hand, the collocation *influence on* more frequently appears in the complement of a copular verb, which tends to express a state rather than a transitive action. In sum, examples of the noun *influence* being followed by *over* tend to express higher transitive events than the cases of *on*.

Although this study focuses only on the collocation with the noun *influence*, a similar tendency has been observed in collocations with other nouns. For instance, 1,946 examples of the collocation *control over* (i.e., the noun *control* co-occurs with *over* in one sentence) could be found in the BNC, while there were only 187 examples of the collocation *control on*. Compared with *influence*, *control* tends to express the relation in which people/organizations with authority exert force intentionally. It matches the typical situation expressed by the control sense of *over*; therefore, it is plausible and seems semantically

motivated that the noun *control* frequently co-occurs with the preposition *over* rather than *on*.¹³

4.5 Discussion

Based on the results of the research on BNC shown in section 4.4, this section discusses the reasons of the differences observed in the expressions *influence on* and *over* from the perspective of metaphorical semantic extension of the prepositions (section 4.5.1). Then, this study also attempts to discuss the idiomatic nature of the collocations *influence on* and *influence over*, demonstrating that our knowledge of constructions including *on* and *over* might effect to the differences between the usages of *influence on* and *influence over* (section 4.5.2).

4.5.1 Cognitive Motivation for the Differences in Metaphorical Use of *On* and *Over*

This section discusses the characteristics of the prepositions *on* and *over*, which are components of the expressions *influence on* and *influence over*. As explained in section 4.2, *on* and *over* have common characteristics in their spatial sense like ‘one thing is higher than and possibly touching the other’, which motivate their common semantic extension to control sense. However, on the other hand, the differences between *influence on/over* cannot be explained by such a general meaning of *on* and *over*. To reveal how their differences have been derived, this section examines more detailed characteristics of the spatial sense of *on* and *over*.

¹³ According to the quantitative research conducted in Horiuchi and Otani (2014), controllers of the events expressed by using the phrase *control over* tend to be agentive as well as the cases of *influence over*.

To observe the senses of *on* and *over* more closely, let us review example (26), which is shown here as example (42) again.

- (42) a. the book *on* the table.
b. the mirror *on* the wall.
c. the bug *on* the ceiling. (Lindstromberg 2010: 51-52)

In these examples, the referents of the complements of *on* ((42a) the table, (42b) the wall, (42c) the ceiling) are much larger than the book, the mirror, or the bug respectively. In contrast, in (43a), the complements of *over* (the sleeping child) is covered with a blanket larger than the child, and in (43b), the painted ceiling is covered with a plastic sheet.

- (43) a. She put a blanket *over* the sleeping child. [OALD7]
b. They put a transparent plastic sheet *over* the painted ceiling of the chapel during repair. (Tyler and Evans 2003: 91)

Kreitzer (1997), based on the examples in (44), indicated that *over* can be interpreted as covering something while *on* can not; this is suggested by the contrastive behavior in (42) and (43) as well.

- (44) a. I have put a cloth *over* a table.
b. I have put a cloth *on* a table. (Kreitzer 1997: 302)

According to Kreitzer, *over* in (44a) means a cloth covers a table and functions as a tablecloth, while *on* in (44b) just expresses the location of a cloth, i.e., the cloth can be rolled or folded.

The existence of idiomatic expression *all over* also suggests that covering sense is attached to *over*. In the sentence (45), for instance, the chaotic distribution of the coffee is illustrated by the phrase *all over* (cf. Queller 2001; Taylor 2006).

(45) The coffee went *all over* my skirt. [OALD7]

Now, let us turn to the differences between *influence on* and *influence over* again, and consider the relation between the control and the spatial sense of these prepositions. Taking our daily experience into consideration, when something small is in slight contact with a larger thing (as in the typical spatial situation expressed by *on*), the larger thing tends not to be influenced by the smaller thing. In contrast, when something large covers a smaller thing (as in the typical situation expressed by *over*), the smaller thing tends to be influenced by the larger thing in certain ways. For instance, in the situation expressed in (43a), the child might feel the weight of the blanket, and sleep well in warm and comfortable conditions due to being covered by the blanket; that is, the state of the child is influenced and changed by the blanket. In the situation of (43b) and (44a), the ceiling or the table is protected by a sheet and a tablecloth as well. On the other hand, when a cloth is folded and put on the table as in (44b), the cloth does not function as a tablecloth to protect the table. That is, even in the ‘spatial’ sense, *over* tends to express the situation in which something larger covers and influences a smaller thing to some degree; that is, the power is exerted from the upper to the lower entity more strongly than the situation expressed by *on*. Such a covering characteristic of *over* seems to be reflected in the behavior of *influence over*, which tends to express the event with higher transitivity than *influence on*. The differences between *influence on/over* and their correspondence with the spatial senses suggest that the abstract senses of prepositions reflect our daily experience of the world at a more detailed level than we may have assumed; the

abstract sense of *over*, for instance, reflects not only the physical location but also the functional aspect and energy transmission of covering. This study has quantitatively demonstrated the importance of the notion of experiential basis and embodied view of language (cf. Lakoff 1987; Tyler and Evans 2003; Evans and Green 2006), and emphasizes that we can better understand the differences between synonymous prepositions by focusing more closely on our experiences.

4.5.2 Collocation and Idiomatic Behavior

4.5.2.1 Idiomatic Nature of Language

The previous section mainly focuses on our experimental and cognitive basis of the metaphorical senses of *over* and *on*, which are the components of the expressions *influence on* and *influence over*. Some differences between *influence on* and *influence over* are considered to correspond to their spatial senses, i.e., they are motivated by our spatial experience of the world through our body and cognitive processes like metaphors.

However, on the other hand, the behavior of the whole expressions *influence on* and *influence over* cannot be fully predicted and explained only by the spatial senses of *on* and *over*. As claimed in many studies of cognitive linguistics (e.g., Fillmore, Kay and O'Connor 1988; Langacker 1987, 2000, 2008; Taylor 2006, 2012), and as summarized in Chapter 2 above, there are thousands of familiar collocations, formulaic expressions, and standard usages memorized as one unit in our language. They are stored as a lexical item even though they consist of multiple words; therefore, they are considered to be located intermediate between lexicon and grammar. Langacker (1987: 42) indicated that “general statements and particular statements can perfectly well coexist in the cognitive representation of linguistic phenomena, just as we learn certain products by rote in addition to mastering

general procedures for multiplication. To the extent that this is so, an accurate linguistic description claiming psychological reality must contain both rules expressing generalizations and specific forms learned as a fixed unit, even if the specific forms accord fully with the rules.” Based on this assumption, the expressions *influence on* and *influence over* could contain both the rule-based aspect, which is derived from or motivated by the meanings of the components *influence* and *on* or *over*, and the characteristic as a fixed unit, which is conventionally associated with the whole units of *influence on* and *influence over*.

4.5.2.2 Idiomatic Nature of *Influence On* and *Influence Over*

To examine the idiomatic nature of the expressions *influence on* and *influence over*, this study compared their grammatical characteristics with the expressions including the spatial use of *on/over*, which express a physical location or a path of concrete entities as in (42), (43) and (44). More concretely, this research additionally extracted 500 examples of each preposition from the BNC using a random sampling method without specifying the part-of-speech (i.e., the extracted data includes the adverbial use of *on* and *over*, such as *come on* or *over there*). Then, the extracted data was annotated manually based on the meanings of *on* and *over*, spatial or non-spatial. As a result, 115 examples of *on* and 136 examples of *over* used in a spatial sense were collected. Then, this research annotated the collected data based on the grammatical status in which *on* and *over* phrases occur.

As a result, in the spatial use, both *on* phrases and *over* phrases most frequently appear as a complement or an adjunct of a verb: 71 examples of *on* phrases (62%) and 105 examples of *over* phrases (77%) occur in that syntactic position. On the other hand, only 30 examples of *on* phrases (26%) and 14 examples of *over* phrases (10%) occur within a noun phrase as a modifier of a noun. Furthermore, among these examples, the noun phrases

including *on* and *over* phrases most frequently occur within an adjunct, i.e., as a complement of a preposition (e.g., *she would invite Lucy to choose a sweet from the box on the counter*) as summarized in Table 4-5.

Table 4-5: The Grammatical Status of NP Including the Spatial Use of *On/Over* Phrase

	a. Subj.	b. Obj.	c. Copular-Comp.	d. Within Adjunct	Others	Total
<i>On</i>	4 (13.3%)	6 (20.0%)	2 (6.7%)	<u>16</u> (53.3%)	2 (6.7%)	30 (100%)
<i>Over</i>	0 (0%)	1 (7.1%)	1 (7.1%)	<u>12</u> (85.7%)	0 (0%)	14 (100%)

Comparing the result in Table 4-5 with that in Table 4-4, it is clear that the distributions of the grammatical status of noun phrases including *on/over* phrases are different between the spatial and control domains. Moreover, *on* and *over* in a spatial sense are often used as adverbs, i.e., not followed by any complement nouns (e.g., *come on, fall over*), while all examples of *on* and *over* co-occurring with *influence* appear as a preposition, i.e., take a nominal complement. That is, the grammatical differences between *influence on/over* do not correspond to those between the expressions including *on* and *over* indicating the spatial senses, and thereby cannot be fully predicted from the spatial senses of *on* and *over*.

This suggests that, in the knowledge of English native speakers, the whole units of *influence on* and *influence over* are paired with the larger constructions (e.g., copula or transitive construction) in which they tend to occur, and are also connected with the type of influence they usually express to some degree. According to the results of the quantitative research, it does not seem that speakers/writers always select one of the prepositions after *influence* based on the original meanings of *on* and *over*, depending on how they construe a

particular situation (for instance, how they feel about the strength or weakness of the power of influence at that time). Rather, the type of situation which *influence on/over* usually express and the constructional patterns in which they tend to occur (e.g., [Agentive INF-er + Verbs of possession/power execution + *influence over* + Non-agentive INF-ee]) are conventionally fixed to each expression in some degree.

Previous studies of the polysemy of English prepositions tended to focus on the meaning of prepositions themselves, i.e., the linguistic unit being analyzed is limited to one word. According to the usage-based model, on the other hand, the knowledge of lexicon and grammar is stored in our knowledge along with the contextual information in which they occur. Based on this model, it is important to examine the linguistic unit beyond one word (such as with collocation or larger constructions) to reveal our linguistic knowledge associated with prepositions. This study implied that the differences between *influence on* and *influence over* in terms of the type of INF-er, INF-ee, and the grammatical constructions in which they occur. The approach matches the notion of the usage-based model, and can be an effective way to reveal the knowledge of language user associated with each preposition. The following chapters in this thesis will further examine the contextual factors which shape such conventionalized patterns.

4.6 Conclusion

This chapter has demonstrated the differences between the synonymous expressions *influence on* and *influence over*. As a result of the quantitative research using the BNC, this study has shown that *influence on* tends to be used when expressing the influence between inanimate things, while *influence over* is more frequently used to express the influence from a human or an organization (i.e., agentive INF-er). Their difference has corresponding aspects to the

spatial senses of *on* and *over*, which are considered to be their basic/primary senses and the source of their semantic extension. It suggests that our daily experiences associated with the spatial meanings of *on* and *over* motivate the characteristics of their usage even when they express extended/abstract senses.

At the same time, the grammatical differences between *influence on* and *influence over* cannot be fully explained and predicted only by the spatial senses of *on* and *over*; that is, their grammatical tendencies and the types of influence they frequently express in actual usage are conventionally associated with each expression to some degree. This research suggests the importance of examining not only the senses of the prepositions themselves but also how they behave with their co-occurring words in actual use to reveal our knowledge of prepositions.

Chapter 5

Under Phrases as Clause-level Modifiers: Comparison with *Over* and *Below* Phrases¹⁴

5.1 Introduction

This chapter focuses on the grammatical behavior of prepositional phrases headed by *under* (*under* phrases), compared with prepositional phrases headed by *over* and *below*. Previous studies on English prepositions in the field of cognitive linguistics have mainly examined the meanings (i.e., semantic aspect) of each preposition to accurately describe their polysemous structures. Among the prepositions, many researchers have analyzed the semantic network of *over* in particular (e.g., Brugman 1981, Lakoff 1987, Dewell 1994, Tyler and Evans 2001, Deane 2005) because *over* has a highly polysemous nature and complex semantic structure. In contrast, the senses and behavior of its antonym, *under*, have not been intensively examined thus far. Even though *under* can express abstract senses as well as spatial ones, it has far fewer senses than *over*, and its semantic network is considered to be rather simple. Tyler and Evans (2003: 123) explained this asymmetry between *under* and *over* as follows: “the semantic network of *under* is far less extensive than that of *over*. This may be because in many of our interactions with the world, objects and entities which are higher are often more accessible.”

However, if we take the syntactic aspect into account, *under* phrases actually have interesting characteristics. In the British National Corpus (BNC), there are many examples of

¹⁴ This chapter is based on Horiuchi (2015a, 2015b, 2016a).

under phrases occurring as a clause-level modifier in clause-initial position, as in (46). In contrast, *over* phrases are less likely to occur with this syntactic status.

- (46) a. *Under a Labour government*, this committee would become an official inquiry into electoral reform.
- b. *Under these services*, revenues would be shared among the participating companies.

Moreover, not only *over* phrases but also *below* phrases hardly ever occur as clause-level modifiers in clause-initial position, even though *below* can express a situation in which something is located ‘lower’ than something else and thereby could be considered a synonymous preposition of *under*. That is, the prepositional phrases headed by *under* have different tendencies in terms of their grammatical behavior than those headed by its antonym *over* or its synonym *below*.

The theory of Cognitive Grammar (Langacker 1987, 2008) has proposed a symbolic view of language, in which the form of a linguistic unit is considered to be motivated by its meaning. Based on this notion, it can be assumed that examining the syntactic behavior of a linguistic element might help reveal its detailed semantic characteristics. This chapter attempts to compare the grammatical characteristics of *under* phrases with those of *over* and *below* phrases using the BNC, demonstrating the semantic and functional characteristics reflected in their syntactic behavior. Moreover, this study considers how *under* phrases have taken on the grammatical tendency to occur as clause-level modifiers in clause-initial position, in terms of the theory of metaphor and a usage-based view of grammar.

5.2 Background: Grammatical Behavior and Meanings of Prepositional Phrases

This section explains the background of this study by reviewing previous studies on the prepositions *under*, *over*, and *below*.

5.2.1 Studies on English Prepositions Focusing on their Meanings

First, section 5.2.1 briefly reviews some of the previous studies on the preposition *over*, and also some on *under* and *below*, which are the focus of this chapter.

Brugman (1981) and Lakoff (1987), as already introduced in previous chapters in this thesis, intensively examined the semantics of *over* and explained its process of semantic extension based on the notion of the image-schema; for example, they assume that an image-schema behind the spatial sense of *over* in (47a) is mapped onto an abstract domain, and the control sense of *over* illustrated in (47b) has been derived through a metaphorical application.

- (47) a. Hang the painting *over* the fireplace. (Lakoff 1987: 425)
b. She has a strange power *over* me. (ibid.: 435)

These studies have demonstrated that the senses of a given preposition are related to each other and organized in a semantic network, and their semantic extensions are motivated by general cognitive processes such as metaphor, i.e., by factors that are not specific to language.

Moreover, Tyler and Evans (2003) elaborated the studies of *over* through

comparison with other related prepositions such as *above*, *under*, and *below*, which show spatial relations along the vertical axis, as briefly introduced in Chapter 3. While all of these prepositions express spatial relations along the vertical axis of the world, they have different characteristics in terms of the relation between the trajectors (TR) and landmarks (LM). While the TRs of *above/below* are distal to the LM in their primary senses, the TRs of *over/under* are close to and possibly touching the LM. The following example represents the differences between *over* and *above*.

- (48) a. ??The bridge is half a mile **over** the fall (Tyler and Evans 2003: 121)
 b. The nearest bridge is about half a mile **above** the fall (ibid.)

In addition, according to Tyler and Evans, the differences between *under* and *below* represent a mirror image of those of *over* and *above*; the TR of *under* is close to and possibly touching the LM, while the TR of *below* is distal to the LM in terms of their primary senses. This is reflected in the differences in (49), for example, in which only *below* naturally co-occurs with the adverb *far*.

- (49) a. ??The valley is far **under** the tallest peak (Tyler and Evans 2003: 122)
 b. The valley is far **below** the tallest peak (ibid.)

Lindstromberg (2010: 157–158) also explained the differences between *under* and *below* based on the distance between the TR and the LM.

What is interesting in the studies of Tyler and Evans (2003) is that the differences in their primary senses are also reflected in their abstract senses. Tyler and Evans noted that *above* and *below* do not have a control sense while *over* and *under* do, as shown in (50),

because the TR and the LM cannot influence each other when they have a distal relationship.

- (50) a. She has a strange power *over* me (Lakoff 1987: 435, Tyler and Evans 2003: 68)
b. We're *under* contract (Tyler and Evans 2003: 125)

Tyler and Evans discussed the senses of prepositions within basic lexical relations such as synonyms (*over/above*, *under/below*) and antonyms (*over/under*, *above/below*), and thereby provided elaborated analysis.

5.2.2 Grammatical Differences and Their Importance

Tyler and Evans (2003) showed the effectiveness of comparing related items such as synonyms and antonyms to uncover the characteristics of each preposition. However, Tyler and Evans (2003), and other studies on English prepositions that are based on the framework of cognitive linguistics, tend not to pay much attention to the prepositions' syntactic behaviors. For example, the control sense of *over* as in (47b) is considered to be derived from its spatial sense as in (47a), but the *over* phrase in (47b) occurs as a modifier of a noun phrase headed by *power*, while that in (47a) occurs within a verb phrase headed by *hang*. Moreover, while Tyler and Evans (2003) claimed that *over* and *under* both have a control sense based on examples such as those in (50), the syntactic status of *over* and *under* phrases differ: whereas the *over* phrase in (50a) occurs as a modifier of a noun phrase, the *under* phrase in (50b) occurs as a complement of a copula verb. However, such grammatical differences have not been pointed out in the literature. Moreover, as introduced in section 5.1, *under* phrases frequently occur in clause-initial position as a clause-level modifier¹⁵ in the BNC data; in

¹⁵ The grammatical status of the 'clause-level modifier' is that of a 'sentence adjunct' in Quirk et al.

contrast, *over* and *below* phrases are less likely to occur with such a grammatical status. Studies such as Brugman (1981), Lakoff (1987), Dewell (1994), Tyler and Evans (2001, 2003), and Deane (2005) have analyzed the meanings of prepositions based on structured examples, i.e., sentences created by the authors, through examining minimal pairs (e.g., (48) and (49)); their analyses have revealed detailed characteristics of each preposition and have contributed much to the study of polysemy. However, they have not conducted corpus research, and thus have paid little attention to the behavior of prepositions in natural discourse, such as, in this case, the grammatical tendencies observed only in *under* phrases, not in *over/below* phrases.

The theory of Cognitive Grammar, which considers the form of linguistic units to reflect their meaning, suggests that syntactic tendencies in the actual use of prepositional phrases might reflect some kinds of semantic and even functional differences between the prepositions. Based on this assumption, this study extracts data from the BNC and conducts quantitative research into the grammatical behavior of *under*, which has not been closely examined in previous literature. To determine the characteristics of *under* phrases, this study compares them with *over* and *below* phrases. Then, it will analyze the results of the quantitative research and suggest possible sources of the grammatical characteristics of *under* phrases.

5.3 Data and Methods

This section explains the data used in this research, and the research methodology. As explained above, this study uses data extracted from the BNC, which is composed of over 100 million words of written and spoken British English. I used the following procedure to

(1985: 511).

collect the data. First, I extracted all the examples of *under*, *over*, and *below* in the BNC without specifying their parts of speech. In other words, I extracted their usage not only as prepositions but also as particles (i.e., prepositional adverb (Quirk et al. 1985: 713–716)), whereby *under*, *over*, and *below* are not followed by any nominal complements (e.g., *over there / see below*). The number of instances of *under* is 60,023, that of *over* is 128,188, and that of *below* is 14,103. Second, I selected 500 examples of each preposition using a random sampling method. Third, to examine these 1,500 examples, I annotated them according to three features. Table 5-1 presents a list of the features and their variables.

Table 5-1: List of Features and Variables

(A)	The grammatical status of <i>under/over/below</i> phrases
	<p>a. Modifier within a noun phrase (e.g., <u>water <i>under</i> the bridge / the pinewood <i>below</i> the cliff</u>)</p> <p>b. Adjunct or complement within a verb phrase (e.g., It ran upstairs and hid <u><i>under</i> a bed</u> / Laura put her hand <u><i>over</i> the mouthpiece</u>)</p> <p>c. Clause-level modifier (Sentence adjunct) (e.g., He committed the crime <u><i>under</i> the influence of drugs</u> / <u><i>Over</i> the years</u>, zoos have declined in popularity)</p> <p>d. Others / Intermediate example (e.g., <u>from <i>under</i> the table</u> / They were exhibited all <u><i>over</i> the world</u> [Verbal modifier or Clause-level modifier])</p>
(B)	The semantic domain of <i>under/over/below</i> phrases
	<p>a. Spatial (e.g., There was a big rear-view mirror <u><i>over</i> the bar</u>)</p> <p>b. Non-Spatial (e.g., His contribution <u><i>over</i> the years</u> was massive)</p>
(C)	The position in the clause of <i>under/over/below</i> phrases
	<p>a. Initial (e.g., <u><i>Under</i> these conditions</u> your anxiety will be greater <u><i>Below</i> the Lakes</u>, the Lune valley too afforded all that was truly picturesque.)</p> <p>b. Not-Initial</p>

	(e.g., Many women find, <u>over a period of time</u> , that they like to take a regular supplement of evening primrose oil. / He committed the crime <u>under the influence of drugs</u>)
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5.4 Results of the Quantitative Research

This section presents the results of the quantitative research.

5.4.1 Grammatical Status

First, the distribution of the grammatical status of each prepositional phrase, i.e., the results of the annotation of Feature (A), is shown in the following table.

Table 5-2: The Grammatical Status of the Prepositional Phrases

	a. Modifier in NP	b. Adjunct/Comp. in VP	c. Clause-level Modifier	d. Others	Total
<i>Under</i>	105 (21.0%)	180 (36.0%)	175 (35.0%)	40 (8.0%)	500 (100%)
<i>Over</i>	147 (29.4%)	274 (54.8%)	24 (4.8%)	55 (11.0%)	500 (100%)
<i>Below</i>	180 (36.0%)	242 (48.4%)	15 (3.0%)	63 (12.6%)	500 (100%)

As summarized in this table, the grammatical behavior of *under* phrases differs significantly from that of the other two prepositional phrases *over* phrases exhibit quite different grammatical tendencies from the other two prepositional phrases. One of the most noticeable characteristics of the *under* phrases is that they frequently appear as clause-level modifiers, which modify an entire clause (35.0%).

(51) Under this threat, Churchill sent a long reply on 28 November, ...

In this example, an *under* phrase modifies the associated clause *Churchill sent a long reply on 28 November*. In contrast, prepositional phrases headed by *over* or *below* rarely occur as clause-level modifiers: only 4.8% of *over* phrases and 3.0% of *below* phrases are used as clause-level modifiers. Instead, they frequently occur as an adjunct or a complement of a verb phrase, or as a modifier within a noun phrase. That is, *over* and *below* phrases tend to occur within the argument structure (i.e., under the scope of a verb phrase or a noun phrase), while *under* phrases frequently appear outside the scope of the argument structure.

5.4.2 Semantic Domain and Its Relation to the Grammatical Status

The previous section, based on the results of the annotation of Feature (A), demonstrates that *under* phrases behave in different ways from *over* and *below* phrases. This section, in turn, focuses on the relation between the grammatical status of prepositions and their meanings, combining the results of the annotation of Feature (A) with those of Feature (B). The results, as summarized in the following table, show that the grammatical tendencies of *under/over/below* phrases in the spatial domain are quite different from those in the non-spatial (i.e., abstract) domain.

Table 5-3: The Relation between Grammatical Status and Semantic Domain

		a. Modifier in NP	b. Adjunct/Comp. in VP	c. Clause-level Modifier	d. Others	Total
<i>Under</i>	Spatial	21 (24.1%)	46 (52.9%)	9 (10.3%)	11 (12.6%)	87 (100%)
	Non-Spatial	84 (20.3%)	134 (32.4%)	166 (40.2%)	29 (7.0%)	413 (100%)
<i>Over</i>	Spatial	15 (11.0%)	105 (77.2%)	4 (2.9%)	12 (8.8%)	136 (100%)
	Non-Spatial	132 (36.3%)	169 (46.4%)	20 (5.5%)	43 (11.8%)	364 (100%)
<i>Below</i>	Spatial	90 (49.2%)	61 (33.3%)	12 (6.6%)	20 (10.9%)	183 (100%)
	Non-Spatial	90 (28.4%)	181 (57.1%)	3 (0.9%)	43 (13.6%)	317 (100%)

When *under* phrases are used with a spatial meaning, as illustrated in this table, they tend to occur within a verb phrase as a complement or adjunct (52.9%). In contrast, when they express a non-spatial sense, more than 40% of the examples appear as clause-level modifiers, as in (51) above, and (52):

- (52) *Under* Ford's influence, Jaguar is placing heavy emphasis on building the car efficiently, speedily and at low cost.

[Non-spatial, Clause-level modifier]

The spatial use of *under* phrases and the non-spatial use of *over/below* phrases rarely occur with this grammatical status; therefore, we can say that this behavior is specific to *under* phrases that express non-spatial meanings.

