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指導教授：鍾曉芳 博士

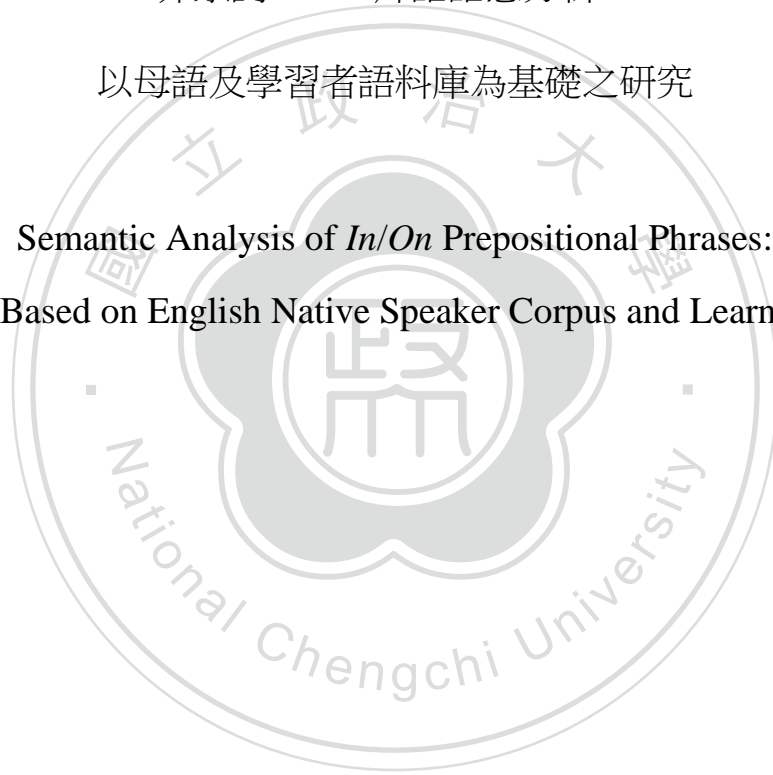
Advisor: Dr. Siaw-Fong Chung

介系詞 *In/On* 片語語意分析：

以母語及學習者語料庫為基礎之研究

Semantic Analysis of *In/On* Prepositional Phrases:

A Study Based on English Native Speaker Corpus and Learner Corpus



研究生：曾郁雯 撰

Name: Yu-Wen Tseng

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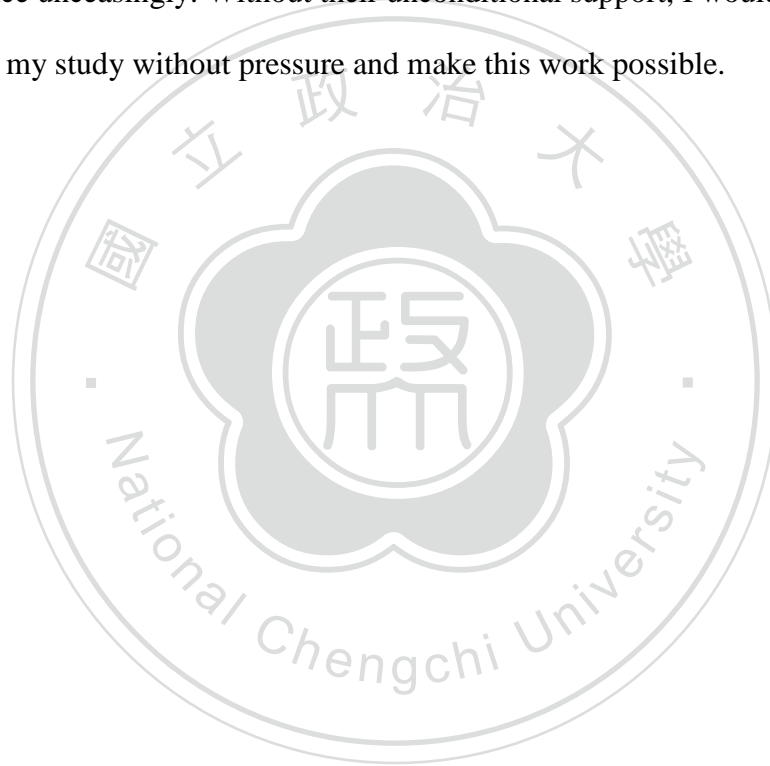
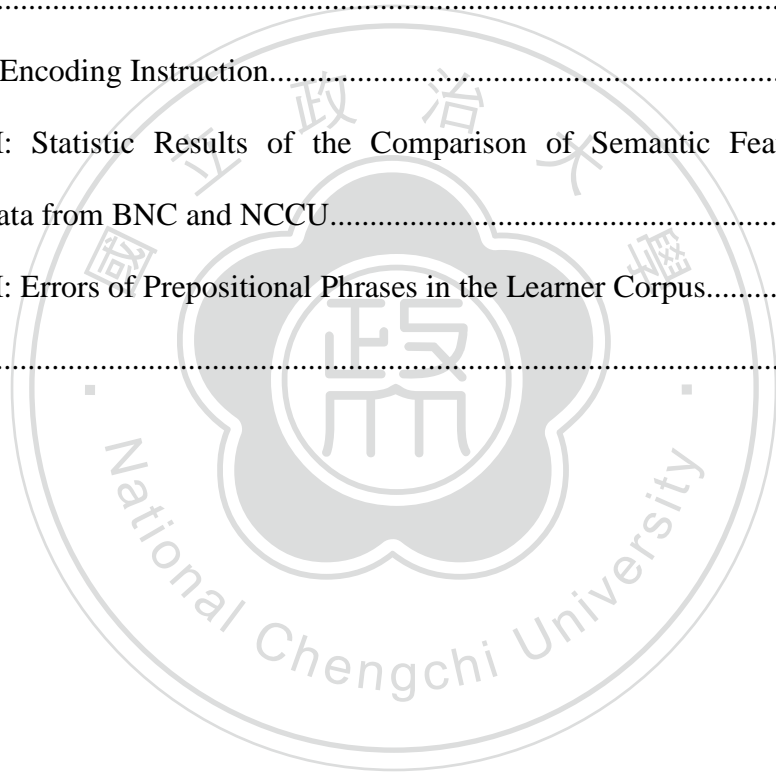


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國立政治大學英國語文學系碩士班

碩士論文提要

論文名稱：介系詞 *In/On* 片語語意分析：以母語及學習者語料庫為基礎之研究

指導教授：鍾曉芳博士

研究生：曾郁雯

論文提要內容：

過去多數英文介系詞語意之研究皆以介系詞為多義詞，並藉由語意網絡去分析其詞義(e.g. Lindner, 1983; Tyler and Evans, 2001)，或透過意象圖式理論(image schema theory)來探究介系詞語意，依不同的前景名詞(figure)與背景名詞(ground)組成可產生不同的形貌結構，從而衍生出其特殊語意(e.g. Lakoff, 1987)。然而，有關介系詞片語中詞彙搭配詞組如何影響介系詞使用之研究則較不多見。故本論文著重在分析前景與背景名詞等搭配詞組之語意特徵，探究其對介系詞 *in* 和 *on* 語意及介系詞片語組成之影響。以英國國家語料庫(British National Corpus)和政治大學外語學習者語料庫(The NCCU Foreign Language Learner Corpus)作分析，比較學習者與以英語為母語者使用 *in* 和 *on* 介系詞片語在語意上的差異。

本研究共分三部分。第一部分的詞義分析比較學習者與母語人士在使用 *in* 與 *on* 之詞義之異同，在介系詞 *in* 的部分，學習者與母語人士語料相較之下僅有細微的差異，多數語料皆為原型場景(proto-scene)之詞義的使用。介系詞 *on* 的詞義使用則稍有不同；學習者較傾向作具體位置的指涉，然母語者則較傾向呈現此介系詞的抽象意涵。第二部分的語意特徵分析則比較介系詞 *in* 和 *on* 在具體(literal)與抽象(metaphorical)片語組成上，前景與背景語意特徵之異同。研究結果顯示不同的介系詞片語會由特定類型的前景與背景名詞組成，故在組成不同語意之介系詞片語時，特定語意特徵出現的頻率會呈現顯著性地差異。第三部分為學習者語料的錯誤分析，探究學習者誤用 *in* 和 *on* 介系詞片語之情形。

綜合上述研究結果可得知，組成介系詞片語的名詞詞組會依上下文語意而產生不同之語意偏好(semantic preferences)，介系詞的語意除了會受到後接名詞的影響，周圍名詞也可能造成語意上的差異。這些名詞可能會選擇特定的介系詞

來使用，亦會影響介系詞在片語中之語意。

本論文深入地探討了介系詞片語詞組之組成，透過大量的語料分析，為英語介系詞複雜的語意層面提出了一個較系統化且完整之解釋，期能將研究發現應用於教材設計上，希望能在學習介系詞使用上有所幫助，也供未來介系詞相關研究作為參考。

關鍵字：第二語言習得、BNC 英國國家語料庫、英文介系詞、學習者語料庫、語意分析



English Abstract

The meanings of English preposition have been explored greatly through vast directions of research. Most studies agree that preposition is a polysemous lexical item whose senses can be construed from the semantic network (e.g. Lindner, 1983; Tyler and Evans, 2001). Its senses has also been examined under the image-schema theory from the cognitive perspective (e.g. Lakoff, 1987), in which the figure (or trajector) and ground (or landmark) interact differently to form various configurations that contribute to sets of distinct senses. Though these studies attempt to provide a comprehensive network for the meanings of prepositions, how the semantic features of the figure and ground might influence the choice of a preposition and the construction of a prepositional phrase is hardly seen. The thesis adopted a native speaker corpus (British National Corpus, BNC) and a learner corpus (The NCCU Foreign Language Learner Corpus, NCCU) to probe into how the semantic features of the figure and ground nouns can help explicate the semantic profiles of the preposition *in* and *on*, and to compare learners' understanding of them with that of the native speakers'.

Based on the corpora, the study is composed of three major analyses. The sense analysis compared the sense distributions of *in* and *on*, from which similarities and differences may be found between BNC and NCCU. The result of this analysis showed that in the sense categories of *in*, the distribution did not differ greatly since most of the data were categorized into the proto-scene sense in both BNC and NCCU, and only slight variations could be found in other categories. In the sense categories of *on*, in senses that refer to location, higher frequency could be found in NCCU, while more metaphorical constructions of *on* were identified in BNC. In the second analysis, the semantic feature analysis, the distribution of the semantic features are compared between literal and metaphorical constructions of *in* and *on* and between BNC and NCCU respectively. For the comparison of *in* and *on*, the statistical results showed that different types of nouns could be observed in the data of particular prepositions. Thus, for nouns in prepositions of different meanings, there may be significant differences in the semantic features identified in these nouns. This result implied that the nouns surrounding a preposition might have some influences toward the meaning of this preposition. In the third analysis, the errors in the learner data were identified and examined.

Based on the results, we proposed that in a prepositional phrase formed by a particular meaning of a preposition, there exist a range of semantic preferences shown in their co-text. The meanings of a preposition are influenced by the lexical words surrounding the preposition, rather than by the word that goes after the preposition

(the ground). This thesis extends from the previous studies on the semantics of prepositions and includes the important linguistic elements in forming the prepositional phrases in the analysis. By incorporating a large amount of data, it also provides a systematic analysis and a more comprehensive explanation toward the complex semantics of English prepositions. The findings can be applied to the design of English teaching materials and techniques and may hopefully bring some insights to further preposition-related studies.

Keywords: second language acquisition, BNC, English prepositions, learner corpus, semantic analysis





CHAPTER 1

INTRODUCTION

1.1 Background and Motivation of the Study

English prepositions (e.g. *in*, *on*, *across*) are lexical items used preceding nouns, pronouns and gerunds, or after verbs, to show the relationship between them and words surrounding it (Richards, Platt, & Platt, 1992; Oxford English Dictionary, 2009). They are called differently according to their function in the context being used. For example, they are called “particles” when they occur as an element in phrasal verbs, or verb-particle construction (e.g. Morgan, 1997; Darwin & Gray, 1999; Dirven, 2001). They are also called “adverbial particles” (Gardner & Davies, 2007), “spatial particles” (Tyler & Evans, 2003; Ho, 2007) and “spatial prepositions” (Goddard, 2002; Van der Gucht, Willems & De cuypere, 2007) in different studies. As the current study focuses on the meaning of prepositions instead of their grammatical structure, the term “preposition” is used to refer to any positions of this lexical item.

Each preposition carries a number of meanings which are usually listed as lexical entry of the dictionary. For instance, on Merriam-Webster Learner’s Online Dictionary, the entry for *in* contains 21 meanings and *on* contains 32 meanings, which may even differ from dictionary to dictionary. When learners learn the meanings of preposition, they may refer to the entry listed on the dictionary whenever they encounter meanings unclear in context. Moreover, the meanings may cause confusion in use for English learners, and this confusion mainly comes from the complexity of the meaning and usage of prepositions (e.g. Armstrong, 2004; Wierzbicka, 1993), which may be clearly known by native speakers of English but not by nonnative

speakers, including language teachers. This complexity may also cause difficulty in comprehension as some of their senses are obscure from the context, as in (1.1).

(1.1) ?*Because many times I thought I could not to get the goal and I would give in before I try.* (NCCU_E030007)

According to the context given, it seems confusing whether what the writer intended to say was *give in* or *give up*. Moreover, it is not obvious to specify the meaning of *in* and the verb-particle expression in this case unless learners have learned the particular verb-particle construction before.

Due to the semantic complexity of prepositions, efforts have been devoted to the analysis of their meanings. Researchers attempt to explain the meanings through a more systematic way under the framework of image-schema theory (Lakoff, 1987; Kreitzer, 1997; Tyler & Evans, 2001, or see Ungerer & Schmid, 2002), in which the concept of trajector (or figure) and landmark (or ground) is adopted to explicate the meanings. The former one refers to the moving entity while the latter is where this entity moves toward or locates. The interaction between them may help greatly in explaining the various meanings each preposition contains. Some other studies have identified prepositions as polysemous items and have presented semantic networks based on their own categorization (Dirven, 1993; Evans & Tyler, 2004; Goddard, 2002; Taylor, 1993). In addition, many studies have probed into particles or adverbs in the construction of phrasal verbs, especially the seemingly random combination of the verb and the particle (e.g. Armstrong, 2004; Darwin and Gray, 1999; Gardner and Davies 2007; Machonis, 2008; Side, 1990; Villavicencio, 2005). These studies show that the combination of phrasal verbs is not unsystematic, as the meaning of

verb-particle constructions could be systematically related to the meaning of verbs and particles. Rudzka-Ostyn (2003) clarifies particles in phrasal verbs and compounds using the cognitive approach, in which he claims that to understand a phrasal verb, it not only involves comprehending how the verbs of physical or spatial motion could be used for abstract motion, but also the meanings of particles which denote various metaphorical meanings. The complexity of how the senses of particles help explicate the meanings and combinations of phrasal verb has also motivated investigations into avoidance strategy used by language learners in their language production. Avoidance strategy usually occurs when the language structure or usage seems unfamiliar to the learner, and learners might underproduce them to lower their mistakes (Odlin, 1989). Previous studies have proposed different causes for this avoidance phenomena, including L1-L2 differences (e.g. the structural differences between learners' native language and target language), L1-L2 similarity (e.g. L2 word combinations that have equivalents in L1 with identical or specific meaning), and L2 complexity (e.g. the literal and figurative semantic differences that exist in the same structure) (Dagut & Laufer, 1985; Hulstijn & Marchena, 1989; Laufer & Eliasson, 1993; Liao & Fukuya, 2004). For example, Dagut and Laufer found that the structural differences between Hebrew and English may have negative influence on Hebrew learners producing English phrasal verbs. They have addressed different levels of avoidance by language learners varying in different language systems. Though these studies suggested how the meanings of particle play a role in the comprehension of the whole verb-particle construction, they did not specify how particles are chosen for a particular combination. For example, as *out* and *up* can both denote the sense of "completion" (c.f. Neagu, 2007), we say *fill out* instead of *fill up*. In other words, the choice of when to use a particle in a particular linguistic context is still left unresolved, and this

indeterminacy may cause difficulty for learners to correctly use them in appropriate linguistic contexts.

Previous research has attempted to probe into learners' performance on using and choosing prepositions via different methods. They investigated into learners' difficulty in using English prepositions through a particular form of diagnostic tests, (e.g. multiple-choice questions in Cheng (2006) and Khampang (1974); corpus-based analysis in Chung & Tseng (2011)), grammaticality judgment test (Tang, 2009), translation or rephrase task (Boers & Demecheller, 1998), and some instructional approaches from various perspectives, including prototype semantics (Lindstromberg, 1996), cognitive semantic approach (Condon, 2008; Hsu, 2005; Morimoto & Loewen, 2007), and polysemous network (Ho, 2007). These studies revealed learners' difficulty in using English prepositions and suggested that certain approach may indeed facilitate the learning of them. However, though they provide implications for the improvement in teaching, they are not based on a large quantity of language data produced by language learners under a systematic analysis procedure, which may reflect learners' knowledge of the sense and usage of prepositions. De Vega et al. (2002) proposed an Integration Hypothesis which claimed that a multiple-constraint process should be activated to comprehend locative sentences with the sensory-motor features of the objects retrieved and fitted into a simulation that facilitates comprehension. A research method analyzing semantic features of the preceding and following nouns was adopted and the result was used to predict the semantic profiles of the selected prepositions. Inspired by this approach, the present study intends to analyze the semantic meanings of prepositions through the semantic feature analysis. Two of the most frequently used prepositions, *in* and *on*, will be analyzed and compared.

Based on the research purposes of the study, the research questions will be addressed as the following:

- (1) How do corpora help explicate the senses of the prepositions *in* and *on* through semantic feature analysis?
- (2) Is there any significant difference in learners' understanding of prepositions from that of the native speakers' in terms of the semantic meanings the prepositions denote?

1.2 Significance of the Study

Previous studies have indicated the importance of comprehending and learning the meaning of prepositions through a certain approach that categorized the meanings more systematically (e.g. Lindstromberg, 1996; Morimoto & Loewen, 2007). A large quantity of research on the senses of preposition was conducted from the cognitive perspectives, utilizing the concept of image schema, trajector and landmark to describe the interaction of trajector and landmark and the meanings motivated from (e.g. Tyler & Evans, 2003; Neagu, 2007). As the senses of preposition are so complex and difficult to discern, error analysis on learners' performance of English prepositions has been carried out on learners of different language backgrounds, which further testified that the senses of preposition are still confusing for nonnative speakers of English, especially when a set of prepositions can be translated similarly in learners' native language (e.g. Khampang, 1974). With the advent of corpus-based study, researchers compared learners' use of preposition with native speakers' via adopting native speaker corpus and learner corpus as the research tool, through which the frequencies of preposition can be explored, and further semantic and syntactic analysis can be implemented and may possibly provide pedagogical implications for

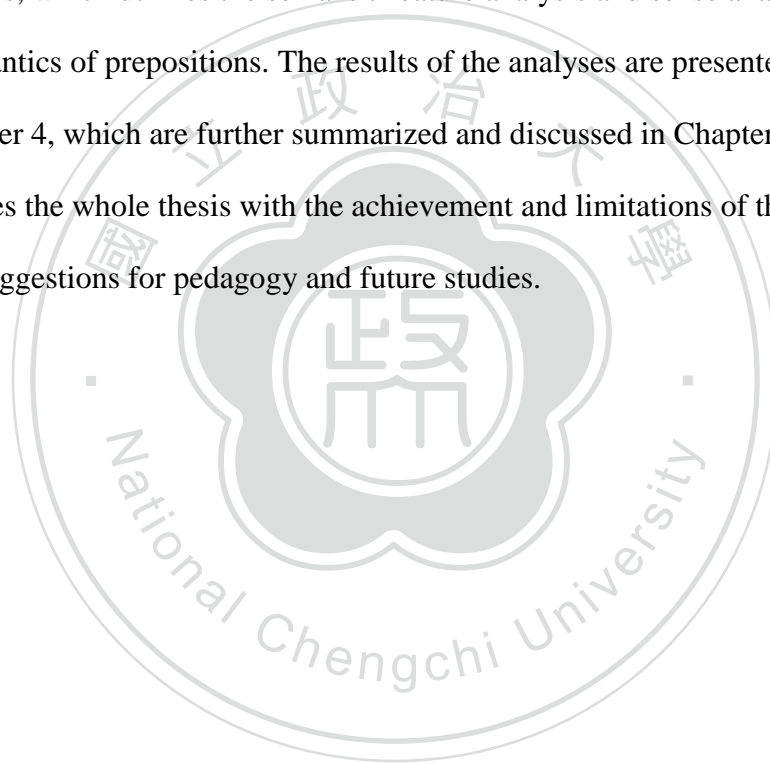
teachers to improve their teaching (e.g. Chung & Tseng, 2011).

However, the sense analysis done by the previous researchers was rather intuitive as they intended to explain the meanings through their self-constructed network based on some semantic theories. The corpus-based study was mostly done through calculating the frequencies prepositions occur in the data without exploring further into their meanings. As De Vega et al.'s (2002) study presented a systematic method of explicating the semantics of preposition through a large quantity of data, the present study intends to follow their hypothesis and adopts a native speaker corpus (the British National Corpus) and a learner corpus (the NCCU Learner Corpus) in order to carry out semantic feature analysis on the nouns that play the role of *figures* and those that are *grounds* in the formation of prepositional phrases with *in* and *on*. Furthermore, as previous studies tend to suggest that a polysemy network can be built for the meanings of preposition, the current study looks into their senses, which will be compared with the results of semantic feature analysis to examine if there is any systematic distribution.

The significance of the present study is that through quantitative and systematic analysis of the nouns involved in the construction with prepositions, it can be used to reflect their holistic semantic profiles and distinctive senses of preposition. Through comparing learners' data with that of the native speakers', researchers can grasp a better understanding of language users' semantic knowledge of this small element in sentence constructions. Moreover, focusing on two of the most frequently used prepositions *in* and *on* may provide suggestions on how to distinguish their senses and the contexts of using them in language teaching and learning.

1.3 Organization

This chapter provides a general introduction of this thesis. In Chapter 2, important studies of the semantic analysis of prepositions, including the sense of prepositions from the cognitive perspective, the semantic network of prepositions and other related studies, are presented. Experimental studies on the learning of English prepositions and the corpus-based studies on native speaker and learners' use of prepositions are also reviewed. Chapter 3 is concerned with the research method of this thesis, which utilizes the semantic feature analysis and sense analysis to analyze the semantics of prepositions. The results of the analyses are presented and discussed in Chapter 4, which are further summarized and discussed in Chapter 5. Chapter 6 concludes the whole thesis with the achievement and limitations of this study as well as the suggestions for pedagogy and future studies.





CHAPTER 2

LITERRATURE REVIEW

As the present study intends to conduct a research on the semantics of preposition *in* and *on* in writing, related studies will be reviewed in this section. Moreover, as De Vega et al.'s (2002) Integration Hypothesis provides the suggestion for viewing the semantic meanings of prepositions comprehensively, the overview of this study will also be given in this chapter. The organization of this section is as the following: how the meanings of preposition were explained (2.1), De Vega et al.'s (2002) study (2.2), corpus-based studies on native speaker's and learners' uses of prepositions (2.3), experimental studies of the learning of English prepositions (2.4), and the summary of this chapter (2.5).

2.1 Semantic Analysis of Prepositions

This section provides an overview of previous studies on the sense analysis of prepositions. As most of the studies probed into the sense of preposition from cognitive perspective, Section 2.1.1 focuses mainly on this direction of research. Section 2.1.2 reviewed studies that emphasize prepositions as polysemy and construct semantic network for the distinctive senses in order to distinguish the senses and contexts of using a particular preposition. In addition to studies from cognitive perspective, those centered on the analysis of sense from other points of view are also reviewed in Section 2.1.3.

2.1.1 Cognitive Perspective on the Sense of Preposition

For high frequency word as preposition, the meanings of it have been interpreted with different approaches. In Tyler and Evans' (2003) review of the distinct meanings of prepositions, the traditional view, which claimed that these meanings are unrelated or are treated as different meanings that accidentally share the same lexical form, was evaluated. For the meaning entries of prepositions in the dictionary, Lindstromberg (2001) examined how the preposition *on* is presented in five advanced learner's monolingual dictionaries. Lindstromberg observed that the sense information listed in the dictionary is misleading, insufficient and sometimes with mismatched examples. The traditional approach was greatly challenged as it ignores the possibility of the relationships among these seemingly distinct meanings of a single lexical form. The following studies thus tried to construct a semantic network that investigates the senses of prepositions from a polysemous point of view (e.g. Lakoff, 1987; Pustejovsky, 1995), which will be discussed in the following section. With regard to polysemization, Taylor (1993) attended to the meaning extension of English prepositions and attempted to distinct prepositional expressions into three important categories: place, path and goal. After this polysemization process, the current researcher suggested three factors that help readers or listeners disambiguate the polysemy of prepositions, including a person's knowledge of the world, the thematic structure of other constituents in a sentence, and the aspectual character of this sentence.

The meaning of prepositions is greatly explored through the image schema theory (Johnson, 1987; Lakoff, 1987) from the cognitive perspective. Based on the spatial constructs they correspond to, as those enumerated by Johnson (1987), including CONTAINER, PATH, PART-WHOLE, POINT, SURFACE, etc., the

senses of prepositions can be revealed. Basically, there is a schematic pattern with an internal structure which exists in every image-schema; for example, for the CONTAINER schema it requires INTERIOR, BOUNDARY and EXTERIOR to construct its framework. Cognitive perspective further claims that metaphorical expressions are instantiated from some basic image-schemata, which will project more abstract concepts and metaphors from its central meaning (Lakoff, 1987).

In addition to the theory of image schema, previous studies on prepositions have focused widely on prepositions as polysemous lexical items whose meanings are mediated from the spatial configuration of trajector (TR, or figure) and landmark (LM, or ground), deriving from its central meaning (e.g. Lakoff, 1987; Kreitzer, 1997; Tyler & Evans, 2001). Trajector (TR) is a moving entity or the most prominent element in the relational structure, while landmark (LM) is the other entity in this relation and is where this entity moves toward or locates. Landmark thus acts as a reference point for the trajector; it can be a surface, a container, or some other schema functioning as a background (Langacker, 1987; Herskovits, 1988). For preposition *in* and *on*, according to Rudzka-Ostyn (2003), the GROUND (LM) noun phrase for prepositional constructions with *in* is seen as a container in which the FIGURE (LM) noun phrase enters, moves away, or being inside. For prepositional constructions with *on*, the GROUND noun phrase acts like a surface for the FIGURE noun phrase to stay, move onto or away from. They are usually connected with image schema theory to mediate the sense of prepositions. Peña (1998) examined metaphors with the prepositions *in* and *out* that express emotions from the aspects of the CONTAINER image-schema. The results indicated that there are mainly three metaphorical systems (PEOPLE ARE CONTAINERS FOR EMOTIONS, ABSTRACT ENTITIES ARE CONTAINERS, and EMOTIONS/EMOTIONAL STATES ARE CONTAINERS)

that instantiate emotional usages with *in* and *out*, and there exists an image-schema interaction for dynamic uses of the CONTAINER metaphor.

The image schema theory has been applied to the explanation of the meanings of particles in phrasal verbs. For example, in Lindner's (1983) study, counter to Fraser's (1976) claim that particles are meaningless in the construction of phrasal verbs, she hypothesized that they carry some part of the meanings in the verb-particle construction. In this study, she analyzed *out* and *up* within the patterns of schematic hierarchy, in which the meanings are unified under a network of semantic extensions. Neagu (2007) further presented a study on *up* and *out*, attempting to analyze them via the cognitive approach. She probed into how the meanings of these two particles are derived from the source domain of space to figurative semantic extensions. For example, for *up*, in addition to its spatial senses of a motion moving from a lower to a higher place and an object in a position higher than others, other senses can be extended from these basic ones. The first derived sense is "reaching a goal, an end, a limit", as in *rush up the bus* and *ran up to somebody*. Upward is usually related to the positive evaluation, as in *cheer up* and *brighten up* (which is opposite to downward that tends to go with negative evaluation). Expressions can be also derived from the metaphor MORE IS UP, LESS IS DOWN, as in *speed up* and *swell up*. Another sense can be derived from the idea that "higher up is more visible, accessible, known", as in examples like *show up* and *turn up*. It may also indicate an object being affected by an action, as in *burn up* and *mess up*. In addition to discussing how the senses can be derived from the basic ones, she further compared the differences between *up* and *out* when they go with *turn*. Slight differences lie within these two phrases, as the former one conveys the idea of spontaneity and unexpectedness, while the latter one relates to the notion of a boundary that has something to do with the sense of privacy. The

similarity and differences between the two particles may be the most confusing part for language learners, and the analysis from the cognitive approach can provide a more systematic way of understanding their senses, which may provide implications in learning these particles.

2.1.2 *The Semantic Network of Prepositions*

As there is an agreement among studies on the senses of spatial preposition that it is polysemous and polyfunctional, several studies attempted to provide the semantic network for prepositions from different perspectives, though there is little consensus on the details of which sense should be included in a network (Sandra and Rice, 1995). A review of the semantic network can reveal that previous studies tended to share the assumption that there is a primary sense associated with the preposition, from which other distinct senses can be extended in a principled way. For example, Lakoff (1987) examined the senses of the preposition *over* and established a chain connected by various schemas that shows the relations among spatial senses of *over* as well as some metaphorical senses extended from the spatial senses. He also elaborated on the importance of natural image-schema transformations that form different categories of senses, for example, the transformation from *path focus* to *end-point focus*. In response to Lakoff's categorization, Kreitzer (1997) tried to constrain the senses of *over* within the polysemy network in a more consistent way via proposing the three levels of schematization, that is, the component level, the relational level, and the integrative level. Kreitzer constrained the complex image-schemata categorized by Lakoff to three image-schemata that are connected at the relational level. In other words, each additional conceptual primitive which is at the component level is viewed as a distinct sense in Lakoff's study, but for Kreitzer these components apply

compositionally at the relational level. Therefore, instead of forming a new distinct sense, the transformations of image-schema simply widen the applicability of a particular sense. However, the three image-schemata and the three basic distinct senses represented were questioned by Tyler and Evans (2001) in that these senses are arbitrarily connected without sharing some common configuration. Moreover, in response to Lakoff and Kreitzer's work, they also claimed that one's understanding of spatial senses of a word is derived from the linguistic antecedents, yet actually it is the contributions of sentential context and our knowledge of the world that construct complex and distinct interpretations of the dynamicity of spatial senses. Therefore, Tyler and Evans posited a principled polysemy framework with the primary sense of *over* as a proto-scene and other distinct senses derived from it.

