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Semantics of Event Nouns

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The Hong Kong Polytechnic University

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THE HONG KONG POLYTECHNIC UNIVERSITY
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Semantics of Event Nouns

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A thesis submitted in partial fulfilment of the requirements
for the degree of DOCTOR OF PHILOSOPHY

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CERTIFICATE OF ORIGINALITY

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_____ (Signed)

_____ Shan WANG _____ (Name of Student)

**To my mother 张万香 *Zhāng Wànxiāng*, and
to the memory of my father 王凤桐 *Wáng Fèngtóng* (1948-2013)**

Abstract

In the philosophy of language and formal semantics, it is often assumed that nouns denote entities and sentences denote propositions and events. This semantic dichotomy is maintained in the study of deverbal nouns, where the verb-like properties of process nominals are attributed to the verbs they derive from. However, non-derived nouns like simple event nominals¹ are considered to behave similarly to result nominals. What kinds of nouns carry eventive information and what information it is are the concerns of this thesis.

This thesis reveals the criteria that can identify event nouns in Mandarin Chinese, including event classifiers, event structure and light verbs. Then it divided event nouns into three categories: process nominals, instant nominals and pure event nouns. Based on the constraint-based linguistic model, it establishes an event-based noun classification system. The findings indicate that process nominals and pure event nouns have the same behavior; instant nominal behave similarly to process nominals and pure event nouns, except that they cannot be selected by aspectualizers and durative time expressions.

Event nouns are typically compound nouns. The thesis explores their morpho-syntactic properties, semantic properties, event representation properties, and information inheritance properties.

This thesis enriches the type system of the Generative Lexicon theory through studying event nouns, including natural types, artifactual types, natural complex types and artifactual complex types. It then examines the qualia role contribution to these types and proposes a scale-based qualia role contribution system.

To elaborate eventive information representation of event nouns, the above theoretical work is followed by a detailed analysis of 會議 *huiyi* ‘meeting; conference’, as a typical non-derived event noun based on the Generative Lexicon theory. The results demonstrate that non-derived event nouns can represent eventive information. They behave like a deverbal nominal very much and unlike an entity-referring noun.

This thesis identifies and classifies different adjectival categories that are capable of modifying event nouns. Based on them, it establishes an eventive qualia structure through examining each qualia role’s attributes and each attribute’s role values. It also examines

¹ The thesis call them *pure event nouns*. Please refer to Section 2.5.2.1 and Section 2.5.3.1 for details.

which types of event nouns (NT, AT, NCT, ACT) that each adjectival category can modify.

This thesis analyzes the compositional mechanisms at work in NN compounds when either the head or the modifier is an event noun. This analysis extends the usage of the compositional mechanisms of GL in two ways: (i) nominal head selection of a nominal modifier, and (ii) their usage in the nominal event domain. This thesis has also proposed a compositional mechanism *sub-composition*.

The comprehensive exploration of event nouns in this thesis contributes to the research on eventive information of nouns as well as the development of the Generative Lexicon theory. The results also have implications for applications in natural language processing, language learning and lexicography.

Publications Arising from the Thesis

- [1] **Wang, Shan & Chu-Ren Huang.** 2010. A Generative Lexicon Approach to Possessive Relation of Mandarin Chinese. *Paper presented at The Symposium Commemorating the 90th Anniversary of the Birth of Prof. Zhu Dexi and the 50th Anniversary of Prof. Lu Jianming's Teaching*, Peking University, Beijing, China.
- [2] **Wang, Shan & Chu-Ren Huang.** 2010. *Adjectival Modification to Nouns in Mandarin Chinese: Case Studies on “cháng+noun” and “adjective+túshūguǎn*. Proceedings of The 24th Pacific Asia Conference on Language, Information and Computation (PACLIC-24), ed. by Ryo Otaguro, Kiyoshi Ishikawa, Hiroshi Umemoto, Kei Yoshimoto & Yasunari Harada. Tohoku University, Sendai, Japan. pp.701-705. [ISBN: 978-4-905166-00-9]
- [3] **Wang, Shan & Chu-Ren Huang.** 2010. *Compositional Operations of Mandarin Chinese Perception Verb kàn: A Generative Lexicon Approach*. Proceedings of The 24th Pacific Asia Conference on Language, Information and Computation (PACLIC-24), ed. by Ryo Otaguro, Kiyoshi Ishikawa, Hiroshi Umemoto, Kei Yoshimoto & Yasunari Harada. Tohoku University, Sendai, Japan. pp.707-714. [ISBN: 978-4-905166-00-9]
- [4] **Wang, Shan & Chu-Ren Huang.** 2010. Mechanism of Composition of Mandarin Perception Verb kàn. *Paper presented at The 16th Symposium on Modern Chinese Grammar*, City University of Hong Kong, Hong Kong.
- [5] **Wang, Shan & Chu-Ren Huang.** 2010. Semantic and Temporal Features of Event Nouns. *Paper presented at Annual Research Forum of Linguistic Society of Hong Kong (LSHK-ARF)*, Chinese University of Hong Kong, Hong Kong.
- [6] **Wang, Shan & Chu-Ren Huang.** 2010. *Sense Representation in MARVS--A Case Study on the Polysemy of chī*. Proceedings of The 11th Chinese Lexical Semantics Workshop, ed. by Qiaoming Zhu, Donghong Ji & Guodong Zhou. Singapore: Chinese and Oriental Languages Information Processing Society (COLIPS) Publications. pp.22-29. [ISBN: 978-981-08-8260-0]
- [7] **Wang, Shan.** 2011. A New Practice on Lexicon System Construction: A Case Study on the “Economy and Trade” Category. *Paper presented at The 19th Annual Conference of the International Association of Chinese Linguistics (IACL-19)*, Nankai University, Tianjin, China.
- [8] **Wang, Shan & Chu-Ren Huang.** 2011. *A Generative Lexicon Perspective to Possessive Relation in Mandarin Chinese*. Proceedings of The 12th Chinese Lexical Semantics Workshop (CLSW-12). National Taiwan University, Taipei. pp.201-213.