On the one hand, *over* phrases tend to occur as an adjunct or a complement of a verb phrase both when they express a spatial sense (77.2%), and when they express a non-spatial sense as well (46.4%). However, at the same time, the non-spatial use of *over* phrases also frequently occur as a modifier of a noun (36.3%). Example (53) illustrates the spatial use of an *over* phrase, which occurs in a verb phrase headed by *flew* and specifies the path of flying. The examples in (54) illustrate the non-spatial use of *over* phrases: the *over* phrase in (54a) occurs in a verb phrase headed by *puzzled*, and that in (54b) modifies the noun *influence*.

(53) Then she flew high *over* the site of Callanish ... **[Spatial, within VP]**

(54) a. people puzzled *over* the band names ... **[Non-spatial, within VP]**

b. Prince Philip has a far greater influence *over* his wife than most people realise.

[Non-spatial, within NP]

Below phrases also exhibit different grammatical tendencies depending on whether they express spatial or non-spatial meanings. *Below* phrases with a spatial meaning are often used as a modifier of a noun phrase, as exemplified by (55)

(55) The concrete spillway *below* the Loch Add reservoir comes down to a stepped slope above the confluence of several small burns draining nearby slopes.

[Spatial, within NP]

The *below* phrase in this example occurs within a noun phrase headed by *spillway* and specifies the location of the spillway. The non-spatial uses of *below* phrases, in contrast, tend

to occur within a verb phrase (57.1%), especially co-occurring with verbs like *see*, *discussed*, *listed*, and *shown* to refer to units of discourse.¹⁶

(56) a. Moreover, by this time, a more rigorous framework of control was in place
(see *below*).

b. A child protection review, discussed *below*, is another type of child protection
conference convened to review arrangements for the protection of a child.

[Non-Spatial, within VP]

As shown in these examples, *below* used as a discourse reference is not followed by a nominal complement, i.e., it is used as a prepositional adverb. The results of this quantitative research suggest that the grammatical tendencies of the non-spatial use of each preposition differ from those of their spatial use.

5.4.3 Position in the Clause

This section presents the results of the annotation of the positions of the prepositional phrases in the clause. The results are summarized in the following table.

¹⁶ This usage of *below*, as in (56), which refers to a unit of written discourse (cf. Quirk et al. 1985: 1462), could seem to indicate a location on paper and thereby be categorized as spatial use; however, this thesis considers this to be a non-spatial use because it can refer to a subsequent part of the discourse even when the referent does not physically exist lower than where the expression *below* occurs (e.g., the information referred to by *below* may sometimes be located at the top of the following page). Further explanation of the discourse-deictic use of *below* will be provided in Chapter 6 of this thesis.

Table 5-4: The Position in the Clause of the Prepositional Phrases

	a. Initial	b. Not-Initial	Total
<i>Under</i>	50 (10.0%)	450 (90.0%)	500 (100%)
<i>Over</i>	15 (3.0%)	435 (97.0%)	500 (100%)
<i>Below</i>	6 (1.2%)	494 (98.8%)	500 (100%)

This table shows that *under* phrases appear in initial position in the clause much more frequently than *over* or *below* phrases do (*under*: 10%; *over*: 3.0%; *below*: 1.2%). This result is closely associated with those of the first case study on grammatical status, summarized in Table 5-2. Quirk et al. (1985: 511–514) explained that prepositional phrases occurring as clause-level modifiers (i.e., sentence adjuncts) as in (57) are naturally moved to the initial position of the clause without without changing the meaning of the clause.¹⁷

- (57) a. She had lived in poverty for thirty years. (Quirk et al. 1985: 513)
 b. On Monday I'll see you at nine. (ibid. : 533)

Based on this explanation, the tendency of *under* phrases to occur in clause-initial position must be related to the high ratio of their usage as clause-level modifiers.

In summary, *under* phrases tend to show quite different syntactic behavior from *over* and *below* phrases, even though *under* has been considered to be the antonym of *over*, and synonymous with *below*. While *over* and *below* phrases tend to occur in verb phrases or

¹⁷ Quirk et al. (1985: 511–514) explains that the most obvious way in which sentence adjuncts (clause-level modifiers as in (i)) can be distinguished from predication adjuncts (modifier or argument within the verb phrase as in (ii)) is through their relative freedom to occur in clause-initial position as well as in clause-final position. The following examples show the difference.

- (i) On the platform, she kissed her mother. [sentence adjunct] (Quirk et al. 1985: 512)
 (ii) ?On the cheek, she kissed her mother. [predication adjunct] (ibid.)

noun phrases, i.e., within the argument structure, *under* phrases frequently occur as clause-level modifiers, i.e., outside the scope of argument structure. Moreover, this grammatical tendency (or the uniqueness) of *under* phrases is observed only when the *under* phrase is used to express a non-spatial sense. Furthermore, *under* phrases are used in clause-initial position more often than *over* and *below* phrases are.

Based on the results of the quantitative research, the next section examines the semantic and functional characteristics reflected in the grammatical tendencies of *under* phrases, mainly focusing on their usage as clause-level modifiers, which is frequently observed in *under* phrases but rarely in *over* or *below* phrases.

5.5 Construal Reflected in Grammatical Status

This section discusses the semantic characteristics of *under* phrases based on the syntactic or formal characteristics presented in the previous section.

5.5.1 Cognitive Differences between Arguments and Clause-level Modifiers

In the theory of Cognitive Grammar, grammatical constructions are considered to have some kind of conceptual import. Langacker (1990: 213, 232) claimed that the grammatical distinction between clause-level modifiers and the nominal arguments of a verb reflects the conceptual difference between the setting for an event and its participants. For example, in (58), *in Oregon last summer* occurs as the clause-level modifier, i.e., outside the scope of the argument structure, whereas *David* and *a large brown trout* occur as the nominal arguments of the verb *caught*.

(58) In Oregon last summer, David caught a large brown trout.

(Langacker 1990: 230)

Langacker (1990) claims that *David* and *a large brown trout* can occur as arguments since they are regarded as the core participants of the event (i.e., the central and essential elements) by the conceptualizer. In contrast, *in Oregon last summer* is regarded as the setting of the event, which is more peripheral and does not constitute a core part of the event structure. For this reason, it appears as a clause-level modifier, which is a syntactically peripheral element. As shown here, based on the assumption that grammatical structures have symbolic nature (i.e., they are associated with their meanings), Cognitive Grammar regards the difference between arguments of a verb and clause-level modifiers as reflecting the conceptual differences between the core and more peripheral elements of an event.

5.5.2 Construal Reflected in the Grammatical Status of *Under* Phrases

The analysis by Langacker (1990) introduced in the previous section helps the interpretation of the syntactic characteristics of *under* phrases. Based on the tendency to occur as clause-level modifiers, *under* phrases could be considered to have the tendency to represent the setting of events, which is peripheral to the events and outside the scope of the core part of the event structure. The setting expressed by an *under* phrase is usually not spatial but abstract, as in the following examples.

(59) a. *Under such circumstances*, the influence of the father **would**, of course, be absent ...

- b. Under a Labour government, this committee **would** become an official inquiry into electoral reform.

The complements of *under* in (59a) and (59b) are noun phrases headed by abstract nouns, *circumstances* and *government*. In both examples, *under* phrases represent some conditions or presupposed circumstances under which an event occurs, and *under* in these sentences behaves as the head of a protasis. The subjunctive mood used in both examples shows the *under* phrase's similarity to *if*, which serves as the head of a conditional clause (cf. Otani and Horiuchi 2013).

In contrast, as shown in Table 5-2, *over* and *below* phrases are less likely to occur as clause-level modifiers than *under* phrases, i.e., tend not to indicate the entire setting of events. Instead, *over* and *below* phrases tend to occur within the argument structure as modifiers of nouns and verbs, i.e., to modify the core elements of the events. Moreover, even when *over* and *below* phrases occur as clause-level modifiers, they do not express such a conditional sense. *Over* phrases as clause-level modifiers tend to be used in the domain of time, expressing the period of an event.

- (60) He followed Garry into the end house. The stairs were still sound and both boys made their way up to the top floor. Standing dangerously close to the crumbling edge, the two looked out across London. Over the last few years the landscape had changed. From their vantage point they could see the whole of their world.

As in this example, *over* phrases usually occur in the form [*over* + *the* + period of time] when they occur as a clause-level modifier, which modifies the related main clause and expresses the duration of an event. *Below* phrases, on the other hand, are rarely used as clause-level modifiers (only 15 out of 500 examples of *below* phrases are used in this syntactic position, as shown in Table 5-2). Even when occurring as a clause-level modifier, the *below* phrase

tends to specify a spatial relation as in the following example.

- (61) In the 1760s the Lake District with its rugged and dramatic scenery began to be all the rage with artists of all sorts, and in their wake, as usual, the dilettanti rich followed limply behind, thinking there must be something in this search for the sublime through unadulterated nature. Below the Lakes, the Lune valley too afforded all that was truly picturesque. Gray and Mason wrote about it, Mrs. Radcliffe raved about it, Turner painted it.

In (61), the complement of the preposition *below* is *the Lakes*, and the *below* phrase represents the spatial relation between the TR (*the Lune*) and the LM (*the Lakes*), rather than abstract notions.

This section has examined the semantic characteristics of *under*, *over* and *below* phrases, which are reflected in their grammatical tendencies. The next section will expand the scope of the analysis to the discourse level.

5.6 Position in the Clause and Discourse Functions

Many studies in the field of cognitive linguistics have investigated the meanings of prepositions within individual standalone sentences; in other words, the characteristics of prepositions tend not to be examined at the discourse level. However, some studies on adverbial clauses from the functional viewpoint have shown that their positions in the clause are closely associated with their discourse functions (Thompson 1985; Ford 1993). This section reviews these studies regarding the position of adverbial clauses and their discourse functions, then discusses the functional characteristics of *under* phrases in discourse contexts.

5.6.1 Functional Differences between Initial and Final Clauses

Thompson (1985) examined English purpose clauses, and showed that the purpose clauses before the main clause (initial purpose clause) as in (62a) have different discourse functions from those after the main clause (final purpose clause) as in (62b).

- (62) a. To cool, place the loaf on a wire rack. (Thompson 1985: 55)
b. Place the loaf on a wire rack to cool. (ibid.)

According to Thompson, when a purpose clause occurs before the main clause, it helps the readers to connect the previous context with the following discourse by guiding their attention. For instance, in (63), the initial purpose clause *to true a blade* names the problem which is expected from the preceding discourse, and the context that follows provides the solution. That is, the initial purpose clause is not just associated with the main clause of the same sentence, but serves as a reminder of the preceding paragraph.

- (63) Keeping the knife blade sharp and under easy control is important. But of equal importance to the successful carver is keeping the V-edge true by the use of a steel. And the following procedure should precede the use of the knife before each carving period. The steel, which should be magnetized, realigns the molecular structure of the blade. To true a blade, hold the steel firmly in the left hand, thumb on top of handle. Hold the hand slightly away from the body. Hold the knife in right hand, with the point upward. Place the heel of the blade against the far side of the tip of the steel, as illustrated... (ibid.: 64)

In contrast, purpose clauses that occur after the main clause do not have such a discourse-organizing function. As in the following example, they just explain the purpose of the action expressed in the main clause.

(64) George had always been my first choice for crew. Twenty-six years old, he had served in the army and later gone to the Middle East to train soldiers for an oil rich sheik. With the money saved from this venture, he had decided to take a couple of years looking around the world and pleasing himself. (ibid.: 68)

Thompson (1985: 61) referred to the three functions of language proposed by Halliday (1973), (i) ideational (content), (ii) textual (text-organizing), and (iii) interpersonal, and claimed that “while final purpose clauses serve at the ideational level, initial purpose clauses operate simultaneously at the ideational and at the textual level.” Ford (1993) indicated similar points in the study of various adverbial clauses: the initial adverbial clauses have the function of creating a link in the discourse or shifting the topic, while the final adverbial clauses do not have such functions. These studies suggest that initial and final purpose clauses have different functions in discourse, and they further imply that the tendency observed in the positioning of *under* phrases is also associated with its discourse function, even though it is not an adverbial clause but a prepositional phrase. Based on these studies, I will examine the discourse functions of *under* phrases in detail in the next section.

5.6.2 Functions of *Under* Phrases in Clause-initial Position

This section will examine the usage of *under* phrases in clause-initial position within a discourse context.

(65) Second let us suppose that you are told that for every counter that you place in the jar within thirty seconds you will receive a pound coin. Under these conditions your anxiety will be greater, as you are keen to earn as much money as possible in

the time allowed. Therefore your task performance is likely to be very fast and efficient.

In (65), the preceding sentence of the *under* phrase specifies a hypothetical situation. Next, the *under* phrase presents this situation as the condition for another event. Then, the situation (or event) *your anxiety will be greater*, which is influenced or controlled by *these conditions*, is expressed after the *under* phrase. Example (66) shows a similar pattern.

(66) They are the sole buyers of some types of labour and materials for the goods and services that only they produce. Examples of such types of labour are firemen, army officers and policemen. In addition, a bureaucratic agency may be given preferential access to some inputs, such as land, through planning legislation, for example. Bureaus can thus under some conditions exercise wage and factor price discrimination. *Under the conditions outlined above*, this is likely to reduce the economic efficiency of public provision.

As in these examples, *under* phrases in clause-initial position tend to occur in the following type of discourse context: (i) the preceding contexts of *under* illustrate some circumstances, (ii) the *under* phrase summarizes the circumstances as the conditions for or the precondition of an event, and (iii) the context described after the *under* phrase illustrates the event which might take place under these conditions. Moreover, in these examples, the *under* phrases contain anaphoric words: *these* in (65) and *above* in (66). This suggests that the *under* phrases that occur in the initial position of a clause create a backward link to the preceding sentences, and thereby have the discourse function of connecting the preceding context with the subsequent parts of the clause, just like initial purpose clauses.

In contrast, *over* phrases in clause-initial position do not seem to have a strong connection with the preceding discourse; instead, in many cases, *over* phrases just specify the period of the event described in the main clause that follows. Ford (1993: 37–38) examines

temporal clauses (e.g., *when* clauses) that occur before the main clause and argues that they have a function to introduce a time frame to the discourse. *Over* phrases, such as in (67) and (68), along with an adverbial clause of time, may introduce a time frame to the discourse; however, they do not contain any explicit anaphoric expressions such as *these* or *above*. Instead, they simply have a connection to the subsequent parts of the clause, rather than the preceding parts.

(67) He followed Garry into the end house. The stairs were still sound and both boys made their way up to the top floor. Standing dangerously close to the crumbling edge, the two looked out across London. *Over the last few years* the landscape had changed. From their vantage point they could see the whole of their world.

(68) Many players are guilty of having a lesson and almost expecting a magical remedy to their problems. *Over the years*, most of the players I have taught at all levels have benefitted from sensible practice, that is, well-organized drilling. You will discover, especially with the better players, that particular drills are valuable in ironing out their weaknesses.

As discussed previously, compared with *under* phrases, *over* phrases do not frequently occur in clause-initial position. Even when they appear in that position, *over* phrases do not seem to have a strong relation to the content of the preceding context, i.e., they do not connect the preceding context to the following discourse. As for *below* phrases, only six out of 500 examples occur in clause-initial position; this may imply that neither *below* phrases nor *over* phrases develop discourse functions at the text-organizing level of connecting the preceding and following contexts.

The grammatical, semantic, and functional characteristics of *under* phrases can be summarized as following. First, *under* phrases tend to occur as clause-level modifiers and frequently appear in clause-initial position more often than *over* or *below* phrases do. Second,

when *under* phrases occur as clause-level modifiers, they tend to express non-spatial senses; more specifically, they express a condition under which an event occurs. Third, *under* phrases as clause-level modifiers tend to have a text-organizing function in natural discourse.

5.7 Discussion: Motivation for the Grammatical Behavior of *Under* Phrases

This section will propose a motivation for the grammatical tendencies of *under* phrases by examining the relation between metaphor and their grammatical status. Previous studies on the metaphorical semantic extension of English prepositions, such as Brugman (1981), Lakoff (1987), and Boers (1996), have mainly focused on the corresponding aspect between the spatial and non-spatial senses of prepositions. In these studies, the non-spatial senses (i.e., the abstract/extended senses) of prepositions are considered to be simply derived from their spatial senses (i.e., the concrete/basic senses). However, the results of this study have demonstrated that *under* phrases tend to occur as clause-level modifiers and in clause-initial position only when they express non-spatial meanings. In other words, the grammatical tendency observed in the non-spatial use of *under* phrases cannot be fully explained by – nor does it correspond to – their spatial use.

How, then, has the grammatical behavior of *under* phrases, which is specific to their non-spatial use, come about? One of the possible sources is the metaphorical senses of the *under* phrases themselves, not their spatial senses. That is, the semantic characteristics of *under* phrases, which tend to express the conditions or presupposed circumstances of an event just like *if* clauses, would facilitate the development of their grammatical characteristics. As mentioned above, the elements conceptualized as the ‘setting’ of an event tend to occur as clause-level modifiers, and therefore it is natural that *under* phrases representing the

conditions of an event, which could be assumed to be the ‘setting’, frequently occur as clause-level modifiers. Moreover, the tendency of *under* phrases to appear in clause-initial position might be motivated by their functions in discourse: they tend to be attached to elements representing conditional senses. Ford (1993: 24) examined the positions of various adverbial clauses (before or after the main clauses) in natural discourse, and found that conditional clauses (e.g., *if*-clauses) more frequently occur before main clauses, which contrasts with the behavior of temporal clauses (e.g., *when*-clauses), as illustrated in the following table.

Table 5-5: Differences in the Positions of Adverbial Clauses (Ford 1993: 24)

Type of Adverbial Clause Position	Temporal	Conditional	Causal	Concessive	Totals
Initial	21	<u>26</u>	—	1	48 (25%)
Final	<u>40</u>	18	75	2	135 (69%)
No main clause	2	8	1	—	11 (6%)
Totals	63	52	76	3	194 (100%)

We notice that both *if* clauses and *under* phrases, which can express the conditions of an event, are likely to occur in the initial position of a sentence/clause, i.e., in the position close to the preceding discourse. This tendency can be explained naturally if we consider the discourse function of *under* phrases to create a linkage with the preceding context. In (65) and (66) above, for instance, *under* phrases with a conditional sense summarize the previous contexts using anaphora (e.g., *these, above*) and present it as a condition for the other event(s) presented by the main clause; these *under* phrases thereby have a text-organizing function of connecting the preceding and the following discourse. Moreover, if we take into account that

if clauses are also likely to occur before the main clause, the positions and discourse functions of *under* phrases might be motivated by, or at least associated with, their semantic value that can express a conditional meaning. This suggests that the formal tendencies in the usage of *under* phrases have developed based on *under*'s sense of representing conditions, rather than on its spatial sense.

In contrast, as shown in Table 5-5, adverbial clauses expressing temporal meanings tend not to occur before main clauses, as compared to conditional clauses. This tendency corresponds to that of *over* phrases representing temporal meanings (e.g., *over the years*), which are less likely to appear in clause-initial position and tend not to have a text-organizing function compared with *under* phrases. The grammatical differences between *under* and *over* phrases seem to correspond to, and further be determined based on, the differences of the metaphorical meanings they can represent (i.e., the difference between conditional or temporal senses), rather than directly influenced by their spatial senses.

Furthermore, there is a possibility that the grammatical tendency of *under* phrases has developed and gradually become conventionalized in the language through analogical reasoning based on their similarity to *if* clauses. The usage-based view of grammar assumes that the behavior of a linguistic expression is shaped by its contexts of natural usage; in other words, the behavior of an expression can be influenced by that of other related expressions. The behavior of a linguistic element can change dynamically in language use through the process of analogy based on other similar expressions, and the process can be applied not only to the behavior of single words but also to grammatical patterns or constructions. This view of grammar allows us to deduce that *under* phrases came to be able to express conditional senses through semantic extension, and then came to be used in a way just like *if* clauses (as a clause-level modifier in sentence-initial position, and sometimes serving as the head of protasis) based on the similarity of their meanings. Although historical studies and

more evidence are needed to support this idea, it could be assumed that the grammatical behavior of each prepositional phrase is gradually shaped and conventionalized in relation to other related expressions in use.

To sum up, even though the metaphorical senses of prepositions are derived from their spatial senses, the grammatical tendency of prepositions used in the metaphorical senses is not directly influenced by their spatial senses; it is rather shaped by the semantic/functional characteristics of the metaphorical senses themselves and through analogical reasoning in relation to other expressions. When we consider the factors by which a preposition's use in discourse is determined, it is essential to examine (i) the characteristics of its extended meanings as well as its 'original' senses, (ii) how the preposition plays a role in organizing the text at the discourse level, and (iii) how it may be associated with other expressions, especially with those that have some commonalities in terms of form, meaning, or function.

5.8 Conclusion

This chapter has closely examined the grammatical behavior of *under* phrases using the BNC, and has compared them with *over* and *below* phrases. Since the semantic network of *under* is considered to be relatively simple, the behavior of *under* phrases has hardly ever been examined closely in the literature. However, in terms of grammatical characteristics, *under* phrases actually show unique tendencies that cannot be observed in either *over* or *below* phrases. To be more specific, *under* phrases frequently occur as clause-level modifiers and tend to occur in clause-initial position. Furthermore, these grammatical tendencies cannot be explained by the spatial senses of *under*, because such grammatical characteristics are not observed when *under* phrases are used to express physical/spatial relations.

Based on the results of corpus research, this chapter has argued that the tendencies

observed in terms of the grammatical status and the position in the clause of *under* phrases have likely been shaped by the characteristic of representing the conditions of an event and by the discourse function of *under* phrases when expressing the conditional sense. Moreover, the way *under* phrases are used in the conditional sense might have become conventionalized through analogy, i.e., based on their semantic similarity to *if* clauses. While the abstract senses of prepositions have been considered to reflect the nature of their basic (i.e., spatial) senses, this study has demonstrated that the grammatical behavior of metaphorical prepositional phrases cannot be fully explained by their spatial senses alone. Rather, the use of prepositions in discourse is determined based on the metaphorical meanings they represent, and the discourse function associated with the metaphorical senses. Moreover, speakers' mental representations of the metaphorical senses of prepositions might be stored in a network with those of other related expressions that have similar meanings/functions, which also might influence and shape the grammatical tendencies of a given prepositional phrase.

In summary, the behavior of metaphorical prepositional phrases cannot be fully explained by their spatial senses, but can be explained by their semantic and functional characteristics in language use, and by the process of analogical reasoning based on these characteristics.

Chapter 6

Asymmetric Behavior between *Above* and *Below* in Formal Written Text¹⁸

6.1 Introduction

This chapter presents the third case study, which examines the discourse-deictic uses of *above/below* to argue how the characteristics of a specific genre influence the behavior of prepositions. In written text, especially in formal writing, *above* and *below* are frequently used to refer to a unit of discourse as in (69).

- (69) 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 (69a) or (69c) is an anaphoric expression which refers to the question/picture in the preceding discourse. *Below* in (69b) or (69d), on the other hand, is a cataphoric expression indicating the arguments/diagrams in the subsequent part of the discourse. In the studies of English prepositions by Boers (1996), the aforementioned examples are regarded as metaphorical uses of *above* and *below* expressing the meaning 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

¹⁸ This chapter is based on Horiuchi (2016b, 2017a).

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 behaviors have not been examined closely so far.

As explained in earlier chapters, the previous studies of English prepositions tend to examine the cognitive motivation of the semantic extension from their central meanings (i.e., spatial meanings) to their abstract meanings (i.e., non-spatial meanings), based on the structured examples. On the other hand, the usage of prepositions in actual contexts, i.e. how they occurs naturally in written text, has not been closely scrutinized. The usage of *above* and *below* in (69), which is associated with discourse structure, also has not been focused on so far.

Cognitive Grammar takes the ‘bottom-up’ approach to language in the usage-based model, in contrast to ‘top-down’ spirit of generative theory (Langacker 2000: 1). Langacker (1997) emphasizes the importance of the context to form a speaker’s linguistic knowledge, and explains the social and contextual basis of cognitive grammar as: “the abstraction of linguistic structures from usage events, which comprise the full contextual understandings of expressions, including a speaker’s apprehension of the speech interaction and how it relates to the ongoing discourse” (Langacker 1997: 242). Based on this spirit of Cognitive Grammar, a speaker’s (or writer’s) understanding of a hearer’s (or listener’s) cognitive status and the structure of ongoing discourse might be reflected to the usage of linguistic elements, which can be an important basis of our linguistic knowledge.

As Langacker pointed out, for studies based on the theory of Cognitive Grammar, observing the discourse context is theoretically important in terms of examining a speaker’s knowledge of prepositions, which are considered to be stored with the contextual information in the actual usage. However, as mentioned above, most studies of English prepositions tend not to examine the dynamic aspect of language use; that is, they tend not to analyze the

behavior of prepositions in relation to the discourse context, and nor consider the communicative/interactional motivation of the usage of each preposition.

Considering this situation, this research focuses on the usage of *above* and *below* for discourse reference, which must be analysed in consideration of discourse structure, and will demonstrate the following three points. First, this study will show that *above* and *below* used for discourse reference actually possess differing characteristics, while most previous studies have focused on their common characteristics. More specifically, this study attempts to show their differences in terms of their grammatical behavior and collocational pattern. Second, this study attempts to explain that such differences are derived from a typical structure of English 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. In contrast, the information referred to by *below* is usually unknown to the reader when the word *below* occurs in a text. This chapter argues how the different behavior between *above* and *below* is motivated by such typical structure of discourse. Furthermore, based on the analysis, this research attempts to reveal the communicative aspect of a written discourse, while interactional aspects of written discourse tend not to be focused on compared with those of spoken discourse. Third, based on these analyses, this study will demonstrate the role of the target domain in the metaphorical semantic extension of lexical items. While studies of English prepositions in literature tend to focus on the characteristics of source domain, this study argues that not only the nature of the source domain but also that of the target domain play an important role in deciding the behavior of prepositions which express a metaphorical sense.