In addition to those mentioned above, Vandeloise (1994) has provided a detailed comparison of the approaches, including the geometrical, topological and functional approach, for analyzing the senses of prepositions in which the case of *in* was taken as an example for illustration. The geometrical approach focuses on the dimensionality of the preposition, so *in* is usually interpreted to be three-dimensional. The topological approach proposes the inclusion of TR within the LM. The functional approach intends to extend further from the previous two in claiming that there is a force exerted between the container and the contained. Evans and Tyler (2004) further claimed that the lexical structure and organization of words is actually systematic, and meaning extension is a highly motivated process which is grounded in spatial-physical experience. They analyzed the preposition *in* and proposed a partial semantic framework based on the motivated process. In this network, the proto-scene of *in* and other clusters of sense which go beyond the meaning of proto-scene was mapped out, as in Figure 2.1, and a brief explanation of the senses within each cluster

is presented in Table 2.1.

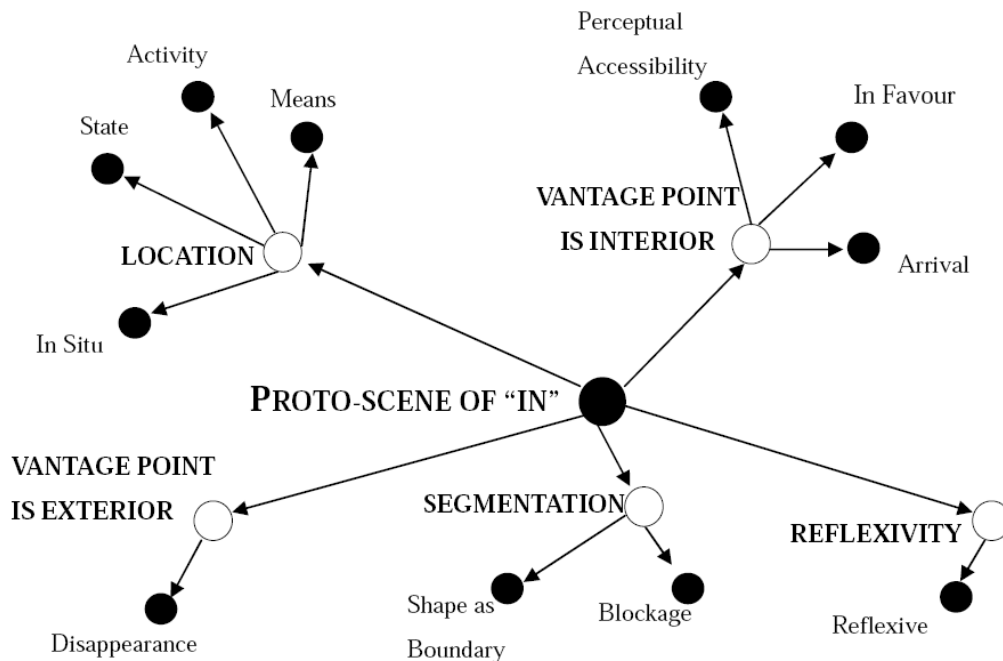


Figure 2.1 The Partial Semantic Network of in (Evans and Tyler, 2004, p.173)

Table 2.1 Explanation of Senses in Evans and Tyler’s (2004) semantic network of in

Cluster	Sense	Explanation	Example
LOCATION	In Situ	TR stayed at the LM for an extended period of time for a particular purpose.	<i>What are you in for?</i>
	State	The state experienced by the entity (TR) in a particular situation (LM).	<i>We are in a state of war.</i>
	Activity	A bounded LM in which the activity done by the TR occurs.	<i>She’s in medicine.</i>
	Means	The relation between a particular activity and the means of accomplishing this activity.	<i>She wrote in ink.</i>
VANTAGE POINT IS INTERIOR	Perceptual Accessibility	The experience being located within the LM, and the TR and interior space delimited by the bounded LM.	<i>I have him in sight.</i>

	In Favour	The TR gains access to certain kinds of bounded LM.	<i>He managed to get in the stadium, even though places were limited.</i>
	Arrival	The experience located inside LM, seeing the TR coming from outside to be located in LM.	<i>The train is finally in.</i>
VANTAGE POINT IS EXTERIOR	Disappearance	The boundary of the LM obstructs the observer's view of the interior and its content.	<i>Angela rubbed in the lotion.</i>
SEGMENTATION	Shape As Boundary	The shape of the LM constitutes both the entity and the boundary.	<i>Can you get in line.</i>
	Blockage	The boundary LM prevents the TR from moving beyond it.	<i>Oxygen must be held in a sealed container.</i>
REFLEXIVITY	Reflexive	The sides (TR) of the container move inwards and eventually occupy the original interior space (LM).	<i>The walls of the sandcastle fell in.</i>

Following Evans and Tyler's (2004) semantic network of *in*, Ho (2007) combined different proposals (Beitel et al., 1997; Evans, 2006; Garrod et al., 1999; Lindstromberg, 1996, 1998) for the senses of *on* and developed a semantic network for *on*, as in Figure 2.2, and the explanations of each sense within the clusters of Ho's this network are briefly introduced in Table 2.2.

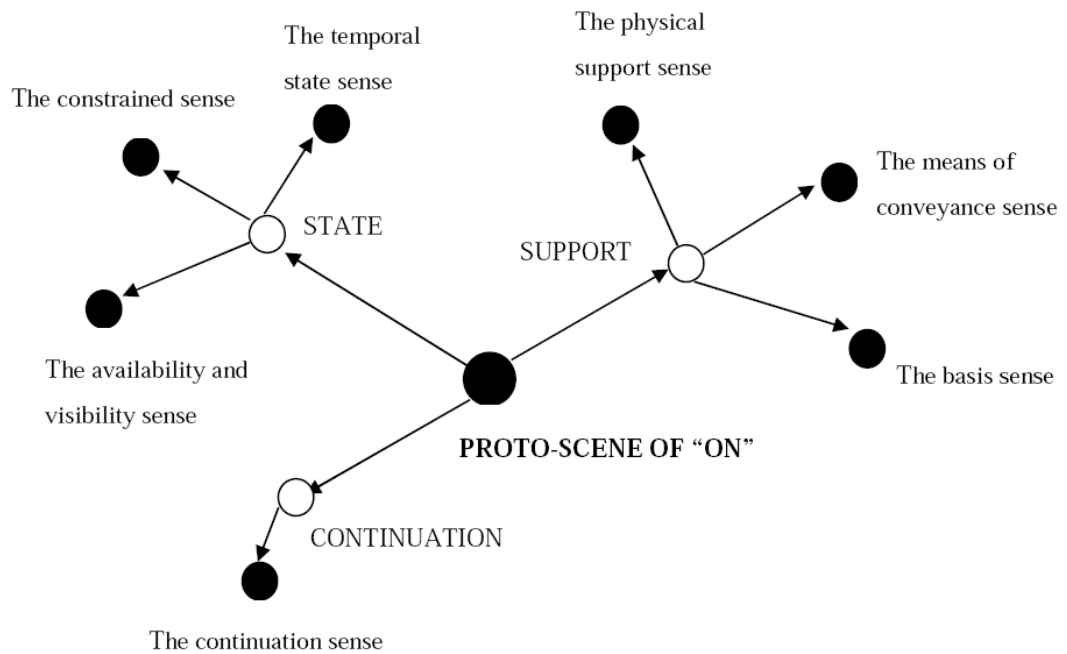


Figure 2.2 *The Partial Semantic Network of on* (Ho, 2007, p.69)

Table 2.2 Explanation of Senses in Ho's (2007) semantic network of *on*

Cluster	Sense	Explanation	Example
STATE	Availability and visibility	The TR is more salient or more visible and available than the LM.	<i>Can you turn on the TV?</i>
	Temporal State	A particular state which does not last for an extended period of time.	<i>The DVD is on pause.</i>
	Constrained	The TR is constrained or influenced by the LM.	<i>There will be new restrictions on the sale of weapons.</i>
SUPPORT	Physical support	One part of the body becomes the supporting pivot for the entire body.	<i>She was on her knees weeding the garden.</i>
	Means of conveyance	The LM acts as the means of conveyance for the TR to accomplish this activity.	<i>Children are on the bus.</i>
	basis	The TR lies on LM, which	<i>The movie is</i>

		provide strong foundation for the TR to be believed or proved.	<i>based on the true story.</i>
CONTINUATION	Continuation	The TR is undergoing the locomotion along the path on the same LM.	<i>Please don't stop, keep on talking.</i>

Both Evans and Tyler (2004) and Ho (2007) intended to provide an explanation of the senses for a particular preposition through the lexical semantic network; however, the categorization of each cluster seems to be based on their intuition and observation of the phrase with *in* or *on*, which still lacks systematicity in identifying the distinct senses of a particular preposition.

Goddard (2002) investigated the polysemy network of the senses of *on* using Anna Wierzbicka's natural semantic metalanguage (NSM) framework, which provided an alternative way of analyzing the polysemy network through verbal explications. Four categories were provided with verbal explication: (1) simple contact and resulting stability of position, e.g. "X is touching Y somewhere for some time"; (2) "part to part" contact, attachment, and resulting stability of position, e.g. "part of X is touching part of Y in some way for some time"; (3) "part to part" contact and resulting part-whole relation, e.g. "part of X is touching part of Y in some way for some time" and (4) visual feature with resemblance to simple contact, e.g. "when someone sees Y, this person can see X at the same time". The interrelationships between the four categories were also discussed; for example, construction (1) "simple contact and resulting stability of position" serves as the model for others, from which the "stability of position" component is shared with (2) "part to part contact" and is related to (4) "visual feature with resemblance to simple contact" directly through visual resemblance. Through verbal explication of the polysemy

network, this study contributed greater explicitness to the components in the lexical semantic network.

Though these previous studies provided possible ways to clarify the meanings of prepositions, they mainly focused on the interaction between the figure and the ground in sentence construction with prepositions. However, the semantic features of the figure and the ground and how they influence the choice of prepositions in the construction of prepositional phrase were rarely seen in the previous studies, which should be systematically examined under a quantitative analysis. The only study that the current researcher has found so far is a study conducted by De Vega et al. (2002), who proposed the Integration Hypothesis which intends to provide particular semantic profiles for prepositions of different dimensions. This methodology and the major results of this study will be introduced and discussed in detail in the following section.

2.1.3 Related Studies on Prepositions from Other Perspectives

The analysis of the senses of preposition usually starts from the disambiguation of a set of lexical items that are similar in meaning. For example, Wierzbicka (1993) discussed temporal *in*, *on*, and *at* and their distinctive meanings, which may motivate the choice of a particular preposition. *At* implies “sameness of time”, *in* implies the concept of “part” and “duration”, while *on* implies “clear, identifiable, and self-contained entity”. These implications may be used to explain why we do not say **at morning* (*morning* designates time as succession), **in Thursday* (*Thursday* is like a unit, not having discernible parts), and **on summer* (*summer* is composed of three months). The result testified that the use of different prepositions is motivated by the meaning, which further supports the concept that grammar is motivated by semantics.

In addition to the analysis of sense, prepositions have been involved in the study

of “multi-word sequence”, as in Stubbs’ (2007) clarification of three related definitions, it may be a study of n-gram “a recurrent string of uninterrupted word forms”, phrase-frame “an n-gram with one variable slot”, or PoS-gram “a string of part of speech categories”. For example, Forchini and Murphy (2008) conducted a study on 4-grams headed by prepositions in English and Italian corpus. They reported that *at the end of* can be said the most frequent 4-gram headed by a preposition and has the temporal meaning. Compared with other synonymic phrases, such as *at the bottom of* and *at the close of*, they have different semantic preferences and collocations and cannot be easily exchanged with *at the end of*, because these phrases tend to occur with nouns of particular semantic fields or meanings.

Another facet which was rarely attended to for the analysis of prepositions in the literature is how type coercion (Pustejovsky, 1995) can be adopted to the interpretation of the sense of prepositions. He classified prepositions into locational and functional categories, and he exploited the qualia structure to analyze what a preposition selects in a linguistic context, as shown in (2.1).

(2.1) (a) ...*my parents would send my younger brother and I to my grandparents' house...* (NCCU_E004009)

(b) ...*we don't neglect those who do small things but helpful **to** our society.*
(NCCU_E004002)

In (2.1a), the preposition *to* selects locations which have a TELIC role of qualia structure; in other words, the location *my grandparents' house* is where *my younger brother and I* will arrive at, which is the goal of this sentence. As the goal is a location, the sense of *to* may involve a movement toward this place. In (2.1b), the noun phrase

our society after *to* is no longer a concrete location where the subject can reach, but an abstract description where people stay together. Therefore, the sense of *to* should be a direction without an actual movement. Through the concept of coercion, we can observe how the senses of the preposition are influenced by the words surround it.

2.2 De Vega et al.'s (2002) Study

Previous studies which focus on the semantics of prepositions pay more attention to the figures and grounds as very schematic geometric entities that nearly ignore the interaction between each feature of the entities in locative sentences. In response to these studies, De Vega et al. (2002) proposed the Integration Hypothesis to explain the semantics of prepositions, as will be introduced in this section.

The integration Hypothesis

As the authors pointed out that the comprehension of a given locative sentence may be the integration of both “what” and “where” representations of the object referred to, they proposed the Integration Hypothesis, claiming that one must go through the multiple-constraint process to comprehend locative sentences. The process depends on the locative construction, the directional preposition, and the retrieving of the sensory-motor features of the objects. The construction follows this format: [NOUN 1 – VERB – LOCATIVE PREPOSITION – NOUN 2]. NOUN 1 corresponds to the figure and NOUN 2 acts as the ground, and the LOCATIVE PREPOSITION shows the relationship between these two components. To understand the meaning of the locative construction, one does not simply add the meanings of the nouns and preposition together. According to the authors, a simulation has to be fitted, as the authors explained how this process works:

...the sensory-motor features of the objects (e.g., animacy, solidity, part-whole, size, etc.) are retrieved from memory, they are placed into the slots for figure and ground, provided by grammar, the topological region marked by the preposition is mapped into the ground features, and then the simulation of the layout is run.

If the features of the figure and ground and the direction of the preposition fit well together, then the simulation works, indicating that the locative construction can be comprehended. Therefore, the features of these objects become very decisive in the comprehension of the locative construction. Based on this hypothesis, the authors predict that some object properties may be associated with certain prepositions, and that the variation of the semantic profiles of figure and ground may be greater between prepositions from different dimensions than those from the same dimension.

Semantic Parameters of the Figure and Ground

In this study, a number of semantic parameters are analyzed: animacy, partitivity, countability, mobility, solidity, the contact between the figure and ground, the relative size between the figure and ground, and the speakers' projective point of view in the layout. The NOUN 1 and NOUN 2 in the locative sentences were tagged according to the parameters they correspond to in each feature. The distribution of these semantic features will be used as predictors of the presence of vertical-direction term (*above* or *below*) versus horizontal-direction term (*front* or *back*). Between-dimension (e.g. *above* vs. *front*, *below* vs. *back*) contrasts and within-dimension (*above* vs. *below*, *front* vs. *back*) contrasts can also be shown through using the semantic features as

predictors in a sentence. In addition to the analysis of the corpora, the authors conducted the second study, preposition-choice task, to test the Integration Hypothesis, employing the results obtained from the first study. However, due to limitation of space, only the first study is reviewed in this section.

The results of the first study show that the nouns that precede or follow prepositions from different dimensions tend to differ on more semantic features than nouns that associate with prepositions from the same dimension. For example, for *above* and *front*, six features are displayed differently to distinguish the nouns associated with them. Sentences contain *above* are more likely to involve partitive figures, figure-ground contact, while those that contain *in front of* are more likely to be solid figures, countable grounds, solid grounds, and a projective point of view. This analysis not only shows the systematic choice of figures, grounds, and prepositions in locative sentences, these features can serve as predictors for prepositions from certain dimension. The results also support the originally proposed Integration Hypothesis, through which a multiple-constraint process can successfully proceed through the information from locative construction, preposition, and the sensory-motor features of the figure and ground.

2.3 Corpus-based Studies on Native Speaker and Learner's Use of English Prepositions

Studies of English prepositions that compare native speaker's and learner's use of English based on corpora, though appeared not much in the literature, can still be found. For example, Wang (2007) analyzed 15 most frequent English prepositions used by Chinese learners of English and found that no significant difference was found in the number of prepositions used in Chinese Learner English Corpus and

Brown Corpus. However, for specific prepositions, some prepositions seem to be overused by learners, such as *to*, *in*, and *about*, while some others seem to be underused, such as *with* and *by*. This study also probed into the causes for the discrepancy in the use of prepositions, including the interference of L1, overgeneralization and unawareness of collocational restrictions, and avoidance strategy in prepositions uncertain to them. Ho-Abdullah (2010) implemented a large-scale study, investigating into the ranges of use of preposition *in*, *on*, and *at* in three corpora, Malaysian English, New Zealand English, and British English, which represent different varieties of English. This study was carried out through a combination of quantitative and qualitative analyses in which it calculated the frequencies of word forms and classified the semantic usage types based on cognitive linguistic framework. A number of important finds was addressed; first, the twenty-five prepositional items that appear most frequently in these three corpora show significant difference at the word-form level. Second, for the semantic type identified in this study, significant differences can also be found among these three corpora. The result of this study acts as a demonstration of lexical variation among nonnative usages of English, reminding teachers of nonnative English speaking contexts to be aware of the possibility of variation in terms of usage or sense level of lexical items.

Chung and Tseng (2011) also conducted a study of the preposition *to* based on their self-constructed learner corpus, in which the distribution of the collocates and the analysis of sense were discussed. They observed that most of the collocates are used correctly by the learners, and the erroneous use only appears in low frequency. Difficulties of analyzing the senses of a preposition were also proposed in this study as it is sometimes difficult to distinguish the semantic meaning from the syntactic

meaning. Moreover, as errors were rarely found in the two-word combinations, the authors suggested that three- or four-word combinations might be worth exploring.

2.4 Experimental Studies of the Learning of English Prepositions

As prepositions usually have a rather small section in textbooks but account for numerous sub-sections in the dictionary entry, Lindstromberg (1996) proposed a new approach of teaching prepositions that intends to apply the concept of prototype semantics to the teaching of these complicated meanings. Extending from the prototypical meaning, a number of literal and metaphorical meanings can be identified and the methods of facilitating students' learning of these meanings are illustrated within this article.

Teaching preposition via introducing its cognitive semantic definitions may have positive effect in facilitating learners' comprehension. As in Boers and Demecheleer's (1998) study, they intended to explore how L1 interference occurs in French learners of English when learning the prepositions *behind* (which has near equivalence in French) and *beyond* (no equivalence in French) and how comprehension of expressions with these two can be facilitated. The authors tested how subjects comprehended the prepositions with figurative senses by asking them to translate and rephrase them. Four experiments were conducted and the results in overall showed that the sense which is absent from French causes difficulty in comprehension and that subjects who received the vocabulary list with cognitive semantic definitions performed significantly better than those who received traditional definitions. The concept of image schema has also been developed as an approach for vocabulary teaching, as in Morimoto and Loewen's (2007) study, the relative effectiveness of image-schema-based and translation-based instruction on teaching polysemous words

was compared. They invited 58 Japanese learners of English and divided them into two experimental groups that received image-schema-based and translation-based instruction respectively, and one control group for comparing the result. Each experimental group received twenty minutes of treatment for teaching the target words *break* and *over*. Though the results were mixed and no significant difference was found between the image-schema based and translation-based groups, this study provided evidence to show that there are positive effects on learners' use of polysemous words like preposition *over* under explicit instruction.

In Condon's (2008) study, she examined the effect of integrating a cognitive linguistics (CL) approach to the teaching and learning of phrasal verbs. Students in the experimental group received instructions of CL motivations for particular sets of phrasal verbs while those in the control group received traditional approach (translation and explanation) in teaching phrasal verbs. The result shows that students who received the CL approach yield superior results in the retention of phrasal verbs taught. Students performed better in phrasal verbs of literal meaning than in those of abstract CL motivations. However, no evidence of strategy transfer of their knowledge of CL motivation to the learning of new phrasal verbs can be found.

However, in recent domestic studies, the results of whether there is positive effect on learners given the cognitive semantic definitions of prepositions vary. In Hsu's (2005) study, she intended to compare the effect of teaching prepositions through the cognitive semantic approach and the traditional preposition instruction approach on senior high school students. For the control group who received traditional approach, the participants were instructed the whole pack of definitions of prepositions *in*, *on*, and *at*, along with some prepositional phrases, from the English dictionary. Students in the experimental group received the same input from the

dictionary; however, the definitions and expressions of *in*, *on*, and *at* were introduced and categorized according to their metaphoric abstractness and relatedness. No significant difference was found between the effect of these two approaches, and students seem to respond more positively to the traditional approach. However, in Ho's (2007) study that focused on prepositions *in* and *on*, she carried out an empirical research on teaching prepositions through introducing the polysemous network. This research lasted two months, involving two groups of subjects in which one was taught by the polysemous-network approach, while the other group received instruction through the images of sense without introducing their relatedness. Though the statistical result does not differ significantly in post-tests, the verbal think-aloud protocol which was administered four months after the instruction showed that learners who received polysemous-network approach can retain the network knowledge longer and better.

In addition to studies that focus on the learning outcome of implementing different approaches to teaching prepositions, some others examine learners' performance from different perspectives through the designed questionnaire. For example, Khampang (1974) utilized a diagnostic test, comprised of three parts, including multiple choice, error correction, and cloze test, to test if particular prepositions are more difficult for Thai learners of English, and further compared the results done by other language groups to explore if any significant difference in the choice of English prepositions may be found. Though from the test scores the author found that there is no significant difference in the choice of English preposition among different language groups and other moderate factors, such as sex, age, number of years, and number of hours per week spent in learning English, this study has implications in the teaching of English prepositions, as it suggested that

placement test and diagnostic test seem to be more effective than the above-mentioned moderate factors in investigating learners' performance on the use of prepositions. For different language groups, they shared similar difficulty in learning English, so the author suggested that the teaching of English place and temporal prepositions should be conducted in the same way for these groups.

For error analysis on the use of prepositions by Taiwanese learners of English, Cheng (2006) analyzed students' performance on prepositions *in*, *on*, and *at*, using a set of 55 multiple-choice questions to test how they performed when these items were used as prepositions in prepositional phrases and as particles in phrasal verbs. The result showed that learners performed significantly worse on *in*, *on*, and *at* particles than prepositions. Within prepositions, learners' performance on temporal ones is worse than their performance on spatial prepositions. Tang (2009), on the other hand, analyzed the preposition *on* from the syntactic perspective, investigating learners' use of preposition-like elements in verb particle constructions and aiming to reveal the cause of difficulty through error analysis. At the first stage, verbal phrases with *on* were selected from senior high school English textbooks, and native speakers of English judged the grammaticality based on the syntactic properties of prepositional elements. The second stage involved 154 senior high school students to do the grammaticality judgment test and gap-filling test. Through analyzing the result, the author would like to remind language teachers that both lexical feature and functional feature are important in learning prepositions.

2.5 Summary of the Chapter

In this chapter, studies on the senses of preposition were discussed from different perspectives. De Vega et al's (2002) Integration Hypothesis along with the analysis

employed to test this hypothesis is reviewed that examines the semantic features of nouns that precede and follow the preposition, which may influence the choice of a particular preposition in a sentence, counter to recognizing the meanings of preposition through cognitive approach that form a semantic network. Due to the semantic complexity of prepositions, approaches that facilitate L2 acquisition are another focus. However, previous studies on the semantics of preposition tended to focus on a single preposition and developed a semantic network based on a particular theory. They focused more on the influence of the landmark in constructing the meaning without attending to all the elements in the construction. Moreover, learners' productions were restricted to elicitation from experiments which are usually composed to sentences being independent from context. In this study, we attempted to utilize the semantic feature analysis to analyze the construction of English prepositions *in* and *on*, which involves the analysis of the figure, ground, and the senses of prepositions *in* and *on*, in order to establish a systematic approach in disambiguating the semantics of preposition and analyzing learner's actual performance on using prepositions. In addition, as the semantic networks constructed in the previous studies are not comprehensive in describing the semantics of particular prepositions, this study will be a corpus-based one that includes data naturally produced by native speakers and learners. In Chapter Three, the methodology of conducting this research would be introduced in order to provide the detailed information with regard to the materials and procedure for data collection and approach for analysis.



CHAPTER 3

METHODOLOGY

This chapter contains four major parts, in which the first section describes the two corpora adopted in this study, the second section introduces tools employed to retrieve the data and criteria of sorting the data, and the last two sections present the procedure of conducting semantic feature analysis and sense analysis, respectively. Through the comparison of the native speaker corpus and learner corpus, similarities and differences in the construction of sentences with preposition may be shown. Moreover, the analysis of sense and semantic features may be a systematic way to probe into the similarities and differences in meaning.

Our hypothesis is that: As preposition *in* and *on* denote different meanings, the figure and ground nouns in the construction of prepositional phrase may have different representations of semantic feature. Therefore, we hypothesized that significant differences may be found between the distributions of semantic features of nouns in literal *in* and *on* prepositional phrase as well as between metaphorical *in* and *on*. Moreover, as L2 learners may feel uncertain for the usages of *in* and *on* due to their semantic complexity, there may be significant differences in semantic features of nouns in prepositional phrases and senses of preposition used by native speakers and L2 learners.

3.1 Materials

In order to investigate how Integration Hypothesis (De Vega et al., 2002) can be applied to explain the distinction between prepositions *in* and *on*, one native speaker

corpus, British National Corpus (BNC), and one learner corpus, The NCCU Foreign Language Learner Corpus (NCCU), are included in the analysis, which will be introduced respectively in the following.

The native speaker corpus BNC is a 100 million word collection of text of written and spoken English from a wide range of sources and genres. In this study, the data was retrieved randomly through the *BNCweb* (<http://bncweb.info/>, Hoffman, Evert, Smith, Lee, and Prytz, 2008), a web-based interface for searching data from the BNC. To make native speaker data comparable with the learner data, only the written part of the corpus was retrieved from the database.

The NCCU Foreign Language Learner Corpus is a newly-created corpus that contains texts from six languages (English, Japanese, Korean, French, Russian, and Arabic) of written work, which were produced by undergraduates in National Chengchi University (cf. Chung, Wang & Tseng, 2010). These students major in these six languages, respectively, taking the courses offered by the departments. These texts were collected by professors who participated in the NCCU Foreign Language Learner Corpus Project, and the source of texts mainly included students' language production from their homework, exams, and in-class activities. As this project is still under execution, more data will be compiled and further work, such as parts-of-speech tagging and error tagging, will be carried out in the future improvements of this project. In addition, as this study was conducted by identifying the figures and grounds for analysis, the tagged version is not necessary as these two elements do not always occur immediate before or after the preposition. Therefore, in the present study, only the raw data from the English sub-corpus, produced by undergraduates of the English Department, are included for analysis. The total number of texts is 342, amounting to 226,549 word tokens and 13,016 types of word.

3.2 The Tool for Extracting Data

As can be seen in Figure 3.1, after keying in the keyword for search and restricting the query in written text, the interface returned the instances along with the keyword. The top row shows the number of hits returned from this query, the total number of words tokens, and the number of instances per million words. For each query, only 5000 hits were randomly selected to be presented on the web page. For example, for preposition *in*, the results returned 1,795,627 hits in 3,139 different texts, and there are 87,903,571 word tokens in the total 3,140 texts. For each million words, about 20427.24 instances of *in* were retrieved. For the data of *on*, BNC returned 648,436 hits in 3,133 different written texts, amounting to 7376.67 instances per million words.

Your query "[word="in"]" in written texts returned 1795627 hits in 3139 different texts (87903571 words [3,140 texts], frequency: 20427.24 instances per million words) (displayed in random order), thinned with method *random selection* to 5000 hits (displayed in random order)

Navigation: < << >> > | Show Page: 1 | Show KWIC View | Show in corpus order | New Query | Go!