- [9] **Wang, Shan** & Chu-Ren Huang. 2011. *Compound Event Nouns of the ‘Modifier-head’ Type in Mandarin Chinese*. Proceedings of The 25th Pacific Asia Conference on Language, Information and Computation (PACLIC-25), ed. by Helena Hong Gao & Minghui Dong. Nanyang Technological University, Singapore. pp.511-518. [ISBN: 978-4-905166-02-3]
- [10] **Wang, Shan** & Chu-Ren Huang. 2011. Derived Event Nouns in Mandarin Chinese. *Paper presented at The 7th LSHK Postgraduate Research Forum on Linguistics (PRFL-7)*, City University of Hong Kong.
- [11] **Wang, Shan** & Chu-Ren Huang. 2011. Domain Relevance of Event Coercion in Compound Nouns. *Paper presented at The 6th International Conference on Contemporary Chinese Grammar (ICCCG-6)*, I-Shou University, Kaohsiung, Taiwan.
- [12] **Wang, Shan** & Chu-Ren Huang. 2011. Event Classifiers and Their Selected Nouns. *Paper presented at The 19th Annual Conference of the International Association of Chinese Linguistics (IACL-19)*, Nankai University, Tianjin, China.
- [13] **Wang, Shan** & Chu-Ren Huang. 2011. Sense Representation in MARVS: A Case Study on the Polysemy of *chī*. *International Journal of Computer Processing Of Languages (IJCPOL)* 23 (3). pp.285-306. [Print ISSN: 1793-8406; Online ISSN: 2010-0205]
- [14] **Wang, Shan**, Yat-Mei Lee & Chu-Ren Huang. 2011. *A Corpus-based Analysis of Semantic Type System of Event Nouns: A Case Study on huìyì ‘conference’*. Proceedings of the 23rd North American Conference on Chinese Linguistics (NACCL-23), ed. by Schmidt Zhuo Jing. Eugene, Oregon, USA. pp.18-34.
- [15] **Wang, Shan** & Chu-Ren Huang. 2012. A Constraint-based Linguistic Model for Event Nouns. *Paper presented at Forum on “Y. R. Chao and Linguistics”, Workshop of The 20th Annual Conference of the International Association of Chinese Linguistics (IACL-20)*, The Hong Kong Institute of Education, Hong Kong.
- [16] **Wang, Shan** & Chu-Ren Huang. 2012. *A Preliminary Study of An Event-based Noun Classification System*. The 13th Chinese Lexical Semantics Workshop (CLSW-13), ed. by Yanxiang He & Donghong Ji. Wuhan University, China. pp.4-9.
- [17] **Wang, Shan** & Chu-Ren Huang. 2012. Qualia Structure of Event Nouns in Mandarin Chinese. *Paper presented at The Second International Symposium on Chinese Language and Discourse*, Nanyang Technological University, Singapore.
- [18] **Wang, Shan** & Chu-Ren Huang. 2012. Temporal Properties of Event Nouns in Mandarin Chinese. *Paper presented at The 57th Annual International Linguistic Association Conference (ILA-57)*, City University of New York, New York, USA.
- [19] **Wang, Shan** & Chu-Ren Huang. 2012. *Type Construction of Event Nouns in*

Mandarin Chinese. Proceedings of The First Workshop on Generative Lexicon for Asian Languages (GLAL-1), Workshop of The 26th Pacific Asia Conference on Language, Information and Computation (PACLIC-26). Faculty of Computer Science, Universitas Indonesia. pp.582-591. [ISBN: 978-979-1421-17-1]

- [20] **Wang, Shan**, Chu-Ren Huang & Hongzhi Xu. 2012. *Compositionality of NN Compounds: A Case Study on [N₁+Artifactual-Type Event Nouns]*. Proceedings of The 26th Pacific Asia Conference on Language, Information and Computation (PACLIC-26). Faculty of Computer Science, Universitas Indonesia. pp.70-79. [ISBN: 978-979-1421-17-1]
- [21] **Wang, Shan** & Chu-Ren Huang. 2012. Light Verbs and Their Selected Nouns. *Paper presented at XIX Biennial Conference of the European Association of Chinese Studies (EACS-19)*, Paris, France.
- [22] **Wang, Shan** & Chu-Ren Huang. 2013. *Apply Chinese Word Sketch Engine to Facilitate Lexicography*. *Lexicography and Dictionaries in the Information Age: Selected papers from the 8th ASIALEX International Conference*, ed. by Deny A. Kwary, Nur Wulan & Lilla Musyahda. Bali, Indonesia. pp.285-292.
- [23] **Wang, Shan** & Chu-Ren Huang. 2013. Aspectualizers and Their Selected Nouns. *Paper presented at The 21st Annual Conference of the International Association of Chinese Linguistics (IACL-21)*, National Taiwan Normal University, Taiwan.
- [24] **Wang, Shan** & Chu-Ren Huang. 2013. *Inchoation of Emotions*. Proceedings of The 14th Chinese Lexical Semantics Workshop (CLSW-14). Zhengzhou University, China. pp.195-202.
- [25] **Wang, Shan** & Chu-Ren Huang. 2013. *Towards an Event-Based Classification System for Non-Natural Kind Nouns*. *Chinese Lexical Semantics*, ed. by Donghong Ji & Guozheng Xiao. Berlin Heidelberg: Springer. pp.381-395. [Print ISBN: 978-3-642-36336-8; Online ISBN: 978-3-642-36337-5; Series ISSN: 0302-9743]
- [26] **Wang, Shan** & Chu-Ren Huang. 2013. *The Semantic Type System of Event Nouns: A Case Study on huìyì 'conference'*. *Increased Empiricism: New Advances in Chinese Linguistics*, ed. by Schmidt Zhuo Jing. Philadelphia / Amsterdam: John Benjamins Publishing Company. (in print)
- [27] **Wang, Shan** & Chu-Ren Huang. *A Generative Lexicon Approach to Possessive Relations in Mandarin Chinese*. *Towards the Contemporary Cutting-edge Science of Modern Chinese Grammar (走向当代前沿科学的现代汉语语法研究)*, ed. by Yang Shen. Beijing: The Commercial Press. (in print)
- [28] **Wang, Shan** & Chu-Ren Huang. *Inchoative State of Emotions*. Proceedings of The 14 Chinese Lexical Semantics Workshop. Berlin Heidelberg: Springer. (in print)