The organization of the rest of this chapter is as follows. Section 6.2 introduces the previous studies of *above* and *below* for discourse reference. After reviewing several studies

which discuss their common characteristics, I summarize a study indicating their differences and point out the problems that lie therein. Section 6.3 explains the methodologies of the research using the BNC. Then, section 6.4 and 6.5 show the results and discusses the motivation of the differences between *above* and *below* from the viewpoint of typical structure of formal written discourse. Section 6.6 argues the theoretical implications of this study, and finally, section 6.7 presents concluding remarks.

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

6.2.1 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). To examine the meanings of a lexical item in detail, the relation between antonyms has been focused on in numerous studies so far (e.g., Lyons 1968, 1977; Leech 1974; Cruse 1986). Recently, we can observe some studies on antonyms based on the distribution in a corpus (e.g., Charles and Miller 1989; Mettinger 1994; Jones 2002; Gries and Otani 2010). Other recent research papers demonstrate some asymmetric behavior between antonymic words and argue that it might reflect the asymmetry of the perceived world (Tyler and Evans 2003; Otani 2007; Otani 2012; Otani and Horiuchi 2013). These studies demonstrate that it is effective to compare the words in an antonymic pair to elaborate on the analysis of their meanings and also to reveal our cognitive tendencies when perceiving the world.

Above and *below* are generally considered to be an antonymic pair, as mentioned earlier, and they can occur in the same syntactic position to express the opposite meanings as follows.

(70) He berthed {*above* / *below*} me.

(71) My height is {*above* / *below*} average.

These examples show that *above* and *below* can be used in the same position and indicate the opposite location along the common scale; the spatial scale along the vertical axis in (70), and the height (or degree) scale in (71).

This symmetric relationship is also observed in the example (72), in which *above* and *below* are used to indicate the unit in a discourse.

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

Above and *below* here indicate the preceding and subsequent parts of the discourse respectively. Previous studies consider them as an antonymic pair not only because they express opposite meanings but also because they have some common characteristics. For instance, Fillmore 1997 (103-104) pointed out that they are both peculiar to written discourse as opposed to spoken discourse. Lindstromberg (2010: 117) also argued this point and explained that they are used especially in formal written texts. Furthermore, according to Quirk et al. (1985: 1462), both of them can refer to units of varying length, even to illustrations, and the units referred to need not precede or follow immediately. In addition, it is also recognized that *above* and *below* for discourse reference 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 an antonymic pair and previous studies have mainly discussed their common features or symmetric aspects.

Among these studies, the study by Boers (1996) gave one of the most detailed analyses on the discourse-deictic usage of *above* and *below*. 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 their spatial senses and it motivates the symmetric behavior of their discourse-referential senses.

6.2.2 Asymmetric Aspect

As shown in the previous section, *above* and *below* as discourse-referential elements basically share their characteristics and behave symmetrically. On the other hand, Boers (1996) argued that they possess not only common characteristics but also two different characteristics; (i) *above* more frequently occurs as discourse-deictic element than *below*, and (ii) *above* has more grammatical variations than *below* as shown in (73) and (74). *Above* in (73) is used as an adjective modifying the following noun phrase and *above* in (74) is used as a noun following an article; in contrast, *below* cannot occur in these syntactic positions.¹⁹

(73) The *above* statement

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

¹⁹ Quirk et al. (1985: 1462) also pointed out these grammatical differences between *above* and *below* used for discourse reference.

Observing the data of *above* and *below*, Boers (1996: 108) summarized their differences as “in 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 a 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. This explanation might contain an important implication to the Concept Metaphor Theory because it suggests that the behavior of *above* and *below* is motivated not only by the characteristics of their spatial senses, as discussed in many studies of prepositions, but also by a typical structure of written discourse (i.e., the nature of the target domain). However, their differences have still not been discussed in detail even in Boers’s study. For example, it has not been made clear whether they have different discourse functions or not, nor how they reflect the structure of written discourse specifically. To examine their differences in more detailed level, this study carries out quantitative research using the BNC data, and then discusses how these differences are derived from the typical structure of English written text.

6.3 Data and Methods

This section explains the data used in this research and the research procedure.

6.3.1 Procedure of Extracting the Target Data

To compare the behavior of *above* and *below* closely, this study used the British National Corpus (BNC) via Shogakukan Corpus Network. Since the ratio of written data makes up

approximately 90% of the BNC, it is appropriate to examine the usage of *above* and *below* for discourse reference, which is generally used in written discourse.

This research extracted the data of *above/below* used for discourse reference according to the following procedure. First, all the examples of *above* and *below* in the BNC (*above*: 25,176, *below*: 14,103) were extracted without specifying the grammatical category (i.e., parts of speech). Second, from the extracted data, 1,000 examples of each preposition were selected using random sampling. Third, this research observed all data, i.e., 2,000 examples in total, and annotated them manually based on the meanings of *above/below*. To annotate their meanings, this study used the four variables:

- (i) Spatial (e.g., He berthed {*above/below*} me.)
- (ii) More/less (e.g., The temperature is {*above/below*} 30°.)
- (iii) Discourse reference (e.g., See {*above/below*}.)
- (iv) Others (e.g., *Above* all, keep in touch.)

The distinction between ‘spatial’ and ‘discourse reference’ is sometimes ambiguous; for instance, while Quirk et al. (1985) considers the usage of *above/below* in the expressions *the picture above* and *the diagrams below* as discourse reference, *above* and *below* here also can be considered to indicate the physical location on the paper at the same time. However, *above* and *below* as in these examples can be used when the referents (a picture or diagrams) are located on other pages in the same book; therefore, the sense represented by *above/below* is not purely spatial. Based on the examples and categorization in Quirk et al. (1985), when *above* or *below* referred to an element in a written text, this research categorized it into the category of discourse reference.

The result of annotation using the variables from (i) to (iv) above is shown in the following table. This table represents the number and the ratio of the examples grouped into each category.

Table 6-1: Distribution of the Senses of *Above/Below* in the BNC

	(i) Spatial		(ii) More/Less		(iii) Discourse Reference ²⁰		(iv) Others ²¹		Total	
<i>Above</i>	395	39.5%	124	12.4%	306	30.6%	175	17.5%	1,000	100%
<i>Below</i>	426	42.6%	212	21.2%	328	32.8%	34	3.4%	1,000	100%

This study applied further research to the data categorized in the sense of “discourse reference”: 306 examples of *above* and 328 examples of *below*. The next sub-section will explain the further research procedure, which shows the way of coding the data categorized as the usage of discourse reference.

6.3.2 The Features Used for Annotating Data of Discourse Reference

To reveal the differences between *above* and *below* used for discourse reference, this research used the contextual information in which these expressions occur; more

²⁰ As summarized in Table 6-1, both *above* and *below* tend to be used to refer to a unit of discourse in around 30% of all examples. This result seems to be inconsistent with the results presented by Boers (1996) at first glance, which indicated that *above* more frequently occurs as a discourse-deictic usage than *below*. However, if we consider the total frequency in the BNC, *above* much more frequently occurs than *below*: the BNC contains 25,176 examples of *above* and 14,103 examples of *below*. Therefore, as indicated by Boers, the raw frequency of the examples of *above* used for discourse reference itself is much higher than that of *below*.

²¹ *Above* frequently occurs within a fixed expression *above all* in the BNC, which causes the high ratio of *above* classified into the category “(iv) Others” here.

concretely, (i) the grammatical constructions in which they occur, and (ii) the words with which they tend to occur.

Regarding the first point, as explained in Chapter 2, the theory of Cognitive Grammar (Langacker 1987, 2008) considers the form of a linguistic unit to be motivated by its meaning and grammatical constructions are considered to have some kind of conceptual import. This assumption suggests that the tendencies of grammatical constructions in which *above/below* occur might reflect their semantic tendencies, i.e., the construal by the language user. Therefore, this study has investigated the grammatical constructions in which *above/below* appear to show their semantic differences.

In addition, regarding the second point, this study also examined the 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 collocational pattern of a word shows its semantic and functional characteristics, as Firth (1957: 11) stated “you shall know a word by the company it keeps.” Based on this assumption, this study used the collocational information in an attempt to reveal the characteristics of *above* and *below*.

The following table shows the detailed features and their variable used to annotate data in this research.

Table 6-2: Features and Variable to Annotate Data of *Above/Below* for Discourse Reference

(i) Grammatical Construction (Formal Characteristics)	
(A)	Grammatical category of the words which are directly modified by <i>above/below</i> a. Noun (e.g., the <u>picture</u> <i>above</i> / The <u>diagrams</u> <i>below</i> illustrate...) b. Verb (e.g., the question <u>mentioned</u> <i>above</i> / <u>See</u> <i>below</i>) c. Others (e.g., From the <i>above</i> it follows that ...)

(B)	Grammatical status (subject or object) of the nouns which are modified by <i>above/below</i> a. Subject (e.g., <u>The diagram <i>above</i></u> sketches this concept) b. Object (e.g., See <u>page 42 <i>below</i></u> .)
(C)	Position of the adverbial clause or the prepositional phrase which contains <i>above/below</i> ²² a. Sentence-Initial or Clause-Initial (e.g., <u>In the context <i>above</i></u> , Mr. Lorry did not.. / <u>As explained <i>above</i></u> , some students...) b. Others
(ii) Words Modified by <i>Above/Below</i> (Collocates)	
Noun or verb directly modified by <i>above/below</i> (e.g., the <u>picture <i>above</i></u> → <i>picture</i> / <u>See <i>below</i></u> → <i>see</i>)	

As shown in this table, the feature “(i) Grammatical Construction (Formal Characteristics)” includes three more detailed features: “(A) Grammatical category of the words which are directly modified by *above/below*”, “(B) Grammatical status (subject or object) of the nouns which are modified by *above/below*” and “(C) Position of the adverbial clause or the prepositional phrase which contains *above/below*.” This research set the features (B) and (C) to examine the position of *above/below* in a sentence or in a clause because it is generally said that the occurring position of nominal arguments or adverbial elements in a sentence/clause is closely associated with their discourse functions (see 6.4.4 for more details).

²² This research examined the example in which *above* or *below* occurs within an adverbial clause or a prepositional phrase, and annotated data as “Sentence-Initial or Clause-Initial” when the adverbial clause or the prepositional phrase is proposed before the main clause or located in the initial position in a clause. That is, when the adverbial clause or the prepositional phrase appear after the main clause or at the clause final position, and when *above* or *below* is not included within an adverbial clause or a prepositional phrase, all of them are annotated as “Others” in this study.

Besides the formal characteristics, this research used the feature “(ii) Words Modified by *Above/Below* (Collocates)” to reveal the types of words frequently co-occurring with *above/below* for discourse reference. This research annotated the extracted data based on what kind of nouns or verbs *above/below* directly modifies and examined the tendencies.

The next section (6.4) will show the results of the corpus search of the first feature: grammatical/formal characteristics. Then, section 6.5 will exhibit the results of the annotation using the second feature: words modified by *above/below* (collocates).

6.4 Differences in Grammatical Behavior

This section shows the results of the annotation in terms of grammatical behavior, suggesting that grammatical differences are observed between *above* and *below* and that they might reflect the typical information structure of a discourse.

6.4.1 Results 1: Grammatical Category of the Modified Words

This section shows the results of annotating the grammatical category of the words or phrases which are directly modified by *above/below*. The numbers of the examples and the ratio are summarized in the following table.

Table 6-3: Grammatical Category of the Words Modified by *Above/Below*

		<i>Above</i>		<i>Below</i>	
a	Noun (e.g., the <u>picture</u> <i>above</i>)	133	43.5%	109	33.2%
b	Verb (e.g., <u>see</u> <i>below</i>)	161	52.6%	210	64.0%
c	Others	12	3.9%	9	2.7%
Total		306	100%	328	100%

Though the ratio of which *above* modifies a noun phrase (43.5%) is slightly lower than that of a verb phrase (52.6%), their frequencies do not much differ from each other. The sentences in (75a) and (75b) exemplify the usage of *above* modifying a noun; in these cases, *above* occurs within the noun phrases headed by the noun *diagram* or *problem* respectively. In examples (76a) and (76b), on the other hand, the words directly modified by *above* are the verbs *described* and *explained*.²³

(75) a. The diagram *above* sketches this concept.

b. In addition to the *above* problem, I discovered another. Looking beneath the carriage, I noticed that there was a machine needle caught and laying flat across the magnets. ...

(76) a. Many of the needs described *above* require the involvement of a school staff who have an understanding of and commitment to the benefits of linking with the world beyond school.

b. As explained *above*, English recognizes a distinction between one and more than one (singular and plural). This distinction has to be expressed morphologically, by adding a suffix to a noun or by changing its form in some

²³ The examples without reference in this chapter are all extracted from the BNC. Underlines, italics, and boldface of the examples have been added by the author.

other way to indicate whether it refers to one or more than one: student/students, fox/foxes, man/men, child/children.

In contrast, regarding the case of *below*, the ratio of verb modification (64.0%) is much higher than that of noun modification (33.2%). The sentences in (77) exemplify the usage of *below* modifying a noun or a noun phrase. In the examples in (77), *below* modifies the noun *guidelines* or the noun phrase headed by *Chapter*.

- (77) a. If you follow the guidelines **below** your complaint will be dealt with in the most efficient manner possible.
- b. The method of issue is described in detail in Chapter 5 **below**.

As already mentioned in section 6.2.2, Quirk et al. (1985: 1462) and Boers (1996: 108) pointed out that *above* can occur before a noun and modify it like an adjective (e.g., the ***above*** statement), while *below* cannot occur in that position (e.g., *the ***below*** statement). The data extracted in this research also contains 70 instances of *above* which modifies a noun immediately after it as an adjective, while it does not contain any examples of *below* occurring in that position.

On the other hand, in the examples (78a) and (78b), *below* modifies the verbs *see* and *discussed* respectively.

- (78) a. Ninety three patients fulfilled the entry criteria (see **below**) and were admitted to the trial.
- b. This issue will be discussed further **below**.

The chi-square test shows that the result in Table 6-3 is significant at the $p < .05$ level;

therefore, it is possible to consider *above* and *below* as showing different tendencies in terms of the grammatical categories of the words they modify.

Furthermore, although *above* in (76) and *below* in (78) are categorized together (i.e., verbal modifiers) in Table 6-3, we notice that the forms of the verbs and the larger constructions in which they occur are different. *Above* in (76a) modifies the verb of past participle form *described*, and the verb phrase *described above* is embedded in the noun phrase headed by *needs*. In contrast, *below* in (78a) occurs with the imperative form *see*, and in (78b), *below* occurs in the predicate position in the passive sentence (... be discussed further *below*). To examine their differences closely, this research annotated the data being categorized as a verbal modifier at a more detailed level, finding the following distributions.

Table 6-4 : Grammatical Patterns in which *Above/Below* Occur

			<i>Above</i>		<i>Below</i>	
a	Noun (e.g., the <i>above</i> analysis)		133	43.5%	109	33.2%
b	Verb	Noun + Participle (e.g., the reasons stated <i>above</i>)	96	31.4%	45	13.7%
c		<i>As</i> + Participle (e.g., as mentioned <i>above</i> , ...)	30	9.8%	13	4.0%
d		Declarative–Active (e.g., we will show it <i>below</i>)	12	3.9%	7	2.1%
e		Declarative–Passive (e.g., ... is listed <i>below</i> .)	4	1.3%	71	21.6%
f		Imperative (e.g., See <i>below</i> .)	19	6.2%	74	22.6%
g	Others (e.g., <i>Below</i> we explain how ...)		12	3.9%	9	2.2%
Total			306	100%	328	100%

This distribution helps us to differentiate between *above* and *below* more clearly. Even when modifying a verb, *above* frequently occurs in the pattern “b. Noun + Participle” as in (76a) “*many of the needs above*.” 31.4% of the examples of *above* occur in this pattern; that is,

above tends to be included within a noun phrase even though it directly modifies the past participle form of a verb. *Below*, on the other hand, tends to occur in the predicate in imperative or passive sentences (the ratio of “f. Imperative” is 22.6%, and that of “e. Declarative-Passive” is 21.6%).

The result in Table 6-4 shows that *above* and *below* have typical grammatical patterns in which they tend to occur respectively, and the patterns of *above/below* are different; *Above* tends to appear within a noun phrase (“a. Noun” or “b. Noun + Participle”), while *below* tends to occur within a verb phrase, i.e., within the predicate in an imperative or passive sentence.

6.4.2 Results 2: Grammatical Status of the Modified Noun Phrases

The preceding section examined the grammatical categories of the words modified by *above/below*. This section, then, will investigate the grammatical status (subject or object) of the noun phrases which are modified by *above/below*. The characteristics of a subject and an object noun phrase have been discussed from various perspectives in literature, and some of those studies claim that the structure of a discourse has much influence on whether a noun phrase occurs in a subject or an object position. This suggests that examining the syntactic status of the noun phrases including *above/below* might help us to reveal the relation between the behavior of *above/below* and the discourse structure in which they occur.

As shown in Tables 6-3 and 6-4, 133 examples of *above* and 109 examples of *below* occur as a modifier of a noun. The noun phrases including *above/below* do not necessarily occur as a subject or an object of a verb (i.e., nominal arguments); that is, they can also occur within an adjunct as a complement of a preposition (e.g., *in the context above*). This section mainly focuses on usage as a subject or as an object of a verb, and the next

section will examine examples in which *above/below* occurs in an adjunct. Among the noun phrases modified by *above/below* (133 examples of *above* and 109 examples of *below*), 70 instances of *above* and 66 instances of *below* occur in the subject or the object positions. This section examines these 136 noun phrases in total, focusing on their grammatical status, subject or object.

The results of the annotation in terms of the grammatical status are summarized here:

Table 6-5: Grammatical Status of Noun Phrases Including *Above/Below*

		<i>Above</i>		<i>Below</i>	
a	Subject (e.g., <u>The diagram <i>above</i> sketches...</u>)	40	57.1%	16	24.2%
b	Object (e.g., See <u>page 42 <i>below</i>.</u>)	30	42.9%	50	75.8%
Total		70	100%	66	100%

The chi-square test shows that the results in Table 6-5 are significant at the $p < .01$ level, which exhibits the clear differences between *above* and *below*. While *above* tends to occur within a subject noun phrase (57.1%) as in example (75a), *below*, in contrast, tends to appear in an object noun phrase (75.8%) as in sentence (77a).

6.4.3 Results 3: Positions of Adverbial Elements in a Sentence or a Clause

Furthermore, this study also focuses on the positions of adverbial clauses and prepositional phrases occurring as a sentence adjunct (cf. Quirk et al. 1985: 511-514). This study annotated these adverbial elements including *above* or *below* using the features “Sentence-Initial or Clause-Initial” and “Others”, and the results are summarized in the following table.

Table 6-6: Position of the Adverbial Element Including *Above/Below*

		<i>Above</i>		<i>Below</i>	
a	Sentence-Initial or Clause-Initial (e.g., <u>In the context</u> <i>above</i> , Mr. Lorry did ...)	46	15.0%	7	2.1%
b	Others	260	85.0%	321	97.9%
Total		306	100%	328	100%

As shown here, while 15.0% of the adverbial elements containing *above* appear in the sentence-initial or the clause-initial position, only 2.1% of the examples of *below* occur in these positions. That is, the adverbial element including *above* tends to occur in the initial position of a clause or a sentence (e.g., (75b), (76b)) compared to *below*.²⁴ The chi-square test shows that the results in Table 6-6 are significant at the $p < .01$ level.

To sum up, the results in section 6.4 demonstrate that there are various grammatical and formal differences between *above* and *below*. First, as discussed in section 6.4.1, *above* more frequently modifies a noun, and is embedded within a noun phrase than *below*. In contrast, *below* more likely appears within a verb phrase, especially in a predicate of an imperative sentence or a passive sentence. Second, section 6.4.2 shows that *above* tends to be used within a subject noun phrase, while *below* tends to occur within an object noun phrase. Moreover, according to the results in section 6.4.3, the adverbial elements containing

²⁴ The frequency of *above* occurring before the main clause is 15.0%. This rate might seem low even though it is higher than the case of *below*. However, it is generally said that the unmarked position of the adverbial elements is after the main clause. For instance, Thompson (1985: 57-58) examined the occurring positions of 1,009 purpose clauses (*To*-clauses) and demonstrated that their ratio of occurrence before the main clause is around just 19%. As explained earlier, this study examines all the examples of *above/below* used for discourse reference; it means that the data includes the example in which *above/below* occur as an argument and cannot be moved to other positions without changing the meaning of the clause. Therefore, the ratio '15.0%' is not so low compared with the results of Thompson's study. Compared with the results of *below*, the results of *above* clearly show that it frequently occurs before the main clause.

above more frequently occur in a sentence- or a clause-initial position than those containing *below*. Thus, *above* has a tendency to occur close to the beginning of a clause or a sentence, such as in a subject, or in an adverbial element at the sentence-initial or the clause-initial position. *Below*, in contrast, tends to appear close to the ending of a clause/sentence; for instance, in an object of a verb or in a predicate of a clause/sentence. As described so far, *above* and *below* for discourse reference show quite different characteristics in terms of the grammatical behavior.

6.4.4 Discussion: Information Structure and Occurring Positions

As summarized in the last part of the previous section, while *above* and *below* are considered to be an antonymic pair, they have quite different characteristics in the discourse-deictic usage. This section then considers the reason why such differences have been observed.

Even though the upper and lower parts of a written text are considered to be opposite locations, actually, they are not symmetric at all from the perspective of a writer or a reader of the text. 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 identify. Moreover, the contents have already been written, of course, so their details are known to the writer as well. In contrast, the contents referred to by *below* are usually unknown to the reader, and it could even be unbeknown to the writer in some cases because it is possible that the writer is still planning the following details of the text when s/he uses the word *below*. Thus, the upper and the lower parts of a written text have different characteristics to the reader and the writer, which might be reflected to the asymmetric behavior of *above/below*.

In pragmatically unmarked sentences in English, ‘old’ information or a theme tends to occur in the subject position, and ‘new’ information tends to appear within the predicate (cf. Halliday 1967, 1994; Brown and Yule 1983; Lambrecht 2000). More generally, it is claimed that an old information occurs earlier than a new information. Brown and Yule (1983) defined the distinction between new and old (given) information as “new information, which is information that the addressor believes is not known to the addressee, and given information which the addressor believes is known to the addressee (either because it is physically present in the context or because it has already been mentioned in the discourse)” (Brown and Yule 1983: 154).

On the bases of this definition, the contents referred to by *above* are usually old (given) information; therefore, it is pragmatically natural that a phrase or a clause containing *above* occurs close to the initial position in a clause or a sentence. On the other hand, the information referred to by *below* is usually unknown to the reader, and the existence of such related information itself is new information for the reader. This characteristic could motivate the characteristics of *below* frequently occurring in the predicate part of a clause, which is the grammatical position where new information typically appears. The following sentences exemplify the usage of *below* in the predicate of a passive sentence.

- (79) Some common strategies likely to lead to success are listed *below*:
1. Restrict the locations in which you keep food (there is no need for food in bedrooms, food in your pockets, or in your handbag, for example).
 2. Decide on set places or locations to eat (say, the dining room table). This should prevent certain other locations, like the chair in front of the television, becoming a cue to start eating.
 3. Keep a good stock of nutritious foods available: do not ...

(80) The eight characteristics of 'excellence' are summarised *below*:

A bias for action. Managers in excellent companies have a strong preference for doing things rather than analysing situations.

Keeping close to the customer. A key factor in these companies' success is knowing their customers' preferences. ...

In the underlined clause of (79), for instance, the existence of the list of strategies itself is the new information and the focused part of this clause. If the list has already been shown in the preceding discourse, on the other hand, it is hardly likely referred to by the expression like “Some common strategies likely to lead to success are listed *above*” because the existence of the list is not new information to the readers. When the writer would refer to the list in the previous context, it seems more natural to express it as “The list given *above* is ...”, which includes the noun phrase *the list* in a subject position as the theme or the topic of this clause. Thus, these differences between new and old information could be closely related to the grammatical behavior of *above* and *below* for discourse reference.

In addition, as introduced in the prior chapter, studies of the adverbial clauses such as Thompson (1985) and Ford (1993) have also pointed out a close relation between their occurring positions (before or after the main clause) and their discourse functions, as explained in Chapter 5. They showed that adverbial clauses before the main clause tend to be associated with the preceding discourse more closely or directly compared with adverbial clauses occurring after the main clauses. For instance, Thompson (1985) explained the differences between purpose clauses (*to cool*) in (81a) and (81b) in terms of their discourse functions.

(81) a. To cool, place the loaf on a wire rack.

b. Place the loaf on a wire rack to cool.

(Thompson 1985: 55)

According to her, a purpose clause before the main clause as in (81a) tends to refer to the problems which are assumed by the preceding context and connect the discourse to the following main clause (*place the loaf on a wire rack*) that suggests the solution. That is, the initial purpose clause here has a text-organizing function to connect the preceding context to the following discourse. In contrast, the purpose clause after the main clause as in (81b) just expresses the purpose of the action expressed by the main clause, and the function of the purpose clause is limited to the content level, i.e., it does not have text-level or discourse-level function. Ford (1993) examined the position of *if* clauses (before or after the main clauses) and also demonstrated that their positions are closely correlated with their discourse functions.