No	Filename	Hits 1 to 50	Page 1 / 100
1	ALU 24	The published accounts of these journeys and the plants found, 250 in Kent and 72 more in Hampstead, were the first records of the herborising expeditions which were to become a regular part of the Apprentices' training in botany.	
2	HL5 1634	The Supreme Court on March 4 formally recognized that 61 workers sentenced in December 1987 for their role in the Brasov riots had been political prisoners of the former Communist regime.	
3	GW6 1742	For example, if at P the parcel had no motion in the east-west direction across the planet's surface and the planet's axial rotation is prograde then it will pick up motion across the grid towards the east, and in moving northwards will end up for example at Q. If it were in the southern hemisphere and moved southward it would also pick up an eastwards movement.	
4	16P 303	In this connection the court will, it is thought, be prepared to recognise the unavailability of cover beyond certain limits and that such top-up cover as may be arranged may only be available on an aggregate, as opposed to an "each and every claim" , basis; (5) any limitation must be brought to the attention of the client and should be confirmed by the client in writing.	
5	ACS 1509	People have to be buried in consecrated ground.'	
6	C13 41	In common with toucans, parrots and woodpeckers, cuckoos have two toes pointing forwards and two pointing back.	
7	CLU 1172	Diversity is another of the Company's aims, with items held in stock ranging from wind-driven generators for a Vickers Vimy (PAS supplied the generators for the Vimy replica G-AWAU when it was airworthy during the late 1960s, Alpha Uniform now resides in the RAF Museum, Hendon), to rudder actuators for the Avro Vulcan, complete 'mod kits' for Mosquitos to illuminated marshalling bats.	
8	12N 402	The dumping of British industrial waste in the North Sea is continuing despite an agreement to stop by the end of 1989. 15.	
9	EWB 709	Lancaster Hole was found in 1949 when a caver sitting having his lunch on a still sunny day noticed the grass nearby waving and stirring as though a wind were moving it.	
10	ACG 1356	The people's confession and Moses' intercession then result in a God-given means of protection from the effect of the venom.	
11	CRV 930	His ignorance of what she feels about his 'human kindness' — she rejects any 'compunctious visiting of nature' (44) — makes him a victim, or accomplice, who has to be instructed in hypocrisy. One of Shakespeare's problems in having to develop an evil conspiracy in the absence of any vocal moral commentary on it is to make it judge or condemn itself.	
12	K4C 1321	'I've done an awful lot of work,' admitted Faldo at the course where Jack Nicklaus won in 1967 and '80.	
13	ARW 862	However she sees a great deal of hope in Miranda's situation, 'You can acknowledge that women do let other women down and still be a feminist.	
14	EWG 1155	Blacks were segregated in churches, schools and colleges.	
15	A1V 843	Mr Kafi said he was not considering scrapping the 3 per cent sales tax that contributed to severe election setbacks for his party in July.	

Figure 3.1 The Query Result Page of BNCweb

However, not all the data retrieved were analyzable in this study, as semantic feature analysis under De Vega et al.'s (2002) integration hypothesis only centered on constructions that are formed by the noun phrases of figure and ground. Therefore, the

data were further sorted to ensure that the four elements in the Integration Hypothesis are presented in the following possible sequences with examples given below:

(3.1)a. **Figure_Verb_Preposition_Ground** [_N*_V* in/on _N*]

e.g. *More hoax bombs found in Aberdeen...*

figure verb prep. Ground

(BNC_K5M 4177)

b. **Verb_Figure_Preposition_Ground** [_V*_N* in/on _N*]

e.g. *When she got home she had to boil spaghetti in acqua minerale.*

verb figure prep. ground

(BNC_FB9 2184)

c. **Verb_Preposition_Ground_Figure** [_V* in/on _N* _N*]

e.g. *Based on the current rate, the death toll is predicted to...*

verb prep. ground figure

(NCCU_E003001)

d. **Preposition_Ground_Figure_Verb** [in/on _N* _N* _V*]

e.g. *In industry machines are stable and raw materials are mobile.*

prep. ground figure verb

(BNC_A64 1460)

In these four examples (3.1a to 3.1d), the shaded parts show the possible sequence of the four elements, that is, figure, ground, verb, and preposition, which are all tagged in the examples. Within the square brackets, there are representations of how these elements were searched in BNC. After keying the structure in square brackets in the web interface, sentence constructions with these four elements were retrieved. For

data that do not conform to these restrictions, they were excluded at this study, as the examples of constructions with prepositions in the following (3.2), which show the prepositional phrases not conforming to the research of integration hypothesis:

- (3.2) a. ...*and so on*.
b. *the report on the World Health Organization*
c. *in 2009*
d. *on the contrary*

Some of the examples in (3.2) are fixed expressions in English, as in (3.2c) and (3.2d), and others were excluded because one or two elements were missing, as in (3.2b), and still others were fixed expressions of *in* or *on* as adverb, as in (3.2a). However, there may be exceptional cases when the figure does not occur as in the order shown from (3.1a) to (3.1d). The figure can only be inferred from the context, as in (3.3).

(3.3) *That is why in Korea, people need to use their real name to register on networking sites*. (NCCU_E030013)

In this example, the figure *registration* cannot be obviously seen on this sentence and can only be inferred from the context.

The data from the learner corpus were processed through AntConc 3.2.1w (cf. Anthony, 2005), a simple corpus extracting tool developed by Laurence Anthony, to extract instances of *in* and *on*. In the NCCU Learner Corpus, 4,464 hits of *in* (0.019%) and 1,350 hits of *on* (0.005%) were retrieved. Figure 3.2 shows the interface of querying the keyword on AntConc.

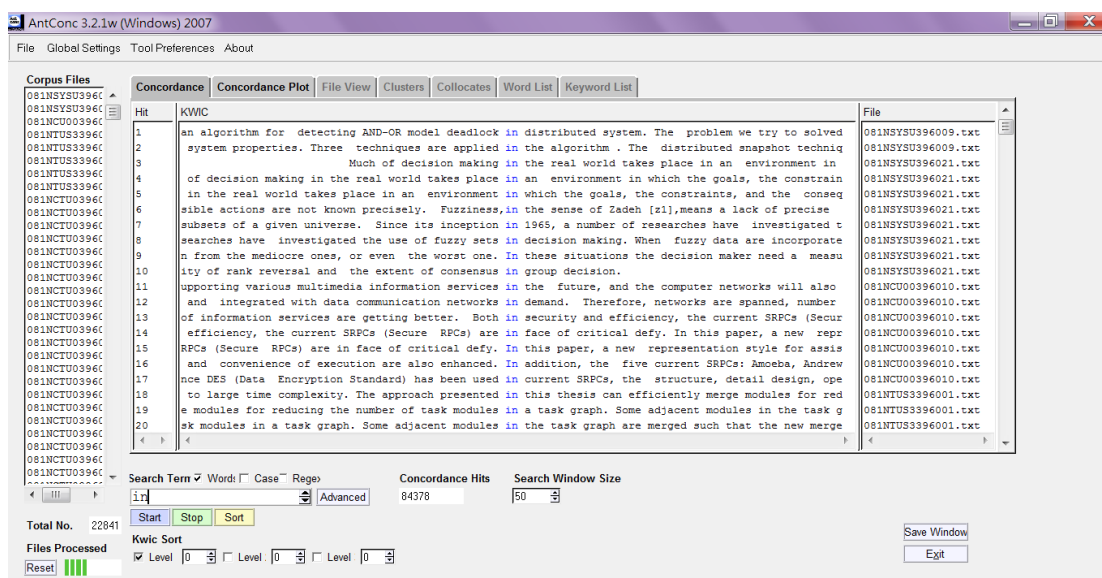


Figure 3.2 The Interface of AntConc 3.2.1w

These retrieved results were then exported to text files and opened in MS Excel for the follow-up semantic feature and sense analysis. Since the quantity of data is much smaller than that in BNC, the four essential elements (figure, ground, preposition, and verb) were sorted manually by the researcher based on the above-mentioned criteria. After exporting the data to MS Excel, 1,000 instances of *in* and *on* were randomly selected, respectively, from the learner corpus in order to avoid extracting data from the same data file too many times. Adding up with the first 1000 hits retrieved from BNC, the number of data amounted to 2,000 instances for each preposition in total. These data were exploited in the follow-up two analyses.

3.3 Semantic Feature Analysis

In the sub-sections of 3.3, the procedure for conducting the semantic feature analysis is introduced. Sub-section 3.3.1 describes the step of identifying figure and ground noun phrases. 3.3.2 illustrates the encoding criterion for the coding of

semantic features of figures and grounds, and 3.3.3 shows the steps of data analysis.

3.3.1 Identifying the Figure and Ground Noun Phrases

From the cognitive perspective of studies that probed into the meanings of prepositions, the spatial configuration of figure and ground is essential in mediating these meanings (e.g. Lakoff, 1987; Langacker, 1987; Herskovits, 1988; Kreitzer, 1997; Tyler and Evans, 2001). The GROUND noun phrase acts like a reference point for the FIGURE noun phrase to move toward/away from or locate. The polysemy of prepositions can be instantiated from the interaction between these two noun phases, which are the two important elements in the Integration Hypothesis.

No.	Instance	L/M	Sens	Figure	Ground	AA	AB	AC	AD
1	(<<< FlyPast Roadshow in attendance >>> .)	M	3	Roadshow	attendance	F	G	F	G
3	Unfortunately, much modern household furniture is a fire hazard, and burning <<< cigarette ends in	L	1	cigarette enc	chairs				
5	Although the report was respectful of doctors, its underlying thrust was the need to assert greater r	M	11	doctors	management				
6	It was a Skein of Geese envelope, with three of the wretched <<< birds embossed in brown >>> on	M	2	birds	brown				
7	Although he could be put to work on the roads, or in the gravel pits, or on a farm (as a [roundsma	M	3	bankruptcy	consequenc				
8	8 Mrs <<< Brown lived in Morrell >>> House, Burton Stone Lane, York, but before that lived for 70 ye	L	1	Mrs Brown	House				
9	9 She realises how pointless her <<< life is in London >>>, then the other side of her character makes	L	1	life	London				
10	10 We shall see more formally why this is the case when we <<< discuss bonds in Chapter >>> 6, but it	L	1	bonds	chapter				
11	12 Grants are available from the European Community, and from the Countryside Commission and Na	L	1	farmers	areas				
12	13 So an aggregate demand disturbance in period t will <<< raise prices in period >>> t but leave prices	M	1	prices	period				
13	14 She had drunk very little, a small glass of wine while they were eating and another ten minutes befo	L	6	they	house				
14	15 High-density seating with many <<< rows fixed in face-to-back >>> mode, together with much more	M	2	rows	mode				
15	16 As was usual with Susie, she was being uprooted by her restless husband the moment the last <<< b	L	10	the last blind	place				
16	17 You do n't <<< get water in pieces >>> do you ?	M	2	water	pieces				
17	18 If one were to suggest to an electronics engineer that he might want to study how a circuit works by	M	1	changes	function				
18	19 The <<< plaintiff lived in Totteridge >>> and was evaluated for the poor rates by the assessors for H	L	1	plaintiff	Totteridge				
19	20 Central Government Departments which achieve savings through competitive <<< tendering will in f	M	1	government	future				
20	21 Just before the police observation team <<< moves in -tain >>> wants a go top... and fires into the k	L	6	team	kitchen				

Figure 3.3 The Figure and Ground in MS Excel

The first step to implement semantic feature analysis is to identify the figure and the ground (as in Figure 3.3, column Y and Z), which may or may not occur immediately before or after the preposition, as shown in (3.4).

(3.4) a. *This opportunity to question suspects **in** custody was clearly of crucial importance to the police.* (BNC_EVK 1106)

b. *In a Well-publicised case, the parents of a baby who died refused to believe evidence **in** court, and there was no conviction.* (BNC_K96 834)

In (3.4a), the figure *suspects* and the ground *custody* are placed immediately before and after the preposition *in*. However, in (3.4b) that mentioned something that *parents* (figure) refused to do in *court* (ground), the figure noun phrase occurs far away from the preposition and can only be identified after reading through the whole sentence. We should also notice that only the head noun in the noun phrase was identified as figure or ground since they are considered the main component in noun phrases, and other elements in a noun phrase were excluded in this process.¹ Tables 3.1 and 3.2 show the top fifteen frequently appeared figures and grounds in BNC and NCCU.

Table 3.1 The Raw Frequency of the Top Fifteen Figures and Grounds in BNC

The Expressions of <i>in</i> in BNC				The Expressions of <i>on</i> in BNC			
FIGURE	Freq	GROUND	Freq	FIGURE	Freq	GROUND	Freq
<i>people</i>	28	<i>front</i>	18	<i>\$</i>	17	<i>behalf of N</i>	26
<i>hand</i>	15	<i>hand</i>	17	<i>pressures</i>	15	<i>top of N</i>	25
<i>changes</i>	14	<i>London</i>	12	<i>works</i>	11	<i>pages</i>	15
<i>I</i>	10	<i>places</i>	12	<i>information</i>	13	<i>board</i>	11
<i>meeting</i>	10	<i>rooms</i>	12	<i>data</i>	9	<i>fire</i>	11
<i>women</i>	7	<i>Britain</i>	11	<i>advice</i>	8	<i>stage</i>	12
<i>differences</i>	6	<i>figures</i>	11	<i>emphasis</i>	8	<i>display</i>	8
<i>they</i>	6	<i>houses</i>	10	<i>people</i>	8	<i>sale</i>	8
<i>company</i>	5	<i>chapter</i>	9	<i>restrictions</i>	8	<i>holiday</i>	7

¹ The noun phrases referred to in this part do not include ‘coordinated nouns’, in which the nouns were treated as a whole to be coded. For those ‘Noun1, Noun2, and/or Noun3’ phrases, as not being identified in the dataset, they were not the concern at the stage of analysis.

<i>interests</i>	5	<i>relation</i>	8	<i>books</i>	7	<i>TV</i>	7
<i>work</i>	5	<i>hospitals</i>	7	<i>VAT</i>	7	<i>land</i>	7
<i>shares</i>	5	<i>response</i>	6	<i>fire</i>	6	<i>offer</i>	6
<i>we</i>	5	<i>bed</i>	5	<i>He</i>	5	<i>courses</i>	5
<i>effects</i>	4	<i>conjunction</i>	5	<i>I</i>	5	<i>issue</i>	5
<i>information</i>	4	<i>doubt</i>	5	<i>notes</i>	5	<i>paper</i>	5

Table 3.2 The Raw Frequency of the Top Fifteen Figures and Grounds in NCCU

The Expressions of <i>in</i> in NCCU				The Expressions of <i>on</i> in NCCU			
FIGURE	Freq	GROUND	Freq	FIGURE	Freq	GROUND	Freq
<i>people</i>	79	<i>Taiwan</i>	77	<i>people</i>	67	<i>streets</i>	44
<i>children</i>	55	<i>countryside</i>	52	<i>time</i>	49	<i>website</i>	43
<i>students</i>	32	<i>city</i>	45	<i>cars</i>	36	<i>internet</i>	36
<i>I</i>	31	<i>life</i>	25	<i>we</i>	28	<i>roadsides</i>	22
<i>they</i>	18	<i>ways</i>	17	<i>students</i>	26	<i>campus</i>	13
<i>we</i>	18	<i>minds</i>	14	<i>they</i>	20	<i>Twitter</i>	13
<i>smoking</i>	16	<i>classes</i>	13	<i>ban</i>	17	<i>7-eleven</i>	12
<i>taboos</i>	10	<i>America</i>	11	<i>\$</i>	16	<i>smoking</i>	11
<i>situation</i>	9	<i>future</i>	11	<i>effects</i>	16	<i>time</i>	10
<i>cars</i>	8	<i>world</i>	10	<i>I</i>	15	<i>BBS</i>	9
<i>smokers</i>	8	<i>areas</i>	9	<i>influence</i>	15	<i>people</i>	9
<i>knowledge</i>	7	<i>offices</i>	9	<i>things</i>	13	<i>way</i>	9
<i>questions</i>	7	<i>school</i>	9	<i>emphasis</i>	10	<i>blackboard</i>	8
<i>things</i>	7	<i>society</i>	9	<i>impacts</i>	10	<i>blogs</i>	8
<i>friends</i>	6	<i>time</i>	9	<i>you</i>	10	<i>books</i>	8

From these two tables, we can observe that the frequencies of nouns appearing in NCCU tend to be higher than those in BNC, which indicates that the variety of content in these two sets of data may be different; the data in BNC reveal a great variety in topics, while the data in NCCU seem to be restricted to the elaboration of particular nouns. We may also observe some regional differences within these two sets of data, as *London* and *Britain* appear as frequent ground nouns in BNC, which is

not the case in NCCU. Moreover, since *BBS* is a popular web interface in Taiwan, it appears frequently in the texts in NCCU but not in BNC.

In addition to the identification of figure and ground, as the expressions of *in* and *on* may vary from literal to metaphorical ones, instances between these two levels were treated separately in the follow-up analyses. In column W in Figure 3.3, whether the instance is literal or metaphorical in the prepositional constructions was also distinguished in abbreviation M (metaphorical) or L (literal), as in Example (3.5).

- (3.5) a. [L] *Stephen parked in front of the old white-painted building, its starkness relieved by bright-green shutters.* (BNC_FRS 915)
- b. [L] *Do you think a brick would float on water?* (BNC_BNG 941)
- c. [M] *Myth and menace merge in India's poll campaign...* (BNC_A4H 112)
- d. [M] *This sort of advertising plays on people's sense of guilt.* (BNC_B2U 2574)

In (3.5a), the figure noun *Stephen's car*, implied from the context given, is located in front of the *building*, so it should be marked as L. Example (3.5b) shows *a brick* being placed on the surface of water, so it should be marked as L. In (3.5c), the *poll campaign* is an activity of where *myth* and *menace* can be found, in which this activity is imagined as a container for *myth* and *menace* to be situated in, hence it should be marked as M. As for (3.5d), the *advertising* does not physically play on *sense of guilt*, which acts as the base of the *advertising*. This step may be helpful in analyzing the semantic parameters to its related noun phrases as literal and metaphorical noun phrases should be treated separately with caution to investigate how they fit into the Integration Hypothesis.

3.3.2 Encoding the Semantic Features of Figure and Ground

The next step is to tag the semantic features of the identified figure and ground in the 4000 instances (2000 for *in*, half from BNC and half from NCCU; 2000 for *on*, half from BNC and half from NCCU). Although semantic feature is the basic unit of meaning hidden within a word (Fromkin, Rodman, & Hyams, 2010), there has been no consensus in a set of semantic features in describing all nouns. After reviewing some studies that focus on semantic features in their analysis (Liu, 1989; De Vega et al., 2002; De Ilarraza, Mayor, & Sarasola, 2002; Bick, 2006), the current researcher constructed a set of semantic parameters and encoding criteria to tag these features in the identified noun phrases. These parameters ‘concrete’, ‘human’, ‘measure’, and ‘activity’ were taken from Bick’s (2006) study of the semantic prototype annotation of a Portuguese Treebank; the parameters ‘animate’, ‘mobile’, ‘partitive’, ‘countable’, ‘solid’, ‘figure-ground contact’, and ‘the relative size of figure and ground’ are from De Vega et al.’s (2002) study of the semantics of locative sentences; the parameter ‘temporal’ is added to the set of criteria after reviewing Liu’s (1989) thesis. Except in De Vega et al.’s study, most of the works did not focus on the coding of the nouns, and the coding method in De Vega et al.’s study is sufficient for analyzing the identified nouns in the data. Therefore, this coding method in this study was adapted from De Vega et al.’s work, as listed in Table 3.3.

Table 3.3 The Coding Scheme for the Semantic Features of Figure and Ground

Coding Semantic Feature	0	1	2	e.g.			
				<i>knowledge in books</i>	<i>curtains on the rod</i>		
				<i>knowledge</i> (figure)	<i>book</i> (ground)	<i>curtain</i> (figure)	<i>rod</i> (ground)
Concreteness	[-concrete]	[+concrete]		0	1	1	1
Animacy	[-animate]	[+animate]		0	1	0	0
Human²	[-human]	[+human]		0	1	0	0
Mobility	[-mobile]	[+mobile]		0	1	1	1
Partitivity	[-partitive]	[+partitive]		0	0	0	1
Countability	[-countable]	[+countable]		0	1	1	1
Solidity	[-solid]	[+solid]		0	1	1	1
Figure-Ground Contact			NA				
	[-contact]	[+contact]		2		1	
Figure-Ground Relative Size							
	F<G	F>G		2		1	
Measure	[-measure]	[+measure]		0	0	0	0
Activity	[-activity]	[+activity]		0	0	0	0
Temporal	[-temporal]	[+temporal]		0	0	0	0

Based on this table, if the noun phrase possesses the above-mentioned parameters, it was encoded as 1. If this feature is not presented in the noun phrase, it was encoded as 0. For example, for “animacy”, the animate figure *prisoner* would be tagged as 1, and the figure *name* which is inanimate would be marked as 0. With regard to the “relative size between figure and ground”, if the figure is smaller than the ground, it would be encoded as 0, and if the figure is larger than the ground, it would be tagged as 1. For non-physical noun phrases that cannot be compared in terms of size and contact, it would be marked as 2.

In each instance of the data, two raters were paid to participate in each instance of the encoding process for achieving test reliability. All raters are English majors

² Though the feature ‘human’ is included in the feature ‘animate’, a noun that is animate does not imply that it is human. Therefore, ‘human’ is coded in an independent semantic feature category.

who study in the English department in National Chengchi University, having taken courses related to semantics and receiving some basic training in language analysis. Before they started the encoding procedure, the researcher provided a thirty-minute training in explaining how these features would be tagged. Firstly, a piece of encoding instruction was distributed (see Appendix I) to each rater and they were asked to look through the instructions feature by feature, as in Table 3.4.

Table 3.4 The Example of Encoding Instruction

Feature	0	1	2
Concrete	非具體/實體之名詞，例如：動作、時間、心理活動等。 (non-concrete/entity nouns, such as action, time, mental activity, etc.)	具體/實體之名詞，例如：動物、物品、場所等。 (concrete/entity nouns, such as animal, object, location, etc.)	無法於此項目下作判斷。 (cannot be judged under this category)

Table 3.4 shows an example of the feature *concrete* along with its coding and the description for each coding. Raters were asked to read these descriptions, and the current researcher then quickly went through these categories to ensure that every rater can totally understand what they should do in each category. After making sure that every rater had no question toward these categories, the current researcher demonstrated how to key in the coding in the MS excel file (see Figure 3.4). The raters were asked to do the same for an instance, and the current researcher checked the result to ensure that they follow the instructions correctly. Later on, the raters were asked to rate ten instances independently without consulting the current researcher, but they could still check the encoding instruction at the same time if they have forgotten the definition of any category. They were told not to consult the opinions of

others or refer to any linguistic related publications or resources. However, if they encounter any noun phrases that are unknown in meaning, they can refer to the web recourses or dictionary to check the meaning. The current researcher looked through the result once again after they have finished ten instances to make sure that they know how to deal with the following instances.

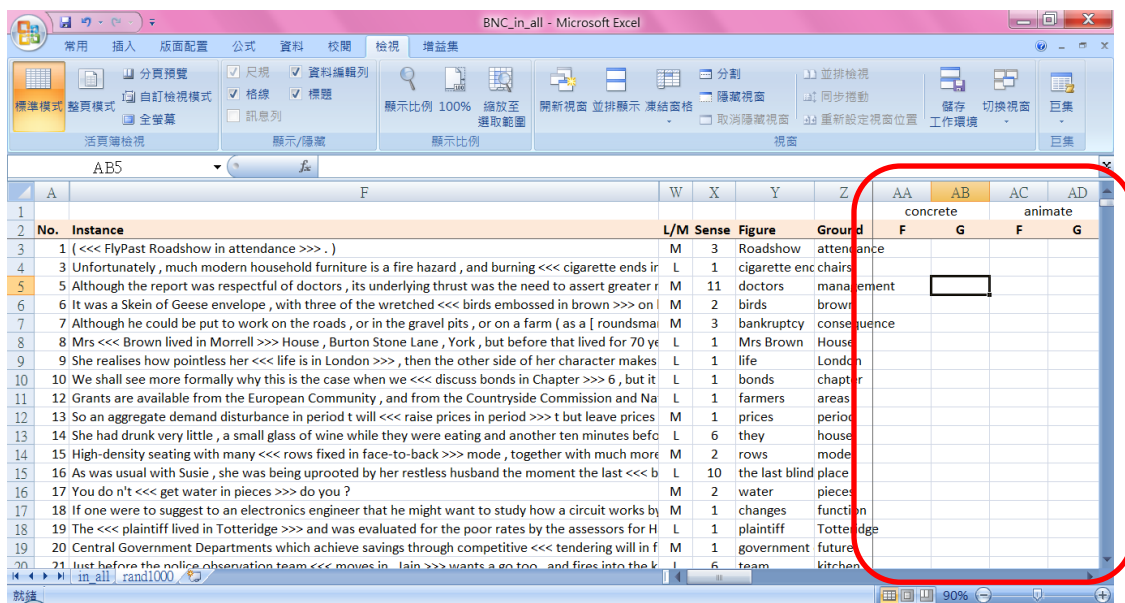


Figure 3.4 Encoding Format in the MS Excel File

The results were all collected in the MS excel file, in which an inter-rater reliability analysis using the Kappa statistic was performed to determine consistency among raters, and inconsistency was resolved by inviting the third rater to tag instances in question. In this analysis, the inter-rater reliability for the raters was found to be $Kappa = 0.674$ ($p < .0.001$), 95% CI (0.6642, 0.6838).

3.3.3 Data Analysis

The analysis adopted the quantitative approach to record the occurrence of semantic features in the figure and ground noun phrases. First, there is the descriptive

data for the semantic parameters presented in figure and ground nouns. Second, the frequency data derived from the encoding procedure in this analysis were quantitatively analyzed through the SPSS 12.0 software. The chi-square test was run because it is an appropriate statistical test for comparing frequency data. The results show between-corpora contrast (BNC vs. NCCU) and between-prepositions contrast (*in* vs. *on*), using the semantic features as indicators for the differences between these two variables. The test of homogeneity was carried out to know whether there are differences among the presence of semantic features between the two corpora and whether the semantic features affect the choice of preposition. The alpha level was set at .05 for all analyses in this study.

3.4 Sense Analysis

In section 3.4.1, the analysis of the senses of preposition *in* and *on* and their distribution within the retrieved data is presented. For the data from NCCU learner corpus, the current researcher also coded the errors found within, which is discussed in 3.4.2.

3.4.1 Categorization of Sense

In this step of analysis, the dictionary definitions from Merriam-Webster's online dictionary (2009) were adopted for the grouping of senses of the 2,000 instances from BNC and 2,000 instances from NCCU. The categorization of the senses for *in* is shown in Table 3.5, for *on* shown in Table 3.4.

Table 3.5 Categorization of the Sense of *in* (from Merriam-Webster’s Online Dictionary)

Sense	
1	used as a function word to indicate inclusion, location, or position within limits
2	into1 (went into the house)
3	used as a function word to indicate means, medium, or instrumentality
4	used as a function word to indicate limitation, qualification, or circumstance
5	into 2 (broke in pieces)
6	used as a function word to indicate purpose
7	used as a function word to indicate the larger member of a ratio
8	to or toward the inside especially of a house or other building
9	to or toward some destination or a particular place
10	at close quarters : near
11	so as to incorporate —often used in combination
12	to or at an appropriate place
13	within a particular place; especially: within the customary place of residence or business
14	in the position of participant, insider, or officeholder —often used with <i>on</i>
15	on good terms
16	in a specified relation
17	in a position of assured or definitive success
18	in vogue or season
19	in production
20	in one's presence, possession, or control
21	from a condition of indistinguishability to one of clarity

This categorization includes both *in* as a preposition and an adverb, in which the senses vary from the central meaning “indicate inclusion, location, or position within limits” (Sense 1) to extended meanings, such as “indicate means, medium, or instrumentality” (Sense 3), “indicate purpose” (Sense 6), etc.

Table 3.6 Categorization of the Sense of *on* (from Merriam-Webster's Online Dictionary)

Sense	
1	used as a function word to indicate position in contact with and supported by the top surface of
2	used as a function word to indicate position in or in contact with an outer surface
3	used as a function word to indicate position in close proximity with
4	used as a function word to indicate the location of something
5	used as a function word to indicate a source of attachment or support
6	used as a function word to indicate a source of dependence
7	used as a function word to indicate means of conveyance
8	used as a function word to indicate presence in the possession of
9	used as a function word to indicate a time frame during which something takes place or an instant, action, or occurrence when something begins or is done
10	used as a function word to indicate manner of doing something ; often used with <i>the</i>
11	used as a function word to indicate means or agency
12	used as a function word to indicate a medium of expression
13	(1) used as a function word to indicate active involvement in a condition or status (2) : regularly using or showing the effects of using
14	used as a function word to indicate involvement or participation
15	used as a function word to indicate inclusion
16	used as a function word to indicate position or status in proper relationship with a standard or objective
17	used as a function word to indicate reason, ground, or basis (as for an action, opinion, or computation)
18	used as a function word to indicate the cause or source
19	used as a function word to indicate the focus of obligation or responsibility
20	used as a function word to indicate the object of collision, opposition, or hostile action
21	used as a function word to indicate the object with respect to some disadvantage, handicap, or detriment
22	used as a function word to indicate destination or the focus of some action, movement, or directed effort
23	used as a function word to indicate the focus of feelings, determination, or will
24	used as a function word to indicate the object with respect to some misfortune or disadvantageous event
25	used as a function word to indicate the subject of study, discussion, or consideration
26	with respect to

27	used as a function word to indicate reduplication or succession in a series
28	in or into a position of contact with an upper surface especially so as to be positioned for use or operation
29	in or into a position of being attached to or covering a surface; <i>especially</i> : in or into the condition of being worn
30	forward or at a more advanced point in space or time
31	in continuance or succession
32	into operation or a position permitting operation

The senses of *on* in this categorization also vary from the central meanings “indicate position in contact with and supported by the top surface of” (Sense 1) and “indicate position in or in contact with an outer surface” (Sense 2) to extended meanings, such as “indicate a source of attachment or support” (Sense 5) and “indicate means of conveyance” (Sense 7).

The frequency of these senses in the data was counted and compared to explore how they distribute in native speaker corpus and learner corpus, which may tell the difference between native speakers’ and learner’s understanding of preposition *in* and *on*. The results of sense analysis will also be compared and discussed with the results of the semantic feature analysis for inspecting whether particular features occur more frequently in certain senses. For example, for grounds in Sense 1 of *on* “indicate position in contact with and supported by the top surface of”, more *solid* feature should be found as it is less possible for non-solid objects to support things. Through comparing the results of sense analysis with semantic feature analysis, we hope that a more complete semantic profile of preposition *in* and *on* may be generated.

3.4.2 Coding Errors in the Learner Corpus

In addition to analyzing the distribution of senses of the data from BNC and NCCU, the erroneous usage of *in* and *on* in the learner corpora would also be attended

to in order to examine learners' performance on using these two prepositions. In fact, the semantic features of figure and ground in erroneous constructions would also be analyzed to inspect how they were distributed. These errors may be coded according to the type of error identified, such as substitution, misuse, etc., as in Example (3.6).