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This moment would have been more meaningful to me, were it not for a sudden car accident, which took away my father on 18 January, 2013. A normal stroll after dinner turned out to be a disaster. It is really hard to accept it as a fact, which is too cruel and unexpected. I keep thinking he is just away for a trip and will be back sooner or later, but days after days, he never turns up again except in my dreams. I am very sorrowful that he cannot join us in celebrating my graduation. If the accident had not occurred, what a joyful moment we would have had.

My father Fengtong Wang was born in 1948. Before the Cultural Revolution (CR), He studied at the No.1 Senior High School in Qingzhou. With the coming of CR, all courses were suspended and he had to stop his study. During the CR, he was always arranged to carry out the most tired manual labor to gain credits for survival. After the CR, he resolutely took part in the university entrance examination. He successfully passed the exam and was enrolled as an undergraduate in a normal university in 1979, majoring in chemistry. He was the only one who got admitted in the town. After graduation, he has been a teacher in senior high school. He was awarded the National Senior Teacher early and he had cultivated many students in more than 30 years' devotion to education.

Besides teaching, my father loved research very much. He invented many things such as low-carrier modulated transponder for TV, electronic ignition, etc. Moreover, he published some national refereed papers. All these achievements were inseparable from his childhood hobby. When he was a child, he loved electronics very much. As early as he was in middle school, he was able to make his own radio. At that time, the leaders in the village doubted that the radio was used to listen to the enemy's broadcast. The misunderstanding was dropped after they listened to it themselves. Even so, they warned him not to make a radio anymore. This childhood hobby became his lifelong interest. In those days, the lack of

technical experts was very serious. He had been to Tai'an and many other places to help them repair their electronic equipments, where he received warm receptions. At that difficult time, many people did not have any knowledge about such kind of new things. Once, after he repaired a radio, an old lady asked: "how can the radio speak? Is a person living there?" Therefore, it is hard for me to image how my father can learn the electronics himself during those days. As an expert, he was able to repair many kinds of electrical appliances, such as household appliances, medical equipments, musical instruments, and so on. Before his sudden departure, he had just fixed several fishing machines. He is regarded as having all-round techniques in electronics. I remember when I was a child, the parents of my friends usually did not allow them to touch their home appliances, not only because they were expensive, but also because they feared that they went wrong. In contrast, I did not have such a concern at all, because I knew that my father was able to repair everything even if I destroyed them.

My father was full of exploration spirit. Electronic technology develops rapidly in the 21st century. He followed the pace of technological development and kept his knowledge updated through continuous learning. Through self-study, he quickly mastered the techniques to repair LED TV, mobile phones, MP3, etc. His techniques have been widely recognized, because the appliances he repaired maintain good quality for a long time. For example, in summer he always helped people to repair their fans and air conditioners. He ensured the re-usage for another three to seven years after his repair. His integrity and honesty gained trust and respect.

My father never gave up to any difficulty. He experienced the great famine in the 1960s and suffered from starving. At that time, people were even too weak to carry out those who died. He worked hard to make a living and the whole family survived this tough period. This experience made him diligent and thrifty throughout his life. Although later life got better and better, he still remained economical and was very grateful to the nation.

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List of Abbreviations

A: adjective in syntax; the agentive role in the Generative Lexicon theory

ACT: artifactual complex type (s)

ADJ: adjective

ADV: adverb

ARG: argument

ARGSTR: argument structure

AS: Accommodation Subtyping

ASAP: as soon as possible

ASP: grammatical aspect/viewpoint aspect, including perfective viewpoints (e.g. the perfective -了 *le*, The Experiential -過 *guò*) and imperfective viewpoints (e.g. the progressive: -在 *zài*, the stative imperfective -著 *zhe*)

AT: artifactual type(s)

BA: 把 *bǎ*, ① Used when the object is placed before the verb, and is the recipient of the action; the sentence structure expresses disposition: 把頭一扭 *bǎtóu yī niǔ* ‘toss one’s head’. ② When used before a verb that is preceded by an object and followed by a complement indicating result, 把 *bǎ* and the verb function as a transitive verbal phrase, such as ‘(cause sb. to be) busy, tired, worried, angry, etc.’]: 把他樂壞了。 *Bǎ tā lè huài le*. ‘He is overwhelmed with joy.’ — *The Contemporary Chinese Dictionary* (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012)

BEI: 被 *bèi*, ① Used in a passive sentence to indicate that the subject is the object of the action (the agent or doer usually follows 被 *bèi* and is often omitted): 那棵樹被(大風)刮倒了。 *Nà kē shù bèi (dà fēng) guā dào le*. The tree was uprooted (by the gale). ② Used before a verb to form a passive phrase: 被批評 *bèi pīpíng* ‘criticized’. — *The Contemporary Chinese Dictionary* (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012)