If we consider the findings in these studies and the characteristics of the information referred to by *above/below*, it is natural that *above* tends to occur at the beginning of a sentence or a clause compared with *below*. *Above* refers to the old information in the preceding contents and has a strong connection with the previous discourse; therefore, the element containing *above* tends to occur in the initial position of a clause or a sentence, by which the readers can make a connection between the preceding context and the current sentence easily. Moreover, it might be easy for the writer as well to construct a sentence starting from the information already provided in the preceding context and then introducing new information after that. For instance, in the following sentences, the information already described in the preceding discourse is referred to again as *the above problem* or *the above criteria*, and the topics regarding another problem or further criteria will be discussed after that.

- (82) a. In addition to the *above* problem, I discovered another. Looking beneath the carriage, I noticed that there was a machine needle caught and laying flat across the magnets. ...

- b. In addition to the *above* criteria of articulation and recognition of breaches, a further necessary condition must be satisfied: ...

In these examples, the prepositional phrases containing *above* seem to function as a reminder to guide the reader's attention to another problem or further necessary condition in the following discourse.

Below, on the other hand, refers to the contents in the following discourse; therefore, it might be easy for the reader to deal with the information when *below* is located at the end of the sentence, i.e., close to the following discourse. Thus, in terms of the cognitive burden for the reader/the writer to understand/organize the discourse, it is natural that *above* tends to appear close to the preceding discourse, while *below* tends to occur close to the following discourse.

6.5 Differences in Collocation

Next, this study focuses on the types of nouns or verbs that regularly co-occur with *above/below* for discourse reference, which are called collocates (Firth 1957). This research examined a noun or a verb based on the results shown in Table 6-3; that is, when *above/below* directly modifies a noun, this research observed the characteristics of the noun, and when it modifies a verb, this research examines the verb.

6.5.1 Results 1: Differences in Co-occurring Nouns

First, this study closely examines the types of the nouns which are directly modified by *above/below* used for discourse reference. First, let me review the following sentences, in which *above/below* modifies a noun, or a noun phrase.

- (83) a. The diagram *above* sketches this concept.
- b. In addition to the *above* problem, I discovered another. Looking beneath the carriage, I noticed that there was a machine needle caught and laying flat across the magnets. ...
- (84) a. If you follow the guidelines *below* your complaint will be dealt with in the most efficient manner possible.
- b. The method of issue is described in detail in Chapter 5 *below*.

In these examples, the nouns (or the noun phrases) modified by *above/below* are different from each other: *diagram*, *problem*, *guidelines*, and *Chapter 5*. However, closely observing these nouns, we notice that they can be roughly classified into the following two types:

(i) Type 1 <Contents Type>

Nouns indicating the types of content or information (e.g., *problem*, *guideline*)

(ii) Type 2 <Format Type>

Nouns indicating the formal aspects of the referents (e.g., *diagram*, *Chapter 5*)

Based on this classification, this study examines the types of the nouns (or the noun phrases) which are modified by *above/below*. The following table summarizes the result.

Table 6-7: Types of Nouns Occurring with *Above/Below*

	<i>Above</i>		<i>Below</i>	
Type 1 (Contents)	<u>81</u>	60.9%	27	24.8%
Type 2 (Format)	44	33.1%	<u>71</u>	65.1%
Intermediate Type ²⁵	8	6.0%	11	10.1%
Total	133	100%	109	100%

The results clearly show that *above* and *below* tend to modify quite different types of nouns. The chi-square test shows that the results in Table 6-7 are significant at the $p < .01$ level. First, look at the results of *above*. As shown in Table 6-7, more than 60% of the examples *above* co-occur with Type 1 nouns (e.g., *problem, question, reason, analysis, method, definition, example, argument, relation, process, assumption, condition, evidence, principle, factor*), which are defined based on their contents. The following sentences exemplify this.

- (85) a. The ***above*** analysis has demonstrated that, in the absence of price adjustments, DD unemployment can be caused by: ...
- b. The relations ***above*** may conveniently be written in matrix form ...

²⁵ The differences between Type 1 and Type 2 nouns are actually not always clear-cut. For instance, *equation, address, and coupon* are not prototypical Type 2 nouns in their intrinsic meanings, but they have some formal peculiarities in written text: an equation and an address (often indicating a URL) are written in some fixed or in conventionalized ways, 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 has classified them into the category “Intermediate Type” here.

In these examples, *above* co-occurs with Type 1 nouns (*analysis, relations*) and helps the readers identify the analysis and the relations which are referred to. *Below*, in contrast, more likely occurs with Type 2 nouns (e.g., *paragraph, page, chapter, (sub)section, figure, table, chart, diagram*). The following sentences exemplify this.

- (86) a. The chart ***below*** shows the number of units of alcohol in different amounts of a range of drinks.
- b. The method of issue is described in detail in Chapter 5 ***below***.

Below in these sentences modifies the noun *chart* or the noun phrase *Chapter 5* respectively. What is interesting here is that the noun phrase *Chapter 5* includes a concrete number 5; in this case, the chapter referred to can be identified even without *below*. That is, although *below* roughly shows the direction of the referent and implies that the chapter is included in the same text (i.e., it is not in other texts), it does not play an important role in identifying the referent uniquely. Just like in this example, *below* often co-occurs with a noun phrase including a concrete number such as *section 4* or *paragraph 8*, whose referents can readily be identified without *below*.

Although the number of examples investigated here is relatively few, the same tendency is shown in additional research using *t*-score, which is a measure of the certainty of a collocation (Hunston 2002: 73). *T*-score is statistically calculated based on a comparison of the actual frequency of a lexical item with the expected frequency of that item, and this score is frequently used in the analyses in the field of corpus linguistics.

To examine the nouns which have a high *t*-score with *above/below*, this research undertook the following procedure. First, this study extracted the nouns

occurring one or two words before (-2 or -1) or immediately after *above* and *below* (+1) using the collocation search function provided in the interface of the Shogakukan BNC.²⁶ The nouns were grouped by lemma. Then, this research sorted the nouns along *t*-scores. Tables 6-8 and 6-9 below show the result, which display the nouns which have top 30 *t*-scores with *above* and *below* respectively. The raw frequency of each co-occurrence is shown in parentheses next to the *t*-score in each line. The numbers from “-2” to “+1” in the column headings express the occurring positions of the collocates; for instance, the nouns appearing directly before *above/below* are in column “-1” and the ones following immediately after *above/below* are in column “+1” in the tables. Type 1 nouns are in bold and shading has been added behind the text. Type 2 nouns are shown in bold and underlined.

Table 6-8 shows the nouns which have high *t*-score with *above*.²⁷ This table shows that *above* is more likely to co-occur with Type 1 nouns (e.g., *example*, *model*, *reason*, *procedure*, *method*, *principle*, *problem*) than Type 2 nouns.

²⁶ Since *above/below* used for discourse reference typically modifies the nouns in the positions from -2 to +1, this research has investigated the nouns in these positions.

²⁷ Due to the polysemous characteristics of *above/below*, the results summarized in the Tables 6-8 and 6-9 include some words which are not related to the discourse domain. For example, the nouns *sky* and *ground* in Table 6-8 are used with *above* in the spatial sense, indicating ‘(physically) higher’. Even so, most of the nouns and verbs ranked in the tables are related to the discourse domain. This fact itself suggests how frequently *above/below* are used for discourse reference in written texts.

Table 6-8: Nouns Co-occurring with *Above* (Horiuchi 2016b: 264)

	-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	paragraph	9.74(96)	foot	15.78(258)		example	11.24(135)
2	section	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	para	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	chapter	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)		equation	5.24(29)
10	level	4.36(33)	hill	7.37(58)		right	5.13(38)
11	page	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)

In contrast, the nouns used with *below* show different tendencies as in Table 6-9.^{28,29} As in Table 6-9, *below* frequently co-occurs with Type 2 nouns, such as *para* (=paragraph), *section*, *chapter*, *page*, *table*, *figure*, or *chart*, rather than Type 1 nouns. The results of the research based on *t*-score also exhibit the different tendencies between *above* and *below* in terms of their co-occurring nouns; that is, *above* tends to be used with Type 1 nouns while *below* more commonly co-occurs with Type 2 nouns.

Table 6-9: Nouns Co-occurring with *Below* (Horiuchi 2016b: 263)

	-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)

²⁸ 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 6.2.2), this study investigated nouns occurring in this position to compare them with the results of *above* and to confirm Boers's claim. As a result, shown in this table, all of the nouns in this position are not related to the discourse-referential sense, which supports the study by Boers.

²⁹ The *t*-score is considered as having significance if it is 2 or more (Hunston 2002: 72); therefore, column "+1" does not include nouns with a *t*-score of lower than 2.

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)			

6.5.2 Results 2: Differences in Co-occurring Verbs

This subsection, then, examines the data in which *above* or *below* modifies a verb (*above*: 161 examples, *below*: 210 examples) (cf. Table 6-3). First, this study counted the raw frequency of each verb modified by *above/below* based on their surface form (not lemma) to observe the constructions in which they frequently occur. The verbs frequently modified by *above* or *below* are shown in (87) and (88). Their occurrence frequency is indicated in square brackets, and here, only the verbs co-occurring with *above* or *below* more than two times are listed.

(87) **Above:** *described* [12], *mentioned* [10], *noted* [5], *outlined* [4], *given/quoted/shown/ see* [3]

(88) **Below:** *see* [43], *discussed* [17], *shown* [11], *listed* [8], *described/considered* [5], *given/summarised* [3]

This result also shows the different tendencies between *above* and *below*. *Above* is more likely to co-occur with the various verbs associated with speaking or explaining something (e.g., *mentioned*, *noted*, *outlined*, *quoted*); in contrast, regarding *below*, the verb *see* shows an extremely high frequency.

Since the number of the extracted data was not adequate to generalize on the tendency of co-occurring verbs, this study had conducted additional research to support this result using *t*-score again. To examine the verbs with high *t*-scores, this research adhered to the following procedure. First, the verbs occurring immediately before *above/below* were extracted by using the function of collocation search provided by the interface of Shogakukan BNC.³⁰ The verbs were extracted in the surface forms (not lemma). Second, this study sorted the verbs along the *t*-score, also using the function provided by the Shogakukan BNC interface. Third, this study compared the higher ranked verbs between *above* and *below* especially focusing on the top 30 verbs.

First, let us look into the results of *above*, which are summarized in Table 6-10. Due to the polysemy of *above*, these results include verbs that express spatial relation such as *rise*, *rose*, and *towering*, which usually co-occur with *above* to express the spatial meanings. Therefore, in this table, the verbs related to the discourse-deictic usage of *above* are underlined.

³⁰ This study examines the verbs immediately before *above/below* (e.g., as explained *above*) because the verbs modified by the discourse deictic usage of *above/below* typically appear in this position.

Table 6-10: Verbs Co-occurring with *Above* (Horiuchi 2016b: 261)

	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)

The results here are similar to (87), which shows that *above* tends to co-occur with the verbs associated with speaking or forms of oral explanation. Table 6-10 contains some general verbs associated with speaking or oral explanations (e.g., *mentioned*, *discussed*, *stated*, *explained*), or various kinds of verbs which specify a particular way in which information is provided (e.g., *described*, *outlined*, *noted*, *quoted*, *cited*, *indicated*, *suggested*, *defined*). These verbs typically occur in the past participle form as follows:

- (89) a. The methods described and examples outlined ***above*** demand a certain amount of expertise on the part of the collaborator.
- b. As explained ***above***, some students may be perfectly well able to discriminate between tones, but have difficulty in labelling them.

In these examples, the verb phrases including *above* express how information has been introduced in the preceding discourse. In (89a), the writer refers back to the information in the previous context using the expression *the methods described and examples outlined above*, and then, an explanation is added in the predicate. In the example (89b), the writer first uses the phrase *as explained above* as kind of reminder, and refers to the information which has already been explained in the preceding context (*some students may be perfectly well able to discriminate between tones*). Then, the writer uses the conjunction *but* to introduce a different aspect of the topic (*[some students] have difficulty in labelling them*). *Above*, as in these examples, is often used in the pattern like [verbs of speaking (past-participle form) - *above*] and serves to remind the reader of the preceding context and makes the following discourse more comprehensible.

The higher ranked verbs in Table 6-10, such as *described*, *mentioned*, or *outlined*, frequently co-occur not only with *above* but also other anaphoric adverbs like *earlier*, *before*, *already*, *previously* in the BNC. The following table shows the adverbs occurring within 5 words before and after the verb *describe* (lemma) and having high *t*-scores with the verb.³¹

³¹ Stubbs (2001: 29) notes that “significant collocates are usually found within a span of 4: 4.” This research is basically conducted along this assumption; however, in the interface of the Shogakukan BNC, the span of the target adverbs can be set as 3: 3 or 5: 5. Therefore, this research set it as 5: 5 and examined the adverbs which tend to occur before or after 5 words of each verb.

Table 6-11: Adverbs Co-occurring with *Describe*

	Preceding Adverbs (-5 – -1)	T-score (freq.)		Following Adverbs (+5 – +1)	T-score (freq.)
1	fully	14.09(202)	<i>Describe</i>	<i>above</i>	23.33(548)
2	<i>previously</i>	14.08(201)		as	14.24(224)
3	also	13.40(226)		<u>below</u>	13.55(187)
4	often	12.64(174)		<i>previously</i>	9.61(95)
5	only	12.23(192)		most	9.44(110)
6	<i>already</i>	11.32(141)		et_al	8.88(80)
7	best	11.04(125)		very	8.74(117)
8	just	10.62(157)		<i>earlier</i>	8.27(72)
9	so	8.44(134)		elsewhere	8.05(67)
10	once	8.38(77)		<u>later</u>	7.25(64)
11	now	8.02(111)		here	7.19(76)
12	more	7.89(106)		only	7.12(90)
13	then	7.53(109)		fully	6.37(44)
14	<u>later</u>	7.39(66)		more	6.33(82)
15	briefly	7.33(55)		briefly	6.30(41)

Here, we can see that *t*-scores of anaphoric expressions (in bold) such as *previously*, *already* and *above* rank highly. Compared with cataphoric expressions (underlined ones), the *t*-score of *earlier* is higher than that of *later*, as well as the anaphoric expression *above*, which co-occurs with the verb *describe* more frequently than *below*.

A similar tendency is also observed in the verbs *mention* and *outline* (lemma), as illustrated in the following tables.

Table 6-12: Adverbs Co-occurring with *Mention*

	Preceding Adverbs (-5 - -1)	<i>T</i> -score (freq.)		Following Adverbs (+5 - +1)	<i>T</i> -score (freq.)
1	<i>already</i>	29.23(860)	<i>Mention</i>	<i>above</i>	30.17(912)
2	just	19.02(382)		<i>earlier</i>	22.77(520)
3	never	18.95(368)		here	13.37(190)
4	also	16.04(278)		<u>before</u>	11.73(140)
5	even	13.52(194)		again	10.73(124)
6	ever	10.09(106)		only	10.46(128)
7	only	9.03(100)		at_all	9.03(84)
8	actually	8.93(84)		briefly	8.80(78)
9	specifically	8.68(76)		once	7.94(66)
10	<i>previously</i>	8.65(76)		<i>previously</i>	7.13(52)
11	too	8.42(82)		<i>already</i>	6.82(52)
12	briefly	7.97(64)		now	6.42(62)
13	hardly	7.39(56)		just	6.41(60)
14	perhaps	7.10(56)		<u>below</u>	6.04(38)
15	briefly	7.33(55)		there	6.04(48)

This table shows that the verb *mention* also tends to co-occur with various anaphoric expressions such as *already*, *previously*, *earlier*, *before*, *previously*, as well as *above*; in contrast, the *t*-scores of cataphoric expressions such as *below* are lower than those of anaphoric expressions.

Regarding the verb *outline*, as in Table 6-13, anaphoric adverbs like *already*, *previously*, *above*, *earlier* recorded high *t*-scores. Although *below* is ranked in the second position, the *t*-score of *above* is much higher than that of *below*; therefore, anaphoric adverbs still tend to co-occur with the verb *outline* compared with cataphoric adverbs.

Table 6-13: Adverbs Co-occurring with *Outline*

	Preceding Adverbs (-5 – -1)	T-score (freq.)		Following Adverbs (+5 – +1)	T-score (freq.)
1	<i>already</i>	9.20(86)	<i>Outline</i>	<i>above</i>	22.88(524)
2	just	8.08(70)		<u>below</u>	11.47(132)
3	briefly	7.61(58)		here	6.28(42)
4	also	7.43(60)		<i>earlier</i>	5.26(28)
5	on	5.82(36)		briefly	4.68(22)
6	then	5.31(34)		yesterday	3.35(12)
7	clearly	4.63(22)		only	3.14(14)
8	yesterday	3.35(12)		very	3.14(14)
9	<i>previously</i>	3.12(10)		<u>later</u>	2.97(10)
10	here	3.08(12)		then	2.93(14)
11	now	2.70(12)		just	2.77(12)
12	therefore	2.67(8)		namely	2.43(6)
13	darkly	2.45(6)		more	2.38(10)
14	however	2.44(8)		clearly	2.33(6)
15	originally	2.41(6)		rather	2.28(6)

Now let's turn to the list of verbs which have a top 30 *t*-score with *below*. Table 6-14 illustrates the results. The underlined verbs are related to discourse-deictic usage of *below*, just as in Table 6-10.

Table 6-14: Verbs Co-occurring with *Below* (Horiuchi 2016b: 260)

	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	reproduced	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)

One of the most distinct characteristics here is that the verb *see* shows an extremely high *t*-score and co-occurrence frequency (*t*-score: 31.32, frequency: 1,010), just as observed in (90). When occurring with *below*, the verb *see* usually appears in the imperative form.

- (90) a. Ninety three patients fulfilled the entry criteria (see *below*) and were admitted to the trial.
- b. Under its constitution West Germany (like Japan -- see *below*) could take no part in external military activities, and by Aug. 20 Chancellor Kohl had apparently accepted that this was a definitive barrier, ...

As in these cases, the collocation *see below* often occurs within parentheses and is inserted into a sentence. Actually, this phrase does little to help the reader to interpret 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 same text. 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, just like implicitly saying that ‘I will discuss this later, so please wait’.

As shown in Tables 6-11, 6-12 and 6-13, the verbs *describe*, *mention* and *outline* tend to co-occur with anaphoric adverbs. In contrast, regarding the verb *see*, only the adverbs *already* and *above* are ranked as anaphoric expressions in top 30 adverbs, and the *t*-score of *below* is still extremely high.

Table 6-15: Adverbs Co-occurring with *See*³²

	Preceding Adverbs (-5 - -1)	<i>T</i> -score (freq.)		Following Adverbs (+5 - +1)	<i>T</i> -score (freq.)
1	never	73.59(5590)	<i>See</i>	again	39.01(1695)
2	ever	52.50(2838)		<u>below</u>	38.41(1504)
3	then	44.17(2434)		also	35.30(1631)
4	now	43.87(2348)		before	30.92(1001)
5	just	43.04(2236)		there	29.47(1094)
6	also	42.52(2200)		so	28.29(1340)
7	only	34.52(1546)		above	26.73(745)
8	still	33.71(1350)		here	25.04(835)
9	well	33.01(1420)		now	24.86(1014)
10	so	31.76(1558)		as	22.97(698)
11	already	30.50(1038)		later	22.72(612)
12	up	30.14(1384)		only	21.96(816)
13	often	30.05(1022)		clearly	21.85(526)
14	actually	28.34(886)		more	21.48(824)
15	really	26.32(840)		then	20.50(854)

³² Although the adverb *later* is ranked in the 11th position as the collocate with the verb *see*, it is usually used in the collocation like *see you later*; that is, the combination of *later* and *see* tends not to express the location in discourse. The verb *see* is highly polysemous, which might be one of the reasons that only a few anaphoric expressions are ranked here. Even so, it is true that the *t*-score of *see* and *below* is extremely high and these two words consist of kind of a fixed pattern.

The results here demonstrate how tightly the verb *see* and its modifying adverb *below* is connected to each other, and they might be stored as a unit (a kind of fixed pattern) in the speaker's linguistic knowledge.

Now, let us look into other verbs which tends to co-occur with *below*. According to Table 6-10, *below* often co-occurs with the past-participle form of verbs which are related to speaking (e.g., *discussed*, *explained*) just like *above*, 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 further information immediately after *below*.

Let us start by considering the first case, in which *below* is used as a part of an advance notice. When *below* appears with verbs such as *discussed* or *considered* as in the following examples, it is frequently used to clarify that detailed information will be provided later in the discourse (but not 'immediately' after *below*).

- (91) 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.
- b. Items (2) - (6) are considered **below** in this chapter with the remainder of this book being devoted to takeover offers ...

Below in these examples functions as an advance notice, which is similar to the cases using the phrase *see below*. Moreover, as in the following sentences, it often co-occurs with the adverbial elements such as *in more detail* and *further*, which suggests that *below* is used to clarify that more detailed information will be provided later in the discourse.

- (92) a. Some of the key plants are described in more detail *below*.
- b. He proposed a model which attempted to weight various commodities used by settlers to a greater or lesser degree, including land use, which will be considered further *below*.

The sentences in (93), 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 *shown*, *listed*, or *summarised*.

- (93) a. 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 gravy.
- b. Some common strategies likely to lead to success are listed *below*:
1. Restrict the locations in which you keep food (there is no need for food in bedrooms, food in your pockets, or in your handbag, for example).
 2. Decide on set places or locations to eat (say, the dining room table). This should prevent certain other locations, like the chair in front of the television, becoming a cue to start eating.
 3. Keep a good stock of nutritious foods available: do not ...
- c. The eight characteristics of ‘excellence’ are summarised *below*:
- # A bias for action. Managers in excellent companies have a strong preference for doing things rather than analysing situations.
 - # Keeping close to the customer. A key factor in these companies' success is knowing their customers' preferences. ...

In the examples in (93), some errors, commons strategies, and the characteristics of ‘excellence’ are listed just after *below*. *Below* of this type is often followed by a colon, forming a kind of fixed pattern like [verb (passive form) - *below* - colon - sequence of itemized information], which implies how frequently *below* occurs in this usage. In contrast, the referents of *above* observed in this research usually occur in a location separated from *above*; that is, it is one of the characteristics of *below* to introduce the referent immediately after it.³³

In addition, based on the *t*-scores, we can see that the verbs *shown*, *listed*, and *summarised* tend to co-occur with *below* compared with *above*. It seems to be associated with the tendency that *below* likely co-occurs with Type 2 nouns (format type nouns). That is, these verbs can be used to introduce the items of Type 2 (e.g., list, table, chart, figure), while the typical speaking verbs such as *mentioned* or *stated* tend not refer to them. This suggests that the tendency observed in the co-occurring verbs here is closely correlated to the tendency of co-occurring nouns, and both of them show the different characteristics between *above* and *below*.

6.5.3 Discussion: Cognitive Differences between Anaphora and Cataphora

This subsection, then, argues why *above* and *below* tend to co-occur with different types of words based on a typical structure of English written discourse. Although the meanings of *above* and *below* are commonly viewed as being extended from the spatial to the discourse

³³ If the writer wants to refer to information immediately before, he or she might use directives or pronouns like *this* or *it* instead of *above*, or just express it with the definite article *the*. Therefore, the writer might not have to use the expression *above* in such a case.

domain, the locations they refer to actually possess different characteristics in discourse, as already mentioned in 6.4.4.

Because of the typical structure of an English written text, the information referred to by *above* is already known to the reader and they usually remembered it. Therefore, even though the reader would not search for the information by physically looking back to the preceding context, they might be able to understand the referent of *above* based on the contents they have already read, i.e., they can locate it in their memory. Consequently, even if *above* co-occurs with an abstract noun which indicates the information content (i.e., a Type 1 noun like *problem, question, reason, analysis*), the reader can readily identify what is being referred to. Furthermore, the reader, and of course the writer as well, knows how the referents have been introduced in the preceding text (e.g., just outlined, quoted, or discussed in detail); this might be one of the reasons why *above* frequently appears with a variety of verbs of speaking or specifying the way in which information is provided, such as *mentioned* or *outlined*.

The content referred to by *below*, in contrast, is unknown to the reader when the word *below* occurs in the discourse. Consequently, the reader cannot find the information referred to by *below* from memory; 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 (86a)), a specific number indicating a unit of discourse (e.g., chapter number or page number as in *Chapter 5*), or the occurrence of the referent immediately after *below* (e.g., (93)). This is one reason why *below* tends to be used with Type 2 nouns, which indicate the formal characteristics of the referent, and with verbs like *shown, listed* or *summarised*, which can naturally co-occur with Type 2 nouns.

Moreover, when using expressions like *listed below* or *summarized below*, the writer usually introduces the itemized information immediately after it. In contrast, the

information referred to by *above* tends to be separated from *above*, i.e., tends not to occur in a sentence just before *above*. This asymmetric behavior might be related to the differences between *this* and *that*, which are also used to refer to the unit of a discourse. In a discourse, *this* can be used to refer to an element both in the preceding and following discourse (as an anaphora and cataphora), while *that* can refer to an element in the preceding context only (as a anaphora) (Quirk et al. 1985: 1461). As well as the case of *above* and *below*, the asymmetry between *this* and *that* might reflect the differences in the cognitive burden of finding the target information from the preceding or following context. That is, identifying the referent from the following discourse is more difficult for the reader and the writer usually organizes a discourse in consideration of such a burden, which might motivate the different behavior between *above/below* and between *this/that*.