(3.6) a. **In* [?] *their hand, compare and contrast are also the ways that teachers may use.* (NCCU_E034013.txt)

Example (3.6) would be coded as “misuse” of preposition *in* as it does not make sense in this prepositional phrase. After coding the error, the current researcher will relate the errors with the type of nouns that most errors occur with.

3.5 Summary of the Chapter

This chapter introduces the method of conducting the two analyses, semantic feature analysis and sense analysis, in the present research. The materials adopted for research were British National Corpus (as the reference corpus) and NCCU Foreign Language Learner Corpus, from which 2,000 instances of *in* and *on* were retrieved from each corpus respectively. For the semantic feature analysis, the current researcher started from identifying the figure and ground nouns in the data of prepositional phrases and set an encoding criterion for analyzing the semantic features of nouns. The distribution of these semantic features will later on be computed for the comparison between preposition *in* and *on*, and between the data of native speakers and L2 learners. For the sense analysis, the current researcher detailed the categorization of the sense to be based on, and introduced the coding of errors in NCCU learner corpus.

In Chapter 4, the results for these two analyses will be presented respectively through comparing the occurrence of semantic features in *in* and *on* between native speaker and L2 learner. The distribution of senses will also be shown in Chapter 4.



CHAPTER 4

RESULTS

The results are organized in three sections. First, in 4.1, there is the result of sense analysis, which shows the sense distribution of *in* and *on* used by native speakers and learners. The frequencies of the senses appearing in the data were calculated to examine how *in* and *on* are used by these two groups. Then, in the result of semantic feature analysis, presented in 4.2, there are descriptive data for the semantic features (e.g. *concrete*, *animate*) in the retrieved instances. The frequencies of semantic features in the nouns contained in the prepositional construction of *in* and *on* by native speakers and learners were computed and analyzed by employing descriptive and inferential statistics. Lastly, we also examine learners' error in constructing *in* and *on* prepositional phrases in 4.3.

4.1 Results of the Sense Analysis

Figure 4.1 illustrates the two corpora (BNC and NCCU) that were included in the analysis, and each can be divided into the data of *in* and *on*. Within each of these two prepositions, the data can be further categorized into literal or metaphorical constructions, in which their senses were identified. Within each set of literal or metaphorical data, figure and ground noun phrases will be identified in order to conduct the semantic feature analysis. This section will present the results of the sense analysis, and the next section will show the results of semantic feature analysis.

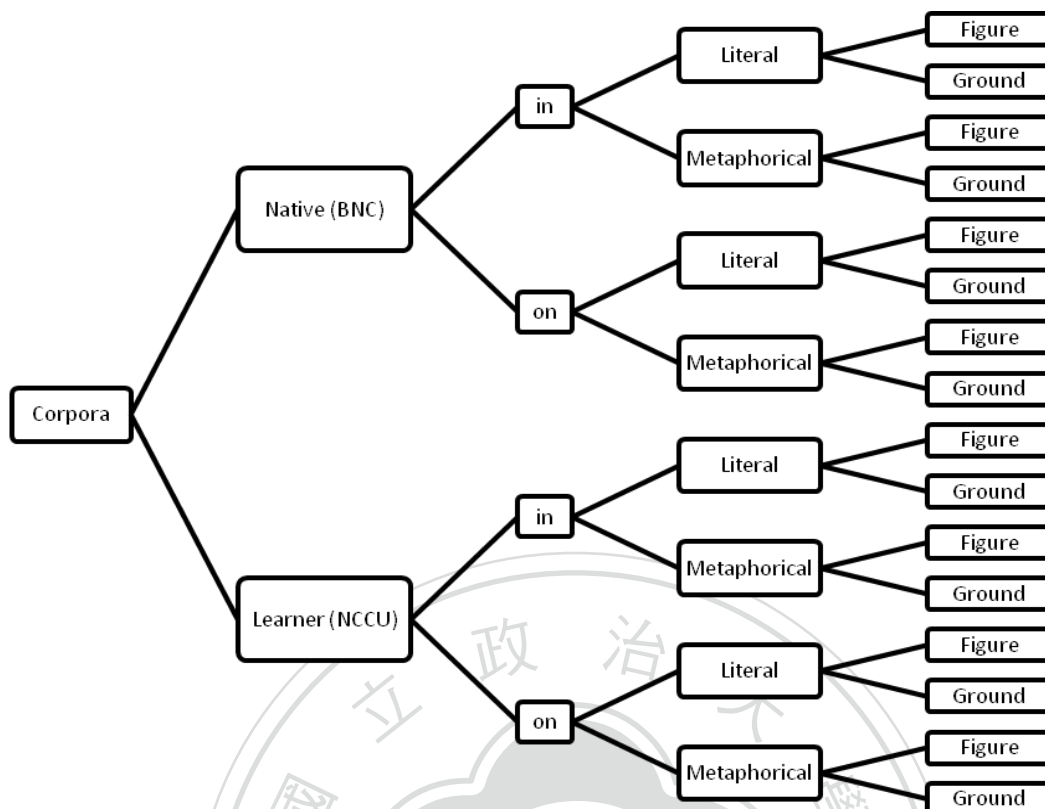


Figure 4.1 The Layout of the Datasets in the Analysis

The descriptive statistics of the overall data is shown in Table 4.1, which presents raw frequency and percentage of literal and metaphorical expressions of *in* and *on*, e.g. *a brick would float **on** water* (literal), *Myth and menace merge **in** India's poll campaign* (metaphorical), in BNC and NCCU. As mentioned in the previous chapter, literal and metaphorical expressions were treated separately since semantic extensions of them would be at different levels.

Table 4.1 Raw Frequency and Percentage of Literal and Metaphorical *in* and *on*

		Literal	%	Metaphorical	%
IN	BNC	446	44.60%	554	55.40%
	NCCU	515	51.10%	485	48.90%
ON	BNC	269	26.90%	731	73.10%
	NCCU	392	39.10%	608	60.90%
Total		1617	40.43%	2383	59.58%

In Table 4.1, the overall percentage shows that more metaphorical expressions are used (59.58%) in the data than the literal ones (40.43%). Generally, in BNC, more metaphorical expressions are used, and the metaphorical expression with *on* accounts for much higher percentages in both BNC (73.1%) and NCCU (60.9%). This conforms to the fact that when inspecting the senses of *in* and *on* listed on Merriam-Webster Online Dictionary, more non-literal senses may be found with both prepositions. As noted in previous studies on the senses of preposition (as in Evans and Tyler, 2004) that the metaphorical senses are extensions of the literal sense, more metaphorical extensions indicate the semantic complexity of prepositions. However, for metaphorical phrases of *in*, higher percentage was only be found in BNC (55.4%), while in NCCU, literal phrases accounted for higher percentage (51.1%) although the differences between literal and metaphorical for *in* are smaller than those of *on*. With regard to the contrast between *in* and *on*, more metaphorical phrases were identified in the data of *on* than in *in*. In the following step, sense analysis was then conducted to examine how these literal and metaphorical senses are actually used by language users.

To investigate the relations among the literal and metaphorical senses, the current researcher grouped these senses according to the clusters in the semantic networks constructed by Evans and Tyler (the network of *in*) and Ho (2007) (the network of *on*). For senses within each cluster, the hypothesized prominent features of figure and ground nouns are illustrated in Table 4.2, with examples given in the last column. From this table, we can see that slight difference may be found within the hypothesized prominent features of figure and ground in senses of different clusters (see p.13 and p.15 of this thesis for the network of clusters for *in* and *on*).

Table 4.2 Hypothesized Prominent Features of ‘Figure’ and ‘Ground’ in Prepositional Phrase of *in* and *on*³

Prepositional phrase of <i>in</i>			
Cluster	Prominent Feature		Example
	Figure	Ground	
Proto-scene	concrete, animate, human, mobile, F<G	concrete	<i>Mrs. Brown lived in <u>Morrell House</u>.</i>
Location	concrete, animate, human, mobile, solid	measure, activity	<i>The circuit cable runs direct to <u>each ceiling rose</u> in <u>turn</u>.</i>
Vantage Point is Interior	mobile, solid	partitive, countable	<i>I have <u>him</u> in <u>sight</u>.</i>
Segmentation	concrete, mobile, countable	concrete, partitive, countable, temporal	<i>Can <u>you</u> get in <u>line</u>.</i>
Reflexivity	concrete, partitive, mobile, countable	concrete, figure-ground contact	<i>The <u>walls</u> of the <u>sandcastle</u> fell in.</i>
Prepositional phrase of <i>on</i>			
Cluster	Prominent Feature		Example
	Figure	Ground	
Proto-scene	concrete, animate, mobile, F-G contact	concrete, mobile, solid	<i>Many <u>passengers</u> were on <u>board</u>.</i>
State	mobile, activity	mobile, activity, temporal	<i>The <u>DVD</u> is on <u>pause</u>.</i>
Support	concrete, animate, human, mobile,	concrete, partitive, countable	<i>The <u>movie</u> is based on the <u>true story</u>.</i>
Continuation	concrete, animate, human, mobile,	activity, mobile	<i>Please don't stop, keep on <u>talking</u>.</i>

Within each construction of prepositional expressions in different clusters, there

³ These clusters are from the semantic networks proposed in Evans and Tyler (2004) and Ho (2007), and the features hypothesized here are from Table 3.2, the set of features constructed for the semantic feature analysis.

are figure and ground nouns which can be described through their prominent semantic features. For example, within the PROTO-SCENE cluster of *in*, the expressions tend to be constructed by animate and human entity as the figure, thus, hypothesized as concrete, animate, human, and mobile features. As for their grounds, the expressions usually involve a concrete container or location (e.g. *city, box*); therefore, it is hypothesized to involve mostly concrete feature. With regard to the relative size of figure and ground, as figure tends to situate inside the boundary of ground (e.g. *the boy* (F) *in the house* (G), thus, $F < G$), so it is hypothesized to be smaller than grounds. Through examining the semantic feature of nouns within senses of these clusters, we can perceive how the nouns constructing the prepositional phrase might influence the semantics of prepositions. These hypothesized prominent features will later be examined in the results of semantic feature analysis to inspect if these listed features are also prominent in the native speaker data.

On the other hand, in order to probe into learners' performance on using preposition *in* and *on*, an additional sense analyses based on the data from NCCU and BNC were run, in which the latter were used as the reference data set⁴. The result of the sense analyses may be compared and contrasted with the results of semantic feature analysis, which will be presented in the next section, for examining whether nouns with particular sensory-motor features may have prominent tendency to appear in the figure or ground nouns in constructing prepositional phrases of particular sense. This inspection into the dictionary meaning was carried out as an initial analysis of the corpora as the entries in the dictionary are what language users may most frequently refer to when encountering unknown meanings or usages. This full list of

⁴ 'Reference data' refers to the data from the reference corpus which is large enough to represent a comprehensive information about a language and is used as a reference for comparison with other corpus (cf. Baker, 2006; McEnery, Xiao, & Tono, 2006).

dictionary explanations toward a particular lexicon may also facilitate the researcher to examine the multiple facets of a lexical item. However, they may not be comprehensive in showing the meanings of the preposition, so a corpus-based analysis may complement the explanations listed on the dictionary. To further examine how the list of lexical entries can be related to the semantic network constructed in the previous studies (Evans and Tyler, 2004; Ho, 2007), the current researcher attempted to identify the senses according to the semantic clusters proposed in the network graphed in Evans and Tyler's (presented again in Figure 4.2) and Ho's work⁵.

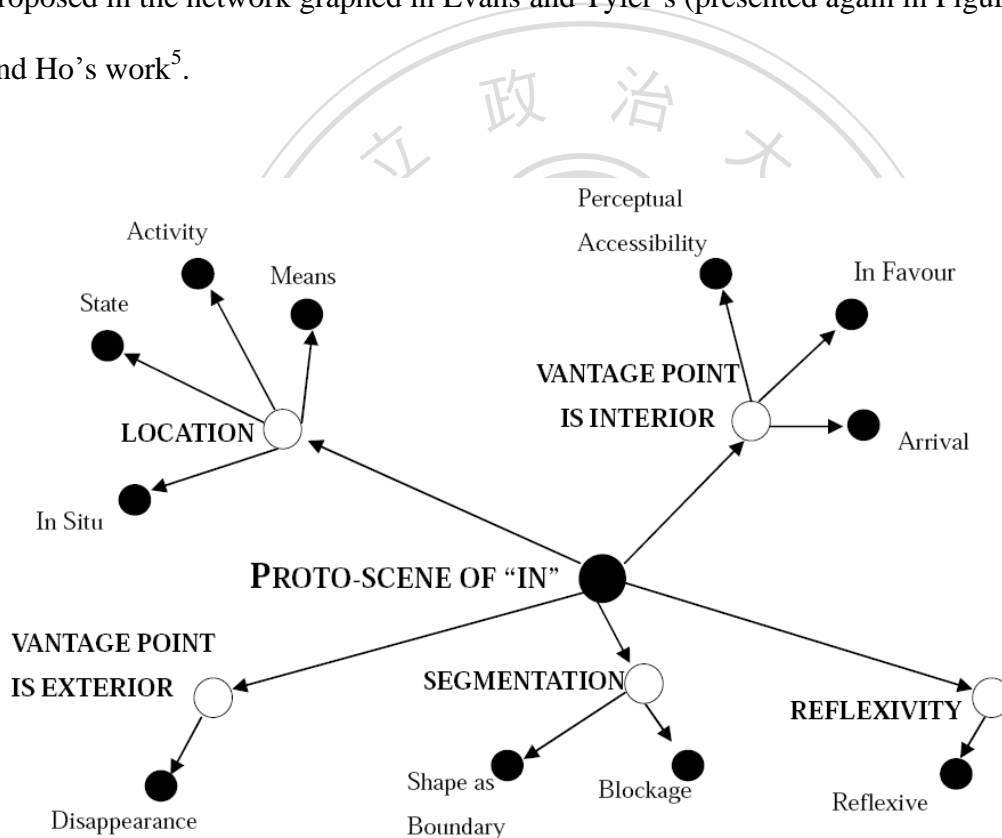


Figure 4.2 The Partial Semantic Network of *in* (Evans and Tyler, 2004, p.173)

Table 4.3 below shows the distribution of the senses of *in* and how the senses can be categorized into Evans and Tyler's semantic clusters in the lexical network of *in*.

⁵ Ho's (2007) network will appear again in the discussion of *on* on p.57.

Table 4.3 Sense Distribution of *in*

Cluster	Sense	BNC		NCCU	
		Literal	Metaphorical	Literal	Metaphorical
Proto-scene	1 inclusion, location, or position within limits	40% (395)	22% (223)	50% (498)	30% (298)
Location	2 means, medium, or instrumentality	0% (0)	4% (42)	0% (2)	5% (47)
	3 limitation, qualification, or circumstance	1% (5)	21% (208)	1% (5)	10% (104)
N/A	4 purpose	0% (0)	3% (33)	0% (0)	0% (4)
N/A	5 the larger member of a ratio	0% (0)	0% (0)	0% (0)	0% (0)
Vantage point is interior	6 to or toward the inside especially of a house or other building	4% (36)	0% (4)	1% (5)	0% (2)
	7 to or toward some destination or a particular place	0% (1)	0% (3)	0% (0)	1% (6)
	8 at close quarters : near	0% (0)	0% (2)	0% (0)	0% (2)
Reflexivity	9 so as to incorporate —often used in combination	0% (0)	1% (5)	0% (0)	0% (2)
Segmentation	10 to or at an appropriate place	1% (5)	0% (4)	0% (0)	0% (3)
Location	11 within a particular place; especially: within the customary place of residence or business	0% (0)	0% (0)	0% (0)	0% (0)
N/A	12 in the position of participant, insider, or officeholder —often used with <i>on</i>	0% (1)	2% (19)	0% (3)	1% (14)
N/A	13 on good terms	0% (0)	0% (0)	0% (0)	0% (0)
N/A	14 in a specified relation	0% (0)	0% (0)	0% (0)	0% (0)
N/A	15 in a position of assured or definitive success	0% (0)	0% (0)	0% (0)	0% (0)
Vantage point is interior	16 in vogue or season	0% (0)	1% (9)	0% (0)	0% (0)
N/A	17 in production	0% (0)	0% (0)	0% (0)	0% (0)
N/A	18 in one's presence, possession, or control	0% (3)	0% (2)	0% (2)	0% (4)
N/A	19 from a condition of indistinguishability to one of clarity	0% (0)	0% (0)	0% (0)	0% (0)
Total		446	554	515	485

The left column shows the corresponding cluster matched to each sense identified by the current researcher, though some of the senses cannot be identified in these clusters (shown as not available ‘N/A’). This implies that the semantic clusters may not be sufficient to include and describe all the meanings in the dictionary entry, and not all the semantic clusters have their corresponding meanings listed on the dictionary. Therefore, in the following semantic feature analysis with results presented in next section, we will focus both on the senses identified in the semantic clusters as well as those that do not have the corresponding clusters, which will be discussed according to the prominent features in figure and ground nouns.

The result of sense analysis for *in*, as displayed in Table 4.3 above, shows the distribution of the senses analyzed by this work based on the meanings given in the Merriam-Webster’s Online Dictionary (<http://www.merriam-webster.com/>), and these counts were separated into literal and metaphorical expressions. Through analyzing large amount of data from the corpora, it may help us detect possible problems with the dictionary meanings. As can be observed in Table 4.3, in both literal and metaphorical data, most of the instances fall into the category “inclusion, location, or position within limits” in both corpora. However, in Evans and Tyler’s semantic network, the “inclusion” sense resembles the proto-scene, which initially involves merely the literal meaning of *in*. For the data categorized under the “inclusion” sense in Table 4.3, they originally refer to both literal and metaphorical meanings without distinguishing these two levels of meanings. This way of categorization may simplify the “inclusion” sense and may pose problems in learning.

The second-most frequently appearing metaphorical sense is Sense 3 “used as a function word to indicate limitation, qualification, or circumstance”, and it is two times higher in BNC than in NCCU. However, in other categories, only some slight

variations can be found between these two corpora. This may imply that native speakers and learners' use of the senses and usages of preposition *in* does not differ so greatly in the other senses.

For the data of *on*, the distribution of the senses of *on* and how the senses can be categorized into Ho's (2007) semantic clusters in the lexical network of *on* (Figure 4.3 below) are shown on Table 4.4.

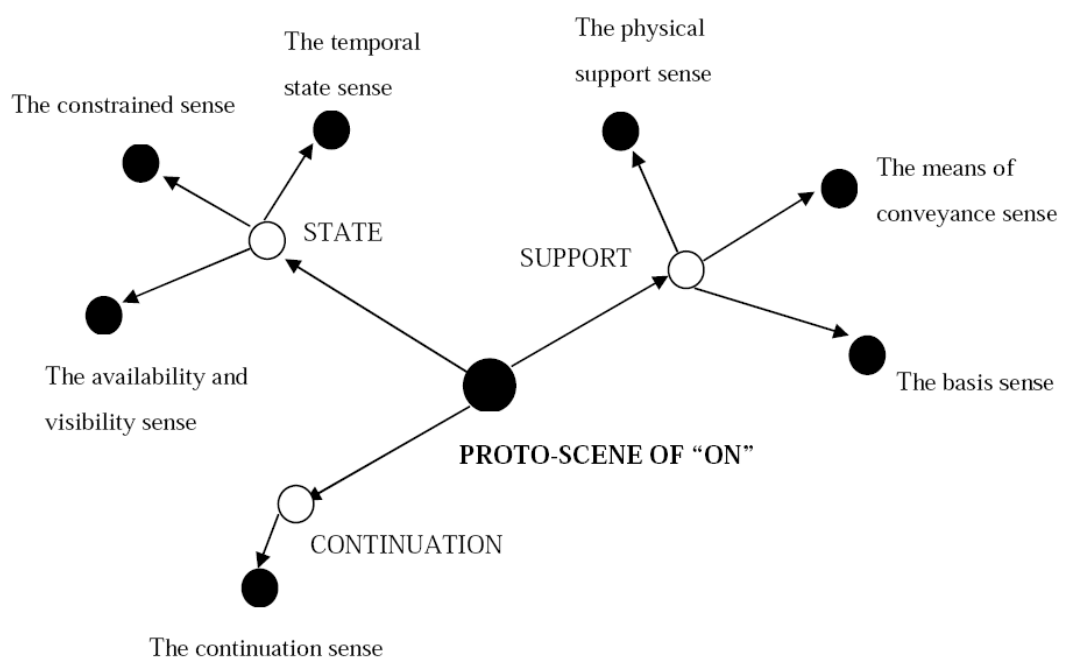


Figure 4.3 The Partial Semantic Network of *on* (Ho, 2007, p.69)

Ho's semantic network is adopted as a reference for the study of *on* in this study because her network basically follows Evans and Tyler's (2004) network that categorizes distinct senses according to their semantic clusters, and this network has also been evaluated by Evans (through personal communication, p.86 in Ho's work) as a reasonable categorization for the distinct senses of *on*.

Table 4.4 Sense Distribution of *on*

Cluster	Sense	BNC		NCCU	
		Literal	Metaphorical	Literal	Metaphorical
Proto-scene	1 position in contact with and supported by the top surface of	2% (20)	0% (0)	4% (39)	0% (0)
	2 position in or in contact with an outer surface	2% (23)	0% (0)	2% (22)	0% (2)
	3 position in close proximity with	0% (0)	0% (0)	0% (0)	0% (1)
	4 the location of something	13% (134)	3% (25)	24% (235)	3% (26)
Support	5 a source of attachment or support	0% (2)	1% (9)	1% (6)	0% (1)
	6 a source of dependence	0% (2)	5% (46)	0% (0)	5% (45)
	7 means of conveyance	0% (2)	0% (1)	0% (3)	0% (1)
N/A	8 presence in the possession of	0% (0)	0% (2)	0% (1)	0% (1)
State	9 a time frame during which something takes place or an instant, action, or occurrence when something begins or is done	0% (1)	2% (17)	1% (4)	2% (24)
Support	10 manner of doing something; often used with <i>the</i>	0% (1)	1% (7)	0% (0)	0% (1)
	11 means or agency	0% (2)	0% (3)	0% (4)	1% (5)
	12 a medium of expression	3% (28)	2% (22)	5% (45)	1% (9)
State	13 (1) active involvement in a condition or status, (2) regularly using or showing the effects of using	0% (3)	5% (50)	0% (0)	1% (7)
	14 involvement or participation	0% (3)	6% (59)	0% (0)	2% (15)
	15 inclusion	0% (0)	0% (4)	0% (2)	0% (1)
	16 position or status in proper relationship with a standard or objective	0% (2)	1% (5)	1% (4)	0% (9)
Support	17 reason, ground, or basis (as for an action, opinion, or computation)	0% (4)	8% (81)	0% (2)	7% (67)
	18 cause or source	0% (2)	6% (56)	0% (0)	1% (6)
	19 the focus of obligation or responsibility	0% (1)	0% (3)	0% (0)	0% (1)
N/A	20 the object of collision, opposition, or hostile action	0% (4)	1% (11)	0% (1)	3% (32)
	21 the object with respect to some disadvantage, handicap, or detriment	1% (7)	3% (25)	1% (7)	3% (33)
	22 destination or the focus of some action, movement, or directed effort	2% (19)	22% (216)	1% (8)	24% (237)
	23 the focus of feelings, determination, or will	0% (2)	1% (5)	0% (1)	2% (19)

	24	the object with respect to some misfortune or disadvantageous event	0% (0)	0% (0)	0% (0)	0% (1)
	25	the subject of study, discussion, or consideration	0% (2)	5% (48)	0% (1)	2% (20)
	26	with respect to	0% (2)	2% (19)	0% (0)	2% (15)
Continuation	27	reduplication or succession in a series	0% (0)	0% (1)	0% (0)	0% (1)
Proto-scene	28	in or into a position of contact with an upper surface especially so as to be positioned for use or operation	0% (3)	1% (5)	0% (4)	0% (2)
N/A	29	in or into a position of being attached to or covering a surface	0% (0)	1% (1)	0% (3)	0% (3)
Continuation	30	forward or at a more advanced point in space or time	0% (0)	0% (5)	0% (0)	1% (5)
	31	in continuance or succession	0% (0)	1% (4)	0% (0)	2% (15)
State	32	into operation or a position permitting operation	0% (0)	0% (1)	0% (0)	0% (3)
Total			269	731	392	608

As the table for preposition *in*, the left column in Table 4.4 displays the corresponding cluster of each sense identified by the current researcher. In the central sense “in contact with or supported by a surface” (Sense 1), NCCU accounts for higher percentage in literal phrases (4%) than BNC (2%). Similar result can also be observed in senses derived from this central sense, as in Sense 4 “the location of something” which still belongs to the PROTO-SCENE cluster in Ho’s semantic network of *on*, the data in NCCU accounts for higher percentage in literal expressions (24%) than those in BNC (13%). This suggests that learners learn *on* as a locational preposition and use it widely as senses under the PROTO-SCENE cluster, as in Example (4.1).

(4.1) *One day Stephen goes for a walk **on** the beach, where he sees a young girl.*

(NCCU_E006011)

In (4.1), the figure *Stephen* may move from one point to another in that location and *beach* is the place for people to act. In this way, *on* as a locational preposition is used to refer to the location of the figure (this is the construction of Sense 4, not Sense 1 because the support meaning is not that prominent in this construction), which is a commonly seen phrases in the data of *on*.

As shown in this table, some of the senses are more metaphorical, and native speakers tend to use more metaphorical expressions of *on* than L2 learners do in certain senses, as in Sense 13 (50 hits (5%) in BNC and 7 hits (1%) in NCCU), Sense 14 (58 hits (6%) in BNC and 15 hits (2%) in NCCU), Sense 18 (56 hits (6%) in BNC and 6 hits (1%) in NCCU), and Sense 25 (48 hits (5%) in BNC and 20 hits (2%) in NCCU). The differences in sense distribution will be helpful in comparing the semantic features in nouns constructing prepositional phrases and in describing the specific semantic profiles each preposition denotes. Moreover, the differences between native speakers' and L2 learners' command or performance of using these metaphorical constructions of *on* may be utilized further in finding out learners' problems in correctly using English prepositions.

4.2 Results of the Semantic Feature Analysis

As the sense analysis is not in itself complete in disambiguating the construction of different senses of prepositions *in* and *on*, the semantic feature analysis was conducted to investigate the interaction of figure and ground nouns with the senses of preposition. In the following subsections, comparisons of twelve semantic features (concrete, animate, human, mobile, partitive, countable, solid, measurance, activity, temporal, figure-ground contact, and the relative size of figure and ground) will be made between the two selected prepositions, *in* and *on*, and

between the two corpora, BNC and NCCU. In order to compare the constructions of *in* and *on*, in 4.2.1 the comparison of semantic features between *in* and *on* will only focus on the data from BNC, and in 4.2.2 the comparison will be directed toward the difference between the data obtained from native speakers and L2 learners.

4.2.1 *The Comparison of Semantic Features between in and on*

This section, divided into four sub-parts, shows the results of semantic feature analysis of figure and ground nouns in *in* and *on* in BNC. The results of semantic feature analysis are to be presented as the following: the comparison of the semantic features of figures and grounds in literal prepositional phrases in BNC is shown in sections 4.2.1.1 and 4.2.1.2. Sections 4.2.1.3 and 4.2.1.4 compare the semantic features of figure and ground nouns in metaphorical prepositional phrases in BNC. Section 4.2.1.5 deals with the two remaining semantic features, figure and ground's relative size and contact, which will be discussed separately because these two features requires the interaction between the figure and ground noun, as will be explained in detail in that section.

4.2.1.1 *Between Figure Nouns of Literal Expressions*

Table 4.5 shows the distribution of semantic features of figure nouns in literal preposition expressions in BNC. The frequencies of each feature appearing in figure nouns in literal *in* and *on* were tabulated (presented in parentheses), and the percentage of each frequency upon all figure nouns in literal *in* and *on*, respectively, is also shown. For example, for the feature *concrete*, it appears 290 times in *in* and 189 times in *on*, which accounts for 65.0% and 70.3% respectively in total 446 figure nouns of *in* and 269 of *on* in literal expression. A statistic chi-square test was run to

compare if there is any significant difference between *in* and *on* in the semantic features. If significant differences can be found between semantic features in the data set of *in* and *on*, we then look into these features to examine if they are also hypothesized as prominent in the corresponding cluster (see Table 4.2 for the hypotheses).

Table 4.5 The Comparison of Semantic Feature of Figure Nouns in Literal Preposition Expressions in BNC

feature	<i>in</i>	<i>on</i>	χ^2	Df
Concrete	65.0% (290)	70.3% (189)	2.082	1
Animate	39.5% (176)	24.9% (67)	15.844**	1
Human	38.1% (170)	22.3% (60)	19.226**	1
Mobile	67.3% (300)	47.6% (128)	28.156**	1
Partitive	4.0% (18)	4.5% (12)	0.075	1
Countable	68.6% (306)	66.2% (178)	0.456	1
Solid	56.5% (252)	56.1% (151)	5.014	1
Measure	5.8% (26)	0% (0)	17.576**	1
Activity	24.2% (108)	12.6% (34)	14.127**	1
Temporal	1.3% (6)	0% (0)	3.649	1

*p <.05. **p <.01.