C: the constitutive role in the Generative Lexicon theory

CA-I: Conventional Attribute Introduction

CE: coercion by exploitation

CI-Q: coercion by qualia introduction

CL: classifier

CLAWS: the Constituent Likelihood Automatic Word-tagging System

CN: common noun

DA: an adverb derived from an adjective, such as beautifully, slowly, fast

D-ARG: default argument

D-E: default event

D-M: determiner-measure word

Dot-E: Dot Exploitation

Dot-I: Dot Introduction

DV: dummy verb

e: entity or event

EVENTSTR: event structure

F: formal role in the Generative Lexicon theory

GL: the Generative Lexicon theory

GQ: generalized quantifier

ind: individual

info: information

lcp: lexical conceptual paradigm

LVC: light verb construction

MI: mutual information

N: noun

NCT: natural complex type (s)

NMR: noun modifier relationship

NN: noun noun

NP: noun phrase

NT: natural type (s)

NV: noun/verb

o: overlap

OBJ: object

p • i: physical object • information

phys / physobj: physical object

POS: part of speech

PP: prepositional phrase

PREP: preposition

PURP: purpose in Cimiano and Wenderoth (2007)

Q: qualia

Q-E: Qualia Exploitation

Q-I: Qualia Introduction

QS: qualia structure

QT: qualia term in Cimiano and Wenderoth (2007)

RB: adverb in Cimiano and Wenderoth (2007)

RDP: recoverably deletable predicate

RESTR: restriction, the ordering restriction over events

RHR: righthand rule

RVC: resultative verb complement

S: sentence

SUBJ: subject

T: the telic role in the Generative Lexicon theory

t: truth value

V: verb

VB: verb, base form

VP: verb phrase

Chapter 1 Introduction

1.1 Background

The noun is a very large grammatical category in Chinese. This is shown from the number of noun entries in *The Contemporary Chinese Dictionary* (Dictionary Department 1978, 1983, 1996, 2002, 2005, 2012), which is a high quality monolingual dictionary, serving as a standard dictionary of contemporary Chinese language usage. Its entries are composed of characters, words, phrases, colloquialisms and idioms of standard Mandarin Chinese. Yin (1986) counted the POS of common words in *The Contemporary Chinese Dictionary*², as illustrated in Table 1. The data show that the noun is the largest grammatical category in this dictionary.

Table 1. POS of Common Words in *The Contemporary Chinese Dictionary*

		POS	No.	Percentage
名詞	<i>míngcí</i>	noun	23,267	56.50%
動詞	<i>dòngcí</i>	verb	11,603	28.17%
形容詞	<i>xíngróngcí</i>	adjective	3,116	7.57%
四言成語	<i>sì yán chéngyǔ</i>	four-character idiom	2,380	5.78%
副詞	<i>fùcí</i>	adverb	239	0.58%
量詞	<i>liàngcí</i>	measure word	202	0.49%
連詞	<i>liáncí</i>	conjunction	86	0.21%
代詞	<i>dàicí</i>	pronoun	83	0.20%
嘆詞	<i>tàn cí</i>	interjection	74	0.18%
數詞	<i>shùcí</i>	numeral	64	0.16%
介詞	<i>jiècí</i>	preposition	37	0.09%
助詞	<i>zhùcí</i>	auxiliary	32	0.08%
Total			41,183	100.00%

The fifth edition of *The Contemporary Chinese Dictionary* (Dictionary Department 2005) for the first time added POS for word senses for this series of dictionaries. We counted all

² Yin (1986) did not mention the edition of *The Contemporary Chinese Dictionary*. There are two editions before the year 1986: the 1st edition published in 1978 and the 2nd edition published in 1983. The 2nd edition only made minor amendments from the 1st edition.

the entries in this dictionary, as depicted in Table 2. The data illustrate that nominal senses are the largest class in this dictionary.

Table 2. POS of Senses in The Contemporary Chinese Dictionary (5th Edition)

POS of Senses			No.	Percentage
名詞	<i>míngcí</i>	noun	32,825	37.73%
動詞	<i>dòngcí</i>	verb	22,662	26.05%
None ³		None	21,819	25.08%
形容詞	<i>xíngróngcí</i>	adjective	6,448	7.41%
副詞	<i>fùcí</i>	adverb	1,361	1.56%
量詞	<i>liàngcí</i>	measure word	618	0.71%
連詞	<i>liáncí</i>	conjunction	325	0.37%
代詞	<i>dàicí</i>	pronoun	313	0.36%
數詞	<i>shùcí</i>	numeral	178	0.20%
介詞	<i>jiècí</i>	preposition	174	0.20%
助詞	<i>zhùcí</i>	auxiliary	167	0.19%
嘆詞	<i>tàncí</i>	interjection	101	0.12%
擬聲詞	<i>nǐshēngcí</i>	onomatopoeia	10	0.01%
Total			87,001	100.00%

In the philosophy of language and formal semantics, it is often assumed that nouns denote entities and sentences denote propositions and events, e.g. Quine (1960). For instance, Chen (1988) stated that the most typical objects always take a certain amount of space; and with the change of different objects, they demonstrate characteristics in size, number, height, and thickness. Differently, the most significant feature of behaviors and actions is temporality. Their internal temporal structure can be determined through investigating the initial phase, the continuous phase and the end phase, etc.. Taking a point on the timeline as a reference, we can discover whether the action occurred in the past, present or future. Li (1996) revealed that the syntactic performance of a noun's spatial property is most evidently demonstrated in the ability of noun-modifier composition. The noun that can combine with individual classifiers (e.g. 個 *gè* 'individual', 頭 *tóu* 'head', 匹 *pǐ* 'CL for horses, mules, etc.', 根 *gēn* 'CL for something long', 條 *tiáo* 'CL for something thin and long', 棵 *kē* 'CL for some plants') possesses the strongest spatial property; the noun that cannot combine with individual classifiers has a weaker spatial property; the noun that can only combine with kind classifiers (e.g. 種 *zhǒng* 'kind', 類 *lèi* 'category') has the weakest spatial property; the

³ "None" means this sense is not marked with POS.

noun that cannot combine with individual classifiers loses its spatial property and its nature changes accordingly. Therefore, it is reasonable to look at classifiers to determine whether the spatial property of a noun is strong or weak.