Finally, let us consider the usage of *below* as a form of advance notice or a deferment device when occurring with the verbs *see* or *discussed*. Whereas the reader does not usually know what is going to be written in the subsequent part of discourse beyond their own assumptions, the writer normally does. Therefore, the writer attempts to signpost the reader's attention and make the subsequent discourse easier to understand by using phrases like *see below* or... *is discussed below*. These phrases serve to inform the reader that related contents will appear later in the same text. This also 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 may be reflected in the various differences between *above* and *below*.

The following table summarizes the differences in the characteristics between the preceding and the following discourse, and their correspondence to the differences between the behaviors of *above* and *below*.

Table 6-16: Asymmetry in Discourse and its Correspondence with the Behavior of *Above/Below*

Preceding Discourse	Following Discourse
Known	Unknown
Easy to search/identify	Difficult to search/identify
Already written	Not written yet



	<i>Above</i>	<i>Below</i>
Grammatical Status	Within a subject	Within a predicate or an object
Position in a Clause/Sentence	Close to initial	Close to final
Types of Co-occurring Noun	Nouns indicating the contents	Nouns indicating the format
Co-occurring Verb	Various verbs of speaking or explanation	The verb <i>see</i> shows extremely high co-occurrence frequency
Referent	Separated from <i>above</i>	Frequently located immediately after <i>below</i>

As summarized here, preceding and following discourse of a formal written text have distinguishing characteristics both to the readers and the writers of the text, which are reflected in and motivated the asymmetric behavior of *above* and *below*. Through analysis, 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.

6.6 Theoretical Implications

Based on the observations and the analysis presented in the previous sections, this section will argue the theoretical implication of this research in the field of the studies of English prepositions, especially in relation to the metaphorical semantic extension.

6.6.1 Influence of ‘Original’ Meaning

In many studies of cognitive linguistics, the metaphorical meanings of the prepositions are considered to be derived from their spatial meanings. Based on this assumption, meanings of prepositions have closely analyzed the corresponding aspects between the spatial and metaphorical (non-spatial or abstract) usage of prepositions. Previous studies of *above* and *below* for discourse reference also tend to explain their common characteristics (i.e., symmetric aspect) based on their spatial meanings, which can be considered as their ‘original’ or ‘basic’ meanings, as explained in section 6.2.1.

Although this chapter has mainly examined the asymmetric behavior of *above/below* based on the structure of written discourse, it is also true that their discourse deictic usage also reflects their ‘original’ meanings to some extent. This was more clearly shown by the results of the additional research conducted here, which compares the characteristics of discourse-deictic usage of *above/below* to those of *earlier/later*. As described in Tables 6-10 and 6-14, the verb *discuss* frequently co-occurs both with *above* and *below*. This verb is often used with the adverbs *earlier* and *later* as well. However, observing the grammatical behavior of the collocations [*discuss* (lemma) + *earlier/above/later/below*] respectively in the BNC, we notice that they tend to occur in different

grammatical status.³⁴ The following table shows the results of the grammatical distributions of [*discuss* (lemma) + *earlier/above/later/below*].

Table 6-17: Grammatical Status of *Discuss* (lemma) + *Earlier/Above/Later/Below*

	<i>Discuss + Earlier</i>	<i>Discuss + Above</i>	<i>Discuss + Later</i>	<i>Discuss + Below</i>
(a) NP modifier	<u>58</u> (38%)	<u>163</u> (65%)	13 (9%)	32 (16%)
(b) Within relative clause	22 (14%)	6 (2%)	8 (6%)	15 (8%)
(c) Within <i>As</i> clause/insertion	44 (28%)	63 (25%)	23 (16%)	47 (24%)
(d) Predicate	31 (20%)	20 (8%)	<u>97</u> (69%)	<u>100</u> (52%)
Total	155 (100%)	252 (100%)	141 (100%)	194 (100%)

This table shows that the anaphoric expressions *earlier* and *above* tend to occur in a NP modifier as in (94); *discussed earlier* in (94a) modifies the preceding noun phrase headed by *theorists* and *discussed above* in (94b) modifies the noun phrase headed by *defences*.

- (94) a. All the theorists ***discussed earlier*** in this chapter offer answers to this question
 ... **[NP modifier]**
- b. Three of the qualified defences ***discussed above*** have an element of
 justification ... **[NP modifier]**

³⁴ Here, I extracted all of the examples in which *earlier*, *above*, *later*, or *below* occurs immediately after the verb *discuss* (lemma form) from the BNC and annotated the grammatical behaviors of the combination of *discuss* and *above*, *below*, *earlier* or *later*, applying these features:

- (a) NP modifier (e.g., the problem *discussed above*)
 (b) Within relative clause (e.g., the problem which are *discussed earlier*)
 (c) Within *As* clause or insertion (e.g., As *discussed earlier*, ... / ..., *discussed later*, ...)
 (d) Predicate (e.g., We will *discuss this below*.)

On the other hand, the cataphoric expressions *later* and *below* likely occur in a predicate of a clause as in (95).

- (95) a. This particular situation will be *discussed later* in Section 20.2. **[Predicate]**
b. These issues will be *discussed below*. **[Predicate]**

The differences between anaphoric expressions and cataphoric expressions themselves are inconsistent with the tendencies which have been described so far (see Table 6-4). However, focusing on the differences among anaphoric words (*earlier* and *above*) and cataphoric words (*later* and *below*), we can see that the behavior of *earlier* and *above*, or *later* and *below*, is slightly different. Compared with the example of *discussed above* (as in (94b)), *discussed earlier* more frequently occurs within a relative clause in which the writer (*I* or *we*) occurs in the subject position as in (96).

- (96) The Hawthorne experiments that *we discussed earlier* indicated that peer group pressure was more important in determining an acceptable level of output irrespective of the demands of management.

This contrast might imply that *discussed earlier* is more writer (or action) oriented than *discussed above*, because the writers are expressed explicitly as a subject and the action *discuss* appears as a main verb in the clause. On the other hand, *discussed above*, which tends to occur as a modifier of a NP expressing the referent, seems more referent (or object) oriented.

The grammatical tendencies of [*discuss* (lemma) + *later*] and [*discuss* (lemma) + *below*] are also slightly different from each other. Regarding the combination *discuss* (lemma) and *later*, around 70 % of the examples occur as a predicate of a sentence as in

Table 6-17; on the other hand, regarding the combination *discuss* (lemma) and *below*, the ratio in which occurs in a predicate position is around 50%. Compared with [*discuss* (lemma) + *later*], [*discuss* (lemma) + *below*] more frequently appears as a modifier of a noun phrase, whose tendency is similar to that of [*discuss* (lemma) + *above*]. These results imply that *above* and *below* used for discourse reference retain some characteristics of space-oriented words; that is, they are basically used to specify the location of the referents in a text rather than focus on the actions of the writer or the speaker as in the expression *we discussed earlier*. Therefore, it can be said that the differences between *above* and *earlier*, or between *below* and *later*, might reflect their usage in the source domains, i.e., differences between space-oriented words and time-oriented words. This result supports the assumption that the discourse-deictic use of *above* and *below* is derived from, and thereby reflects the nature of their spatial meanings to some extent, as discussed in previous studies.

6.6.2 Differences between Spatial and Metaphorical Meanings of the Prepositions

On the other hand, as shown in this chapter so far, *above* and *below* used for discourse reference actually show asymmetric behavior, which cannot be fully explained by their spatial senses because it does not have any correspondence to their spatial usage. Rather, such asymmetric behavior might reflect the nature of written discourse. How can we consider or treat this fact in relation to the Conceptual Metaphor Theory (cf. Lakoff and Johnson 1980; Lakoff 1987)? Studies of metaphors using a corpus by Deignan (2005) might provide some insight into this question.

Based on close examination of various metaphorical expressions using a corpus, Deignan indicated that the target domain plays a much more important role in deciding the

metaphorical usage of a word than is suggested by the Conceptual Metaphor Theory. Deignan demonstrated this point taking the words referring to an animal like *fox* or *dog* as an example. According her research, while the word like *fox* or *dog* usually occurs as a noun when indicating the literal meaning (i.e., an animal), it tends to be used in a verb form or adjective form when it expresses the metaphorical meanings such as human behavior or human characteristics. In the case of the word *fox*, for instance, the verb form *fox* (or *foxes/foxing/foxed*) is used to express ‘trick or outwit somebody’, and the adjective form *foxy* is used to express ‘attractive’ or ‘sly’ depending on the context. Deignan argued that human behavior and human characteristics are usually expressed by a verb or an adjective respectively, which motivate the shift of the part of speech of *fox* through the metaphorical semantic extension. Based on this kind of example, Deignan claims that the characteristics of the target domain play an important role in deciding the metaphorical usage of a word, as well as those of the source domain.

Being similar to the examples suggested by Deignan, the behavior of *above* and *below* examined in this chapter also shows various asymmetric characteristics, which does not correspond to and cannot be explained by their spatial meanings directly. To demonstrate such non-corresponding aspects quantitatively, this study conducted additional research on the spatial usage of *above* and *below*, which were extracted as the first step of this research (*above*: 395 examples, *below*: 426 examples) (cf. Table 6-1). More concretely, in my additional research, I have examined the part of speech of the word modified by the spatial use of *above/below*. As a result, regarding the spatial usage of *above*, 58.0% of the examples (229 examples) modify a noun while 29.9% of the examples (118 examples) modify a verb. On the other hand, regarding the spatial usage of *below*, 53.3% of the examples (227 examples) modify a noun and 30.0% of the examples (128 examples) modify a verb. Comparing the results of these two prepositions, it can be

said that their grammatical distributions are not so different to each other. Moreover, as in Table 6-10 and 6-14, the spatial usage of *above* tends to co-occur with verbs like *rise*, *raise*, or *tower*, which express movement to a higher position, while the spatial usage of *below* frequently co-occurs with the verbs such as *fall* or *drop*, which indicates movement to a lower position, directly opposite to the case of *above*. These facts imply that *above* and *below* tend to behave in a symmetric way when expressing spatial meanings.

The symmetric tendencies in their spatial usage support to notion that the asymmetric behavior in their discourse-deictic usage is motivated by the structure of discourse rather than being derived from their spatial meanings directly; that is, the nature of the target domain (discourse domain in this case) is considered to shape the asymmetric behavior between them. The physical locations in the text referred to by *above* and *below* are symmetric if we take an objective view. However, for the reader and writer, the locations indicated by *above* and *below* have various different meanings and functions; for instance, known/unknown, already written/not written yet. The differences between the preceding and following discourse, and the strategy of the writer to organize the text considering the knowledge or the cognitive status of the reader, is considered to be reflected in the discourse deictic usage of *above/below*. This study highlights the importance of examining the nature of the target domain of metaphorical semantic extensions as well as that of the source domain.

Moreover, among the extracted data, around 60% of the spatial usage of *above/below* consists of prepositions, i.e., the form taking a complement noun. In contrast, all of their discourse-deictic usage occurs as an adverb, i.e., without taking a complement. Although this fact itself has already been brought to light by Boers (1996) (cf. section 6.2.2), it is an interesting behavior from the viewpoint of the part-of-speech shift through metaphoric semantic extension. When *above* and *below* express spatial meanings, they

can be used both as a preposition or an adverb; on the other hand, when they are used in a discourse domain, they can only be used as an adverb. That is, their parts of speech are shifted as in the Deignan's example *fox* or *dog*. This shift might occur because the location of the expression *above/below* itself can be an implicit landmark, which also shows the importance of the nature of the target domain to shape the grammatical behavior of a word being used metaphorically.

Furthermore, this study demonstrated that usage contexts and communication environment in which the expressions occur play a key role in determining conventionalized way of using them. It can be considered that the characteristics of target domains (in this case, the characteristics of the genre of formal written discourse) are shaped based on the communication styles and purposes between the readers and writers. In a formal written text, the writers attempt to organize their arguments logically to explain complex notions, compared with conversations. In light of this situation, the writers are more likely to use discourse-deictic expressions such as *above* and *below* to organize a discourse logically, and to make the discourse easy to understand for the readers.

Now, let me summarize the discussion in this section. The common characteristics of *above* and *below* for discourse reference, and their unique characteristics compared with *earlier* and *later*, might be explained by the nature of their spatial meanings. However, if observed more closely, the usage of *above* and *below* for discourse reference shows various asymmetric behavior, which cannot be fully described by or corresponding to their original meanings. These differences might be motivated by the differences between the preceding and following discourse for the writer and the reader, i.e., motivated by the characteristics of the target domain of the metaphorical semantic extension. Moreover, the nature of the target domain, or specific genre itself,

might be shaped depending on the communicative purposes between the writers and the readers of the texts. This implies the importance of communicative and contextual factors in shaping the frequently observed patterns of prepositions.

6.7 Conclusion

This chapter examines the behavior of *above* and *below* indicating a unit of discourse using the BNC, demonstrating that they tend to appear in different grammatical statuses and co-occur with different types of words. *Above* tends to occur within a subject noun phrase or adverbial elements in the clause or sentence initial position, while *below* tends to appear within a predicate of a clause. Moreover, *above* tends to co-occur with a noun expressing the contents of a unit of discourse (e.g., *analysis*, *problem*) or verbs of speaking (e.g., *mention*); in contrast, *below* tends to co-occur with a noun phrase indicating the formal aspect of the information referred to (e.g., *section*, *chart*), or the verb *see*.

Furthermore, this chapter argues the motivation of such asymmetric behavior observed between *above* and *below* based on the typical structure of a formal written discourse. As a result, this study pointed out that their asymmetric behavior reflects the differences between the preceding and subsequent part of a written text for the reader and the writer. It suggests that not only the characteristics of source domain (i.e., spatial domain) but also those of the target domain (i.e., discourse domain in this case) play an important role in deciding the behavior of prepositions used in a metaphorical sense. Moreover, in this study, the characteristics of the target domain themselves are closely related to the communicative styles and communicative purposes of a formal written text.

It implies that our aims of communications shape a typical structure of formal written texts and motivate the behavior of *above/below* for discourse reference.

To organize a written discourse, the writer tends to refer to a unit of the discourse in consideration of the readers' cognitive status, thereby inducing the asymmetric behavior of *above* and *below*. The interactional characteristics of a written discourse have not been focused on so far in previous studies. In contrast, this research has shed light on such communicative aspects between the writer and the reader, demonstrating that it can be one of the major factors in deciding the behavior of prepositions as in the case of *above/below*.

Chapter 7

Children's Use of Prepositions from the Perspective of Resonance³⁵

7.1 Introduction

This chapter will examine natural conversations between children and their parents, the most dynamic of the communicative environments explored in this thesis. To be more specific, this chapter will focus on children's use of prepositions through their interactions with their parents, demonstrating how children come to produce prepositions in their daily conversations. In addition, this chapter will also show how the ways in which children use prepositions change as they grow older.

Before I explore the process by which children acquire prepositions, let me introduce an example of a conversation in which a mother teaches her child the meaning of a noun. In the conversation, the mother shows a cookie to her child and says "What's this?", but the child does not reply. Then, the mother says "Cookie" by herself, which might help the child learn the noun *cookie*. As shown in this example, the meanings of concrete nouns such as *cookie* can be taught explicitly by showing or pointing to the referents, which usually visible in the location where the conversation is taking place. This kind of interaction is frequently observed in conversations between parents and children, and it may help children gradually learn the meanings of nouns.

In contrast, it seems more difficult to teach functional words (i.e., grammatical

³⁵ This chapter is based on Horiuchi (2017b, to appear).

elements) such as prepositions in an explicit way; for instance, the referent or the meaning of the prepositions *of* and *for* cannot be shown or indicated straightforwardly.³⁶ If this is the case, then how do children learn the meanings of prepositions and acquire how to use them? And how does the communicative environment (e.g., utterance sequences and interactional purposes) influence children's process of acquiring prepositions? To answer these questions, this chapter analyzes children's use of prepositions by observing everyday talk between children and their parents in detail.

As mentioned earlier, the meanings of English prepositions have been a focus of study in the field of cognitive linguistics from its inception; however, scholars have tended to examine the characteristics of prepositions within a single sentence which has usually been created by the authors. That is, most studies of English prepositions from cognitive perspectives have paid little attention to the prepositions' functions in discourse, especially in spoken discourse such as natural conversation. According to the usage-based account of grammar (Langacker 1987, 2000, 2008), our linguistic knowledge associated with prepositions (and larger constructions including prepositions) is considered to be formed from actual instances of use and stored with information about the contexts in which they occur. Tomasello (2003), who examined language acquisition from the usage-based perspective, also demonstrated that children's utterances are motivated by their communicative purposes in daily interactions and children's language ability develops depending on their socio-cognitive abilities such as joint attention and understanding of others' intentions. These studies suggest the importance of examining the actual usage of prepositions, which is embedded in the context of their linguistic and social communication

³⁶ Tomasello (2003) has also pointed out that "even the most pedagogically conscious Western middle-class parents seldom play the pointing-and-naming game with words other than object labels; parents do not say to their children "Look! Giving" or "Look! Of." This means that the child must learn many, perhaps most, words from more complex interactive situations in which determining the adult's intended referent from some novel word is much less straightforward." (Tomasello 2003: 43)

environments.

To show how speakers' knowledge regarding prepositions is gradually formed from spoken discourse, this study will examine the usage of prepositions of three children applying the framework (or theory) of 'dialogic syntax' proposed by Du Bois (2001, 2014). This framework emphasizes the importance of communicative and dialogic aspects in our language use in forming syntactic patterns. According to Du Bois (2014: 359), "[t]he patterns that define language emerge from the interaction of particulars, as one utterance follows another, reproducing its pattern in part." Based on this framework, this study will examine the role of prior/following utterances for children's production of prepositions.

The organization of this chapter is as follows. Section 7.2 will identify problems in previous studies on English prepositions, and section 7.3 will introduce the framework of dialogic syntax developed by Du Bois (2001, 2014). Section 7.4 will explain the data and method of this study and the results will be given in section 7.5. Section 7.6 will discuss the theoretical implications of this research, and the last section, section 7.7, will provide concluding remarks.

7.2 Criteria of Determining the 'Central' Meaning of a Preposition

This section will provide an overview of previous studies on the meanings of English prepositions and their acquisition process. In past studies of English prepositions, as summarized in Chapter 3, one of the senses of each preposition tends to be set as the 'central' (i.e., basic, primary, or prototypical) sense to explain the semantic extension process from the central to the extended meanings. However, the meaning determined as 'central' can differ depending on the researchers; moreover, it has been pointed out that the most salient sense for adult speakers (i.e., the 'central sense' determined by researchers) might not coincide with

the first instances of use learned by a child.

In light of these circumstances, the first part of this section (section 7.2.1) will summarize previous studies of English prepositions, especially focusing on how these studies have defined the ‘central’ meaning of each preposition. After that, section 7.2.2 will describe studies by Hallan (2001) and Rice (2003), which questioned the notion of ‘central’ senses of prepositions from the viewpoint of children’s language use. Then, section 7.2.2 will also point out some deficiencies of the studies by Hallan and Rice, and will suggest a alternative approach.

7.2.1 What is the ‘Central’ Meaning of a Preposition?

In the field of cognitive linguistics, various researchers have examined the polysemy of the English preposition *over*, which is one of the most polysemous prepositions (e.g., Brugman 1981; Lakoff 1987; Taylor 1988; Dewell 1994; Tyler and Evans 2001, 2003; Deane 2005). Their analyses were mainly based on the notion of the prototype, and hence mainly focused on how the meanings of *over* had been extended from its ‘central’ sense through cognitive processes such as metaphor or metonymy. However, the sense considered to be ‘central’ actually differs depending on the analysis.

As described in Chapter 3, Brugman (1981) and Lakoff (1987) defined the central meaning of *over* as ‘ABOVE + ACROSS’ based on the example such as (97).

(97) The plane flew **over** the field. (Brugman 1981: 10)

In contrast, Dewell (1994) argued that the central schema of *over* is an arc-like up-down trajectory and attempted to explain the semantic extension process of the preposition mainly

based on the image-schema transformation. Tyler and Evans (2001, 2003) examined the senses of *over* through comparisons with its synonym *above* and its antonym *under*, identifying the primary feature of the central sense of *over* (they called it ‘protoscene’) as “the trajector is above but within a region of potential contact with the landmark.”

The central senses of *over*, as briefly summarized here, have been characterized differently depending on the researchers. Regarding the notion of a ‘central’ sense, Taylor (2012) has argued:

“The notion of a basic or central sense can be interpreted in different and sometimes incompatible ways (Fillmore 1982). It could be the historically oldest sense from which the others have developed in the course of time; it could be the meaning which children acquiring their mother tongue learn first and which then gets extended to other situations, by one or more of the processes mentioned above; or it could be the meaning which in some sense is most salient to speakers of a language. These criteria do not always deliver the same result. The original sense, from a historical point of [view], might no longer be extant, or the most salient sense for adult speakers might not coincide with the first uses learnt by a child.” (Taylor 2012: 228–229)

In previous studies of prepositions, the central sense tends to be defined based on the intuitions of researchers (i.e., “the most salient sense for adult speakers” in Taylor’s terms) or based on comparisons with related words such as synonyms and antonyms. However, intuitions and ways of determining the central meaning can differ depending on the researchers, which may lead to the differing results of their analyses. Moreover, previous studies of the preposition *over* have examined its meaning based on sentences created by the authors, and have defined the meaning of *over* by itself, without observing its contexts in actual use. To sum up, as Taylor pointed out, the sense which adults feel is ‘central’ might be inconsistent with that of a child, and analyses based on created sentences can also differ from

the analyses based on the actual usage of adults. The following section will introduce the studies of children's use of prepositions by Hallan (2001) and Rice (2003), which were based on natural language data extracted from a corpus.

7.2.2 The First Uses Learned by a Child

In terms of language acquisition, Hallan (2001) observed conversational data between children and adults in the Wells Corpus, which can be accessed through CHILDES (MacWhinney 2000). As a result, she identified some interesting findings related to the uses of prepositions. First, she demonstrated that children begin to use *over* in some fixed expressions such as the verbal complexes (e.g., *fall over*, *knock over*) and the deictic expressions (e.g., *over there*). That is, the earliest uses of *over* learned by children neither express the 'ABOVE + ACROSS' sense, nor are they even prepositions (i.e., the usage followed by nominal complements). In addition, she also observed adults' use of *over* in the British National Corpus (BNC), pointing out that not only children but also adults frequently use *over* in phrasal verbs or in fixed expressions, such as *all over*, in actual use. She found that these tendencies are observed especially in spoken language. Based on the results, she claimed that "fixed patterns may play an important role in all the uses of this word form in adult language" (Hallan 2001: 102).

In addition, Rice (2003) also examined children's uses of prepositions (9 prepositions in total) and pointed out that "each child seems to have his or her own starting point within a lexical category—one which may not be conceptually basic—with additional senses appearing in a piecemeal fashion, usually as part of a favorite fixed expression, rather than through stepwise semantic extension driven by processes such as metaphor and schematization" (Rice 2003: 243–244). This explanation also shows that prepositions tend to

be learned based on a fixed expression, which is usually consisting of more than one word.

These studies have some significant insights into the study of English prepositions, especially with regard to the following two points. First, they empirically show the gaps between actual use and intuition-based analyses. That is, the ‘central’ senses determined based on researchers’ introspection are not necessarily used frequently, neither by children nor even by adults. Generally, it has been found that results of corpus research (i.e., research based on a large amount of natural language data) sometimes show different tendencies from analyses based on researchers’ intuitions (cf. Fillmore 1992; Hopper 2001). Hallan (2001) and Rice (2003) quantitatively demonstrated this point by examining the natural use of prepositions.

Second, these studies suggested that children start to learn prepositions based on phrasal verbs or fixed expressions, i.e., units larger than single words. As mentioned in the previous section, Brugman (1981) and Lakoff (1987) defined the meaning of the single word *over* as ‘ABOVE + ACROSS,’ without closely focusing on the relations between the senses of *over* and its co-occurring words. This might imply that they assumed the meaning of *over* could be separated or extracted from its naturally occurring contexts, and that it was possible to define on its own, although they did not explain this explicitly. In contrast, Hallan showed that children start learning the uses of *over* within phrasal verbs or fixed expressions such as *fall over* or *over there*. It seems impossible to extract the meaning of the single word *over* from these phrases because the meaning of *over* in these expressions can be understood only in relation to the co-occurring words. Based on observations of corpus data, Hallan suggested that speakers’ knowledge of prepositions might be understood and stored based on units larger than individual words. This suggestion is consistent with the usage-based view of grammar, which considers speakers’ knowledge of linguistic elements to include information about the contexts in which they occur.

The studies by Hallan (2001) and Rice (2003) imply that children learn prepositions by relying on how they are used in the contexts of daily interactions rather than what kind of concepts are expressed by each preposition. In other words, they have shown the importance of contextual information for children's acquisition of prepositions, and have contributed to the study of English prepositions from a usage-based perspective. However, these studies have mainly focused on the contextual information within an utterance (e.g., co-occurring word(s) forming a fixed expression), not on the relation between utterances. In other words, the utterance sequences have not been examined in detail, and thereby the roles of prior or subsequent utterances, or the interactional purposes of children's utterances, have not been clearly investigated. While they identified the importance of contexts for the process of acquiring prepositions, the range of 'context' they referred to was still limited.

In response to this situation, this study analyzes children's uses of prepositions especially focusing on utterance sequences based on the theory of dialogic syntax by Du Bois (2001, 2014), which emphasizes the role of on-going discourse for speakers' production of utterances. The next section will describe the theoretical framework.

7.3 Dialogic Syntax

This section will introduce the theory of dialogic syntax, which was developed by Du Bois (2001, 2014). First, section 7.3.1 will explain the background of this theory, and also provide summaries of the important concepts of the framework, such as *resonance* and *diagraph*. Then, section 7.3.2 will provide an overview of the studies of language acquisition to which the framework of dialogic syntax has been applied.