The result shows that significant differences between *in* and *on* can be found in ‘animate’, ‘human’, ‘mobile’, ‘measure’, ‘activity’, and ‘temporal’ semantic features. As most of the literal expressions of preposition *in* fall into the PROTO-SCENE cluster in the semantic network proposed by Evans and Tyler, the distribution of semantic features for figure noun in literal expressions of *in* may be an exact representation of the feature of nouns involved in the construction of the sense of “inclusion, location, or position within limits”. That is to say, the result tells us that the majority of the usages in Sense 1 involves figure noun that is animate, especially

referring to human, and is active in moving (e.g. *people in shops*). This result perfectly proves the hypothesis of prominent semantic features proposed for figures in senses of PROTO-SCENE cluster (shown in Table 4.2). For example, an inspection of the corpora showed that, in many cases, a lot of human names (e.g. *Stephen, Gwendolen*) and other different references to people (e.g. *captain, communicator*) were used in this set of literal data. They are less likely to be partitive as they are entities (which are also found in inanimate nouns in this position, e.g. *ice, letter*) instead of reference points in prepositional construction that are actively involved in this construction, as in (4.2).

(4.2) *Jannie lay in bed, looking at him over the edge of the covers.* (BNC_G12 879)

The figure *Jannie* is constructed of features that are [+concrete] [+animate] [+human] [+mobile] [+solid], which is also a typical figure used in literal construction of *in*.

For literal *on*, as the proto-scene is the figure being in contact with or supported by a surface (ground), we hypothesized that the figure should contain more concrete, animate, and mobile feature (shown in Table 4.2). However, the result is slightly different from the prediction; *concreteness, mobility, countability, and solidity* seem to account for higher percentage in this set of data, such as *book, card, and chalk*, as in (4.3).

(4.3) *However, a Derry road-sweeper found the handbag lying on Strand Road this week and handed it into Derry RUC.* (BNC_HJ3 3922)

The figure *handbag* is composed of [+concrete] [+mobile] [+countable] [+solid],

which is a common composition in the data of figures in literal *on*. Comparing this result with the sense distribution of *on* (see Table 4.4), most of the figure nouns in literal instances were categorized into Sense 4 (“the location of something”), and some of them to Sense 1 (“position in contact with and supported by the top surface of”) and Sense 2 (“position in or in contact with an outer surface”). On the other hand, the prominent features stated here may not be decisive factors for constructing prepositional phrases in a particular sense since they simply show us the tendency of the kind of noun mostly found in the figure noun. This further emphasizes the complexity of senses and the elements in constructing the prepositional phrases. Exceptions of this tendency can also be observed in the data, as shown in (4.4).

(4.4) *So when you get accidents on motorways they're normally pretty horrendous aren't they?* (BNC_FM0 194)

This sentence provide a typical instance of Sense 4, but within this construction, *accidents* is [-concrete][-animate] as the focus in this sentence is to indicate the location. This example counters to the prominent presence of particular features as the complexity in constructing prepositional expressions; however, the above-presented result still approximate to the type of nouns the figures tend to be in literal construction of prepositional *in* and *on* phrases.

4.2.1.2 *Between Ground Nouns of Literal Expressions*

Table 4.6 shows the distribution of semantic features of ground nouns in literal preposition expression in BNC.

Table 4.6 The Comparison of Semantic Feature of Ground Nouns in Literal Preposition Expressions in BNC

feature	<i>in</i>	<i>on</i>	χ^2	Df
Concrete	92.8% (414)	84.7% (228)	11.911**	1
Animate	0.42% (19)	1.30% (35)	18.404**	1
Human	0.42% (19)	1.04% (28)	10.330**	1
Mobile	15.4% (69)	38.6% (104)	49.202**	1
Partitive	6.5% (29)	10.4% (28)	3.491	1
Countable	37.4% (167)	57.2% (154)	0.456	1
Solid	33.4% (149)	76.9% (207)	130.186**	1
Measure	0% (0)	0% (0)	NA	1
Activity	1.5% (7)	1.8% (5)	0.085	1
Temporal	0% (0)	0% (0)	NA	1

*p <.05. **p <.01.

Table 4.6 shows that significant differences between *in* and *on* may be found in ‘concrete’, ‘animate’, ‘human’, and ‘mobile’ features. For grounds in literal preposition *in* (e.g. *people in shops*, *trade in land*), the current researcher hypothesized that more concrete nouns may be found in the data, which is partially true when looking into the result of this part. For example, a lot of place names or location (e.g. *bed*, *Bristol*, *library*) appear as ground nouns in *in*-construction. This result is apparent from the literal meaning of *in*, as it refers to the figure being situated or surrounded by the ground, so definitely the ground may be concrete places or objects. For preposition *on*, as grounds act as the surface that support the figure, we hypothesized that there should be more concrete, mobile, and solid features in the data from the PROTO-SCENE cluster. The result basically conforms to this hypothesis as we can easily observe a lot of nouns in the data that are concrete, mobile, and solid (e.g. *Mars*, *board*, and *seat*).

As *on* is often used to refer to location and is regarded as a surface instead of a

container from the perspective of image schema theory, this may be one of the possible reasons for the difference between the prominent features of ground noun in *in* and *on* construction. Both prepositions can be used to refer to location, but the location in the former constructions should be able to include the figure entity while in the latter the figure should remain on the surface of ground after located on it, as the examples shown in (4.5).

- (4.5) a. *The protests were smaller than those of March 1989, when police opened fire on marchers and martial law was imposed.* (BNC_CRC 868)
- b. *It was richly covered with trees, glinting in the sunlight, a land hidden in mountains, completely cut off.* (BNC_HGK 841)

In (4.5a), instead of stating **opened fire in marchers*, *on* is used to refer to the location of the occurrence of *fire*, which is in contact with the outer side of the marchers and does not really go into the body of them. In (4.5b), we can also see the contrast between *in* and *on*: it is not possible to say **a land hidden on mountains* since from the semantic point of view, only *mountains* implies the meaning of surrounding or inclusion.

After examining the result of literal prepositional phrases, the cases in metaphorical phrase will be discussed in the following two sections to investigate if the result may exactly conform to the hypotheses and help illustrate the construction of metaphorical phrases.

4.2.1.3 Between Figure Nouns of Metaphorical Expressions

Table 4.7 shows the distribution of semantic features of figure nouns in

metaphorical preposition expressions in BNC. Metaphorical expression is a construction which may not be comprehended from its literal meaning. For example, in *situation in control*, *dependence on oil*, the literal meanings of *in* “inclusion” and *on* “in contact with or supported by” cannot be applied to explain these two phrases, and extended meanings are needed to fully explain them. For metaphorical data, a statistic chi-square test was also run to compare if there is any significant difference between *in* and *on* in the semantic features.

Table 4.7 The Comparison of Semantic Feature of Figure Nouns in Metaphorical Preposition Expressions in BNC

feature	<i>in</i>	<i>on</i>	χ^2	Df
Concrete	50.7% (281)	43.6% (319)	6.352*	1
Animate	29.2% (162)	17.2% (126)	26.121**	1
Human	28.3% (157)	15.8% (116)	29.293**	1
Mobile	63.8% (354)	26.5% (194)	179.843**	1
Partitive	4.6% (26)	0.05% (4)	23.758**	1
Countable	70.7% (392)	57.5% (421)	23.507**	1
Solid	41.1% (228)	35.9% (263)	20.758**	1
Measure	0.09% (5)	0.09% (7)	0.010	1
Activity	22.3% (124)	17.7% (130)	4.203*	1
Temporal	0.10% (6)	0.05% (4)	1.172	1

*p <.05. **p <.01.

Table 4.7 shows that significant differences between *in* and *on* may be found in ‘concrete’, ‘animate’, ‘human’, ‘mobile’, ‘partitive’, ‘countable’, ‘solid’, and ‘activity’ features. This indicates that when English native speakers use preposition *in* and *on* in their metaphorical meanings, more figure nouns with semantic features of animate, human, mobile, partitive, and solid may be found in *in*, or these features appear to be less in *on*. On the other hand, more concrete, countable, solid, and

activity features may be found in the figure nouns of *on*, or these features appear to be less in *in*, as discussed in the following passages.

For metaphorical *in*, the kind of figure nouns is like those in literal expression which involved people’s names, references to people, as well as body terms (e.g. *skull*, *face*, *blood*). As these figure nouns are part of an animate being, undoubtedly most of them are active in moving (e.g. *doctors*, *Tom*). Extending this result to the distribution of sense in those metaphorical prominent categories (including Senses 2, 3, 4, 12, and 16, which appear to have higher frequency in metaphorical construction in Table 4.3), Figure 4.4 shows the graphic representation of how this set of semantic features may help represent the figures in metaphorical constructions..

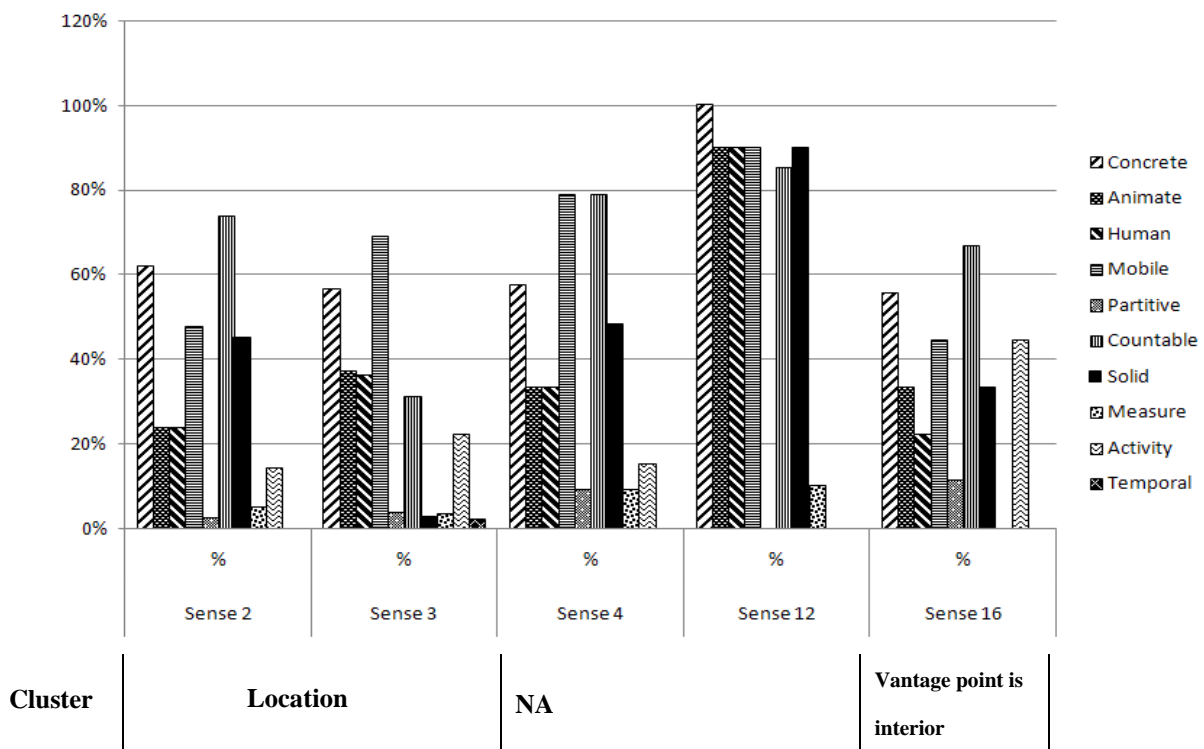


Figure 4.4 The Graphic Representation of Figures in Metaphorical Prominent Senses of *in* in BNC

In prepositional expressions categorized into Sense 2, which is used to describe “means, medium, or instrumentality”, the figures tend to be inanimate noun phrases.

Sense 3, which expresses “limitation, qualification, or circumstances”, tends to describe concrete things, especially mobile items, such as human beings, objects, or other things that are closely related to human activity (e.g. *stock market, language*). Comparing this result with the hypothesis postulated in Table 4.2, the hypothesis cannot be proven in the “means sense” within the LOCATION cluster, in which inanimate nouns appear to be more frequent in the data.

Sense 4, showing the “purpose” of the figure, tends to include figure nouns that are more concrete, mobile, countable, and solid (e.g. *mouth, gene*), though non-solid items are also very common in the figures of this sense (e.g. *vote, course*). The data in Sense 12 display great consistency in the sort of features they contain; most of them are concrete, animate, human, mobile, countable, and solid. This result might be unique in all senses as it intends to show the “position of participant, insider, or officeholder”, so the figure surely needs to be human beings. Sense 16 mainly contains figures in vogue or season, which may not necessarily be concrete as they may vary from concrete objects, activities, attitude, to organizations.

Compared with *in*-construction, a lot of concrete nouns can also be found in the metaphorical *on*-construction. Evaluating the result based on the hypothesis presented in Table 4.2, we can see that some of the metaphorical prominent categories, that is, senses that appear to have higher frequency in metaphorical construction in Table 4.4 do not have their corresponding semantic clusters in the network in Figure 4.3, including Senses 21, 22, 25, 26. For Senses 6, 17, 18 which are grouped under the SUPPORT cluster, the result does not correspond to the distribution predicted in hypothesis. In this cluster which includes the senses of “physical support”, “the means of conveyance”, and “basis”, the current researcher hypothesized that concrete, animate, human, and mobile feature may be more prominent in the metaphorical data;

however, the result shows that, in addition to concrete feature, countable, solid, and activity features also appear in high frequency. The senses under the SUPPORT cluster actually display great variation among them, as the basis sense usually involve an [-animate] figure (e.g. *movie* in *This movie is based on a true story.*), while the “physical support” and “the means of conveyance” senses tend to be constructed by human beings as the figure noun (e.g. *children, student*). Since most of the data identified within the senses of this cluster belong to the basis one, less animate nouns can be found in this set of data, leading to the inconsistency with the hypothesis.

As for Senses 13 and 14 belonging to the STATE cluster, the result basically conforms to the hypothesis with more activity semantic feature found in these nouns (e.g. *car collection, treatment*). Extending this result to the distribution of sense in those metaphorical prominent categories (including Sense 6, 13, 14, 17, 18, 21, 22, 25, and 26), Figure 4.5 shows the graphic representation of how this set of semantic features may help represent the figures in metaphorical constructions.

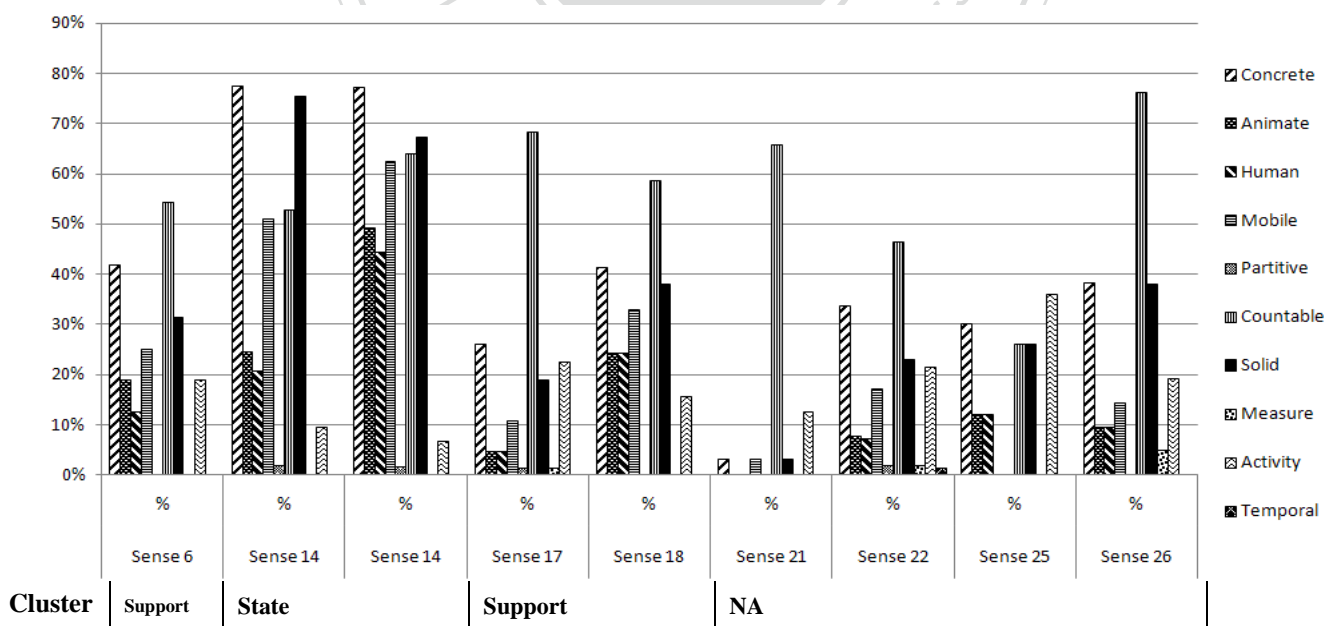


Figure 4.5 The Graphic Representation of Figures in Metaphorical Prominent Senses of on in BNC

From Figure 4.5, we can observe that there are some features that are more prominent in particular senses. For example, the figures in the construction of Sense 21 are purely inanimate and non-human as these nouns are nearly all negative descriptions of incidents which may cause “harm” to the grounds, as in (4.6).

(4.6) *It is significant that one which was encountered more than once was a “lack of follow-up support after the course and a lack of procedures for evaluating impact on participants’ performance as opposed to the quality of the training experience”.* (BNC_HPX 1396)

In (4.6), the *impact* symbolizes detriment to the ground *performance*. Other nouns that may appear in the position of figure for Sense 21 includes *patenting, duty, hardship, loss, trick*, etc., which are all non-human in feature. In Sense 6, no partitive, measure, and temporal feature can be observed in the data. In Sense 13, concrete and solid feature appear extremely high in frequency. Both can also be explained through looking into the description of their senses, as the former refers to a source of dependence which has to be whole entity, while the latter directs to an entity being involved in a condition. The examples of these two senses are given in (4.7).

- (4.7) a. *Affirmation depends on negation: white is valued at the expense of black; youth acquires status through the devaluation of ageing.* (BNC_C9S 202)
- b. *Kwik Save also prosecuted for offering Danish blue cheese which was unfit because of its bacteria count, and having food on sale at temperatures of up to 20 degrees which should have been stored at a maximum of eight degrees*

centigrade. (BNC_K97 2038)

The tendency in the distribution of semantic feature in different senses within the semantic clusters provides evidence that prepositional phrases of a certain sense can only be constructed with a particular type of nouns. After examining the distinctive features in the figures of metaphorical phrases and the correlation of distinctive features with particular senses, the result of grounds in metaphorical phrase is probed into to see if there is any significant difference in the feature of these grounds.

4.2.1.4 Between Ground Nouns of Metaphorical Expressions

Semantic feature differences are also revealed in ground nouns used in metaphorical expressions of *in* and *on*. Table 4.8 shows the distribution of semantic features of ground nouns in metaphorical preposition expression in BNC. A statistic chi-square test was run to compare if there is any significant difference between *in* and *on* in the semantic features.

Table 4.8 The Comparison of Semantic Feature of Ground Nouns in Metaphorical Preposition Expressions in BNC

feature \	<i>in</i>	<i>on</i>	χ^2	Df
Concrete	18.9% (105)	35.4% (259)	42.147**	1
Animate	4.8% (27)	10.2% (75)	12.512**	1
Human	0.37% (21)	0.9% (66)	13.699**	1
Mobile	49.2% (273)	16.4% (120)	162.226**	1
Partitive	0.34% (19)	0.2% (15)	2.322	1
Countable	40.5% (223)	45.2% (331)	3.248	1
Solid	12.0% (67)	27.0% (198)	50.626**	1
Measure	4.1% (23)	0.05% (4)	21.268**	1
Activity	42.5% (236)	21.4% (157)	66.227**	1
Temporal	4.8% (27)	0.09% (7)	18.763**	1

*p <.05. **p <.01.

From this table, significant differences between *in* and *on* may be observed in semantic feature of ‘concrete’, ‘animate’, ‘human’, ‘mobile’, ‘solid’, ‘measure’, ‘activity’, and ‘temporal’. Having this result compared with the hypotheses of metaphorical prominent clusters (LOCATION and VANTAGE POINT in *in* and STATE and SUPPORT in *on*) proposed in Table 4.2, differences may be observed.

We hypothesized in the data of *in* that measure and activity nouns would appear more frequently in the data as senses of *in situ*, state and activity all may involve activity in the construction (e.g. *in development*, *in competition*) or measure nouns as the means or limitation to the figure nouns (e.g. *in order*, *in step*). However, from the result we can observe that in addition to the above-hypothesized features, mobile and temporal features are also prominent in the construction of metaphorical *in*.

As for the cases of *on*, we initially hypothesized that there should be more mobile, activity, and temporal features in nouns in the STATE cluster and concrete, partitive, and countable in the SUPPORT cluster as these two are metaphorical prominent semantic clusters in the data. A great difference can be observed in the result; concrete, animate, human, and solid features tend to occur in higher frequency compared with *in* in the data. Though animate and human features appear to be higher in frequency of *on*, in the distribution of all features in the ground nouns of *on*, they seem to play a minor role in representing the nouns used. Within the data of metaphorical *on*-construction, concreteness, countability, solidity, and activity seem to be relatively prominent in the formation of ground nouns. Similar to ground nouns in literal *on*-construction, they are usually real world objects, acting as locations for other entities or events to be happening, as in (4.8).

(4.8) a. *Most organisations rely on people, especially managers, to build their business.* (BNC_HWY 10)

b. *The bungy jumping was filmed on video.* (BNC_HPP 1487)

In (4.8a), the ground *people* carries [+concrete] [+animate] [+human] [+mobile] [+countable][+solid] features and is regarded as a basis that supports the figure *organizations*. In (4.8b), the ground *video*, which facilitates the visibility of figure *bungy jumping*, represents the typical prominent features [+concrete] [+mobile] [+countable] [+solid] in *on*-construction. The results are further discussed in the metaphorical prominent categories, including Senses 2, 3, 4, 12, 16, and the graphic representation of the distribution of semantic features for these senses is presented in Figure 4.6.

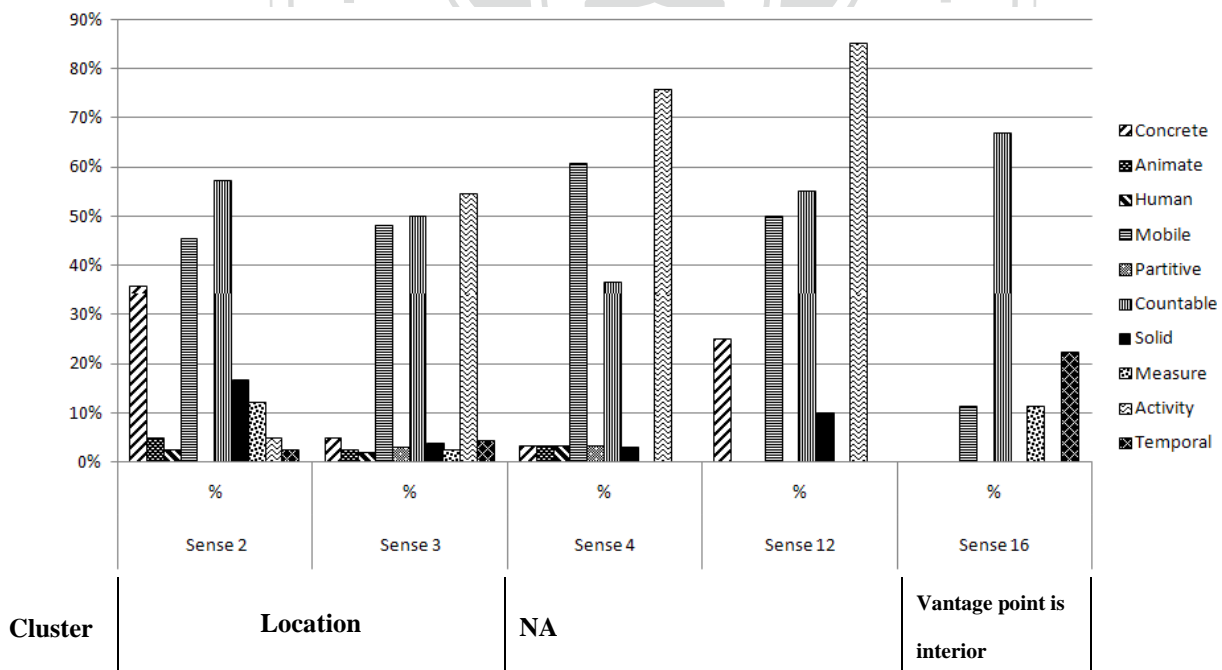


Figure 4.6 The Graphic Representation of Grounds in Metaphorical Prominent Senses of in in BNC

The grounds in these senses are mainly related to means, limitations, purpose, position, and trend (e.g. *in turn*, *in horror*, *in exchange*), so they tend to be non-concrete and inanimate entities. Looking into the senses separately, we found that the grounds in Sense 2 tend to be non-partitive, more concrete, countable, and mobile (e.g. *in groups*, *in cash*, *in step*), in Sense 3 they tend to be more mobile, countable, and activity (e.g. *in practice*, *in use*), in Sense 4 they are similar to the case in Sense 3 though no measure and temporal feature were found, in Sense 12 almost all are activity (e.g. *in eating*, *in jamboree*), and in Sense 16 they are only countable, mobile, measure, and temporal (e.g. *in season*, *in style*). From the graphic representations of semantic features in the senses above, an interesting description of the nouns occurred in the position of ground in *in*-construction is presented.

Figure 4.7 shows the graphic representation of those metaphorical prominent senses in the data of *on*.

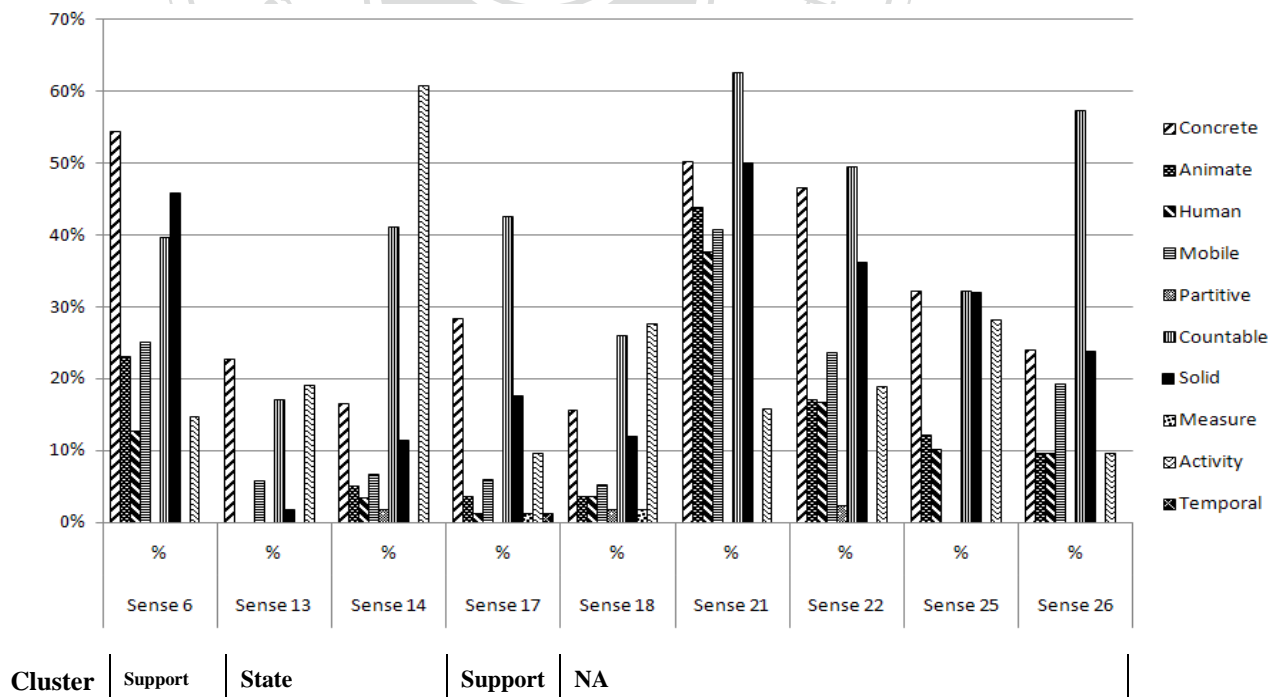


Figure 4.7 The Graphic Representation of Grounds in Metaphorical Prominent Senses of *on* in BNC

As the cases in metaphorical prominent senses of *in*, some features are absent in the construction of particular senses. For example, partitive nouns can only be found in Senses 14, 18, and 22, temporal nouns appear only in Sense 17, and measure nouns only in Senses 17 and 18. Some other features appear much more frequently in particular senses; for instance, a lot of concrete and solid nouns were used as grounds in the construction of Sense 6 “a source of dependence”, nouns that show activity tend to occur in the construction of Sense 14 “involvement or participation”, and animate and human nouns in the construction of Sense 21 “the object with respect to some disadvantage, handicap, or detriment”, as shown in (4.9).

- (4.9) a. *Pork was the staple diet of most Europeans for many centuries and it was said that the peasants of Britain lived **on** bread, bacon and beer.* (BNC_BNJ 723)
- b. *In the same year he reluctantly began to take bets **on** elections.*
(BNC_GTE 1233)
- c. *...in these cases will inflict hardship **on** owners who are refused permission to develop or whose land is bought compulsorily.* (BNC_J16 905)

In (4.9a), the ground *bread, bacon and beer* is the source of dependence that feeds the figure, so it can be solid and concrete even though in this metaphorical construction.

In (4.9b), the ground *election* is an activity for the figure noun to be involved in. The

ground *owners* in (4.9c) acts as the target of the detriment, which is usually human

being. An interesting contrast can also be seen in the feature of figure and ground in prepositional phrase of Sense 21, in which the figures are [-human] [-animate]

[+countable], but the data of ground is [+human] [+animate]. This further supports the interpretation of this sense, as the figure is about negative events which causes harm

to the ground, which can be object and mostly about human beings. Through looking into these senses and their corresponding semantic features, we have a more comprehensive overview of the type of noun occurred in that construction.