However, there is a type of nouns that lexically encodes eventive information, including event structure and temporal information. They do not have the spatial property stated in (Chen 1988, Li 1996), but have special eventive features. They are called event nouns, temporal nouns, or process nouns in literature. The term *temporal nouns* can refer to temporal expressions, such as 年 *nián* ‘year’ and 月 *yuè* ‘month’. The term *process nouns* ignores nouns that express instant events. This thesis applies the term *event nouns*, because an “event” not only has temporal properties, but also includes subevents that may occur in it.

As early as in 1960s, Chao (1968) noticed event nouns and treated them as a kind of abstract nouns. They can be selected by verbal classifiers, such as 三場戲 *sān chǎng xì* ‘three scenes of a drama’, 一場大禍 *yī chǎng dàhuò* ‘a great misfortune’. In recent years, there has been growing interest in these event-representing nouns. Previous research on event nouns in Mandarin Chinese focuses on the structures in which they usually occur (Ma 1995, Chu 2000, Han 2010a), their classifiers (Ma 1995, Wang & Zhu 2000, Wang & Huang 2011d), internal and external temporal attributes (Liu 2003, 2004), their semantic categories (Wang & Zhu 2000, Han 2004, Liu 2004, Han 2007a, 2010b), among others. However, only a limited number of studies have investigated their eventive information.

1.2 Motivation

Chierchia (1984) found that some predictive expressions of English (VPs, CNs, ADJs, etc.) are turned into noun-like items. They have singular references like proper nouns do, but they also have properties that are different from entities. He presents an analysis of ACCUSATIVE-ing and POSSESSIVE-ing constructions and how they relate to CN-gerunds. V-gerunds denote propositional functions, i.e. eventuality functions. NP-gerunds (without possessive subjects) are associated with nominalized eventuality functions, and thus they differ from to-VPs. ACCUSATIVE-ing constructions, POSSESSIVE-ing constructions (i.e. NP-gerunds with possessive subjects), for-to clauses and that-clauses all denote states of affairs or eventualities.

If a predictive expression can have noun-like properties (Chierchia 1984), then a natural question to ask is whether a nominal expression can have verb-like properties, such as carrying eventive information.

Previous studies on event nouns typically focused on deverbal nominals, such as 報導 *bàodào* ‘reporting; report’ and claim that deverbal nominals carry eventive information as their verbal counterparts, but event nouns that are not derived from verbs are taken as having no eventive features (Chomsky 1970, Grimshaw 1990).

Chomsky (1970) classified nominalization into three types: (1) gerundive, (2) derived, and (3) mixed. Examples are shown from (1) to (3) respectively.

- (1) John’s refusing the offer
- (2) John’s refusing of the offer
- (3) John’s refusal of the offer

Chomsky discussed the differences between gerundives and derived nominals. First, the productivity is different. The transformation applies to gerundive nominals freely. However, the formation of derived nominals has many restrictions. The structures underlying (4) are transformed into the gerundive nominals in (5), but not into the derived nominals in (6):

- (4)
 - a. John is easy (difficult) to please.
 - b. John is certain (likely) to win the prize.
 - c. John amused (interested) the children with his stories.
- (5)
 - a. John’s being easy (difficult) to please
 - b. John’s being certain (likely) to win the prize
 - c. John’s amusing (interesting) the children with his stories
- (6)
 - a. *John’s easiness (difficulty) to please
 - b. *John’s certainty (likelihood) to win the prize
 - c. * John’s amusement (interest) of the children with his stories

Second, only derived nominals have the internal structure of noun phrases, as shown in (7) and (8).

- (7) the proof of the theorem (* the proving the theorem, with a gerundive nominal)
- (8) John’s unmotivated criticism of the book (* John’s unmotivated criticizing the book)

Correspondingly, the derived nominals do not contain aspect. Moreover, many derived

nominals have plural forms and can occur with a full range of determiners, as depicted in (9) and (10).

(9) John's three proofs of the theorem

(10) several of John's proofs of the theorem

Grimshaw (1990) divided nominals into three classes: complex event nominals, simple event nominals and result nominals⁴. She holds that complex event nominals have an event structure and thus an argument structure, while simple events and result nominals have no argument structure and event structure. Borer (2003) refers to Grimshaw (1990)'s complex event nominals as argument structure nominals and result nominals as referential nominals, as illustrated in Table 3. Their properties are shown in Table 4.

Table 3. Examples of Argument Structure Nominals and Referential Nominals

Argument Structure Nominals	Referential Nominals
The instructor's (intentional) examination of the student	The instructor's examination/exam
The frequent collection of mushrooms (by students)	John's collections
The monitoring of wild flowers to document their disappearance	
The destruction of Rome in a day	These frequent destructions took their toll

Table 4. Properties of Argument Structure Nominals and Referential Nominals

Argument Structure Nominals	Referential Nominals
a. θ -assignors, Obligatory arguments	a. Non- θ -assignors, No obligatory arguments
b. Event reading	b. No event reading
c. Agent-oriented modifiers	c. No agent-oriented modifiers
d. Subjects are arguments	d. Subjects are possessives
e. <i>by</i> phrases are arguments; In Hebrew, selects <i>al-yedey</i>	e. <i>by</i> phrases are non-arguments; in Hebrew selects <i>šel (of) me'et</i>
f. Implicit argument control	f. No implicit argument control
g. Aspectual modifiers	g. No aspectual modifiers
h. frequent, constant etc. possible without plural	h. frequent, constant etc. possible only with plural nouns
i. Mass nouns	i. Count nouns

⁴ Please refer to *Section 2.5.2.1* for the names of different terms in different research.