7.3.1 Theoretical Background and Key Concepts

What is grammar, and how does language come to be what it is? The answers to these questions can differ depending on the linguistic theory. Generative grammarians, for instance, assume an innate language system called Universal Grammar, which enables speakers to produce grammatical sentences. In contrast, Emergent Grammar proposed by Hopper (1987, 1988, 1998) does not consider grammar to have a fixed or inherent structure but to have emerged from discourse (i.e., from specific utterances made by speakers) as summarized below:

“The notion of Emergent Grammar is meant to suggest that structure, or regularity, comes out of discourse and is shaped by discourse as much as it shapes discourse in an on-going process. Grammar is hence not to be understood as a pre-requisite for discourse, a prior possession attributable in identical form to both speaker and hearer. Its forms are not fixed templates, but are negotiable in face-to-face interaction in ways that reflect the individual speakers’ past experience of these forms, and their assessment of the present context of these forms, and their assessment of the present context, including especially their interlocutors, whose experiences and assessments may be quite different. Moreover, the term Emergent Grammar points to a grammar which is not abstractly formulated and abstractly represented, but always anchored in the specific concrete form of an utterance.” (Hopper 1987: 69)

As described here, functional linguistics emphasizes the role of speakers’ concrete utterances for the development of grammar. Consequently, studies based on a functional view of grammar generally analyze conversational data, based on the assumption that “spoken

discourse most transparently reveals grammar in use” (Du Bois 2003: 54).

The framework (or theory) of dialogic syntax is also based on this dynamic view of grammar; this framework attempts to explain how the structures of language emerge in the environment where utterance meets utterance. Dialogic syntax assumes that syntactic patterns are not just a reflection of the individual grammatical knowledge of speakers but are built and stored dialogically.³⁷ Therefore, from this perspective, the structural coupling of two or more utterances is considered to be a fundamental unit of language. The following passage in Du Bois (2014) illustrates the essence of this theory:

“The patterns that define language emerge from the interaction of particulars, as one utterance follows another, reproducing its pattern in part. The resulting parallelism invites a perception of pairing, generating something new in the event: a specific resonance of forms and meanings. This is the phenomenon of dialogic syntax.” (Du Bois 2014: 359)

One of the key concepts in this framework is dialogic resonance. Du Bois (2014: 372) defines the term *resonance* as “the catalytic activation of affinities across utterances” and explains that “resonance can arise between paired elements at any level of language: signs, words, morphemes, constructions, phonemes, prosodic structures, features, meanings, referents, illocutionary forces, pragmatic functions, interactional moves, and so on.” The following excerpt provides an example of dialogic resonance, in which Ken produces his utterance by using elements from the prior utterance by Joanne.³⁸

³⁷ The theoretical background of dialogic syntax, and the relationships among theories such as emergent grammar, the usage-based model, and dialogic syntax, are also summarized in Sakita and Okamoto (2010).

³⁸ The transcription symbols and conventions used in Du Bois (2014) follow the system of “Discourse Transcription” (Du Bois et al. 1993). In this system, (H) means in-breath, numbers such as (0.8) mean the length of pause, and the symbol “^” means primary accent.

(98) (Deadly Diseases SBC015: 870.750–874.220)

1 JOANNE; (H) It's kind of like ^you Ken.

2 (0.8)

3 KEN; That's not at ^all like me Joanne.

(Du Bois 2014: 361)

To highlight the parallelism between utterances, an analyzing tool called a *diagraph* (from *dia-* 'across' plus *graph* 'mapping') has been used in this theory. In a diagraph, corresponding elements between utterances are aligned along a vertical line as follows.

(99) <Diagraph>

JOANNE; it 's kind of like ^ you Ken .

KEN; that 's not at ^all like me Joanne .

(Du Bois 2014: 362)

This diagraph shows that the dialogic resonance between the two utterances builds on parallels between participants' selection of the same words (*'s : 's*, *like : like*) as well as common grammatical elements such as pronouns (*it : that*, *you : me*), proper names (*Ken : Joanne*), and adverbial modifiers (*kind of : not at all*). Moreover, *you* and *me* refer to the same person. We also can observe the parallels at the phrasal level in the construction *X is Y*. In addition, according to Du Bois, prosody also provides an important source of structural parallels. The two utterances in the above example follow a similar intonation pattern, i.e., both of them use final intonation. This example exhibits that the structure of the prior utterance produced by Joanne plays an important role in Ken's construction of his utterance. As in this example, when we structure a new utterance, we tend to use plenty of resources from the on-going discourse. Resonance is frequently observed in our daily interactions, and

the theory of dialogic syntax considers grammatical patterns to have emerged from such structural couplings of two or more utterances.³⁹

7.3.2 Dialogic Syntax and Language Acquisition

As mentioned above, different linguistic theories can make different assumptions about our grammatical knowledge, and also about children's language acquisition. In a usage-based account, it is assumed that children learn language based on the utterances produced by their interlocutors (generally, parents or caregivers) (cf. Tomasello 2003). Dialogic syntax, as explained in section 7.3.1, considers syntax patterns to have emerged from speakers' utterances and emphasizes the importance of utterance sequences for the development of grammar; therefore, the tools and key concepts of this theory (e.g., diagraphs and resonance) can be applied to examining children's language learning as well.

Köymen and Kyratzis (2014) have applied the framework of dialogic syntax to language acquisition. They examined how toddlers use complement constructions (e.g., *I think she is here*) as a communicative resource in peer interactions in terms of resonance. This study demonstrated that children start to use complement constructions through transforming and embedding prior utterances into matrix clauses with stance-indexing verbs (e.g., *I think, I said, I want*), which supports the idea that complex complement constructions are built up dialogically over sequences of interaction. It has also been argued that toddlers' use of complement constructions is closely related to their stance-taking (cf. Du Bois 2007) towards other toddlers and caregivers, which also supports the perspective that the process of learning complement constructions is grounded in their communicative purpose. Sakita and Okamoto (2010: 120-121) examined conversational data in Japanese, showing

³⁹ Regarding resonance, see also Sakita (2006, 2008) and Sakita and Okamoto (2010).

some interesting phenomena as well. They found that children frequently answer questions by simply resonating with prior utterances, even though the content of their answers may actually differ from what they really intend to say. This implies that priming effects from prior utterances have great influence on the structures of children's utterances. In addition, according to Sakita and Okamoto (*ibid.*: 126), children can recognize some local patterns or structures in specific utterance sequences, and children use these to produce their own utterances. That is, not only specific words or morphemes but also more complex constructions are learned based on concrete utterances, i.e., based on specific items embedded in interactional contexts. This claim is consistent with the results of Tomasello's (2003) study and those based on the constructional view of grammar (cf. Goldberg 1995, 2006; Hilpert 2014). These studies also demonstrated the item-based nature of language learning and claimed that language acquisition relies on a number of socio-cognitive skills such as joint attention, intention reading, the ability to form schemas, imitation, and pattern recognition.

The research introduced above suggests the potential value of applying the framework of dialogic syntax to language learning; however, there are still only a limited number of such studies. Since the framework of dialogic syntax was only published recently (the paper written by Du Bois in 2001 was just a manuscript version and his full paper was published in 2014), analyses using the framework still tend to focus on the conversations of adults. In addition, even in the literature on language learning based on this framework, the studies tend not to focus on specific grammatical elements or grammatical categories such as prepositions. While numerous studies on prepositions have been conducted in the field of cognitive linguistics, the results of such traditional studies have not been effectively connected with those of studies emphasizing the role of on-going discourse.

In order to show how such results can be related to each other, this thesis will examine children's use of prepositions from the viewpoint of resonance, demonstrating how

children produce prepositions based on prior utterances. Moreover, this research also attempts to show how children's production changes as they become older. Based on the results, this research aims to show how the knowledge of prepositions is built up dialogically in daily interactions.

7.4 Data and Method

This section will explain how the target data were collected and annotated for this study.

7.4.1 Data

This study is based on data from the Providence Corpus (Demuth et al. 2006). This corpus is available for research through the CHILDES database (MacWhinney 2000), which is a large collection of data of child language. The Providence Corpus consists of transcriptions and audio/video recording data from 6 English-speaking children, 3 boys (Alex, Ethan, William) and 3 girls (Lily, Naima, Violet), born in the United States in 2000 or 2001. All of them are monolingual. The corpus includes their conversational data over 1–3 years during spontaneous interactions with their parents (usually their mothers) at home. Each child was recorded for around 1 hour every two weeks. Two of the girls (Lily and Naima) were recorded more often: once a week between ages 2–3. The total corpus consists of 364 hours of speech. Transcriptions and audio data are available for all children, and video recording data are also available for all children except Ethan, who was diagnosed with Asperger Syndrome at the age of 5.

This study used the Providence Corpus mainly for the following two reasons. First, the corpus consists of longitudinal recordings at least every two weeks, which allows us to

observe the language development of each child between the ages of 1–3. Second, it contains video recording data as well as transcriptions and audio recordings. Video recording data helps us to understand the contextual information for each conversation; for example, the places or situations where the conversation took place, and the actions or movements of participants. Such information is especially useful in analyzing child language because children tend to achieve their communicative goals by using not only verbal but also various non-verbal resources (e.g., pointing/picking up the referent instead of saying the name). Among the 6 children, 3 were randomly selected as target children for this study: Alex (boy), William (boy), and Lily (girl).⁴⁰ Alex’s data will first be analyzed in detail, and will then be compared with those of William and Lily.

7.4.2 Research Procedure

This section will explain the details of the research procedure. First, I extracted all of Alex’s utterances in which prepositions were used. The transcribed data include part-of-speech annotations. Prepositions are annotated as ‘prep,’ so the target utterances were first extracted using the “prep” tag. However, when a preposition is used as an adverb without nominal complements (e.g., when *over* occurs in phrases such as *fall over*), it is annotated as “adv” (adverb) in the corpus. Therefore, to extract the examples of prepositions with the “adv” tag as well, this study first searched for all words annotated as “adv” in Alex’s data. Then, any of those word that were included in the list of prepositions below (from Altenberg and Vago (2010)) were regarded as the research target and the utterances including them were extracted

⁴⁰ Although the target children were basically selected at random, this study excluded the data of Ethan, who was diagnosed with Aspergers Syndrome and whose video data cannot be accessed, in order to analyze the data of several children under similar conditions.

from the corpus.^{41,42}

(100) about, above, across, against, along, among, around, at, before, behind, below, beneath, beside, between, beyond, by, despite, down, during, for, from, in, into, like, near, of, off, on, onto, out, over, since, through, throughout, till, to, toward(s), under, until, up, upon, with, within, without

(Altenberg and Vago 2010: 65)

After the target utterances were extracted, they were annotated in terms of resonance. More concretely, this study examined Alex's utterances including prepositions, especially focusing on the following viewpoints: (i) whether the utterance was produced through resonance with the prior utterances or not, and (ii) if it was produced through resonance, which pieces of the prior utterance it used (e.g., whether it just used the same preposition, or whether it reproduced a larger construction such as [verb + prepositional phrase] or a whole sentence pattern such as [subject noun phrase + verb + prepositional phrase]).

Let me explain these two viewpoints in detail. Regarding the first point, various criteria can be assumed in determining whether the utterance was produced by relying on resonance or not. This is because, as summarized in the previous section, parallelism between utterances can be observed at various levels and in various patterns; for instance, parallelism

⁴¹ This study has extracted the target data basically by searching the transcribed data using information from part-of-speech tags such as "prep" and "adv." However, when comparing the transcripts with the video data or looking at the contextual information carefully, some errors were found in the transcribed data; for example, an utterance produced by a mother is attributed to a child, or the word *like* used as a verb is tagged as a preposition. In addition, some utterances produced by the children are not clear and it is sometimes very difficult to judge whether the child produced a preposition or not (especially a preposition consisting of one syllable). This study excluded these kinds of errors and unclear utterances from the target data.

⁴² The target children sometimes sing songs which contain prepositions, and they tend to repeat the same songs or the same parts of a song again and again. Since this research aims to observe the usage of prepositions in an interactional context (i.e., in utterance sequences with dialogic partners), prepositions produced in songs were not included in the target data.

could arise from selecting common words or constructions, using similar prosody, or indicating the same referents. Though there might not be a single ‘correct’ way to annotate it, in this study, resonance was annotated using the criterion selected by Köymen and Kyratzis (2014). Köymen and Kyratzis annotated resonance based on whether any pieces of the complement construction were primed (i.e., common verbs were used) within 20 clauses in the prior discourse (ibid.: 503). In accordance with this criterion, the present study examined whether each of Alex’s uses of prepositions was primed within 20 clauses in the prior discourse. More concretely, if the preposition observed in Alex’s utterance was used in the parents’ utterance within 20 clauses in the prior discourse, it was annotated as a usage relying on resonance. According to Du Bois (2014), it is also possible that Alex’s utterance was primed by the prior utterance produced by himself; however, this research attempts to focus on how prepositions begin to be used dialogically through dynamic interactions between children and their parents. Therefore, when Alex used the same preposition as in his own prior utterance, such a case was annotated as self-repetition to distinguish it from cases of resonance.

After Alex’s data had been annotated and analyzed, William’s and Lily’s data were then annotated to investigate whether the tendencies observed in Alex’s data were also observed in other children’s data. Conversational data for each child were recorded either once or twice a month. If the data were recorded twice in a month, only the earliest data in each month were used for counting the number of instances of resonance at a specific age.

7.5 Results and Discussions

In this section, the results of the data annotation will be presented and analyzed. Section 7.5.1 will give an outline of the results. Sections 7.5.2 to 7.5.5 will discuss characteristics of Alex’s

usage of prepositions and how this changes as he becomes older. After that, section 7.5.6 will examine the data from William and Lily as a comparison.

7.5.1 Outline of Alex's Use of Prepositions and Its Changes

The Providence Corpus includes data from Alex between the ages of 1;4 (1 year and 4 months old) and 3;5 (3 years and 5 months old). His utterances in the first 4 months of the corpus do not contain any prepositions; that is, we can observe his use of prepositions for the first time at age 1;8, and his ways of using prepositions gradually change as he becomes older. From the perspective of resonance, the following two main changes are observed.

First, Alex's percentage of prepositions relying on resonance tends to be higher in earlier stages, but gradually decreases as he becomes older. Table 7-1 below shows whether Alex's prepositions occur through resonance or not, calculated for each 6-month period. The numbers in columns (a)–(c) give the frequencies of each type of preposition production: Column (a) gives the frequencies of prepositions relying on resonance, i.e., when the same preposition was used in the prior utterances within 20 clauses made by the parents. Column (b) displays the frequencies prepositions produced through self-repetition, i.e., based on Alex's own prior utterances. The numbers in column (c) are the frequencies of prepositions which were not included in prior utterances within 20 clauses. The percentages in column (d) indicate the ratio of resonance, i.e., the percentages of frequencies in column (a) among the total frequencies of prepositions produced from (a)–(c).

Table 7-1: Changes of the Ratio of Resonance in Alex’s Use of Prepositions

Age (Year;Month)	(a) Resonance	(b) Self-Repetition	(c) Production by himself	(d) The Ratio of Resonance (%)
(i) 1;8 – 2;1	10	4	5	52.6%
(ii) 2;2 – 2;7	37	9	41	42.5%
(iii) 2;8 – 3;1	56	138	203	14.1%
(iv) 3;2 – 3;5	43	111	156	13.9%
Total	146	262	405	18.0%

As shown here, in the first stage of using prepositions (ages 1;8–2;1), the ratio of resonance is high (52.6%) compared with that of other ages. However, the ratio gradually decreases as Alex grows up, dropping to 13.9% in the last set of the corpus data (ages 3;2–3;5).

Second, the primed units become larger as he grows older. In earlier stages, he tends to produce utterances consisting of a single preposition (e.g., saying just “UP!”) or a fixed phrase including a preposition (e.g., saying just “Over there!”) while relying on resonance. At later stages, in contrast, he tends to pick up larger units from prior utterances; for instance, when his mother said “I’ll let you pour it in”, Alex answered “Pour it in”, which consists of not only a preposition but also the verb (*pour*) and object noun (*it*) from the prior utterance. As with this example, he gradually expands the span of resonance from a single preposition (or a single prepositional phrase/fixed phrase) to a larger unit such as a verb phrase, clause, or sentence including a preposition. Starting in the next section, the results will be explained in detail using concrete examples. To describe the characteristics of Alex’s use of prepositions at different ages and to show how this changes over time, this study designates 4 phases as he grows older, and will explain the characteristics of his use of prepositions in each phase.

Before starting to examine concrete examples, I will explain the way conversational data is displayed in this chapter. Although there are various ways to transcribe spoken data, this chapter presents the data in a way based on the transcription system of the Providence Corpus. This means that the way of indicating intonation patterns and the placement of line breaks are based on the transcription in the corpus. In addition, in the conversational data, speakers of each utterance are indicated as “MOT” (mother), “FAT” (father), and “CHI” (target child), and the name of the child and his/her age follow the conversation. For example, if the target child is Alex and the conversation was recorded when he was aged 1 year, 8 months, and 25 days, this information will be provided as “Alex, 1;8.25” within parentheses after the conversational data. This chapter also provides diagraphs based on Du Bois (2001, 2014) to show parallelisms between utterances.

7.5.2 Starting to Use Prepositions through Resonance (Phase 1)

This section explores the data from the earliest phase, in which Alex is just starting to produce prepositions. In this phase, Alex tends to produce prepositions through resonance, i.e., to reproduce the same preposition as in the prior utterances produced by his mother.

The first example, (101), comes from a conversation recorded when Alex was 1;8, which is around the time when he was just starting to use prepositions. In the situation in (101), Alex and his mother are playing with toys that are shaped like numbers (‘8’ and ‘6’ in (101)). After his mother throws one of the toys, she tries to make Alex answer her question about where the toy has been thrown.

- (101) 1. MOT: where’s the yellow one?
2. MOT: it’s *over* there.
3. MOT: do you see the eight?

4. MOT: it's *over* there.
5. MOT: eight.
6. CHI: *over* there.
7. MOT: six.
8. CHI: ooh.
9. CHI: *over* there. (Alex, 1;8.25)

In the first line in (101), Alex's mother asks him a question "Where's the yellow one?", but Alex does not respond. Then, the mother says "It's over there." by herself, which gives the answer to the question. In lines 3 and 4, she repeats a similar question-answer pair. After that, she says "Eight", again to urge Alex to answer her question about the location of the toy. Then, in line 6, Alex finally answers "Over there." by resonating with the prior utterances. Similarly, Alex produces the utterance "Over there." in line 9 as well. The diagraph below highlights the correspondence between the utterances here.

(102) <Diagraph>

- | | | | |
|----|------|---------------------------|--------------------|
| 1. | MOT: | where 's the yellow one ? | |
| 2. | MOT: | | it 's over there . |
| 3. | MOT: | do you see the eight ? | |
| 4. | MOT: | | it 's over there . |
| 5. | MOT: | eight . | |
| 6. | CHI: | | over there . |
| 7. | MOT: | six . | |
| 9. | CHI: | | over there . |

"Over there." in (101) is the earliest use of the preposition *over* in the corpus data from Alex. This result is consistent with Hallan's (2001) finding that children start to learn the preposition *over* in fixed expressions or phrasal verbs, rather than in prepositional phrases expressing a vertical relation (e.g., The plane flew *over* the field). In the data earlier than age

2;3, Alex only uses *over* in the fixed phrase *over there*. Moreover, when he uses this phrase, it is pronounced like a single word, i.e., without any pauses between *over* and *there*. These facts might imply that Alex remembers this phrase as one unit, not as a combination of two words. Pine and Lieven (1993) showed that English-speaking children begin language acquisition by learning some combinations of words as ‘frozen’ phrases; that is, they learn some expressions used by adults as holophrases (e.g., *I-wanna-do-it*, *Lemme-see*).⁴³ Alex’s uses of the phrase *over there* can be considered another example of this phenomenon.

In addition, focusing on the functional relations between lines 1–2, 3–4, 5–6, and 7–9, we can note that all of these pairs consist of a question asking about the location of a toy and an answer to the question. That is, Alex resonates not only at the lexical/phrasal level (i.e., using the common phrase *over there*) but also at the functional level (i.e., constructing question-answer adjacency pairs). The utterances by his mother in lines 5 and 7 themselves would actually be hard to interpret as questions if we did not also observe the utterance sequences, because they have neither rising intonation nor the syntactic pattern for interrogative sentences. This means that they can only be interpreted as questions based on the utterance sequences in this conversation. Regardless of such complexities, Alex answers his mother’s questions by resonating with the patterns of prior utterances. This phenomenon may be related to one discussed in Carpenter et al. (1998). Their study argued that toddlers generally begin to understand others’ intentions starting around age 1;4, and they selectively imitate the intended actions. In example (101), Alex may understand the intention of his mother’s utterances (the intention that she wanted him to answer her question about the location of the toy) based on the sequences of the prior utterances, and may respond appropriately by resonating with the patterns.

In earlier stages of using prepositions (especially ages 1;8–2;3), Alex frequently

⁴³ This tendency is also explained in Tomasello (2003: 38).

used the phrase *over there* when he was asked about the location of something, even when the location was actually not ‘over there’. The following conversation, which was recorded when Alex was 1;11, exemplifies this.

- (103) 1. MOT: where does the bird go?
2. CHI: over there.
3. MOT: no the bird goes in the tree. (Alex, 1;11.2)

In this example, Alex’s mother asks “Where does the bird go?” and Alex answers the question using a phrase which is familiar to him, “Over there.” This question-answer pattern is similar to that in (101). However, in line 3, his mother says “No” and gives him an alternative answer “the bird goes in the tree.” This response implies that the answer “Over there.” was not appropriate for the situation, or was different from what she was expecting. However, it can be assumed that Alex used this phrase based on prior experiences such as in (101), in which he could answer *where*-questions by saying “Over there.”, which enabled him to communicate with his mother successfully. It could be argued that he has applied this knowledge to the case of (103) as well. This example also suggests that he first starts to understand and produce the preposition *over* based on a fixed phrase, *over there*, and in the specific context of answering a question. This implies that children might start to store the knowledge of prepositions within utterance sequences motivated by communicative purposes, as claimed by Tomasello (2003). According to Tomasello (2003), children remember utterances produced by adults within the usage context, and they are able to reproduce them in similar, appropriate contexts. Alex seems to remember the phrase *over there* as a kind of holophrase, and reproduce it within contexts in which he is expected to answer a *where*-question. This seems to indicate that both the usage and acquisition process of this

phrase heavily depends on conversational and communicative contexts.

As shown in the examples above, Alex started to use prepositions in adverbial uses, i.e., in forms that are not followed by nominal complements. Later, when he was age 2;1, he started to produce the form [preposition + complement] based on utterances in the preceding conversational context. Example (104) is from age 2;1. In (104), Alex produces the prepositional phrase *in chair* in line 3.

- (104)
1. MOT: okay, get *in* your chair.
 2. MOT: hurry up!
 3. CHI: no *in* chair.
 4. CHI: yyy yyy.
 5. MOT: yes, it's Alex's chair. (Alex, 2;1.2)

It seems that Alex's use of the prepositional phrase headed by *in* was primed by the prior utterance by his mother. The following diagraph shows the parallelism between utterances.

(105) <Diagraph>

1. MOT: okay , get in your chair .
3. CHI: no in chair .
5. MOT: yes , it 's Alex 's chair .

In this situation, Alex's mother says "get in your chair" to make Alex sit in his chair. Then, in line 3, Alex says "No in chair." using the preposition *in* and the noun *chair*, both of which are in the prior utterance. Alex's utterance here, however, is not just a repetition of his mother's utterance; it does not contain *your* or any other particles before *chair*. In addition, Alex pronounces the words *in* and *chair* as two separate words, rather than as a holophrase. These facts might indicate that he has started to recognize each word as a separate element.

In example (104), Alex still reproduces a preposition from the prior utterance when

he uses the preposition *in*. In contrast, once he is around the age of 2;3, his frequency of producing prepositional phrases without relying on resonance gradually increases. That is, he starts to use prepositions which did not occur in the prior utterances, constructing ‘new’ prepositional phrases to achieve his communicative purposes (e.g., making a request, asking a question, or showing his understanding). The following section will examine the data from the ages 2;3–2;4.

7.5.3 Increasing Use of Prepositions without Resonance (Phase 2)

At 2;3, Alex started to use prepositions which were not primed by the utterances in the previous context, as in example (106). In the scene in which this conversation took place, Alex grasped some beans in a bowl and threw them. His mother saw this and said “Don’t do that again.” (line 1).

- (106) 1. MOT: don’t do that again.
2. CHI: *in* the bowl.
3. MOT: yes that’s right.
4. MOT: you put them *in* the bowl, don’t throw ’em [: them].

(Alex 2;3.14)

To respond to his mother’s utterance, Alex produces the prepositional phrase *in the bowl* in line 2 without relying on resonance. However, it is not appropriate to conclude that resonance is not relevant to this conversation. When we look at the relation between the utterances in lines 2 and 4, we can see that Alex’s mother uses the same prepositional phrase *in the bowl* as in Alex’s utterance. If she were just aiming to show her understanding, it might be enough for

noun *you*, the verbs *wanna*, *sit*, *go*, and the possessive pronoun *your* before the noun *chair*. These elements help to clarify the meaning of Alex's utterance compared with just saying "In chair." in this context.