From the discussion in the above sub-sections, we can see that basically the distribution of semantic feature in literal prepositional phrases of *in* and *on* can support the hypotheses made for this study. As for metaphorical data set, greater variation in the distribution of semantic features can be found due to the complexity of meaning and inconsistency in the dictionary sense categories and clusters in the semantic network. Through the result we can perceive how these elements in the construction influence the meanings of preposition. The remaining two semantic features, *figure-ground contact* and *the relative size of figure and ground*, are discussed in the next section. They are treated separately as these two show the interaction between figure and ground, which is different from the previous ten features that encode the presence of a specific feature in figure or ground.

4.2.1.5 The Comparison of Relative Size and Contact in Literal Expressions

These two features are restricted to describing concrete things in the world since deciding the size and closeness of non-concrete objects may not be subjective. For example, it is difficult to decide the size of *happiness* as big or small, and we can hardly tell if two nouns have contact when both are non-concrete nouns (e.g. *argument on owner occupation*). The examples illustrating the two features are shown in (4.10).

(4.10) a. *Half of all aircraft are said to be inoperable and two thirds of all vessels are in port at any given time.* (BNC_AAP 228)

- b. *Reptiles reproduce by laying eggs on land or by giving birth to live young.*
(BNC_AM2 207)
- c. *Grants are available from the European Community, and from the Countryside Commission and National park authorities for farmers living in upland areas.* (BNC_K4W 11496)
- d. *The obvious window treatments in traditional dining rooms are curtains on rods...* (BNC_HGW 1634)

Examples (4.10a) and (4.10b) are instances of the presence of the figure and ground contact feature, as in both cases the figure must physically have contact with the ground. Examples (4.10c) and (4.10d) are instances for the relative size of figure and ground, in which the former one shows the figure *farmers* being smaller than the ground *upland areas*, while the latter is the case of the ground *rods* is smaller than the figure *curtains*. The fact that the figure being smaller than the ground feature may be found to be more prominent in preposition *in*. From cognitive perspective, the meaning extensions of *in* are developed from the container schema, in which the figure is contained in the ground. Based on this conception, the current researcher hypothesized (in previous Table 4.3 and 4.5) that the figure should be smaller than the ground in prepositional phrases of *in*, and that the figure should have contact with ground in the cases of *on*. The frequencies of figure and ground having contact and figure being smaller than ground in BNC are shown in Table 4.9, and the percentages of the frequency in all literal phrases of *in* and *on* are also shown in this table. For example, for the contact feature, it appears 136 times in *in* and 127 times in *on*, accounting for 30.4% and 47.2% respectively in total 446 literal phrases of *in* and 269 phrases of *on*. The statistic chi-square test was run to compare if there is any

significant difference of these two features between *in*- and *on*- literal constructions.

Table 4.9 Comparison of Relative Size and Contact Feature in Nouns of Literal Phrase in BNC

feature	<i>in</i>	<i>on</i>	χ^2	Df
F-G with contact	30.4% (136)	47.2% (127)	128.051**	2
Relative Size (F<G)	53.1% (237)	39.4% (106)	20.660**	2

*p <.05. **p <.01.

The degree of freedom is 2 as there are three choices in the encoding process of these two semantic features (“0”=no contact/F>G; “1”=with contact/F<G; “2”=N/A)

From Table 4.9, we can observe that significant differences between *in* and *on* exist in these two features, *contact between figure and ground* and *the figure being smaller than the ground in terms of their relative size*. This indicates that more contact of figure and ground can be found in the prepositional phrase of *on*, and more figure being smaller than the ground feature can be found in *in*, which both conform to the hypothesis given. This result suggests that the contrast of these two features in prepositional phrases of *in* and *on* may be one of the decisive features in describing the interaction of figure and ground in literal phrases.

4.2.2 Semantic Features for *in* and *on* between BNC and NCCU

In this section, the comparisons are conducted between BNC and NCCU, separating the data of literal and metaphorical expressions of *in* and *on*.

4.2.2.1 Figure Nouns of *in*: Between BNC and NCCU

Firstly, the figure nouns in literal and metaphorical expressions were compared. Figure 4.8 shows the distribution of semantic features of figure nouns in the construction of *in* in BNC and NCCU, and as in the previous section, a chi-square test

was run between BNC and NCCU to compare if there is any significant difference in the use of semantic features of figure nouns in both the literal and metaphorical construction of *in* respectively (the full statistic result for this section can be seen in Appendix II). Significantly frequent features were marked with an asterisk on the top of the bars in the literal or metaphorical sets (separated by dotted line).

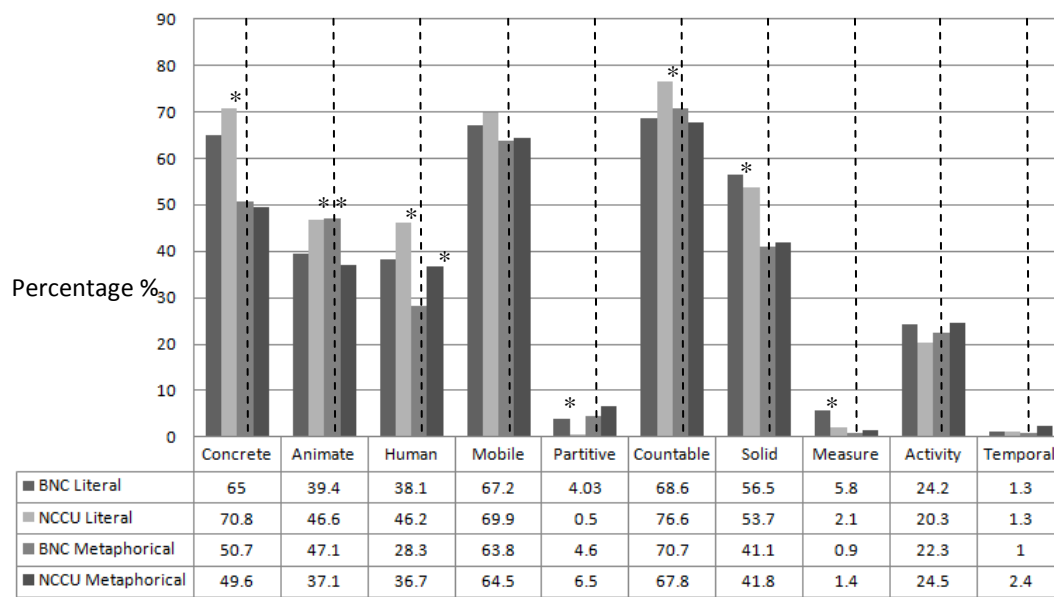


Figure 4.8 The Comparison Between BNC and NCCU of Semantic Features of Figure Nouns in Literal and Metaphorical Constructions of Preposition in

The result shows that significant differences of the presence of semantic feature in literal *in* between BNC and NCCU may be observed in ‘concrete’, ‘animate’, ‘human’, ‘partitive’, ‘countable’, ‘solid’, and ‘measure’ features. As for metaphorical construction, significance can be found in animate and human feature. For the cases of literal *in*, an inspection of the corpus data revealed that far more human names or references to human beings (such as occupation, e.g. *teacher*, *manager*, or a group of people, e.g. *smokers*, *youngsters*) were used by learners than native speakers. These features identified as prominent in learner data are actually intuitively true because

most animals, or even human beings, are concrete, solid, and separable entities. Many concrete nouns were used in native speaker corpus, and there are still greater varieties in these nouns, which might also be non-animate, such as *accommodation*, *company*, *rocks*, etc, resulting in lower percentage of the use of animate nouns as figures in literal *in*-construction of native speaker data. However, the variation in this result might be the difference in themes of the corpus data, which may require further exploration to prove this point.

With regard to noun features in the figures of metaphorical *in*-constructions, not many features differ significantly in frequencies in both corpora, revealing that for metaphorical constructions of preposition *in*, learners seem to have a similar command with the senses and usages as native speakers do. This implies that the learners can identify and use the appropriate nouns to construct a particular sense of the metaphorical *in*-constructions. Significant differences can only be observed in solid, animate, and human features; more solid figures can be found in BNC and more animate and human figures were used by the learners. These two set of prominent features are not mutually exclusive; instead, features that are animate and human must be solid, indicating that learners' production of the figures in metaphorical *in*-construction tends to restrict to human beings or animate entities, while native speakers also produce figures with other inanimate objects, such as *vessels*, *envelope*, etc. Summing up from the above discussion, though there are slight differences between the data from BNC and NCCU, we may still claim that basically there is no great difference in learners' understanding of preposition *in* in its metaphorical constructions when compared with the native speaker data.

4.2.2.2 Ground Nouns of in: Between BNC and NCCU

Figure 4.9 shows the distribution of semantic features of ground nouns in the construction of *in* in BNC and NCCU, and a chi-square test was run to compare if there is any significant difference between them. Note that ground nouns usually denote the reference point for the figures to locate and a significant difference would mean different understandings toward the types of nouns that can be used under the constructions of particular sets of data or senses.

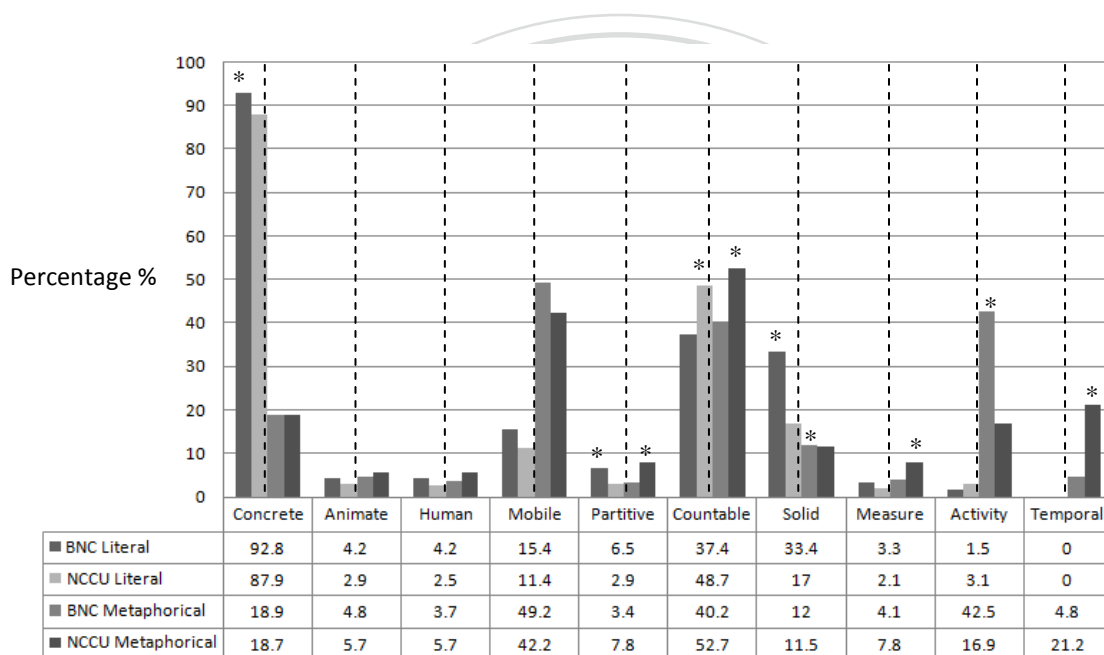


Figure 4.9 The Comparison Between BNC and NCCU of Semantic Features of Ground Nouns in Literal and Metaphorical Constructions of Preposition in

The result shows that significant differences (marked with asterisks) of the presence of semantic feature in ground nouns in literal *in* between BNC and NCCU may be observed in ‘concrete’, ‘partitive’, ‘countable’, and ‘solid’ features. As for grounds in metaphorical constructions, significance may be observed in partitive, countable, solid, measure, activity, and temporal feature.

Inspecting into the data of literal constructions, we found that the short of solid

grounds in NCCU might result from the use of region or country names in large quantity, such as *Taiwan*, *countryside*, *area*, etc, which are non-solid but concrete in feature. However, in BNC, the abundant uses of buildings which are concrete and solid, such as *house*, *room*, *library*, etc., were found as ground nouns in the current data. This difference might be caused by the restriction on the topics of the data collected in NCCU learner corpus, which are more closely related to issues happening in Taiwan or comparisons between two regions or areas.

For ground nouns in metaphorical *in*-constructions, activity grounds and solid grounds were identified to be used more frequently by native speakers, such as *response* [+activity], *uniform* [+solid]. In the learner data, activity grounds appear not so often as they do in BNC, but partitive, countable, measure, and temporal grounds were found to appear more often in metaphorical *in*, especially temporal grounds, such as *mind* [+partitive], *aspect* [+countable], *the unit for measuring time* (e.g. *minute*, *hour* [+measure] [+temporal]). This indicates that learners understand the description for a period of time well and can often use the preposition *in* appropriately.

Summing up from the above discussed points, this section found that the types of noun used by learners seem to be more restricted than those used by native speakers, since more animate figures and non-solid or temporal grounds were used by the learners; however, in BNC, fewer prominent features can be found in a single set of data, implying that a greater variety of nouns, that is, not merely animate figures or non-solid and temporal grounds, may appear in the figures and grounds in the prepositional expressions of *in* in BNC. After examining learners' use of preposition *in* in literal and metaphorical constructions, the next section will discuss the cases in literal and metaphorical *on*.

4.2.2.3 Figure Nouns of on: Between BNC and NCCU

Figure 4.10 shows the distribution of semantic features of figure nouns in literal and metaphorical expressions of *on* in BNC and NCCU, and a chi-square test was run to compare if there is any significant difference (marked with asterisks) in literal and metaphorical data (separated by the dotted lines) between BNC and NCCU in the use of semantic features of figure nouns in the construction of *on*.

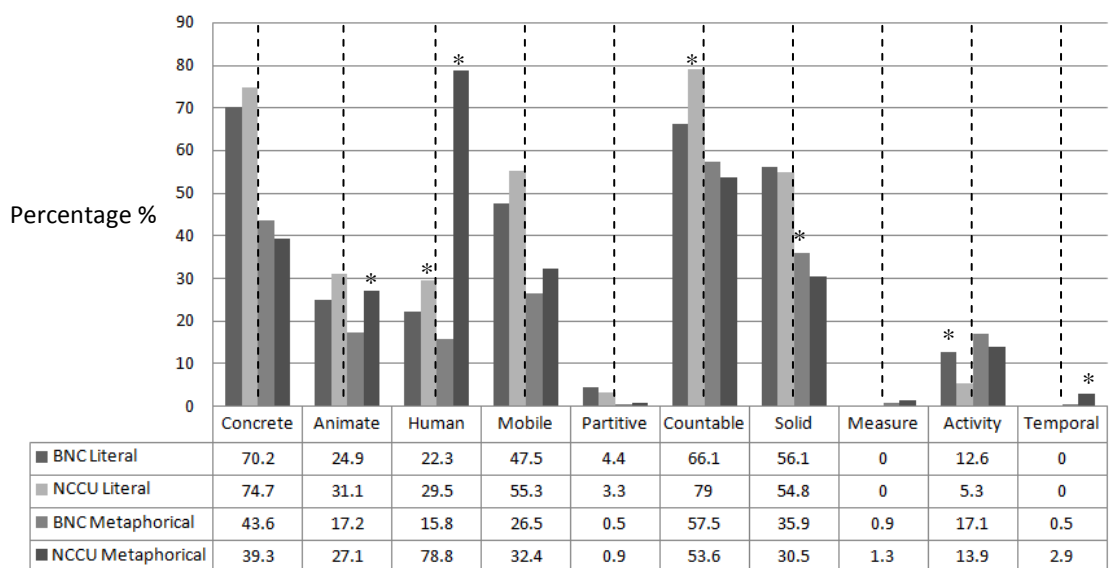


Figure 4.10 The Comparison Between BNC and NCCU of Semantic Features of Figure Nouns in Literal and Metaphorical Constructions of Preposition on

The result shows that significant differences of the presence of a semantic feature in literal *on* between BNC and NCCU may be observed in ‘human’, ‘countable’, and ‘activity’ features. An inspection into the data showed that, as with the case of literal *in*-constructions, a lot of nouns of human names or references to people were used in figures of literal *on*. This result is not surprising as, in the construction of English prepositions, especially in literal expressions, human beings are actively involved or being embodied a projected point of view in the whole layout (cf. De Vega et al. 2002). In this layout, people rely on a deictic ground of reference to view things in the

world. Moreover, as mentioned in the discussion of literal *in*, some of the features are intuitively true because figures that are human must be animate, solid, and mobile entities; those that are not animate cannot be human nouns, and so are the cases for solid and mobile features.

With regard to figure nouns in metaphorical constructions of *on*, significance can be observed in ‘animate’, ‘human’, ‘solid’, and ‘temporal’ features. As for figures in the metaphorical construction of *on*, if these features are examined in the bar chart of the frequency of features in each metaphorical prominent sense, we can observe more variations between the data of these two corpora. Figure 4.11 shows the graphic representations of metaphorical prominent senses which are selected correspond to the ones appearing in Figure 4.3.

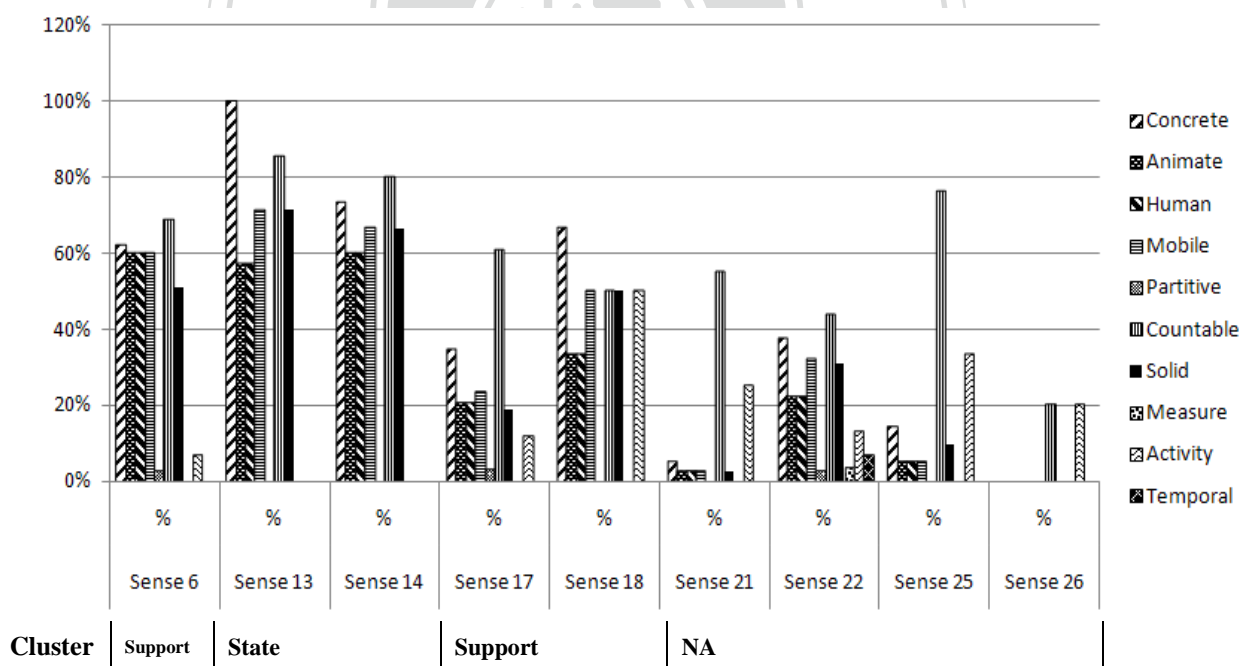


Figure 4.11 The Graphic Representation of Figures in Metaphorical Prominent Senses of *on* in NCCU

Though human and animate feature appear significantly frequently in NCCU, this

does not apply to all metaphorical prominent senses in this set of data. In Senses 6, 13, and 14, the animate and human features account for a rather high frequency in this data set. They provide a good evidence how the figures (and grounds as well) are influenced by the distinctive senses; for example, Sense 13 shows “active involvement in a condition or status”, implying that the figure must be animate (or even human) so that it can be actively involved in some status. However, in some senses there is nearly no appearance of these two features, as in Sense 26 “with respect to”, shown in (4.11), the figure involved is usually non-human and simply refers to things to be focused on.

(4.11) “*Hippy Artist*” *all has their special taste on dressing.* (NCCU_E026004)

The figure in Sense 25 “the subject of study, discussion, or consideration” is also very near to inanimate and non-human as mentioned in the description unless the subject refers to human or animate entity in particular cases. After examining the figures in BNC and NCCU, the next section presents the comparison in the ground nouns of *on*.

4.2.2.4 Ground Nouns of *on*: Between BNC and NCCU

Figure 4.12 shows the distribution of semantic features of ground nouns in literal and metaphorical expressions of *on* in BNC and NCCU, and a chi-square test was run to compare if there is any significant difference (marked with asterisks) in literal and metaphorical data (separated by the dotted lines) between BNC and NCCU in the use of semantic features of ground nouns in the construction of *on*.

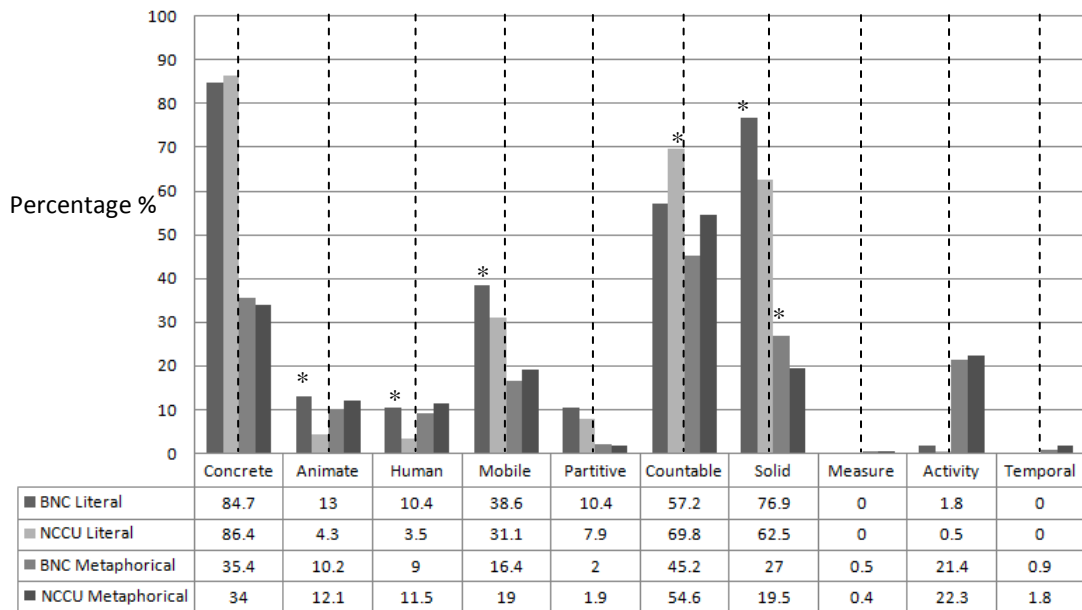


Figure 4.12 The Comparison Between BNC and NCCU of Semantic Features of Ground Nouns in Literal and Metaphorical Constructions of Preposition on

The result shows that significant differences (marked with asterisks) of the presence of a semantic feature in literal *on* between BNC and NCCU may be observed in ‘animate’, ‘human’, ‘mobile’, ‘countable’, and ‘solid’ features. This indicates that in the data collected for this analysis, when forming the preposition *on* as literal expressions, the learners tend to use ground nouns that contain ‘mobile’, ‘countable’, and ‘solid’ features (which may not necessarily be animate or human being, e.g. *on the blackboard*, *on the wheel*), while native speakers of English are more inclined to use animate or human being as ground nouns (e.g. *on insects*, *on demonstrators*). However, this difference may also result from the sampling and the themes of the corpora data, and further exploration is needed for the absolute tendency in distribution.

For the cases of ground in metaphorical *on*-constructions, significant difference in semantic features between BNC and NCCU may only be observed in the feature of ‘solid’. As the case with the metaphorical *on*, the data is also inspected into through

analyzing those metaphorical prominent senses, as illustrated in Figure 4.13.

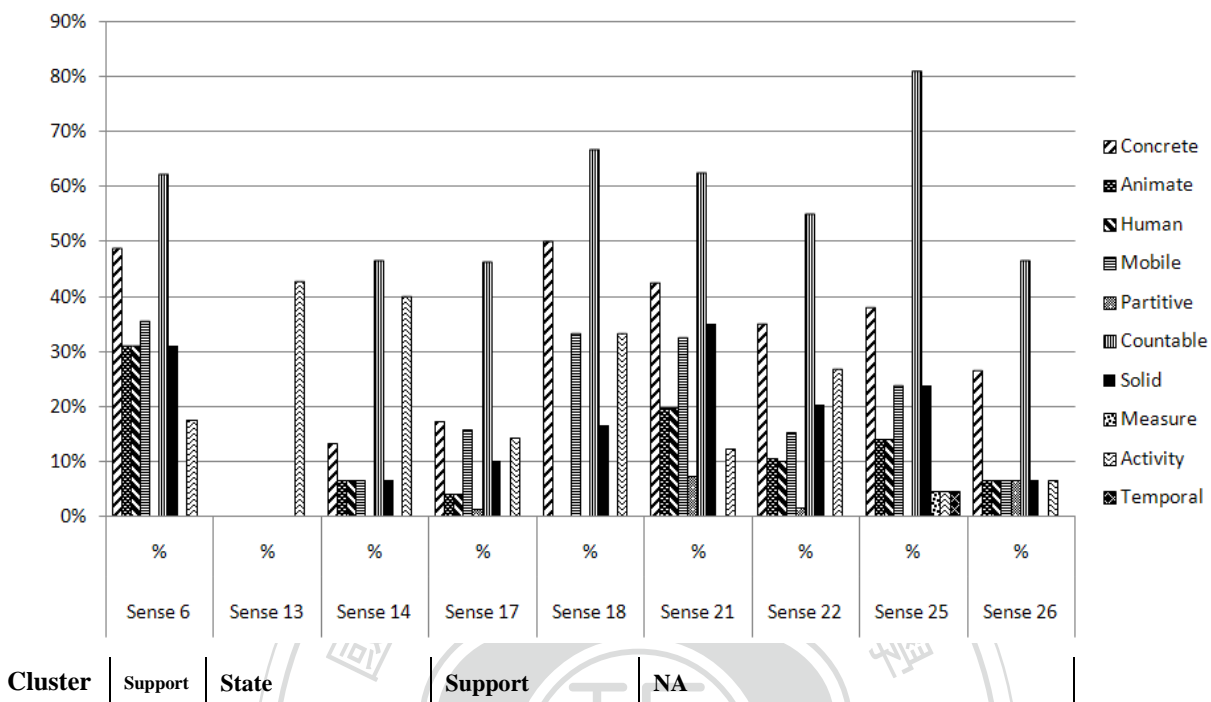


Figure 4.13 The Graphic Representation of Grounds in Metaphorical Prominent Senses of on in NCCU

Except Sense 13 “active involvement in a condition or status” which can be identified with only one semantic feature ‘activity’, most of the grounds on Figure 4.13 are highly countable. The instance for Sense 13 is shown in (4.12).

(4.12) We can see numerous girls going **on** the diet and use various ways to become thinner. (NCCU_E006004)

The ground *diet* in (4.12) is an activity noun showing condition or status for the figure *girls* to be actively involved in, so it can hardly be animate entities. Solid nouns are also not commonly seen in this set of data. As in Sense 26 “with respect to”, the ground noun may be an issue, quantity, etc., as in (4.13).

(4.13) *English Departments can always enrich their knowledge on literature in “Litdiscussion”.* (NCCU_E030008)

The non-solid tendency can also be observed in Sense 14 “involvement or participation” and Sense 17 “reason, ground, or basis”, in which the grounds are usually concerned with issue, topic, position, etc. Through investigating into the semantic features, we can have a better understanding of learners’ command of the meanings of preposition *on*. In the following section, apart from looking into learners’ correct productions of preposition *in* and *on*, we examine learners’ errors, though not many, which may also be worth exploring.

4.3 Error Analysis

The learner corpus reveals how English learners use these prepositional phrases, and through analyzing the senses and semantic features within these constructions, the errors were also identified. These errors were further categorized into two types, namely the substitution (i.e. *in* or *on* is substituted by other prepositions) and misuses of prepositions (including the redundant and incorrect usages of the prepositions), and they are discussed respectively in the following paragraphs.

In the data of *in*, 18 errors could be identified, in which they were further categorized into two types, namely The majority of substitution cases occurs with *on* (6 cases, e.g. **in [on] a Sunday afternoon*) and *at* (8 cases, e.g. **in [at] the start line*), which are both possibly be translated into *zai4* “在” in Chinese which shows the location of an entity. As emphasized, the choice of a preposition involves the consideration of the features of ground noun and its interaction with the figure noun. Therefore, learners’ misconception of the features of ground might be a factor for the

inappropriate use of preposition *in*, as in (4.14).

(4.14) ***In** [on] *a Sunday afternoon, you sit in a coffee shop in the campus and read your favorite novel.* (NCCU_E003004)

In this instance, the preposition *in* is used as the indication for the time; however, as *in* usually goes with a longer period of time and *Sunday afternoon* is considered to be relatively shorter than the length of time denoted by *Sunday*, the preposition *on* would be a more appropriate choice in this sentence.

In the data, we can also observe that learners might use *in* to substitute the preposition *at* in some cases, such as *in home, in the start line, in sixteen* (age), as in the sentences in (4.15).

(4.15) a. *Parents afraid that their children will lose *in [at] the start line, so they require children to learn a lot of talents or go to cram schools, don't care whether children agree or not.* (NCCU_E009005)

b. *However, male and female can be engaged *in [at] sixteen and fourteen.*
(NCCU_E049001)

In (4.15a), the ground noun *start line* in this sentence metaphorically refers to a flat line which does not connote the sense of inclusion; therefore, it would be more appropriate to use the locative preposition *at* than *in*. The substitution of *at* with *in* in (4.15b) may be explained by imaging the passing of time as a line on which there is a lot of points for people to stay at a time. Hence, it would be more appropriate to state *at sixteen, at fourteen* because these ages are simply a small part in a person's whole

life. Though these inappropriate matches of prepositions and nouns may not bring about the comprehension breakdown, clarifying these misconceptions toward the features of ground nouns to the students may still be helpful in raising students' awareness of the types of nouns that co-occur with a particular preposition.