Fu (1994) summarized Grimshaw (1990)'s research on the difference between process nominals and result nominals, as shown in Table 5.

Table 5. Differences between Process Nominals and Result Nominals (Grimshaw 1990)

Nominal	Determiner System		Argument structure		Event structure		
	Determiner	Plural	Subject-Oriented Adjective	Argument Taking	Frequency Adjective	Durative Time Expression	Rational Clause
Process	the/Ø	-	+	+	+	+	+
Result	the, a, that	+	-	-	-	-	-

Grimshaw (1990) claimed that simple event nominals denote events in some sense. They occur or take place, and they occur over time. However, they act like result nominals because they share the determiner system of result nominals, occur only with optional modifiers and not with arguments, disallow *frequent* and *constant* unless they are in the plural, and disallow event control (Grimshaw 1990: P58-59):

(11) That trip/event took five days.

That trip/those trips took five days.

(12) * The frequent trip/event was a nuisance.

The frequent trips/events were a nuisance.

(13) * That trip/event in order to

Furthermore, simple event nominals disallow aspectual modifiers of any kind:

(14) * Mary's trip in six days/for six days was interesting.

* the process in five hours/for five hours

Only complex event nominals have an event structure and a syntactic argument structure like verbs. The argument structure of complex nominals licenses (and requires) arguments. Complex event nominals are distinguished from simple event nominals and result nominals in the range of determiners and adjuncts they occur with as well as in event control and predication (Grimshaw 1990: P59).

Following Grimshaw (1990)'s research, Fu (1994) compared process nominals, result nominals, and concrete entity nouns in Chinese, and finds that they have the same behavior as those in English.

However, instant nominals and pure event nouns in Chinese have not yet been studied. This thesis argues that both of them bear eventive features, which is similar to process nominals.

Grammatical analysis to event nouns is not enough. For example, in the compound 音樂會 *yīnyuèhuì* ‘concert’, grammatically, 會 *huì* ‘meeting’ is the head, while semantically it is double headed. The grammatical head and the semantic head do not match.

Event nouns (e.g. 會議 *huìyì* ‘conference’, 比賽 *bǐsài* ‘competition’, 婚禮 *hūnlǐ* ‘wedding’) have similar grammatical properties with entity nouns (e.g. 木頭 *mùtóu* ‘wood’, 玻璃 *bōlib* ‘glass’). For example, they can occur in the subject, object or modifier position. However, event nouns possess unique eventive information. A grammatical analysis cannot predict such information.

For example, single event nouns (e.g. 地雷戰 *dìléi zhàn* ‘landmine war’, 會議 *huìyì* ‘conference; meeting’), [adjective-event noun] constructions (e.g. 大規模的土石流 *dàguīmóde tǔshíliú* ‘large-scale mud-rock flow’), and NN compounds with an event noun as a head or modifier (e.g., 籃球比賽 *lánqiú bǐsài* ‘basketball competition’, 婚禮相片 *hūnlǐ xiàngpiàn* ‘marriage photo’) have no verbal element in them, but all of them all contain eventive information.

It is obvious that grammatical analysis cannot reveal such information. Then how to account for such information? This thesis adopts the Generative Lexicon Theory (GL) as the theoretical framework. The next section introduces the details of this theory.

1.3 Theoretical Framework

The Generative Lexicon theory (GL) was first proposed in Pustejovsky (1991, 1995) and further developed in Pustejovsky and Jezek (to appear). Its goal is to capture the generative nature of lexical creativity and sense extension phenomena. We adopt GLT as the theoretical basis of this thesis because it provides a comprehensive account of lexical semantic information of a lexical item and it has the most well-developed representation of eventive information for nouns. This section will introduce the basic ideas of GL.

1.3.1 The Semantic Type System

In GL, any category can be distinguished into three distinct dimensions. With regard to nouns, the interpretation can vary in the light of the three dimensions: (i) Argument Structure: the number of arguments the nominal takes; whether they are simple, artifactual or

complex types; (ii) Event Structure: what events the nominal refers to explicitly and implicitly; (iii) Qualia Structure: the basic predicative force of the nominal and the relational information associated with the nominal, both explicitly and implicitly; (iv) Lexical Inheritance Structure: position of a lexical structure in the type lattice. Because Lexical Inheritance Structure uses a very shallow ontology in GT, thus it is not discussed in this thesis.

1.3.1.1 Argument Structure

Pustejovsky (1995) distinguishes four types of arguments: true arguments, default arguments, shadow arguments, and true adjuncts.

True arguments are syntactically realized words. In (15), the one-place predicate requires the explicit representation of the argument *Julia*, so *Julia* is a true argument.

(15) *Julia* came.

Default arguments are parameters that participate in the logical expression in the qualia, but they do not need to be expressed syntactically. In (16), that desk must be made up of something. *Out of rosewood* shows the material of the desk, so it is a default argument.

(16) Bill made the desk *out of rosewood*.

Shadow arguments are parameters that are lexicalized into the lexical item and they can only be expressed by subtyping or discourse specification; otherwise, they will lead to pleonasm. In (17), the verb *kick* depicts an action done by a leg. The preposition phrase *with his left leg* gives new information about which leg is used.

(17) Evan kicked the door *with his left leg*.

True adjuncts are parameters that modify the logical expression, but are not fastened to any lexical item's semantic representation. In (18), the location *in Harbor City* is a true adjunct.