Moreover, in terms of its function, Alex's utterance in this conversation is different from that in the previous sections. The conversations discussed in the previous sections (e.g., section 7.5.2) start with Alex's mother initiating a new adjacency pair; Alex just responds to her utterance using the same prepositional phrase. In contrast, the conversation in (108) is initiated by Alex's utterances, asking his mother to put him on the chair. It is generally agreed that children around 18–24 months old (1;6–2;0 years old) start to produce multi-word utterances with the purpose of directing the caretaker's attention to particular aspects of joint activity (Hilpert 2014: 163). Alex in example (108) also attempts to attract his mother's attention and make a request by producing the multi-word utterances "Mommy, up." and "In chair." In this scene, it must be possible for his mother to put him on the chair without saying anything. However, she resonates with Alex's 'incomplete' utterance and expresses her understanding explicitly. In line 1 in (108), Alex uses the preposition *up* but his mother does not say anything. Therefore, after that, he uses the preposition *in* with the noun *chair* and finally his mother understands his intention. This example suggests that Alex at this age has difficulties in constructing full sentences by himself, and thereby his utterances are sometimes not understood. The responses by his mother, as in line 3 "Do you wanna sit in your chair?" and line 5 "Go sit in your chair", might provide input for him about how to construct a full sentence which can be understood correctly. That is, the utterances by his mother function as feedback to teach him how to express his intentions clearly, and how to use prepositional phrases in larger units such as verb phrases and clauses/sentences.

To sum up, Alex at this age is starting to utter single prepositional phrases such as "In the bowl" and "In chair" without relying on resonance. In this phase, his mother tends to

resonate with his ‘incomplete’ utterances, embedding the same prepositions into larger units such as verb phrases or clauses/sentences. His mother’s utterances as in (106) and (108) may function as feedback to demonstrate for Alex how to express his intentions clearly and also how to use prepositional phrases in larger constructions.

7.5.4 Expanding the Units of Resonance (Phase 3)

As shown in the previous section, at ages 2;3–2;4, Alex’s rate of producing prepositions based on resonance decreases and he tends to use prepositional phrases which are not primed by prior discourse. Later, at ages 2;5–2;7 (phase 3), his rate of producing prepositions through resonance increases again; about 40 percent of his use of prepositions in this period relies on resonance. However, his way of using resonance in this period is not the same as that in his first stage of using prepositions (phrase 1), in which Alex reproduced a single preposition or a single fixed expression such as *over there*. In contrast, in phase 3 (2;5–2;7), Alex tends to resonate with the larger units in prior utterances such as [verb + object noun phrase + prepositional phrase], and he sometimes replaces a part of the prior utterance when reproducing it. In addition, his mother’s utterances in this period become longer and more complex compared with the earlier data.

Example (110) was recorded when Alex was age 2;5. In this situation, his mother is trying to put sugar into the bowl and is speaking to Alex. Alex’s utterance here is primed by his mother’s utterance, including the prepositional phrase “in the bowl” and the object noun “this” as well.

- (110) 1. MOT: would you like to put this in the bowl.
2. CHI: this in the bowl? (Alex, 2;5.23)

(111) <Diagraph>

1. MOT: would you like to put this in the bowl .
2. CHI: this in the bowl ?

In this example, Alex takes up a part of mother's utterance and says "this in the bowl", which reproduces a part of the verb phrase "put this in the bowl" in line 1. What is interesting here is that his utterance does not correspond to either of the grammatical units, VP (verb phrase) or PP (prepositional phrase); this implies that Alex produces this utterance simply based on the form of the prior utterance, rather than recognizing an abstract grammatical structure, such as VP or PP, in constructing his utterance. The utterance by his mother in line 1 has a more complex structure compared with those in the earlier examples, such as (101). Regardless of this complexity, Alex reproduces a part of the prior utterance and responds to his mother's utterance.

While Alex's utterance in example (110) does not contain any verbs, his utterance in (112) includes the verb *pour*.

- (112) 1. MOT: and I'll let you pour it in.
2. MOT: okay?
3. CHI: pour it in. (Alex, 2;5.23)

Although the utterance by his mother in line 1 has a relatively complex structure as well

- (116) 1. MOT: come on, put all the pieces inside.
 2. MOT: help me.
 3. MOT: I'll open it.
 4. CHI: open.
 5. MOT: okay, go ahead.
 6. MOT: put 'em [: them] in.
 7. CHI: put it in. (Alex, 2;6.6)

- (117) <Diagraph>
- | | | | | | |
|----|------|-----------|----------|------------|----------|
| 1. | MOT: | come on , | put all | the pieces | inside . |
| 6. | MOT: | | put them | in | . |
| 7. | CHI: | | put it | in | . |

As in this example, when Alex was 2;6, he frequently used prepositions in the pattern [*put* + object noun + preposition (prepositional phrase)] based on prior utterances, which suggests that he was starting to learn the usage of the verb *put* relying on resonance around this age.

After 2;6, Alex gradually began to reproduce 'complete' clauses or sentences, which contain not only a verb phrase but also a subject noun phrase. The conversation in (118) and its diagraph (119) exemplify this. As shown in this example, Alex at the age of 2;10 produces a sentence consisting of a subject noun and a verb phrase relying on resonance.

- (118) 1. MOT: we hafta move to the inside (be)cause we're running out of
room.⁴⁵

⁴⁵ While it is possible to consider the phrase *out of* as a combination of the two separate prepositions *out* and *of*, the phrase has a meaning as a unit, i.e., functions as one phrase. Therefore, when

2. CHI: yyy yyy. (unclear)
3. CHI: we're running *out of* room. (Alex, 2;10.11)

(119) <Diagraph>

1. MOT: (be) cause we ' re running out of room .
3. CHI: we ' re running out of room .

As in this example, Alex gradually comes to use prepositions in clauses or sentences by reproducing (a part of) his mother's previous utterance. After this stage, he finally starts to use prepositions within clauses or sentences by himself, i.e., without replying on resonance. The next section will present the data in this final stage.

7.5.5 Producing Prepositions in Clauses/Sentences without Resonance (Phase 4)

The next example was recorded when Alex was 2;11. In this conversation, Alex uses the preposition *on* in a 'complete' sentence. Although the preposition *on* is not used in the prior 20 clauses, he constructs the prepositional phrase "on the floor" and uses it correctly.

- (120)
1. MOT: there's an alligator right there, there's oh there no, oh these two match.
 2. MOT: here ya go.
 3. CHI: he's sleeping.
 4. CHI: he's sleeping *on* the floor.

counting the frequency of occurring expressions, this study regards *out of* as one word.

5. MOT: yeah, his eyes are closed, he's tired. (Alex, 2;11.8)

After Alex says "He's sleeping on the floor." in line 4, his mother responds to this with "Yeah, his eyes are closed, he's tired." This utterance implies that the description by Alex in line 4 was appropriate for this situation (or, at least, that he could communicate smoothly with his mother in this scene). At this age, he seems to be able to construct prepositional phrases correctly by himself and use them in 'complete' clauses or sentences.

The next conversation was recorded at 3;5, which is Alex's last recording in the Providence Corpus. In this example, Alex uses various kinds of prepositions including *down*, *like*, *on*, and *with*, while his mother uses only *in* and *out*.

- (121)
1. CHI: Mom let's go xxx.
 2. CHI: yyy yyy *down like* this.
 3. MOT: no, because it's too hot *in* there.
 4. MOT: I don't want you *in* there.
 5. CHI: Mommy there's a bee *on* it.
 6. MOT: I know +//.
 7. MOT: we'll get the bee *out* later.
 8. CHI: hey Mom!
 9. CHI: you wanna play *with* the bee? (Alex, 3;5.16)

This conversation proves that Alex at this age can choose appropriate prepositions depending on the context or his intentions, and can use them within 'complete' clauses or sentences without relying on resonance.

However, as shown in Table 7-1 above, his use of prepositions based on resonance

does not completely disappear even at this stage (which is natural if we consider the fact that resonance is frequently observed in conversations between adults (cf. Du Bois 2001, 2014)). The conversation in (122) exemplifies this. This conversation took place when Alex was 3;2 and he reproduced the prepositional phrase *in this one* which was used in his mother's utterance. In this situation, Alex and his mother are attempting to find a target toy from several boxes with lids.

- (122)
1. MOT: xxx how (a)bout this one?
 2. CHI: no no no.
 3. MOT: no no oh no it's not *in there* I'm sorry it's *in this one*.
 4. CHI: *in this one*. (Alex 3;2)

In this scene, Alex's mother picks up one of the boxes and produces the utterance in line 1. Then Alex says "No no no." to inform her that the toy they are looking for is not in that box. In line 3, then, his mother responds "No no oh no it's not in there I'm sorry it's in this one." while picking up another box. After that, Alex resonates with his mother's utterance by saying "In this one." in line 4. Since the prepositional phrase *in this one* occurs in the last part of his mother's previous utterance in line 3, it might be easy for Alex to take up and reproduce this phrase. Besides, it seems natural to reproduce this part in terms of its meaning and function. The sequence of his mother's utterances "it's not in there" and "it's in this one" positions the "in this one" phrase as the most highlighted and important part of her utterance. Alex could be considered to have selectively reproduced this prepositional phrase to show his understanding of and agreement with the prior utterance. The following diagram represents the parallelism.

(123) <Diagraph>

3. MOT: it 's not in there
 I 'm sorry it 's in this one .
4. CHI: in this one .

Among the elements in his mother's utterance, Alex reproduces only the last phrase, which is the most important and highlighted in the prior utterance.⁴⁶

7.5.6 Comparison with Other Children

As discussed above, two main tendencies were observed in Alex's data. First, his percentage of producing prepositions through resonance was high in the earlier stages, but gradually decreased. Second, the primed units became larger as he grew older. To determine whether these tendencies are observed in the data of other children, I extracted the data of William (boy) and Lily (girl) from the Providence Corpus and annotated them in the same way as I did for Alex's data. Since I examined Alex's data between ages 1;8–3;5 (for 22 months), I extracted 22 months of data from William and Lily for 22 months as well, starting with the month when they were starting to produce prepositions.

First, let us look at the data from William. His data started to be recorded when he was 1;4, and his use of prepositions can be observed in his earliest data in the corpus. Therefore, I extracted his data from 1;4–3;1 (for 22 months). His changing rates of resonance

⁴⁶ In an English clause, new information generally occurs in the last part; therefore, when that part is reproduced in following utterances, it might be difficult to judge whether it was selected because of its form (i.e., its position in the utterance) or its meaning. In example (122), it seems impossible to decide whether the phrase might have been selected because it was close to the following utterance or because it was semantically important (or whether both of these factors were equally important). Further studies are needed to discover which factor(s) might play a crucial role in determining which part(s) of the prior utterance tend to be reproduced in following ones.

are as follows.

Table 7-2: Changes of the Ratio of Resonance in William’s Use of Prepositions

Age (Year ; Month)	(a) Resonance	(b) Self-Repetition	(c) Production by himself	(d) The Ratio of Resonance (%)
(i) 1;4 – 1;9	7	4	9	35.0%
(ii) 1;10 – 2;3	15	15	12	35.7%
(iii) 2;4 – 2;9	47	89	131	17.6%
(iv) 2;11 – 3;1	34	103	127	12.9%
Total	103	211	279	17.4%

In William’s case, his rate of using prepositions based on resonance from 1;4–1;9 is lower than that of Alex (and also lower than that of Lily). In the data from age 1;4, William produces *up* several times even when the prior discourse does not contain the preposition; this might imply that he had already acquired the preposition *up* even earlier than the age of 1;4. As shown in column (c) in Table 7-2, during the period between 1;4–1;9, William produces prepositions by himself (i.e., without relying on resonance) 9 times: 4 of them are *up* and 2 of them are its antonym, *down*. Tomasello (1987) observed the language acquisition process of his child and found that the prepositions *up* and *down* are acquired earlier than other prepositions. William’s data is thus consistent with the results of Tomasello’s study. William may have learned these prepositions earlier than 1;4, so his rate of producing prepositions without relying on resonance is relatively high during his earliest period compared with that of other children. However, setting this issue aside, William’s data also have some tendencies in common with Alex’s data: his rate of resonance (in column (d)) starts to decrease at age 2;4, and finally drops to 12.9% during the period of 2;11–3;1. This result indicates that William, like Alex, starts producing prepositions through resonance, but

once he acquires them, he gradually becomes able to produce prepositions without relying on resonance.

In the data from Lily, we also can see that her rate of resonance decreases as she becomes older. Lily’s first use of prepositions was observed at age 1;8, at the same age as Alex’s. Therefore, I examined her rates of resonance up to age 3;5. The results are shown in the following table.

Table 7-3: Changes of the Ratio of Resonance in Lily’s Use of Prepositions

Age (Year ; Month)	(a) Resonance	(b) Self-Repetition	(c) Production by himself	(d) The Ratio of Resonance (%)
(i) 1;8 – 2;1	26	14	26	39.4%
(ii) 2;2 – 2;7	57	59	115	24.7%
(iii) 2;8 – 3;1	66	99	201	18.0%
(iv) 3;2 – 3;5	60	115	214	15.4%
Total	209	287	556	19.9%

Compared with Alex and William, Lily produces a larger total number of prepositions. In addition, Lily tends to use various kinds of prepositions even in the earlier stages, and therefore the rates in column “(b) Self-Repetition” are lower than those of other children. Furthermore, the data from Lily at age 2;10 contains an interesting example including “co-construction” (cf. Ono and Thompson 1995), which is a phenomenon in which incoming speakers complete the previous speaker’s utterance. In (124), Lily does not reproduce the same preposition as that in her mother’s utterance but adds a new kind of prepositional phrase, co-constructing an utterance with her mother.

- (124)
1. MOT: he really likes to watch tv what does he like to watch on tv?
 2. CHI: with me?
 3. MOT: right. (Lily, 2;10.8)

Co-construction is similar to resonance in that it is an interactional phenomenon in which a speaker produces an utterance by using information in the previous speaker's utterance. Lily is relatively quick to acquire language, and can construct various kinds of utterances including co-construction in interaction. At the same time, when focusing on resonance, Lily's rate of utterances relying on resonance decreases as she becomes older, as do those of Alex and William.

Moreover, in the data from William and Lily, the primed units gradually become larger. When the children are just starting to use prepositions, they tend to produce single prepositions such as *up* and *down* by resonating with their parents' previous utterances.

- (125)
1. FAT: we all fall....
 2. FAT: down!
 3. CHI: down! (William, 1;7.5)

While William utters the single word *down* in (125) through resonance, he resonates with his mother's utterance in a larger unit, as seen in (126) and (127), at age 2;3.

- (126)
1. MOT: here, I'll play with this.
 2. CHI: let's play with this.
 3. MOT: let's play with this, okay. (William, 2;3.7)

(127) <Diagraph>

1. MOT: here, I 'll play with this .
2. CHI: let 's play with this .
3. MOT: let 's play with this , okay.

William's utterance in this conversation reproduces the previous utterance "I'll play with this" with changing the *I'll* part to *let's*. His utterance in line 2 is grammatically complete and is naturally understood by his mother, as suggested by her utterance in line 3. Starting around this age, William gradually becomes able to produce a 'complete' sentence including prepositions even without relying on resonance.

A similar kind of change can be observed in the way Lily uses resonance as well. When Lily is 2;0, she starts to use prepositions in verb phrases (e.g., *take it off*) relying on resonance. After that, starting around age 2;2, she gradually becomes able to produce a sentence including a subject based on the form of her mother's previous utterance, as seen in (128) and its diagraph in (129).

- (128) 1. MOT: don't you wanna jump *on* it?
2. CHI: I don't want jump *on* it. (Lily, 2;3.5)

(129) <Diagraph>

1. MOT: don 't you wanna jump on it ?
2. CHI: I don 't want jump on it .

While Lily has changed the verb *wanna* in the previous utterance to *want*, she produces the preposition *on* within a 'complete' sentence including most grammatically required elements

relying on resonance.

As shown in examples (125) to (128), William and Lily expand the scope of their resonance as they become older and gradually start to reproduce their parent's utterances in larger units such as clauses or sentences. After that, they begin to use prepositions within clauses or sentences even without relying on resonance.

7.6 The Role of Resonance and Theoretical implications

This section discusses the role of resonance in children's use of prepositions, and considers the theoretical implications of this research.

7.6.1 Summary of Children's Use of Prepositions in terms of Resonance

Before discussing the role of resonance in language acquisition, let us review the changes in children's use of prepositions as they grow older. First, in phase 1, they tend to produce single prepositions or fixed phrases by resonating with prior utterances. For instance, Alex produced the preposition *over* for the first time in the fixed expression *over there* by resonating with his mother's prior utterance. Moreover, from a functional viewpoint, Alex produced this phrase when he was under pressure to answer to his mother's question. In contrast, in the next stage (phase 2), children start to use new kinds of prepositions, which do not occur in the prior utterances; for example, Alex said "In chair." without relying on resonance to ask his mother to put him in his chair. After that, in phase 3, children start to use prepositions in larger units, and finally become able to use them in grammatically 'complete' clauses/sentences without relying on resonance.

As mentioned earlier, during phase 2, parents frequently resonate with children's

utterances and provide feedback on children's 'incomplete' utterances. The next section will discuss the role of parents' utterances in detail, and how it might facilitate children's process of acquiring prepositions.

7.6.2 The Role of Resonance from Parents

In studies of language acquisition, it has been widely pointed out that input from caregivers plays an important role in children's process of learning language. For instance, the amount of child-directed speech from caregivers influences children's output, such as the frequency of using specific words and the age they start using them (cf. Huttenlocher et al. 1991; Hart and Risley 1995; Goodman et al. 2008). In addition, Roy et al. (2009) have demonstrated that caregivers' utterances are influenced by their children's utterances as well, i.e., parents tend to adjust their utterances depending on the child's language ability. For instance, at the stage where a child has not yet acquired a specific word, parents tend to make their utterances including the word shorter; in contrast, once the child becomes able to produce the word, parents start using the word in the longer utterances. This kind of adjustment might help the child learn a new word, and the structure of phrases/clauses including the word, step by step. Based on the results of their quantitative research, Roy et al. (2009) pointed out the existence of a feedback cycle between children and their caregivers; that is, the characteristics of their utterances can influence each other.

Similar to the findings by Roy et al., the results of this study indicate the importance of caregivers' utterances in children's process of learning prepositions; however, this study might have further implications than those of Roy et al. in terms of uncovering the relationship between immediately co-occurring utterances. Roy et al. (2009), and other previous studies on the process of acquiring prepositions, have focused only on the internal

structure of individual utterances, not on units consisting of multiple utterances. For instance, Hallan (2001) has examined the frequencies of individual words co-occurring with each other (e.g., frequencies of the phrases *over there* and *fall over*), and Roy et al. (2009) have focused on the length of each utterance produced by caregivers. In contrast, this study has analyzed the parallelism between multiple utterances and demonstrated that (i) adjusted utterances by caregivers help children become able to produce prepositions based on resonance, and (ii) immediate feedback by caregivers helps children understand how to use prepositions in larger constructions. These findings suggest that resonance could provide children with scaffolding (cf. Vygotsky 1978), which supports children in improving their language ability step by step. Thus, not only the internal structure of individual utterances but also parallelism between utterances can be considered important factors in facilitating children's process of learning the usage of prepositions.

7.6.3 Implications for Research on Resonance

Next, I will discuss the implications of this study for the theory of dialogic syntax. This study has demonstrated that resonance is frequently observed in conversations between children and caregivers, as well as in those among adults; this suggests that the theory of dialogic syntax can be applied to studies on language acquisition. Moreover, this study also demonstrated that the theoretical framework is effective in analyzing the usage of grammatical elements such as prepositions. Examining conversational data from the viewpoint of resonance can shed light on the way grammatical knowledge is formed on the basis of language use, which is motivated by the communicative purposes of the participants. While this study has focused on prepositions, it would be possible to analyze children's use of nouns and verbs based on this framework as well. Prepositions are considered to be

functional words rather than content words, and their meanings are highly context-dependent. For instance, it would be difficult to describe the meanings of the preposition *of* without relying on its co-occurring words, or to extract the meaning of *by* from the phrase *step by step*. In contrast, compared with prepositions, it seems relatively easy to define the individual word meanings of many concrete nouns and action verbs without any contextual information. That is, the degree of contextual dependency differs among words and that difference might have some influence on their use in resonance. Further studies are needed to examine whether the results of this study are commonly observed in words belonging to other grammatical categories.

In addition, this study suggested that first speakers' utterances (i.e., parents' utterances in this study) might have a gradient structure in terms of whether the second speakers (i.e., children) tend to resonate with them. For instance, during phase 1 in Alex's data, his mother tends to produce short utterances consisting of only a few words (e.g., *it's over there*), which might be easy to reproduce. In contrast, at phase 2, his mother starts to produce relatively long and complex utterances. Previous studies on resonance have mainly focused on the selective reproduction by second speakers, i.e., the adjustment or active decision-making process of second speakers rather than first speakers. Du Bois (2014), for instance, explained that "dialogic syntax builds on the selective reproduction of certain aspects of a prior utterance. Selective reproduction calls for a decision-making process on the part of the speaker, whether conscious or unconscious, to determine which aspects of the previously produced utterance will be reproduced" (Du Bois 2014: 379). In contrast, the adjustment of utterances produced by first speakers, as examined in this study, has not been discussed in detail by previous literature. Although this research examined conversational data between children and caregivers, adjustment of utterances may occur in various kinds of conversations, even those among adults. During interactions, speakers often modify their

ways of speaking, selecting words/constructions/topics depending on the reactions of their dialogic partners—whether consciously or unconsciously. Therefore, the feedback cycle involving resonance can be observed frequently in our daily interactions. Paying more attention to the characteristics of first speakers' utterances might deepen our understanding of the processes of making adjustments to utterances, i.e., the dynamic negotiation between participants in on-going discourse, in detail.

7.6.4 Implications for Research on Prepositions

Finally, I would like to turn to the implications of this study for the research field of prepositions. This study has identified resonance as playing a key role in children's learning prepositions (and learning constructions including prepositions) based on interactions with their parents. As discussed in the earlier chapters, previous studies on prepositions have tended to define the meanings of prepositions based on examples created by the authors, not based on actual use. These studies rarely examined spoken data, so they did not discuss how prepositions occur in utterance sequences or for what purposes they are used. In other words, these dynamic aspects of grammar have not been investigated so far, especially in studies on grammatical elements such as prepositions. In contrast, this study has suggested that children's use of prepositions heavily depends on the interactional context. Children's production is motivated by the form of the previous utterances, and also by their communicative purposes (e.g., responding to a question, or requesting something). The results of this study quantitatively demonstrate that communicative/interactional contexts play a crucial role in children's processes of learning prepositions and forming their linguistic knowledge associated with prepositions. From a theoretical viewpoint, this study emphasizes the importance of examining the usage of prepositions within their communication context to

better understand how our grammatical knowledge is organized in a bottom-up way.

Although this study has examined children's conversations, it is also plausible to consider that grammatical patterns used by adults are also strongly motivated by their communicative purposes to achieve their interactional goals. Assuming this is the case, even the knowledge of grammatical elements such as prepositions seem to be organized based on specific repetitions of concrete utterances in discourse.

7.7 Conclusion

While the previous chapters (Chapters 4–6) examined adults' use of prepositions mainly in written discourse, this chapter has analyzed children's use of prepositions based on the theory of dialogic syntax, especially focusing on resonance. This study demonstrated that children tend to start producing prepositions by resonating with their parents' previous utterances, and they gradually acquire constructional knowledge through expanding their range of resonance as they grow older. The results indicate that children come to understand how to use prepositions and start producing them depending on utterance sequences in communicative/interactional contexts. This implies that our grammatical knowledge is organized based on actual, specific uses in discourse, influenced by immediately co-occurring utterances. The process of acquiring prepositions thus seems to be highly context-dependent.

Moreover, this study pointed out that caregivers' utterances and feedback cycles play an important role in children's process of learning prepositions. That is, caregivers' short utterances in phase 1 help children to start producing prepositions through resonance, and resonance from their parents then functions as feedback that facilitates children's acquisition of the usage of prepositions in larger constructions. This finding suggests that parents adjust their utterances based on their children's utterances in on-going discourse, which can be a

basis for children's process of learning grammatical patterns. This study has demonstrated that grammatical knowledge of prepositions might be formed based on utterance sequences motivated by our communicative purposes; this conclusion also illustrates the importance of examining data focusing on the relations between multiple utterances in actual use.

In addition, this study showed that the framework of dialogic syntax can be applied to various kinds of studies, e.g., studies on language acquisition or those on our knowledge of grammatical elements such as prepositions. The method used in this chapter will facilitate the development of grammatical studies based on actual language use in dynamic, interactional contexts.

Part III

Chapter 8

Discussion

This chapter reviews the case studies in Chapters 4–7, and examines how cognitive and contextual/interactional factors integrally motivate the behavior of prepositions in each case. This chapter also considers the methodological and descriptive importance of this study and discusses theoretical implications for future research.

8.1 Summary

This section briefly summarizes the case studies in Chapters 4–7. The first case study, Chapter 4, examined the usage of *influence on/over* in the British National Corpus (BNC), demonstrating that the preposition *on* tends to be selected when both the influencer (INF-er) and the influence-ee (INF-ee) are inanimate, while *over* tends to be used to express situations in which an animate/agentive INF-er influences an inanimate INF-ee. These tendencies can be explained based on the spatial senses of the prepositions *on* and *over*; therefore, they can be considered to be motivated by our spatial cognition. However, some aspects of their behavior, e.g., the grammatical differences between the noun phrases *influence on* and *influence over*, do not seem to be fully explained or predicted solely by the spatial senses of the prepositions *on/over*. To be more specific, *influence over* is more likely to occur in an object noun phrase of a transitive verb (in particular, verbs of possession or power execution such as *have*, *exert*, *exercise*), whereas *influence on* more frequently occurs in a copula

construction. These results imply that the entire phrases *influence on* and *influence over* each have status as a unit, and are also included in larger constructions such as [Agentive INF-er + Verbs of possession/power execution + *influence over* + Non-agentive INF-ee]. Speakers/writers might use the expressions, *influence on* or *influence over*, based on this constructional knowledge.