Some other cases are misuse of the preposition *in* or misuse in the construction of prepositional phrases, as in (4.16).

(4.16) ***In** [?] *their hand, compare and contrast are also the ways that teachers may use.* (NCCU_E034013)

In (4.16), a prepositional phrase of *in* with its meaning unknown to the reader is used, which may be the result of students' conception of *hand*; being able to grasp something in one's hand means having the ability to do something. However, as instances like these do not occur frequently in the learner data, further exploration is needed if we would like to examine how these misuse phrases were constructed.

For the learner data in preposition *on*, 12 erroneous constructions were identified by the current researcher, including the substitution of *in*, *at*, and *to* with preposition *on* and some other misuse cases. First, let us take a look at the cases of substitution, as shown in (4.17).

(4.17) a. ***On** [at] *the bus station, there are several people waiting for the bus coming.*

(NCCU_E012007)

b. *7-eleven is like a magnet, attracts more and more consumers to meet their necessity* ***on** [in] *7-eleven...* (NCCU_E006008)

c. *Actually "Cool boy" is a description of one kind of characteristic who pay*

*attention *on [to] his own outlook, and easy to get alone with.*

(NCCU_E026004)

In these examples in (4.17), most of the errors seem to come from the influence of ground nouns. In (4.17a), learners may view the *bus station* as a place constructed of a surface. In (4.17c), learners may consider one's *own outlook* as a surface which is the focus of one's *attention*; however, *attention* is a mobile abstract concept that goes with a directional particle to show its end-point on the path of moving and *pay attention to* is almost a fixed expression as a phraseological unit, so it would be more appropriate to use *pay attention to* than *pay attention on*. As for (4.17b), learners seemed to regard *7-eleven* as a platform where people can gain satisfaction in shopping. However, *7-eleven* in Taiwan is usually seen as a store within a building, so it would be more appropriate to use *in 7-eleven* (focusing on people inside this place) or *at 7-eleven* (indicating the location of the people).

In addition to the cases of substitution, misusing *on* was also observed in the data, as in (4.18).

(4.18) **No matter which character he is on [?], it is the personality make him a "Cool Boy"*. (NCCU_E026004)

In this instance, the learner might want to express the presence or possession of a particular character, so he/she also added *on* as reinforcement of meaning, which seems to be rarely seen in native speaker's use of *on*.

From these presentations of erroneous constructions, the source of error may come from the misconception of distinctive features of each ground noun and

mismatching of the meanings of a particular preposition with figure and ground nouns. These errors may also come from the result of learners still reforming the construction of prepositions, since in some other cases, the nouns in the erroneous constructions here may be observed to be used correctly with the prepositions. Though most of the errors mentioned in this section do not cause comprehension breakdown and may be accidentally misused by the learners, choosing the more appropriate preposition and nouns is an essential part that should be highlighted in helping learners learn the construction of prepositional phrases. Evidencing how the surrounding nouns may influence the choice of a particular preposition, pedagogical suggestions will be further discussed in 6.2.

4.4 Summary of the Chapter

In this chapter, we first presented the results of the sense analyses of *in* and *on*. We counted the sense distributions of *in* and *on*, grouped the senses according to the semantic clusters, and listed the hypothesized prominent features for each cluster, which would be checked in the follow-up semantic feature analysis. We also compared the sense distributions between the data from BNC and NCCU. Then, we displayed the results of the semantic feature analysis with the data compared between the prepositions *in* and *on* and between BNC and NCCU. In the end of this chapter, learners' errors were also examined.

Summing up from what we found in this chapter, some points could be specially addressed. First, from the sense analyses we found that the sense distributions for the preposition *in* are similar in both the native speaker data and the learner data. For the sense distributions in *on*, more data of senses that belong to the metaphorical part can be found in BNC than in NCCU. Second, in the comparison of semantic feature

analyses for *in* and *on*, we found that the major distinction in the literal expressions of *in* and *on* is the higher frequency of animate and human nouns and the figure being smaller than the ground in the data of *in*, while in the data of *on*, the animate feature is not that prominent, and the interaction between the figure and the ground becomes the figure having contact with the ground. As for the grounds, the concrete and solid features are more prominent in the data of *on*, which is not the case in literal *in*. In metaphorical expressions, the results were further discussed according to the semantic clusters, and for different clusters we can observe different distributional patterns of these semantic features. Therefore, the contrast may exceed the difference between *in* and *on* to the difference in these semantic clusters.

On the other hand, for the comparison of the results of semantic feature analysis between the data of BNC and NCCU, in both literal and metaphorical data of *in*, human beings were used more often by the learners as the figures in the *in*-constructions than native speakers, though other features did not differ so greatly between these two groups. As for the ground nouns, fewer solid ground nouns can be found in NCCU in literal data; for metaphorical expressions, activity and solid ground nouns account for higher percentages in BNC, while in NCCU there were more temporal nouns as the ground. With regard to the data of *on*, as in the case of *in*, human beings were again used more often by the learners as the figures in literal *on*-constructions. In the metaphorical *on*, though a lot of nouns of human beings can be found in the learner data, we can also observe many non-human nouns which are influenced by the distinctive sense with the requirement of inanimate or non-human figures. As for the ground nouns, in literal *on*, learners tend to use concrete, mobile, and solid nouns more frequently (which may not necessarily be animate), but more nouns of animate entities can be observed in the native speaker data. In the

metaphorical data set of *on*, a variety of nouns can be observed in distinctive senses. For example, in the sense that refers to ‘active involvement in a condition’, the ground tends to be an activity noun; in the sense of ‘with respect to’, the ground is more inclined to relate to an issue. From these results, we can conclude that the distribution of semantic features in some way may reflect the different types of nouns used in the construction of a particular sense, and some differences may indeed be observed in the native speaker and learner data. Therefore, in the last section of this chapter, we also provide an investigation into the errors in the learner data, from which we can mainly categorize these errors into several types, that is, substitution, redundant use or misuse of the prepositions *in* and *on*.

In Chapter 5, we would discuss and synthesize the findings of the analyses of sense and semantic features so as to provide an interpretation for the complex senses of prepositions *in* and *on* and clarifying the formation of the senses.



CHAPTER 5

DISCUSSION

The issue of distinguishing the meanings of *in* and *on* through semantic feature analysis in combination with sense analysis has been the focus of this thesis. This chapter will discuss these findings with the support of related theories, organized as the following. First, a summary of the major findings in Chapter Four is provided in 5.1. Then, in Section 5.2, research findings are discussed against the research questions based on the results obtained herein.

5.1 Major Findings

As the prepositions *in* and *on* have many overlapping yet different meanings, their variety in senses and usages is worth exploring. This study adopted the semantic feature analysis in combination with sense analysis in order to provide a systematic approach of analyzing *in* and *on*. This quantitative approach may help distinguish the semantic meanings of *in* and *on* through looking into the kinds of figure and ground nouns and their interaction in forming the prepositional constructions. With regard to the comparison between native speaker's and L2 learner's performance in using these two prepositions, the result was also run to compare the similarities and differences of semantic features and senses identified in these two sets of data. This method is different from previous related research as previous studies tend to focus on exploring the senses of a particular preposition or inspecting learners' performance in the use of a set of prepositions in some elicitation experiments. However, in this study, we investigated both the senses and learners' performance in using two prepositions at

the same time, with the aim to provide a more comprehensive result toward this issue.

In the first section of Chapter Four, we firstly looked into the result of sense analysis, from which we attempted to investigate if there is any difference between native speakers' and L2 learners' use of the prepositions *in* and *on*. The result showed that, for preposition *in*, most of the instances could be grouped into the “inclusion, location, or position within limits” category, which is the closest meaning to whose proto-scene in the semantic network of *in* (Evans & Tyler, 2004). The second-most frequent one is the sense “used as a function word to indicate limitation, qualification, or circumstance”, which is about two times higher in BNC than NCCU. Only slight variations between BNC and NCCU can be found in other categories, implying that native speakers and learners' understanding and command of the senses and usages do not differ greatly in the construction of *in*. For the result of preposition *on*, in senses that refer to location, higher frequency could be found in NCCU. More metaphorical constructions of *on* were identified in the data of BNC, which implied that learners' command of *on* is more restricted and thus learners may use the locational sense of *on* extensively in the data. This may also result from the complexity in the senses of *on*, which vary diversely from literal to metaphorical extended meanings, engendering the avoidance strategy in using unfamiliar senses and constructions of *on*. With regard to semantic feature analysis, the distribution of semantic feature is compared between the literal and metaphorical constructions of *in* and *on* respectively, as summarized in Table 5.1.

Table 5.1 List of Statistically Prominent Features in BNC

Literal		Metaphorical	
Figure	Ground	Figure	Ground
<i>In</i>	concrete	animate	mobile
	mobile	concrete	measure
	animate	measure	activity
	human		temporal
	figure < ground		measure
Literal		Metaphorical	
Figure	Ground	Figure	Ground
<i>On</i>	concrete	concrete	concrete
	mobile	mobile	animate
	countable	solid	human
	solid		solid
	figure-ground contact		

For figure nouns in literal constructions, in the case of *in*, the figure nouns tend to be animate (and human) entity which is active in moving. Slight difference was found with *on*, in that animate feature is no longer prominent in the data; instead, it tends to go with entities that are concrete, mobile, countable, and solid (e.g. *handbag*, *electrocandles*). As for features in ground nouns of literal constructions, mostly concrete nouns are prominent in the data of *in*, which refer to places or locations in the real world. Concrete feature was identified as a prominent feature in the data of *on* (e.g. *on page 8*, *on Mars*); however, adding the meaning of support, that is, the ground acting as a supporting surface for the figure to be situated, ground nouns are more mobile and solid as well (e.g. *on the board*, *on the seat*).

The results in the metaphorical expressions are more complex since greater complexity in these extended senses can be found in both *in* and *on*. As the variation among features in senses is great, the distribution of semantic features cannot be

summed up by simply showing the tendency in all metaphorical instances, but has to be compared separately in those prominent senses. Therefore, the results in this part were also discussed based on the metaphorical prominent sense categories identified in the sense analysis. For figure nouns of *in*, [-animate] feature tends to appear more frequently in the data of the MEANS cluster. These [-animate] objects are usually concrete things which are closely related to human activity or for completing an action (e.g. *in brown*, *in line*). Features that are prominent in the data may vary from concrete to non-concrete in metaphorical expressions of *in*, as in the sense referring to “something in vogue or season”, the figure may be concrete nouns (e.g. *clothing*, *blue*) and may also be style or activity (e.g. *action*, *fashion*), etc. Similar cases in the variation of prominent semantic features can also be observed in the data of the metaphorical *on* constructions. For example, examining the results from those metaphorical prominent senses, we found that the nouns in the SUPPORT cluster (e.g. *tickets*, *money*) are more concrete and solid, but they may also contain activity feature (e.g. *choice*, *reliance*). For ground nouns in the metaphorical *in* constructions, measure and activity features were found to appear frequently in the data as in the LOCATION cluster, as there is a “state” sense which shows the condition of an entity as well as an “activity” sense indicating where the figure occurs. In contrast to the tendency to be [-animate] in *in*, in the metaphorical prominent senses of *on*, concrete, solid, and countable features tend to occur more frequently. Being similar to the grounds in literal constructions, the grounds in metaphorical constructions are usually real world objects acting as locations that constrain the occurrence of an activity. From the findings in this part, we claim that there is indeed a tendency that certain type of noun goes with a particular expression with a preposition, and the prominent features within these nouns may vary from literal to different metaphorical senses of

that particular preposition.

In addition to the comparison between the semantic feature distributions of *in* and *on*, the comparison within each preposition group was also conducted between the native speaker and learner data, as summarized in Figure 5.1.

Literal <i>in</i> expressions		Metaphorical <i>in</i> expressions		Literal <i>on</i> expressions		Metaphorical <i>on</i> expressions	
FIGURE	GROUND	FIGURE	GROUND	FIGURE	GROUND	FIGURE	GROUND
BNC: Greater variety	BNC: Solid nouns	BNC: Animate, mobile, and countable nouns	BNC : Activity and solid nouns	BNC: Human names, reference to human beings	BNC: Animate and human beings	BNC: Solid Entity	BNC: Solid Entity
NCCU: Human names, reference to human beings	NCCU: Region, country	NCCU: Human, mobile, and countable nouns	NCCU: Partitive, countable, measure, and temporal nouns	NCCU: Human names, reference to human beings	NCCU: Mobile, countable, and solid nouns	NCCU: Animate and human nouns	NCCU: Not that many solid nouns

Figure 5.1 The Comparison of Prominent Semantic Features Between BNC and NCCU

As summarized in Figure 5.1, the content in the grids on each column shows the prominent type of nouns in that category. For the cases of literal *in*-constructions, more human names or references to human beings were found in the figure nouns in the learner data, while greater variety can be seen in the figures of native speaker data. As for the grounds, there is a tendency of fewer solid grounds in learner data as regions or country names account for a high frequency in the data, but this tendency was not observed in the data from BNC. For metaphorical *in*-construction, no great difference in figure nouns was found between the data from BNC and NCCU, but in

ground nouns, activity and solid features were identified with higher frequency in native speaker data, which are not the case in NCCU. With regard to *on* prepositional phrases produced by the learner, in literal constructions, human names or references to people were used more frequently in figure nouns, and higher number of mobile, countable, and solid features were used in ground nouns. In metaphorical data of *on*, L2 learners were still inclined to use animate and human figure nouns while native speakers used more solid figure nouns. As for ground nouns in metaphorical *on* constructions, there are also higher number of solid nouns found in native speaker data. However, for the metaphorical set of data, due to the complexity in sense, the results may vary within different metaphorical prominent senses. From these results we can observe that though in sense analysis, no great difference was found between the distribution of senses in BNC and NCCU, inconsistency in the distribution of the types of nouns can still be seen in semantic feature analysis. The more various the types of nouns are involved in, the less prominent features may be found as these varieties of nouns may not be able to be described using the same sets of semantic features. If a set of nouns vary diversely, it is less likely to be described using many different semantic features. Therefore, we can conclude that learners' use of figure and ground nouns in constructing prepositional expressions is more restricted to particular nouns.

In the last section of Chapter 4, the errors identified in the learner data were discussed respectively according to some common error types, including substitution of other prepositions, redundancy, and misuse of a particular preposition. In fact, not many errors were found in the data produced by the learners, so each error type in both *in* and *on* was discussed to probe into the possible causes of the error.

In next section, these findings will be discussed to investigate the formation of

prepositional phrases of particular senses. Moreover, in order to facilitate the learning of English prepositions, these findings are also extended to probe into the learners' tendency and problems in producing prepositional phrases.

5.2 Discussion of the Results

Traditionally, studies on the sense of prepositions concern mostly on nouns going after a preposition as the factor of influencing the meanings of it. For example, from the cognitive perspective, in Wierzbicka's (1993) paper, the distinction in the meanings of temporal prepositions *in*, *on*, and *at* was inspected in terms of the length of time indicated from nouns going after these prepositions. The use of *at* implies sameness of time in the word following it (e.g. *at breakfast*, *at 10 o'clock*), *in* implies that there is a period for the time of the event (e.g. *in summer*, *in the 19th century*), while *on* implies that there must be a clear identification of time which is an indivisible and clearly defined part of a period (e.g. *on Thursday*, *on the last day of each month*). However, from the findings above, we discovered that all the elements, including the prepositions, figure and ground nouns, in constructing the prepositional expressions, must be comprehended as a whole and have tremendous influence on the sense and usage of the chosen preposition. Through understanding how these elements can be fitted into the construction, the meaning of this expression can then be generated. Previous studies have also shown that the relative location and locomotion of figure and ground are able to generate various senses in the semantic network (cf. Lakoff, 1987; Evans and Tyler, 2004), while this thesis shows how the meanings of a particular preposition vary according to its co-text. Although there have been studies focusing on the semantics of preposition by viewing different meanings of the preposition as generation from the primary sense instead of distinctive sense

categories, how the meanings vary according to different linguistic contexts is rarely explored in a systematic way. In fact, as shown in this work in a prepositional phrase formed by a particular meaning, there is a range of semantic preferences in their co-text. In other words, the meaning of a preposition could be coerced by the lexical words it is surrounded by (cf. Pustejovsky, 1995), but not merely the word that goes after that preposition. The co-occurrence of the preposition and the figure and ground nouns thus form a semantic unit, which cannot be comprehended without viewing them as a whole. To summarize what we have emphasized so far, in the sentence *I am on the stage* with *I* as the figure and *stage* as the ground, it can be interpreted both with its locational meaning as well as the extended ‘an involvement in an activity’ meaning. However, in the sentence *the chair is on the stage* with the *chair* as the figure and a similar ground, the *chair* may be seen as the property that is put on the stage. There are many instances like this pair that are similar in construction but differ in meaning(s). Our study on the semantic features of the figure and ground nouns thus contributes to finding out the differences of the pair(s). One cannot comprehend these sentences without considering the features of the figure and ground nouns. Figures 5.2 and 5.3 summarize our findings from the analysis of BNC, displaying the semantic preferences of the nouns that function as the figure and ground in the prepositional construction and how the senses of *in* and *on* might be influenced by these nouns.

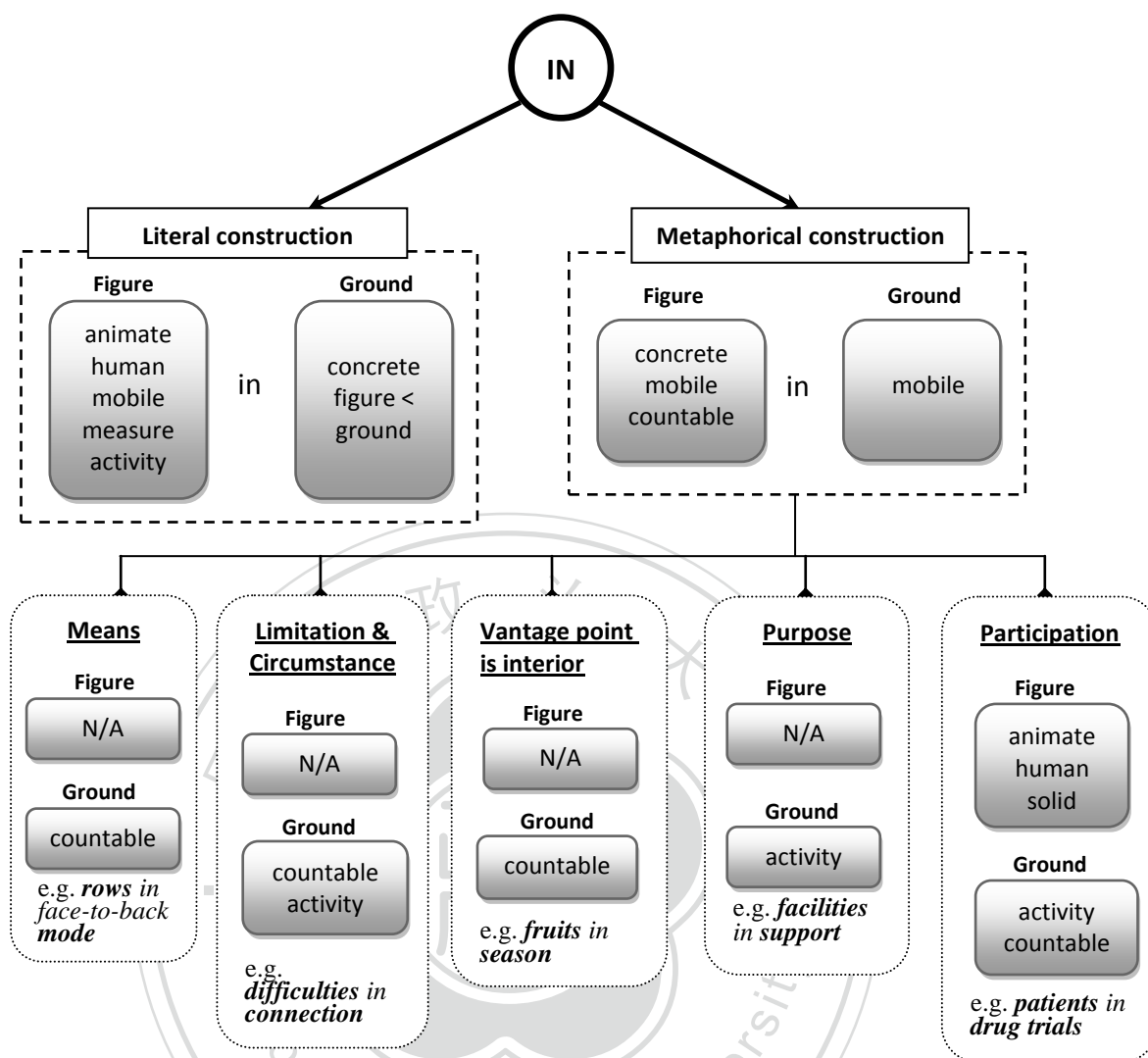


Figure 5.2 The Diagram of Figure and Ground Nouns in the co-text of Preposition in Influencing the Senses of Prepositions

Figure 5.2 shows how the distribution of semantic features might differ between literal and metaphorical constructions of *in*, and how these features can be further distinguished among different semantic meanings under the category of metaphorical construction (The literal construction usually has one meaning—a ‘location’ meaning). The features listed in the grid of ‘metaphorical construction’ are the shared features identified in these metaphorical semantic meanings, and the grids below are the extended metaphorical semantic meanings with their own unique prominent semantic

features. However, owing to the distribution of data in the senses, not all the semantic meanings can be identified with their prominent semantic features. Therefore, those shown in Figure 5.2 only include the meanings with higher distribution in the sense analysis. This also shows how each sense of *in* is distributed in BNC. The diagram for the preposition *on* is also shown in Figure 5.3.

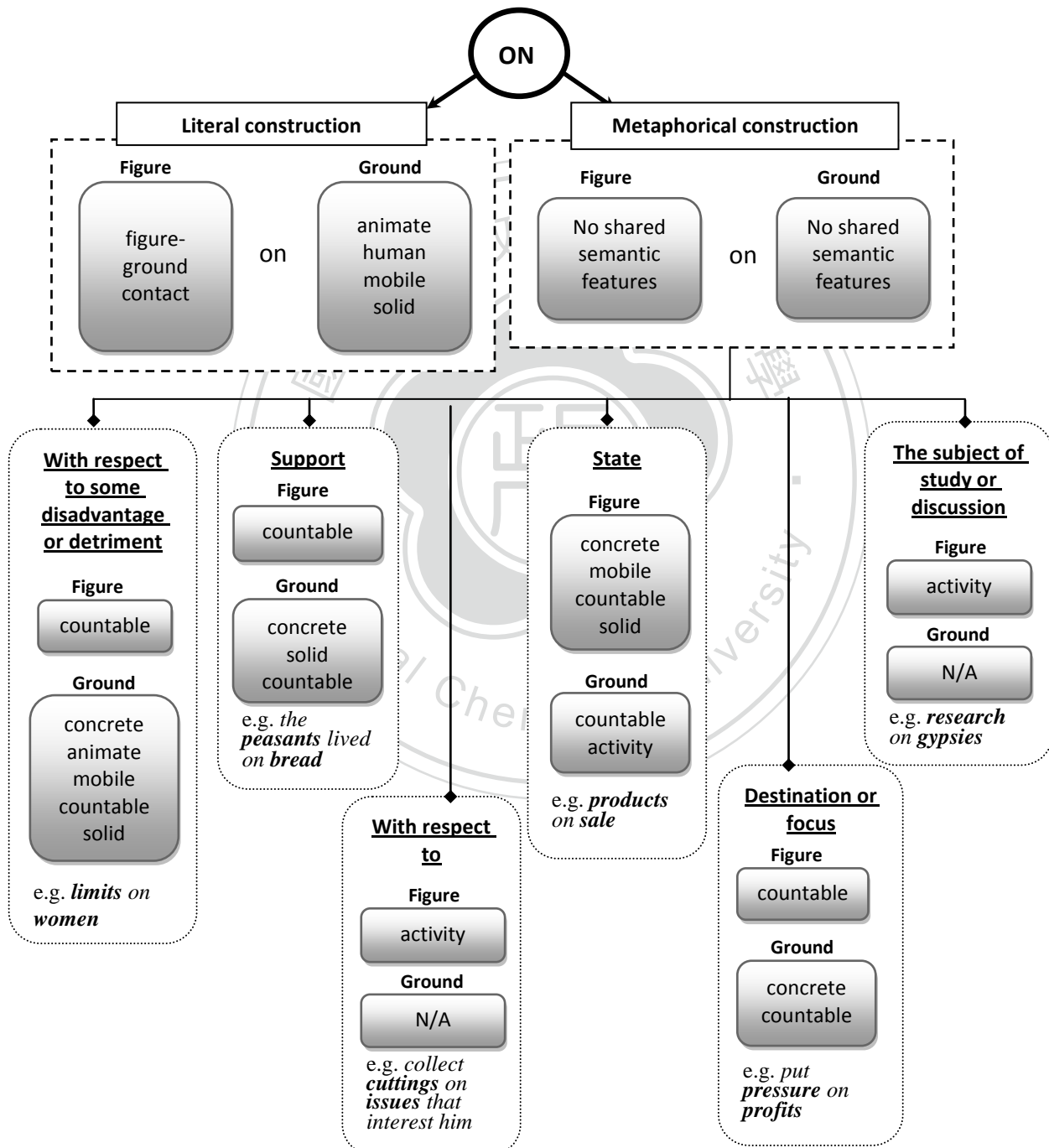


Figure 5.3 The Diagram of Figure and Ground Nouns in the co-text of Preposition *on* Influencing the Senses of Prepositions

Similarly in Figure 5.3, the diagram only shows the partial representation of the semantic meanings of *on* since the shortage of corpora data identified for all the senses. For the features in the overall metaphorical constructions, there is no shared feature identified in the metaphorical semantic meanings, which indicates that the types of nouns constructing the metaphorical expressions possess greater diversity than those appeared in the metaphorical expressions of *in*.

From Figures 5.2 and 5.3 we can observe that it is the varied nouns with different features that decide which semantic meanings should the construction belongs to. They show how the sense of a preposition would be greatly influenced by different sets of semantic preference that restrict particular types of figure and ground. The interaction among the figure and ground noun phrases and the sense(s) of prepositions *in* and *on* observed in the native speaker data may be represented through the model shown in Figure 5.4.

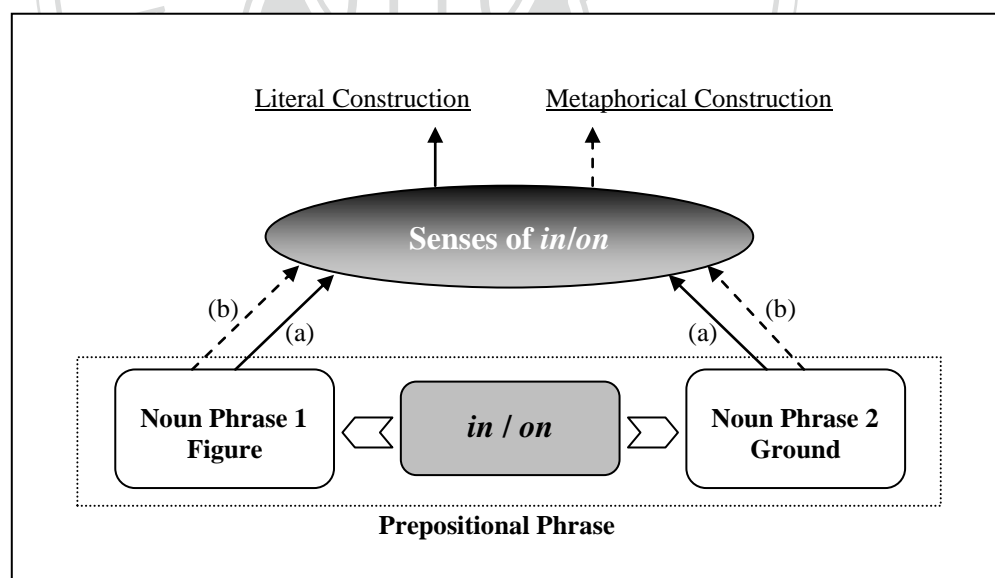


Figure 5.4 The Model of the Interaction among the Figure and Ground Nouns and the Prepositions In and On

This model displays the interaction among the noun phrases and the preposition, as

well as the role of the noun phrases in this construction. In sense construction of a prepositional phrase, different types of figure and ground nouns may have some influences on the senses of the preposition, generating either literal or metaphorical meanings. As the production of metaphorical expressions is more varied in sense, the constructions are shown in dotted lines (b) in this model. This indicates that a great variety of nouns may result in different metaphorical meanings of a particular preposition. Moreover, as the figure and ground are important elements in the construction of prepositional phrases, the change of the figure or ground nouns may also shift the sense denoted in this construction. For example, in the clause *she is in medicine* with *she* as the figure and *medicine* as the ground, *in* refers to the activity done by the figure. When the figure is changed to some other nouns with inanimate feature, such as *statistics*, *careers*, etc., these nouns may affect the whole construction to become a different interpretation. In this way, the ground *medicine* in *statistics in medicine* refers to a particular field of study. The ground *medicine* is taken as working on something in *careers in medicine*. Thus, the establishment of meaning goes beyond the locomotion or the relative location of figure and ground, and this can be compensated through the semantic preferences of a particular sense and how the preferred nouns in this sense work to generate the meaning under a certain structure. This model reflects some of the concept of coercion proposed by Pustejovsky (1995), who claimed that nouns surrounding the preposition may also influence the prepositional senses denoted in a particular sentence. In this study, the nouns are further identified according to their semantic features for discussing how they may appear in forming constructions of different senses, and we also focus on the interaction between the figure and ground nouns in contributing to the alteration of senses. The above are some of the important contributions of this thesis.