(18) Lucy goes shopping *in Harbor City*.

1.3.1.2 Event Structure

Pustejovsky (1991, 1995) classify events into states, processes and transitions. Transitions are further divided into achievements and accomplishments.

He depicts subeventual structure of events. One subevent of a complex event is more prominent than the other and is the head of that event. Event headedness marks

foregrounding and backgrounding of event arguments. Headed subevent is annotated as e^* .

Accomplishment verbs which have a process and a resulting state are left-headed. Achievement verbs which focus on the final state are right-headed. When the head of an event is underspecified, polysemy occurs.

With the hypothesis that all events have a binary event structure and there are three temporal ordering relations ($<_{\alpha}$, o_{α} , and $< o_{\alpha}$), there are 6 possible head configurations with two events, given a single head; there are 12 possibilities, if unheaded and double-headed constructions are included, as presented in (19).

(19)

- a. $[e^{\sigma} e_1^* <_{\alpha} e_2]$ — build
- b. $[e^{\sigma} e_1 <_{\alpha} e_2^*]$ — arrive
- c. $[e^{\sigma} e_1^* <_{\alpha} e_2^*]$ — give
- d. $[e^{\sigma} e_1 <_{\alpha} e_2]$ — UNDERSPECIFIED
- e. $[e^{\sigma} e_1^* o_{\alpha} e_2]$ — buy
- f. $[e^{\sigma} e_1 o_{\alpha} e_2^*]$ — sell
- g. $[e^{\sigma} e_1^* o_{\alpha} e_2^*]$ — marry
- h. $[e^{\sigma} e_1 o_{\alpha} e_2]$ — UNDERSPECIFIED
- i. $[e^{\sigma} e_1^* < o_{\alpha} e_2]$ — walk
- j. $[e^{\sigma} e_1 < o_{\alpha} e_2^*]$ — walk home
- k. $[e^{\sigma} e_1^* < o_{\alpha} e_2^*]$ — ??
- l. $[e^{\sigma} e_1 < o_{\alpha} e_2]$ — UNDERSPECIFIED

In (19), (a) represents accomplishment verbs. (b) represents achievement verbs. (c) represents events involving a relational predicate on each subevent and characterizes unilateral transitions with three arguments. (e) and (f) represent two simultaneous events, but only one is focused by the lexical item. (i) represents ordered overlap, where one event begins, and subsequently gives rise to another process which continues only while the first event continues to hold.

1.3.1.3 Qualia Structure

Qualia structure is one of the most important levels in the generative lexicon theory. Pustejovsky (1995) shows how lexical items encode semantic information in the qualia structure. There are four roles in a qualia structure, and each is associated with some values: (i) the constitutive role is about the relation between an object and its constituents or parts. Its role values include material, weight, parts and component elements; (ii) the formal role

can distinguish the object within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values; (iii) the telic role is about the purpose and function of the object; (iv) the agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, causal chain.

1.3.2 Generative Mechanisms

Primitives-based approach to word meaning has met up with much difficulty in explaining all well-formed expressions in languages. Instead, the Generative Lexicon (GL) provides richer compositional representation through generative devices (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). Under a tripartite system of domain of individuals (e.g. natural types, artifactual types and complex types), GL establishes three mechanisms at work when a predicate selects an argument.

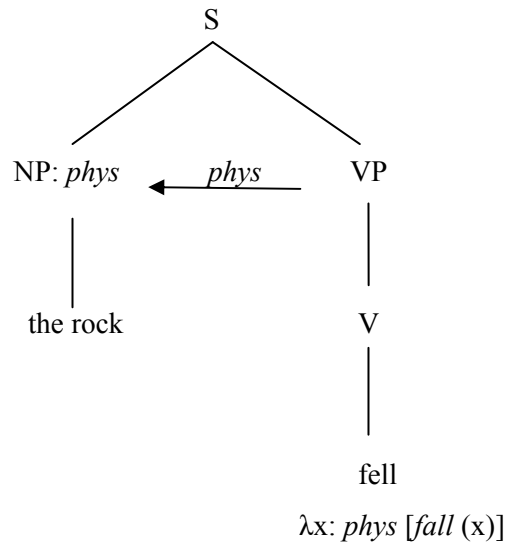
- (I) Pure Selection (Type Matching): the type a function requires is directly satisfied by the argument;
- (II) Accommodation: the type a function requires is inherited by the argument;
- (III) Type Coercion: the type a function requires is imposed on the argument type. This is accomplished by either:
 - (i) Exploitation: taking a part of the argument's type to satisfy the function;
 - (ii) Introduction: wrapping the argument with the type required by the function.

1.3.2.1 Type Matching and Accommodation

When the type restrictions of a functional element are directly satisfied by an argument, it is pure selection or type matching. A case in point is shown in (20).

- (20) The rock fell. (Source = Natural)

(21)



In (20), the predicate *fell* requires a physical object, and the argument *the rock* meets this requirement, as shown in (21). Therefore the compositional mechanism is pure selection or type matching. The derivation is shown in (22).

- (22)
- a. “fall” is of type $\mathit{phys} \rightarrow t$;
 - b. “the rock” is of type *material* (modulo GQ type shifting);
 - c. Accommodation Subtyping applies, $\mathit{material} \sqsubseteq \mathit{physical\ object}$:
 \Rightarrow “the rock” is of type *physical object*;
 - d. Function Application (Type Matching) applies:
 $\Rightarrow \mathit{fall}(\mathit{the-rock})$

If the argument type is a subtype of the target type, then accommodation subtyping happens, as shown in (23).

(23) Some beverage fell on the floor.

The noun *beverage*, typed as *liquid*, where $\mathit{liquid} \sqsubseteq \mathit{phys} \sqsubseteq e_N$, will satisfy the target type requirements from the predicate *fall*. The derivation is shown in (24).