The second case study, Chapter 5, examined the behavior of the prepositional phrases headed by *under* in discourse contexts. Based on quantitative research using the BNC, this study demonstrated that *under* phrases tend to occur as clause-level modifiers and in clause-initial position. These grammatical tendencies are not observed when *under* phrases express spatial senses. This study then suggested that these tendencies are likely to be motivated by the semantic characteristics of abstract uses of *under* phrases, which tend to represent conditions of events, and also by their discourse functions to connect the preceding and the subsequent parts of discourse.

Chapter 6 examined the behavior of *above* and *below* for discourse reference, which is one of the metaphorical/extended uses of *above/below*. This study demonstrated that *above* and *below* tend to co-occur with different types of words and occur in different grammatical constructions, even though they are considered to be an antonymic pair and behave relatively symmetrically when they express spatial senses. This study suggested that their different tendencies (i.e., asymmetric behaviors) might reflect the differences between the preceding and subsequent parts of a discourse for the readers and writers. That is, writers attempt to organize a discourse in consideration of the readers' cognitive status, thereby leading to the asymmetric behavior of *above* and *below*. This study shed light on the interactional/communicative characteristics of written discourse, demonstrating that these can be major factors in shaping the typical use of prepositions in a specific genre.

As shown above, Chapters 4–6 have analyzed adults' use of prepositions. In

contrast, Chapter 7 analyzed conversational data between children and their parents based on the theory of dialogic syntax. This chapter demonstrated that children tend to begin producing prepositions through resonating with the previous utterances produced by their parents, and they tend to expand their span of resonance as they grow up. These results suggest that children come to understand how to use prepositions and start producing them depending on the utterance sequences, which are motivated by communicative/interactional purposes.

8.2 How do Cognitive and Contextual Factors Interact with Each Other?

Based on the case studies in previous chapters, this section discusses how cognitive and contextual factors interact with each other and motivate the behavior of prepositions (or prepositional phrases).

8.2.1 Cognitive Basis of the Behavior of Prepositions

First, this section examines cognitive factors. The case studies in Chapters 4 to 7 have explained some behaviors of prepositions based on the theory of metaphor and the embodied view of language, as proposed in previous studies (e.g., Brugman 1981; Lakoff 1987; Boers 1996; Tyler and Evans 2001, 2003). To be more specific, the case studies have shown that (i) semantic extensions to abstract senses might occur based on their spatial senses, (ii) the characteristics of the spatial senses of a preposition are reflected in its abstract sense, and (iii) children's use of prepositions tends to start from spatial senses.

Let me provide further explanations for these three points. As summarized in (i), it can be assumed that the process of semantic extension itself is motivated by the metaphorical mappings between spatial and abstract domains, as proposed by previous studies of

prepositions. For instance, the meanings of the prepositions *on* and *over* are extended to the control sense (as shown in Chapter 4) based on characteristics of their spatial senses, which typically express vertical relations between two things that are close to (or in contact with) each other. This explanation can be supported by the fact that *above*, which typically expresses the vertical relation between two things distal to each other, is not extended to the control sense.

In addition, as summarized in (ii), the characteristics of the abstract use of prepositions correspond to, and might be further motivated by, the characteristics of their spatial senses. For instance, the semantic differences between *influence on* and *influence over* have aspects that correspond to the differences between the spatial senses of *on* and *over*, and thereby seem to reflect our spatial cognition. Moreover, the symmetric aspects observed in the use of *above* and *below* for discourse reference might also be derived from their symmetric characteristics in their spatial senses.

Furthermore, as shown in (iii), we have observed that children begin to use prepositions with spatial senses (e.g., *over there*, *put it in*), not abstract/metaphorical senses. The theory of metaphor and the embodied view of language can offer explanations for these phenomena.

8.2.2 Contextual Basis of the Behavior of Prepositions

In addition to the cognitive factors, some behaviors of the prepositions focused on in this thesis cannot fully be explained only by metaphor; rather, they seem to be shaped and conventionalized based on usage. The case studies in this thesis have identified at least four contextual factors that play a crucial role in determining the behavior of each preposition.

8.2.2.1 Forming Constructions with Frequently Co-occurring Elements

The first contextual factor that plays a crucial role in determining prepositions' behavior is the interaction between prepositions and their frequently co-occurring elements. As shown in Chapter 2, the repetition of strings of elements leads to the emergence of chunks, or constructions. This section reviews the results of the case studies in previous chapters in terms of the relationship between prepositions and their co-occurring words in detail, and examines the role of constructions.

Chapter 4, as briefly reviewed in the preceding section, examined the differences between *on* and *over* when they co-occur with the noun *influence*. The differences between the expressions *influence on* and *influence over* might partially be motivated by the differences between the spatial senses of *on* or *over*, as explained above. However, the results in Chapter 4 also demonstrated that the grammatical differences between *influence on* and *influence over* cannot fully be explained by the characteristics of their components. Speakers seem to use these expressions based on the knowledge of larger constructions in which they typically appear (e.g., [Agentive INF-er + Verbs of possession/power execution + *influence over* + Non-agentive INF-ee]), which might be conventionalized through repetitions in usage, rather than speakers selecting *on* and *over* based on their spatial senses each time. This implies that speakers' mental representations of prepositions are not stored by themselves but rather are stored and accessed with the prepositions' co-occurring words and with the constructional schemas in which they frequently occur.

Although Chapter 5 did not examine data from the constructional viewpoint, the usage of *under* in the conditional sense is also closely associated with constructional knowledge. Examples (130), (131), and (132) below are typical examples of the conditional sense of *under*: the *under* phrases occur as clause-level modifiers and the complements of

under are abstract nouns associated with some kinds of power (*a Labour government, this threat, Ford's influence*), and so can easily be interpreted as having some influence on an event.

(130) *Under a Labour government*, this committee would become an official inquiry into electoral reform. [BNC]

(131) *Under this threat*, Churchill sent a long reply on 28 November, ... [BNC]

(132) *Under Ford's influence*, Jaguar is placing heavy emphasis on building the car efficiently, speedily and at low cost. [BNC]

As in these sentences, when *under* phrases are interpreted in the conditional sense, they often occur in the form [*under* + nouns of power (+ comma) + main clause]. And vice versa: when *under* phrases appear in this form, they are usually interpreted with the conditional sense. The conditional reading of *under* is thus considered to be paired with this form, and the grammatical behavior of *under* in the conditional sense might be determined by this constructional knowledge.

The results of the study of the discourse-deictic use of *above/below* also suggest the importance of conventionalized patterns. Chapter 6 demonstrated that *above* tends to occur in the pattern [verbs of speaking (past-participle form) - *above*] (e.g., *as mentioned above*) while *below* frequently occurs in the verb phrase *see below* and in the predicate of passive sentences; that is, *above* and *below* used for discourse reference are used in different types of constructions with their frequently co-occurring words. These constructions might originally have been shaped by the characteristics of the preceding and subsequent parts of a given discourse, i.e., motivated by the functional differences between anaphora and cataphora, as suggested in Chapter 6. However, once such conventionalized patterns are formed, people

tend to use words (*above* or *below* in this case) in these conventionalized ways; this might have magnified the asymmetrical behavior between *above/below* shown in Chapter 6. That is, in speakers' knowledge, the units such as [verbs of speaking (past-participle form) - *above*] or *see below* might be more salient than the individual words *above/below*, and the characteristics of speakers' mental representations would cause the different behaviors between *above/below*.

These case studies suggest that prepositions tend to be used as part of larger patterns/constructions, and that the mental representations of prepositions include information about their co-occurring words and these constructions. Even though the spatial senses of prepositions motivate the formation of the constructions, the ways in which prepositions are used in discourse contexts are not directly determined based on their spatial senses, but rather based on constructional knowledge. These studies demonstrate the importance of examining not only the senses of the prepositions themselves but also how they interact with frequently co-occurring items and contribute to shaping larger constructions.

8.2.2.2 Organization of Discourse and Communication in Written Texts

The second contextual factor that plays a key role in determining the behavior of prepositional phrases is the way discourse and communication are organized between readers/writers in written texts.

In the case of *under* phrases, their tendency to occur in clause-initial position is considered to reflect a common structure in discourse. As shown in Ford's (1993) study, cited in Chapter 5, conditional adverbial clauses like *if* clauses occur before main clauses more frequently than other types of adverbial clauses. In addition, observing the actual usage of

under phrases with a conditional sense, we notice that *under* phrases frequently include anaphoric expressions and tend to have a strong connection to the preceding sentences. These tendencies imply that the position of *under* phrases in the clause is motivated by their discourse function to connect the preceding and the following discourse.

Compared with spoken discourse, written discourse had been considered static, i.e., in written discourse, dynamic interactions do not occur and language users do not change their way of using prepositions dynamically depending on communicative reasons. However, even though written texts are not formed dialogically, writers usually attempt to organize the texts in such a way that readers easily and correctly understand their intentions. The process of organizing discourse might have contributed to shaping the grammatical behavior of *under* phrases with a conditional sense, and also to the asymmetries between *above/below* in formal written texts. This implies that not only linguistic contexts but also communicative strategies adopted by writers play a crucial role in shaping the frequently used patterns of prepositions, which can then become conventionalized as part of grammar.

8.2.2.3 Genres and Communication Environment

The third contextual factor I identified relates to the characteristics of genres in which prepositions occur. The linguistic differences between genres have been investigated for a long time (e.g., Ferguson 1977, 1983, 1994; Biber 1986; Kuiper 1996; Halliday and Matthiessen 2004; Fischer 2015), and the importance of the communication environment in shaping grammar has been argued in recent studies as well, especially in those based on a usage-based view of grammar. For instance, Iwasaki (2015) proposed the model of ‘multiple grammar’, claiming that:

“although conversation, one type of spoken language environment, plays a crucial role in the emergence of grammar, for some speakers in a literate society, the written language environment may also contribute to developing a grammar. The two language environments are expected to provide unique incentives to shaping grammar differently as they diverge greatly in terms of media types (sound vs graph), constraints (online processing vs detachment), and purposes (interaction vs ideational formation), among others. At the same time, speakers may come in contact with and acquire additional sets of grammar for specific genres” (Iwasaki 2015: 161).

Iwasaki (2015), as explained here, proposed that different kinds of grammar are shaped in spoken/written language environments and we use different sets of grammatical knowledge depending on the genre. This model suggests that the behavior of prepositions, too, can differ according to the communicative environment in which they occur.

The case study in Chapter 6 examined the usage of *above/below* that is observed only in a specific genre, in this case, in formal written texts; therefore, the behaviors of *above/below* observed in Chapter 6 could be analyzed in relation to the characteristics of the genre. In formal written texts such as academic papers, the writers have to organize their arguments logically to explain complex content, whereas in our everyday conversations, we are more likely to have the goal of building/maintaining social relationships. Corresponding to this purpose, the writers tend to use anaphoric and cataphoric words differently, in ways that help clarify the discourse structure so that readers can easily understand the content. This writing strategy in formal texts might shape the conventionalized behaviors of *above/below*, which are specific to the genre. In this way, it can be assumed that the characteristics of a genre, too, can influence the behaviors of prepositions in the genre, and can lead to the formation of conventionalized usage patterns specific to the genre.

8.2.2.4 Utterance Sequences in Conversations

The fourth contextual factor is utterance sequences in spoken discourse. The case study in Chapter 7 demonstrates the importance of this factor by examining children's use of prepositions from the perspective of resonance. This study showed that children tend to start producing prepositions by resonating with the previous utterances, and they gradually acquire constructional knowledge through expanding their range of resonance as they grow older. In addition, this study demonstrated that (i) adjusted utterances by caregivers help children become able to acquire prepositions based on resonance, and (ii) immediate feedback by caregivers helps children understand how to use prepositions in larger constructions. This process indicates that resonance could provide children with scaffolding (cf. Vygotsky 1978), which supports children in improving their linguistic ability step by step.

Thus, relations between utterances can be considered important factors in facilitating children's acquisition of the usage of prepositions, as well the internal structure of individual utterances and the characteristics of discourse itself (e.g., genres, communication modes). The results of this study strongly suggest that our grammatical knowledge is organized based on actual, specific uses in discourse, influenced dynamically by their local contexts.

In sum, as discussed in this section thus far, not only cognitive but also various contextual factors motivate the behavior of prepositions in language use. Semantic extensions of prepositions might be motivated by our cognitive tendencies; however, after the meanings of prepositions have been extended to metaphorical senses, the behaviors of the prepositions in metaphorical meanings are determined and gradually conventionalized through usage, based on their metaphorical senses themselves, their functions in discourse, and the characteristics of communicative environments in which they are used.

8.3 What are the Meanings of Individual Words?

The previous section discussed the way various kinds of factors integrally motivate the behavior of prepositions, reflecting the complex structures of the networks of our linguistic knowledge, which are organized based on our cognition and usage. Based on these arguments, this section will consider what the meanings of words are.

As discussed in section 8.2, language users might store knowledge of prepositions with adequate contextual information such as frequently co-occurring words, discourse structure, genres/communicative situation, and the patterns of utterance sequences. These contextual factors influence the way prepositions are used in a particular sense or in a particular communicative environment, and contribute to forming conventionalized patterns in which prepositions occur. Thus, it seems that individual ‘words’ are not the basic unit of our language use, or of our mental representations of linguistic elements that convey meanings. Instead, language users have the rich knowledge of concrete ‘patterns’ including prepositions (some of them are highly schematic and others can be more specific strings of words), which are organized and entrenched in their contexts of usage.

It is possible for linguists to describe the semantic networks of polysemous words to explain the cognitive process behind the semantic extensions; however, the networks do not necessarily correspond to speakers’ mental representations of the words. Even though the process of semantic extension and the behavior of prepositions in abstract senses are motivated by their ‘original’ meanings, language users do not usually care about what the ‘original’ meaning is, or how an abstract sense is associated with the ‘original’ one. Rather, individual senses of a preposition (e.g., the spatial sense and conditional sense of *under*) might be stored separately in speakers’ mental representation, as part of different patterns

organized based on different usage contexts. In other words, speakers' knowledge of prepositions is stored based on patterns organized in actual use, and new patterns are also created through combining existing patterns or expanding them through analogical reasoning. For instance, the knowledge of the conditional sense of *under* might be associated with that of other conditional expressions like *if* clauses, as well as (or rather than) the knowledge of its spatial senses, and its relation to other conditional expressions might determine the grammatical behavior of *under* phrases in the conditional sense.

Furthermore, speakers' production of prepositions is also context dependent. That is, the knowledge of prepositions is activated based on contextual cues, not on other senses associated with the same preposition. For instance, as shown in Chapter 7, children tend to start using prepositions based on resonance, i.e., contextual cues from the prior utterances. Moreover, when Alex (one of the children focused on in Chapter 7) was age 1;8, for instance, he always used the phrase *over there* if his mother asked him about the location of something regardless of the actual location of the entity. In this case, the communicative context such as 'his mother asks him about the location of an entity' might work as a trigger, and he may access the knowledge of the pattern *over there* based on that contextual cue.

This thesis thus proposes that the behavior of prepositions in use can be determined only in terms of their relationships with other elements in the discourse context. We might not be able to define the meanings of individual words by themselves, or to represent them as abstract schemas; rather, the meanings of words have emerged as the accumulation of concrete patterns in language use, and the meanings are also conveyed by the patterns, i.e., by units larger than individual words, even though the usage does not seem 'irregular' or 'idiomatic' at all.

8.4 Methodological/Descriptive Importance and Theoretical Implications

This section considers the methodological and descriptive importance of this thesis, and also discusses its theoretical implications.

8.4.1 Methodological/Descriptive Importance

This thesis gives methodological and descriptive insights into previous studies of prepositions. First, this thesis has introduced methods and theoretical frameworks for investigating the behavior of prepositions based on dynamic discourse/interactional contexts. As discussed earlier, previous studies of English prepositions in the field of cognitive semantics have tended to examine structured examples created by the authors, which are usually stand-alone sentences. In contrast, this thesis has observed the actual use of prepositions in corpora, and characterized them with information about the contexts in which prepositions occur. For instance, the case study in Chapter 5 explained the grammatical tendencies of *under* phrases based on their discourse functions. Chapter 6 examined the asymmetric behaviors between the discourse-deictic uses of *above* and *below*, considering their motivations from the perspective of typical structures of formal written text. Chapter 7 explored the characteristics of children's use of prepositions in relation to utterance sequences. These case studies expanded the scope of analyses of prepositions from the sentence-level to the discourse-level, demonstrating that the behaviors of prepositions are influenced by discourse-level factors.

Second, this thesis presented empirical ways of identifying characteristics of prepositions with quantitative, as well as qualitative, evidence, using some methods developed in corpus linguistics. Previous studies on prepositions tend not to be based on quantitative research; in contrast, all of the studies in this thesis quantitatively identified the characteristics of each preposition. For instance, Chapters 4–6 showed the differences in

synonymic prepositions (e.g., *on-over*, *below-under*) and the asymmetric behaviors of antonymic prepositions (e.g., *over-under*, *above-below*) based on frequencies in the BNC, using statistical data such as *t*-scores. Moreover, Chapter 7 described the characteristics of children's use of prepositions in each month based on the rates of resonance. The analysis of conversational data is often qualitative rather than quantitative, because it might be considered hard to 'calculate' the characteristics of dynamic interactions or utterance sequences. The case study in Chapter 7, in contrast, has provided a methodology for quantitatively analyzing the usage of prepositions in conversations, highlighting the role of the immediately co-occurring utterances. The method of calculating the rates of resonance can be applied to various linguistic units in spoken data, and can thereby facilitate the development of studies of grammar in spoken discourse.

Third, this study sheds light on the grammatical tendencies of each preposition. Even though Cognitive Grammar theoretically proposed that forms of linguistic units are motivated by their meanings, previous studies of prepositions have paid little attention to their grammatical behavior (i.e., formal characteristics). In contrast, Chapter 4 of this thesis examined not only the co-occurring words but also the grammatical behavior of *influence on* and *influence over*, demonstrating the differences in behavior of the grammatical patterns in which they typically occur. Chapters 5 and 6 also demonstrated the grammatical characteristics of *under*, *over*, *above*, and *below*, showing that their semantic/functional differences are reflected in their grammatical behaviors. These findings show the importance and richness of constructions/conventionalized patterns in our knowledge of words such as prepositions; such conventionalized patterns are stored and can convey meanings as a whole.

This study thus combined the insights of various linguistic fields (e.g., cognitive linguistics, corpus linguistics, discourse-functional linguistics, and language acquisition), analyzing the behavior of prepositions using multiple sources. The methods and perspectives

in this thesis can be applied to various linguistic elements other than prepositions. They will contribute to future dynamic grammatical studies, i.e., context-dependent and discourse-based analyses of grammar, based on quantitative evidence.

8.4.2 Theoretical Implications

This study also has theoretical implications for various linguistic fields. First, for studies of English prepositions, this study emphasizes the role of usage contexts in forming our knowledge of words. As described in Chapters 2 and 3, traditional studies of English prepositions tend to focus on the general cognitive factors that motivate their semantic extensions. In addition, previous studies have attempted to determine the semantic characteristics of prepositions by themselves in stand-alone sentences. In other words, they tend not to examine the interactions between the meanings of prepositions and the contexts in which they occur. Although Cognitive Grammar was proposed as a usage-based theory, the usage context and speakers' grammatical knowledge, formed along with contextual information, have not been examined in detail in studies of polysemy. In contrast, this thesis highlighted the importance of contextual information in analyzing the usage of prepositions. The case studies in Chapters 4 through 6 demonstrate that conventionalized patterns including prepositions are dynamically shaped by the usage context. Moreover, the case study in Chapter 7 demonstrated that immediately co-occurring utterances play a crucial role in children's acquisition of grammatical patterns that contain prepositions. These case studies suggest that speakers' knowledge of prepositions is formed, and also activated, based on contextual information. Examining various contextual factors will thus contribute to the studies on prepositions, and also facilitate further development of Cognitive Grammar as a usage-based theory.

Second, the discussions in Chapters 6 and 7 demonstrate the close relationship between the grammatical behavior of lexical items and the environments in which they occur, such as specific genres or communicative situations. These case studies emphasize the importance of paying attention to the varieties of usage of single lexical items/constructions, and the importance of examining them in terms of ‘context’ in a broader sense, not just their co-occurring words but also the larger communicative environment. These studies show the interface between cognitive linguistics and discourse studies that focus on genres; this implies that the close examination of linguistic elements based on a dynamic view of grammar might contribute to the development of genre studies as well.

Third, the discussion in Chapter 7 also provides important implications for children’s language acquisition. This study showed that not only the frequency of input from caregivers in a specific period but also resonance, i.e., the relation of an utterance to its immediately co-occurring utterances, facilitate children’s acquisition of prepositions. The study highlights the importance of local context, which is closely associated with the functional/interactional aspects of language use, in shaping children’s grammatical knowledge.

To sum up, the case studies of this thesis demonstrate the importance of analyzing prepositions not only from a viewpoint that considers the cognitive basis of language but also from one that considers the dynamic interactions. Previous studies of prepositions have tended not to analyze them in relation to usage contexts. In contrast, this study has emphasized the context-dependent characteristics of prepositions, which pertain to the interface between grammar and social interaction. The results of this study will provide insights for studies of prepositions, discourse/genre, and also language acquisition. In addition, they will facilitate the development of grammatical studies from a dynamic view, which can highlight the dynamic and interactional nature of language use as a source of

grammatical structures.

Chapter 9

Concluding Remarks

9.1 Importance of a Dynamic View of Grammar

This thesis conducted quantitative research on the actual use of prepositions, demonstrating that their behavior is motivated not only by general cognitive factors but also by discourse context in social interactions. The case studies in this thesis examined the interface between embodied cognition (especially spatial cognition) and dynamic usage, based on adults and children's language data. The term 'context' here includes various kinds of elements, such as frequently co-occurring words, discourse organization, characteristics of genres, and utterance sequences. This thesis emphasized the role of these contextual factors in shaping the behavior of prepositions and in organizing constructional patterns including prepositions.

Based on the case studies on prepositions in their discourse context, this thesis proposed that (i) the meanings of linguistic expressions tend not to be conveyed by the 'word' unit but rather by larger constructions embedded in specific communication environments, (ii) our linguistic knowledge is not necessarily stored in 'word' units, and (iii) the behavior of an individual 'word' is determined and heavily conventionalized depending on the contexts in which it occurs. The theoretical framework and methodology of this thesis can be applied to studies of various kinds of lexical items and grammatical constructions as well. This study is situated at the intersection of various research fields, such as cognitive linguistics, discourse-functional linguistics, interactional linguistics, genre studies, dialogic syntax, and language acquisition. All of these fields of study can be connected to each other through the

notion of ‘usage’. We use language mainly to communicate with each other, and our interactional purposes shape the essential parts of our grammar. This study thus contributes to the development of various studies based on the usage-based view of grammar, and to our understanding of the characteristics of our linguistic communications.

9.2 Future Issues

This thesis has examined a limited number of prepositions to identify their characteristics in detail. For a more general discussion, it would be necessary to expand the scope of research to other prepositions, other grammatical categories, and constructions larger than single words. One possible future study would be to develop the research of resonance based on Chapter 7. The case study in Chapter 7 examined children’s use of prepositions from the perspective of resonance; however, it yet to be determined which tendencies are unique to prepositions and which are more general, i.e., observed in other word classes such as verbs and nouns. As discussed in Chapter 1, the meanings of prepositions seem to be more context-dependent compared with those of verbs or nouns. In future research, it might be effective to apply the method of examining resonance to other grammatical categories such as verbs and nouns, or to linguistic units larger than single words, and then compare their processes of acquisition with those of prepositions.

Moreover, the scope of ‘context’ examined in this thesis was also somewhat limited. For instance, the study in Chapter 7 did not closely examine non-linguistic elements such as movements or eye gaze. These are essential to the interactions between children and caregivers, because it is sometimes hard for children to convey their intentions through language alone. In addition, in this thesis, the social relations between interlocutors and their influence on language have not been examined in detail. For instance, children’s language

use can differ depending on who the interlocutor is, e.g., mother, father, brothers/sisters, or friends. If we extend the scope of ‘context’ and examine its influence on concrete linguistic phenomena, we can elaborate the dynamic view of grammar, and apply it to analyses of grammatical structures in various communicative situations.

Furthermore, the dynamic view of grammar of this thesis is compatible with the view of ‘multiplicity in grammar’ by Iwasaki (2015), as mentioned in Chapter 8. This is a relatively new model and Iwasaki focused mainly on introducing the theoretical framework, so it has not been clearly identified (i) what kinds of ‘multiplicity’ can be observed in a language, and (ii) how the multiplicity corresponds to and is motivated by the characteristics of a specific communicative environment. While this thesis focused on the grammatical varieties of prepositions in particular, depending on the communicative environment, such varieties can also be observed for lexical items other than prepositions. If more case studies are conducted in an attempt to answer the questions above, the study of grammar from a dynamic view will be further developed.

Thus, closer examination of the relationships between linguistic phenomena and co-occurring contexts will facilitate the development of the dynamic view of grammar, in which the dynamic nature of language use is not considered to be a peripheral element but rather a core element in shaping grammar.

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