Another finding of this work is that the selection of the figure and ground nouns seems to be bounded by the preposition, and there is no strict relation between these two nouns. Therefore, the interaction shown on this model reveals that the influence does not merely concern how the figure and ground nouns pose changes in meaning, but also how the preposition decides the types of noun it should go with in that expressions with particular senses. For example, we hypothesized that most of the literal expressions of *in* should contain the feature “figure being smaller than the ground (F<G)” since in the image schema theory reviewed in Chapter 2, the proto-scene is pictured as the ground being the container where the figure is placed in. Therefore, in the phrase *the boy is in the house*, where the ground noun *the house* is a concrete noun that denotes a location, in which the figure noun *the boy* situates, the figure *boy* must be smaller than the ground *house*, and the opposite case is not preferred in the construction of the locational expression of *in*. In this way, the relative location or locomotion are revealed from the semantic features used to describe them. However, if we replace *in* with *on*, the relative size of *the boy* and *the house* in *the boy is on the house* is not restricted as long as the *boy* is in contact with and is supported by the top or a part of the *house*. In this way, the contact between the figure and the ground becomes an essential feature in this sentence.

The discussion so far has focused on native data; we now examine the data produced by L2 learners. As the sense is greatly influenced by the words in the co-text, the types of the nouns used by the learners were also analyzed. The findings indicate that in the learner data, the range of semantic preference tends to restrict to specific semantic features in a particular set of data in both literal and metaphorical constructions. For example, learners used *in* as a locational preposition to refer to a region or location, in which the figure tends to be human beings who stay in a

particular place that acts as the ground. In metaphorical instances, the restricted set of semantic preferences seems more obvious, as fewer instances were found to be activity nouns (e.g. *battle, driving*) in the grounds of *in*-constructions, which is a prominent characteristic in native speaker data. Learners' metaphorical usages of *in* were constructed more frequently with body part (e.g. *mouth, heart*) and measure and temporal nouns (e.g. *era, minute*), implying that learners may learn prepositional phrases by the semantic fields these nouns belong to. In this way, learners' production of other senses of the preposition *in* is thus limited. Therefore, in language teaching, the teacher could attend to the variety of the elements in the prepositional constructions, which will be discussed further in Section 6.2.

For the case of the preposition *on*, learners' problem in using this preposition is slightly different from that of *in*. The above-mentioned findings indicate that the sense of a particular preposition is greatly influenced by its co-text and we found that learners' production of nouns is restricted to nouns of certain semantic fields. When acquiring the usages of English prepositions, learners tend to perceive the prepositional phrases as multi-word units or even fixed expressions and use the prepositions particularly with a set of words. In this way, we may find a lot of set usages in the learner data of *on* (e.g. *spend some time **on** doing something, keep an eye **on** something*) which may result in the restrictive types of nouns in producing prepositional expressions of *on* since these nouns tend to come from the same semantic field. In language teaching, different methods should be employed in inspiring productions of different combinations.

Investigating into the errors found in all of the learner data, the current researcher observed that most of the errors occur with concrete nouns, especially locations (e.g. **on [in] 7-eleven, *on [at] the bus stop*). If we look into the corpora, we may not

know whether this is due to learners' avoidance or learners' good command in prepositional expressions other than locational ones. This is a question which may be answered in other elicitation experiment, but the above-mentioned points still remind language teachers that different facets of attention toward the complex meanings and usages of English prepositions should not be overlooked.

Compared with the previous study conducted by De Vega et al. (2002) that utilized the semantic features to analyze the semantics of prepositions, the findings of this thesis proceeded to the exploration of metaphorical constructions. In De Vega et al.'s study, they claimed that the integration hypothesis can be used to explain the locative construction of prepositions. This hypothesis posited that a multiple-constraint process should be activated to comprehend locative senses, through which the sensory-motor features of the objects are retrieved and fitted into a simulation that facilitates comprehension. However, for constructions beyond the locative ones, the present study found that the integration hypothesis can solely be used to "describe" the features of figures and grounds instead of precisely predicting which preposition or sense may be used with particular figures and grounds in a unique way. Therefore, the model in Figure 5.4 is presented above in order to provide a more comprehensive explanation for both literal and metaphorical constructions of English prepositions.

5.3 Summary of the Chapter

To sum up, in this study the feature of figures and grounds do not show such consistent differences between *in* and *on*, since the contrast goes beyond the locational level to more metaphorical ones that are diverse in meaning. This research also presents possible bi-directional interactions of all the important elements (figure,

ground, and the preposition) in constructing a meaningful prepositional phrase, through which the words appearing in the co-text are found to have influenced meaning change to both the target preposition and the semantic preferences in deciding the meaningful words in forming a prepositional phrase.

In Chapter 6, the main points of this thesis will be summarized, and limitations of this study and suggestions for future study will also be addressed. Pedagogical suggestions will also be discussed so as to provide language teachers and learners with a different direction regarding the teaching and learning of English prepositions.



CHAPTER 6

CONCLUSION, LIMITATION, AND PEDAGOGICAL SUGGESTIONS

This chapter concludes with a short summary of this thesis (6.1), followed by some pedagogical suggestions on teaching and learning English prepositions (6.2). Limitations and suggestions for future related studies are addressed in (6.3).

6.1 Overall Summary

In the first chapter of this thesis, the background and motivation of conducting this study are addressed, including the difficulties and problems of distinguishing the semantics of English prepositions. For example, in the dictionary, the entry for preposition *in* contains 21 meanings but each may be related in some ways with another meaning(s). Due to this semantic complexity, learning difficulties engendering from this complexity have also been the focus of research.

Based on these studies and the integration hypothesis proposed in De Vega et al.'s (2002) study, we attempted to conduct sense and semantic feature analyses based on native speaker and learner corpora. The methodology of conducting these two analyses was elaborated on in Chapter 3. In the sense analysis, the data were identified according to the categories of sense the instances belong to in the meanings of *in* and *on* listed in English dictionaries. From this analysis, we may observe that more metaphorical constructions were found in both *in* and *on* data, but the distribution of sense does not reveal great difference between the data produced by native speakers and learners.

For the semantic feature analysis, after the data of *in* and *on* prepositional

phrases were retrieved from the two corpora, figures and grounds were identified in prepositional phrases and were further analyzed according to the self-constructed criterion for encoding the semantic features. Moreover, how the distinctive semantic features related to particular senses were also examined for disambiguating the complex semantics of English prepositions. The findings showed that there are tendencies for nouns of different semantic features that go more frequently with a particular set of data, varying from literal and metaphorical expressions to senses belonging to distinctive semantic clusters in *in* and *on*. This difference in the prominence of semantic features in figures and grounds can also be observed in literal and metaphorical as well as some sense categories between native speaker and learner data. In addition, when examining the learner data, we observed that nouns used by L2 learners in forming prepositional phrases do not show great varieties and are more restricted in feature. Some errors which may be caused by misusing the construction of prepositional phrases or substituting one with other prepositions were also discussed.

In Chapter 5, the findings were interpreted via how semantic preferences may influence the meaning of prepositions in order to establish the correlation between the semantics of prepositions and the elements in constructing prepositional phrases. Figures and grounds of different features may indeed engender changes in the meaning of prepositions; therefore, in learning prepositions this issue should also be attended to, instead of initially starting from the meaning of preposition without recognizing its interaction with other elements. In the next two sections 6.2 and 6.3, limitations of this study will be discussed, from which possible directions for future studies will be suggested. Pedagogical suggestions in language teaching and learning are also addressed, hoping that the findings may enhance related fields in language

learning.

6.2 Pedagogical Suggestions

According to the findings and discussion presented in the previous chapters, though the data adopted in this study were produced by high intermediate to advanced English learners, their production was not without errors. Based on the findings, some pedagogical suggestions can be provided herein. From the corpora analysis of semantic features in prepositional phrases in this thesis, since the sense of the preposition is greatly influenced by the words in its co-text (as the diagram shown in Figure 5.2), language teachers should attend to all the important elements in the prepositional construction. Instead of starting from introducing each sense of a preposition respectively, the teacher should facilitate students in recognizing these important elements in forming this phrase. We can check whether the figure noun is animate and whether the ground noun is indeed a reference to a concrete object or is actually implying an activity, as these may be decisive elements in completing the construction of a particular sense. For example, in one of the senses of *on* that refers to ‘active involvement in a condition or status’, the prepositional phrases should involve an animate especially human figure noun and a non-concrete ground noun that expresses an activity, as in *He* (figure) *is on watch* (ground). If we replace the figure noun to other non-human nouns (e.g. *the ant, the blackboard*), these nouns may cause the breakdown in interpreting this sentence, as this sense requires an animate (human especially) figure noun. After viewing these items in congruence, deciding the locational or functional structure they intend to present, and the sense of this construction can thus be identified as a whole. In the above example, this is a representation of the functional structure that intends to show the condition involved.

If any element within this construction undergoes any change, the meanings of the whole phrase and the sense of the preposition may differ accordingly, so all the elements cannot be omitted in the whole construction.

Moreover, from the analysis of errors, erroneous constructions can still be found in some prepositional phrases (e.g. *pay attention **on** something*). Utilizing corpora analysis combined with the concept of the co-occurrence of words in forming a particular meaning, language teachers can remind L2 learners of the difference between or among a set of similar prepositions via explaining the co-text of using them. For example, especially in EFL context, for similar prepositions like *in*, *on*, and *at* that all refer to locations in their proto senses and share the same equivalence in Chinese (e.g. 在學校 **zai** *hsueh hsiao* ‘**in** school’, 在臉書 **zai** *lien shu* ‘**on** Facebook’, 在公車站 **zai** *gong che jan* ‘**at** the bus stop’. The bolded words in Chinese all share the same form, but may be expressed differently in English), learners may feel uncertain in which preposition should be used for a particular expression. Therefore, the focus of instruction and practice should not be constrained to the clarification of the meanings for each preposition, but may involve comparisons and distinctions of the cluster of sense and the related nouns within these easily-confusing lexical items. This may be done through learners actively involved in the analysis of meanings for a similar set of data to induct prominent features, or to indicate the difference in the semantic preference of a lexical item directly in class. For example, to distinguish the complex senses a preposition may possess, the teacher can provide a set of figure nouns that are [\pm animate] [\pm concrete] (e.g. *mother*, *disc*, *organization*, *happiness*) and ground nouns that are of locations and functions which can be described through a number of features [\pm concrete] [\pm animate] [\pm activity] [\pm mobile] [\pm solid], etc. (e.g. *house*, *wall*, *pause*, *turn*, *sight*, *line*) for practice. Utilizing nouns from these two sets

may generate a variety of combinations and thus create different senses a preposition may include. For example, in *my mother is in sight*, *in* is used to describe something that is within one's vision, while in *the end is in sight*, the meaning of *in* is shifted to some event that is approaching. From this example, we can see that a small in change in the figure noun may bring about the transformation in meaning. The teacher can then utilize nouns of different features to inspire creations of different usages and to disambiguate the senses of different prepositions.

6.3 Limitations, Suggestions for Future Studies, and Conclusion

This thesis attempts to utilize a more systematic approach in analyzing *in* and *on* phrases in order to have a holistic understanding of the senses and constructions of these two prepositions, as these two prepositions share some similarities but at the same time possess differences in their construction. Therefore, a different approach, that is, semantic feature analysis in combination with sense analysis, was adopted in this study to investigate the senses and constructions of these two prepositions. However, since this is a new attempt which is different from previous studies on English prepositions, some limitations still exist in the approach of this study, and these limitations are addressed in this section for improvement of the designs of research methods in related studies in the future.

First, the coding of sense and semantic feature may be affected by the rater's interpretation toward the data. To avoid the problem this may cause, we invited two raters to encode each set of data for the semantic feature analysis. Owing to budget and time constraint, we did not invite another rater to identify the sense of each instance. The current researcher adopted the sense categories listed on the dictionary entries as a reference and tried to keep the interpretation toward data in a consistent

way by following the categories carefully. When encountering a phrase with more than one possible meanings, the rater would check the explanations and examples on the dictionary carefully to ensure that the identification of sense is consistent. In the future preposition related studies, if the budget and time allow, the enhancement of inter-rater reliability should be taken into consideration.

Second, a combination approach which involves both corpora and experimental data would be a better way of examining the sense and usage of prepositions. Though corpora provide important information about the use of language, the experimental data may help us obtain a precise understanding of particular linguistic phenomena (cf. Gilquin & Gries, 2009). Since the analyses in this thesis only include corpus data, future studies may also consider designing a psycholinguistic experiment to probe into the variables in helping subjects decide which preposition to be used and what difficulties they may have.

Third, with regard to the selection of learner corpus, we only adopted the L2 data of learners of English majors in the university. The data created by learners of other proficiency levels are also worth exploring, since learners of other levels may have different problems in using the English prepositions. We can compare the results of research on different levels of proficiency to investigate if there is any difference towards learners' command of the senses of English prepositions.

Fourth, in identifying the figure and ground nouns in the data, in some cases the figure nouns cannot be found apparently within the instance, but have to be inferred from the context. Moreover, particles within phrasal verbs may not be identified with their figure or ground nouns as they may be absent in the fixed expression of verb-particle constructions. As the current approach requires the involvement of the four elements, figure, verb, preposition, and ground, in analyzing the construction of

prepositional phrases, the possible missing element poses a limitation to the research on prepositions through the current approach because we cannot explain the semantics of English prepositions comprehensively in these conditions. Therefore, we suggest that, in the future studies, the zero figure or ground (the missing figure or ground nouns, including those that can be inferred from the contexts only) cases should be carefully treated.

To conclude, this thesis presents a corpus-based research with a quantitative approach of analyzing the construction of prepositional phrases *in* and *on* through the semantic feature and sense analysis. This approach has proposed a clearer description and interpretation of the senses for prepositions *in* and *on* with complex meanings, and the interaction between senses and the nouns surround *in* and *on*. Learners' command of these two prepositions has also been discussed so as to provide some implications to the learning of English prepositions. Based on the work of this thesis, the limitations can be supplemented and the results can be utilized to further into the studies in the comparison of other sets of related prepositions and usages. For English teachers, they can also benefit from the insights for the enhancement of their teaching techniques and material design.

Appendix

Appendix I: Encoding Instruction

語言實驗指導語

感謝您抽空參與本次語言學實驗。本實驗目的為名詞語意特徵之標記，參與實驗分析過程中，請依您的直覺作答，沒有標準答案。請您獨立完成本實驗，分析過程中請勿參考任何資料和書籍，並避免詢問他人意見。您所完成的內容僅供研究分析與參考用，請您放心填答。

本實驗共包含語料每人一千筆，含檔名開頭為 BNC 與 NCCU 之 Excel 檔中各五百筆，每筆完成時間不限。如下圖所示，於此二 Excel 檔中，您僅需完成灰底之部分，請您根據檔案中 Figure (F) 和 Ground (G) 欄位中之名詞（如下表中 Figure 欄位之 harassment，Ground 欄位之 person），依下頁之標記說明依序作語意標記，將標記之代號「0」、「1」或「2」填入各語意特徵（e.g. concrete、animate、human）下方對應之位置。

No.	Instance	Figure	Ground	concrete		animate		human	
				F	G	F	G	F	G
1	...ting, harassing, making fun of other	harassment	person	0	1	0	1	0	1
2	...tion of the space in Taipei let most of roads	Taipei	Taipei	1	1	0	0	0	0
3	...monitor their costumers well and have regulations	building	building	0	1	0	0	0	0
4	...his is the major cause of the lingering teenagers	fast food store	fast food store	1	1	1	0	1	0
5	...way of studying before entering college exams	high school	high school	1	1	0	0	0	0
6	...erefore the limit should not lowered limit	places	places	0	1	0	0	0	0
7	...ng lived in both place for a long time we	shoe	shoe	1	1	1	0	1	0
8	...limitation of distance. Furthermore, we	store	store	1	1	1	0	1	0
9	...ills how fabulous it will be to visit Fag temple	Jinshen	Jinshen	1	1	0	0	0	0
10	...uses and even frustrate many parents employers	Taiwan	Taiwan	1	1	1	0	1	0

	0	1	2
Concrete	非具體/實體之名詞，例如：動作、時間、心理活動等。	具體/實體之名詞，例如：動物、物品、場所等。	無法於此項目下作判斷
Animate	無生物（人造／自然物）	有生物（動植物）	
Human	非人類之名詞	人類（含人稱代名詞）	
Mobile	較少或不可移動及活動之人事物，例如：樹、房子、窗戶。	可動或自行移動之人事物，例如：交通工具、椅子（可被移動）	
Partitive	非表示部分之名詞，例如車子、身體。	可表示部分之名詞，例如：輪胎（為車輛之一部分）、手（為身體組成之一部分）	
Countable	不可數名詞，例如：沙、人群等。	可數名詞，例如：石頭、人、河川（幾條）	
Solid	非固體之名詞，例如：水、乳狀物。	固體之名詞，例如：石頭、車子。	
Figure-Ground Contact	代表 Figure 與 Ground 的兩個名詞片語沒有實際接觸，例如：A <u>village</u> (figure) is on the <u>sea</u> (sea). Village 和 sea 僅為「靠近」之關係，並無實際接觸。	代表 Figure 與 Ground 的兩個名詞片語有實際接觸，例如：The book is on the table. Book 與 table 彼此觸碰。	
Figure-Ground Relative Size	代表 Figure 的名詞較 Ground 之名詞為小，例如：The book is on the table. Book (figure)較 table (ground)小。	代表 Figure 的名詞較 Ground 之名詞為大。	
Measure	非數量或單位之名詞	計量名詞，例如小時、單元。	
Activity	非表示活動之名詞。	表示活動之名詞（含心理活動），例如：疑問、購物。	
Temporal	非表示時間之名詞	表示時間之名詞，例如：小時、天。	

Appendix II: Statistic Results of the Comparison of Semantic Features Between Data
from BNC and NCCU

feature	BNC	NCCU	χ^2	df
Between figure nouns in literal construction of preposition <i>in</i>				
Concrete	65.0% (290)	70.8% (365)	3.771*	1
Animate	39.4% (176)	46.6% (240)	4.963*	1
Human	38.1% (170)	46.2% (238)	6.414**	1
Mobile	67.2% (300)	69.9% (360)	0.773	1
Partitive	4.03% (18)	0.5% (3)	13.335**	1
Countable	68.6% (306)	76.6% (395)	7.935**	1
Solid	56.5% (252)	53.7% (277)	10.660**	1
Measure	5.8% (26)	2.1% (11)	11.206**	1
Activity	24.2% (108)	20.3% (105)	2.029	1
Temporal	1.3% (6)	1.3% (7)	0.000	1
Between ground nouns in literal construction of preposition <i>in</i>				
Concrete	92.8% (414)	87.9% (453)	6.408*	1
Animate	4.2% (19)	2.9% (15)	1.272	1
Human	4.2% (19)	2.5% (13)	2.237	1
Mobile	15.4% (69)	11.4% (59)	3.336	1
Partitive	6.5% (29)	2.9% (15)	7.049**	1
Countable	37.4% (167)	48.7% (251)	13.468**	1
Solid	33.4% (149)	17.0% (88)	113.500**	1
Measure	3.3% (15)	2.1% (11)	1.368	1
Activity	1.5% (7)	3.1% (16)	2.418	1
Temporal	0% (0)	0% (0)	NA	1
Between figure nouns in metaphorical construction of preposition <i>in</i>				
Concrete	50.7% (281)	49.6% (241)	0.215	1
Animate	47.1% (162)	37.1% (180)	6.750**	1
Human	28.3% (157)	36.7% (178)	7.742**	1
Mobile	63.8% (354)	64.5% (313)	2.286	1
Partitive	4.6% (26)	6.5% (32)	2.849	1
Countable	70.7% (392)	67.8% (329)	1.472	1
Solid	41.1% (228)	41.8% (203)	14.422**	1
Measure	0.9% (5)	1.4% (7)	0.639	1
Activity	22.3% (124)	24.5% (119)	0.554	1

Temporal	1.0% (6)	2.4% (12)	2.878	1
Between ground nouns in metaphorical construction of preposition <i>in</i>				
Concrete	18.9% (105)	18.7% (91)	0.006	1
Animate	4.8% (27)	5.7% (28)	0.417	1
Human	3.7% (21)	5.7% (28)	2.262	1
Mobile	49.2% (273)	42.2% (205)	5.456	1
Partitive	3.4% (19)	7.8% (38)	9.680**	1
Countable	40.2% (223)	52.7% (256)	16.342**	1
Solid	12.0% (67)	11.5% (56)	8.084*	1
Measure	4.1% (23)	7.8% (38)	7.189*	1
Activity	42.5% (236)	16.9% (82)	80.372**	1
Temporal	4.8% (27)	21.2% (103)	63.257**	1
Between figure nouns in literal construction of preposition <i>on</i>				
Concrete	70.2% (189)	74.7% (293)	1.769	1
Animate	24.9% (67)	31.1% (122)	3.090	1
Human	22.3% (60)	29.5% (116)	4.418*	1
Mobile	47.5% (128)	55.3% (217)	5.269	1
Partitive	4.4% (12)	3.3% (13)	0.564	1
Countable	66.1% (178)	79.0% (310)	14.221**	1
Solid	56.1% (151)	54.8% (215)	0.085	1
Measure	0% (0)	0% (0)	NA	1
Activity	12.6% (34)	5.3% (21)	11.022**	1
Temporal	0% (0)	0% (0)	NA	1
Between ground nouns in literal construction of preposition <i>on</i>				
Concrete	84.7% (228)	86.4% (339)	0.497	1
Animate	13.0% (35)	4.3% (17)	16.479**	1
Human	10.4% (28)	3.5% (14)	12.470**	1
Mobile	38.6% (104)	31.1% (122)	3.938*	1
Partitive	10.4% (28)	7.9% (31)	1.205	1
Countable	57.2% (154)	69.8% (274)	11.504**	1
Solid	76.9% (207)	62.5% (245)	17.132**	1
Measure	0.0% (1)	0% (0)	1.456	1
Activity	1.8% (5)	0.5% (2)	2.756	1
Temporal	0.0% (0)	0.0% (0)	NA	1
Between figure nouns in metaphorical construction of preposition <i>on</i>				
Concrete	43.6% (319)	39.3% (239)	2.640	1

Animate	17.2% (126)	27.1% (165)	18.987**	1
Human	15.8% (116)	26.9% (164)	24.589**	1
Mobile	26.5% (194)	32.4 % (197)	5.425*	1
Partitive	0.5% (4)	0.9% (6)	0.861	1
Countable	57.5% (421)	53.6% (326)	2.222	1
Solid	35.9% (263)	30.5% (186)	6.229*	1
Measure	0.9% (7)	1.3% (8)	0.380	1
Activity	17.7% (130)	13.9% (85)	3.611	1
Temporal	0.5% (4)	2.9% (18)	11.934**	1
Between ground nouns in metaphorical construction of preposition <i>on</i>				
Concrete	35.4% (259)	34.0% (207)	0.304	1
Animate	10.2% (75)	12.1% (74)	1.202	1
Human	9.0% (66)	11.5% (70)	2.215	1
Mobile	16.4% (120)	19.0% (116)	1.586	1
Partitive	2.0% (15)	1.9% (12)	0.011	1
Countable	45.2% (331)	54.6% (332)	11.335**	1
Solid	27.0% (198)	19.5% (119)	11.401**	1
Measure	0.5% (4)	0.4% (3)	0.019	1
Activity	21.4% (157)	22.3% (136)	0.142	1
Temporal	0.9% (7)	1.8% (11)	1.805	1

*p <.05. **p <.01.

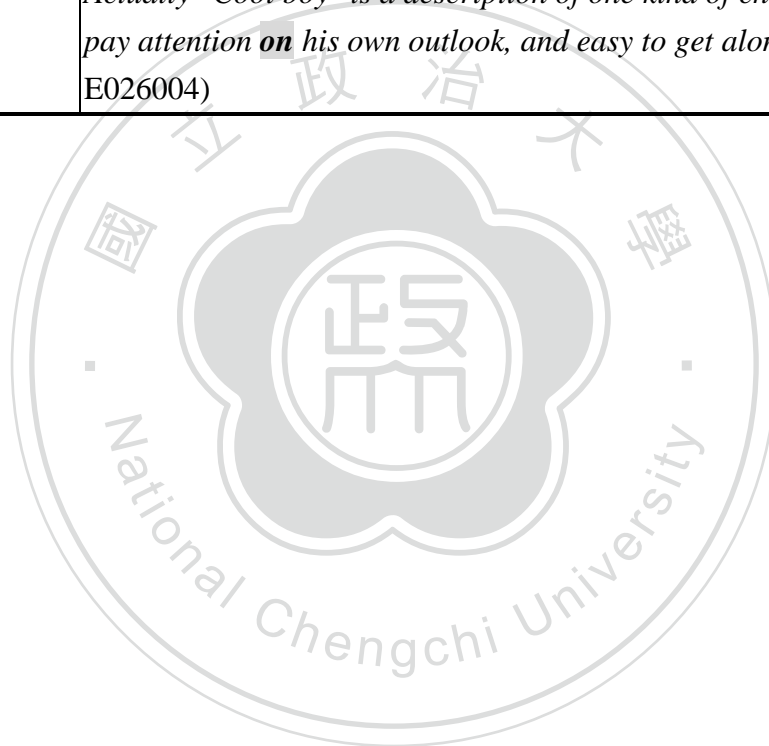
Appendix III: Errors of Prepositional Phrases in the Learner Corpus

In	
Error Type	Instance
Substitution of at	<i>So, according to the above two aspects of dogs and cats' difference, people usually feel cats are harder to keep in home as pets because they are too picky. (NCCU_E002009)</i>
	<i>All these can only learned by speaking and using of the Taiwanese, especially in home. (NCCU_E035009)</i>
	<i>Parents speaking native language in home can also teach their children about ancestors' life and the culture's history. (NCCU_E035009)</i>
	<i>However, smokers are not the only ones that impose a financial burden on health care costs, the nonsmokers live with partners who smoke in home are the "culprits" too, though they assume the charge involuntarily. (NCCU_E003014)</i>
	<i>Parents afraid that their children will lose in the start line, so they require children to learn a lot of talents or go to cram schools, don't care whether children agree or not. (NCCU_009005)</i>
	<i>The government allow us the above rights in our early age, driving in 18, smoking in 18, marriage in 16, and voting in 20, the age that for most of us start to face the world independently. (NCCU_049007)</i>
	<i>However, male and female can be engaged in sixteen and fourteen. (NCCU_E049001)</i>
<i>It is different from traditional conference [sic] everyone is in different place, but has the same meeting in the same time. (NCCU_E004006)</i>	
Substitution of from	<i>In my observation, people can only speak native language with other people who have closer relationship with. (NCCU_E035009)</i>
Substitution of on	<i>In a Sunday afternoon, you sit in a coffee shop in the campus and read your favorite novel. (NCCU_E003004)</i>
	<i>By telling "you is the one that matters," these web sites successful attract people to use them and create this phenomenon in which web sites charaterized on personalized information become a hit. (NCCU_E030001)</i>
	<i>In these web sites, users not only receive information but provide information by themselves. (NCCU_E030001)</i>
	<i>Besides the music industry dedicates in playing up the issue,</i>

	<i>individual online game-player also tries to let the issue out in the air. (NCCU_E006009)</i>
	<i>The number was calculated under the circumstances of 3,000 visitors a day (1,090,000 visitors a year), each of whom stays eight days in Taiwan and spends 237 US dollars in average. (NCCU_E011001)</i>
	<i>It all centered in a website called "Gossip girl", the site will provide gossip news and pictures by text message, and those resource of gossips are also from its readers. (NCCU_E004013)</i>
Misuse	<i>The limitation also protects the young would-be mother's health and life safety in consider of giving birth to a new life, which risks much more if the female's body is not mature enough. (NCCU_E049010)</i>
	<i>In their hand, compare and contrast are also the ways that teachers may use. (NCCU_E034013)</i>
	<i>The same problem may lie in department stores as well, since the smoking area needs time and funds to carry out, it is hard for the designer to set up a subtly appropriate smoking spot right after the announcement in last year. (NCCU_E003020)</i>

On	
Error Type	Instance
Substitution of at	<i>They dwelled on the same time, and both of them share the same popularity and fame from then and now. (NCCU_E002012)</i>
	<i>On the bus station, there are several people waiting for the bus coming. (NCCU_E012007)</i>
Substitution of in	<i>For example, at junior high school, there is always chemical experiment on chemistry class. (NCCU_E008008)</i>
	<i>7-eleven is like a magnet, attracts more and more consumers to meet their necessity on 7-eleven; therefore, fewer and fewer consumer go to their rivals. (NCCU_E006008)</i>
	<i>Coupon, the second sections, gives more incentive to consume on 7-eleven. (NCCU_E006008)</i>
	<i>By Jolin Tsai endorsing this action, a lot of people know this action soon; therefore, people start to consume on 7-eleven. (NCCU_E006008)</i>
	<i>This discount is an incentive which encourages people to consume on 7-eleven. (NCCU_E006008)</i>

	<i>This fact is also an incentive which encourages people to spend more money on 7-eleven. (NCCU_E006008)</i>
Misuse	<i>No matter which character he is on, it is the personality make [sic] him a "Cool Boy." (NCCU_E026004)</i>
	<i>Only when the things are more serious and you cannot push the responsibility to others, like who didn't finish the work on the post, or, who did broke the expensive vast, like EBay advertisement said. (NCCU_E010012)</i>
Substitution of to	<i>If the school can pay more attention on the smoking problem and take practical actions, it is believed that the cases that students smoke on campus will be reduced. (NCCU_E003002)</i>
	<i>Actually "Cool boy" is a description of one kind of characteristic who pay attention on his own outlook, and easy to get alone with. (NCCU_E026004)</i>



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