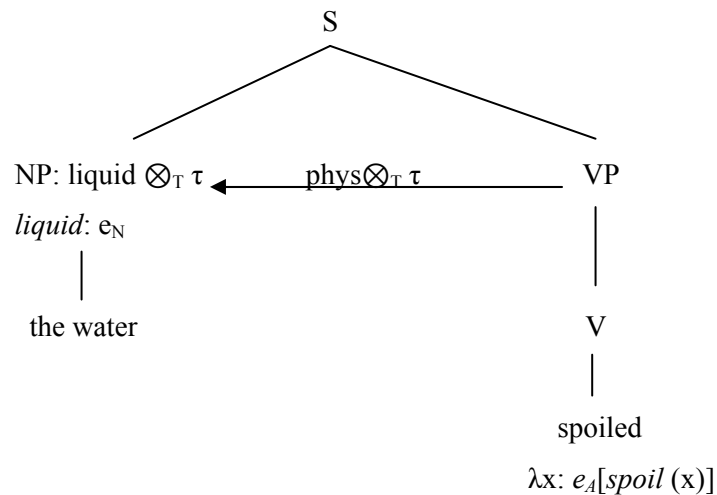
- (24)
- a. “fall” is of type $\mathit{phys} \rightarrow t$;
 - b. “some beverage” is of type *liquid* (modulo GQ type shifting);
 - c. Accommodation Subtyping applies, $\mathit{liquid} \sqsubseteq \mathit{physical\ object}$:
 \Rightarrow “some beverage” is of type *physical object*;
 - d. Function Application (Type Matching) applies:
 $\Rightarrow \mathit{fall}(\mathit{some-beverage})$

1.3.2.2 Coercion by Introduction

This section presents how new typing information is introduced to the source type of the argument by the selecting predicate.

Qualia Introduction:

(25) The water spoiled.



In (25), the verb *spoil* selects for an artifactual type, but in (25) the subject *water* is a natural type. In such a case, Qualia Introduction applies and coerces *water* to be an artifactual type, suggesting that the water has a purpose (telic role). The computation is shown in (26).

- (26)
- a. “spoil” is of type $\text{phys} \otimes_T \tau \rightarrow t$;
 - b. “the water” is of type *liquid* (modulo GQ type shifting);
 - c. Accommodation Subtyping applies to the head, $\text{liquid} \sqsubseteq \text{physical object}$:
 \Rightarrow “the water” has type *physical object*;
 - d. Coercion by Qualia Introduction (CI-Q) applies to the type *physical object*, adding a TELIC value τ :
 \Rightarrow “the water” has type $\text{phys} \otimes_T \tau$;
 - e. Function Application applies:
 $\Rightarrow \text{spoil}(\text{the-water})$

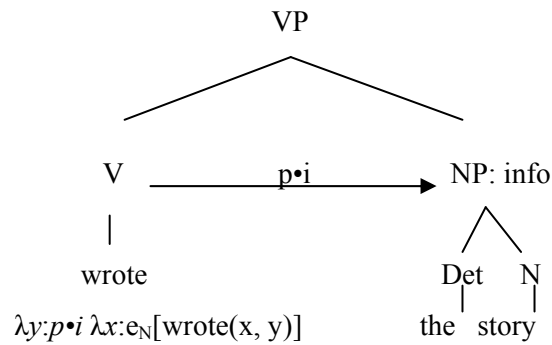
Dot Introduction:

(27) He wrote a story.

In (27), *wrote* is a complex type-selecting predicate and it selects for a dot object, $\text{phys} \bullet \text{info}$,

as its internal argument. However, the internal argument *story* is an artifactual, representing *info*. To fit the requirement of the predicate, the operation of Coercion by Dot Introduction occurs, as illustrated in (28).

(28)



The derivation for this structure is shown in (29):

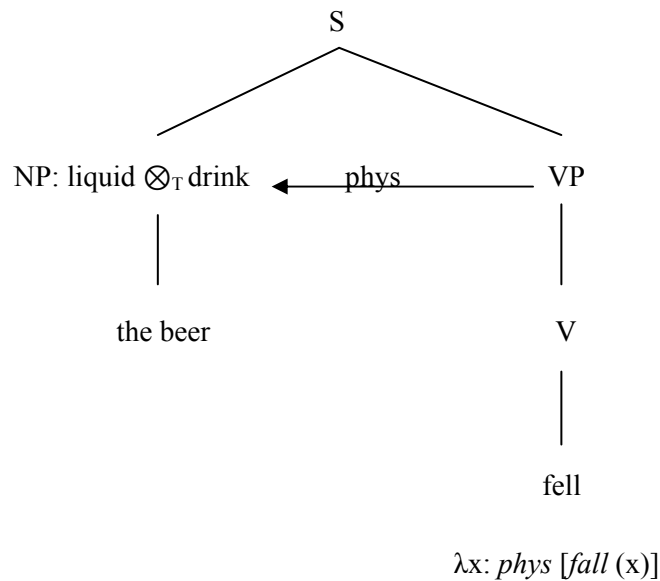
- (29)
- a. “read” is of type $p \bullet i \rightarrow (e_N \rightarrow t)$;
 - b. “the story” is of type i , $i \sqsubseteq t$ (modulo GQ type shifting);
 - c. Coercion by Dot Introduction (CI-•) applies to the type i , adding the missing type value, p , and the relation associated with the •:
 \Rightarrow “the story” has type $p \bullet i$;
 - d. Function Application applies:
 $\Rightarrow \lambda x[\text{wrote}(x, \text{the-story})]$

1.3.2.3 Coercion by Exploitation

Artifactual types and complex types have an internal structure, and therefore can be exploited.

(30) The beer fell.

(31)



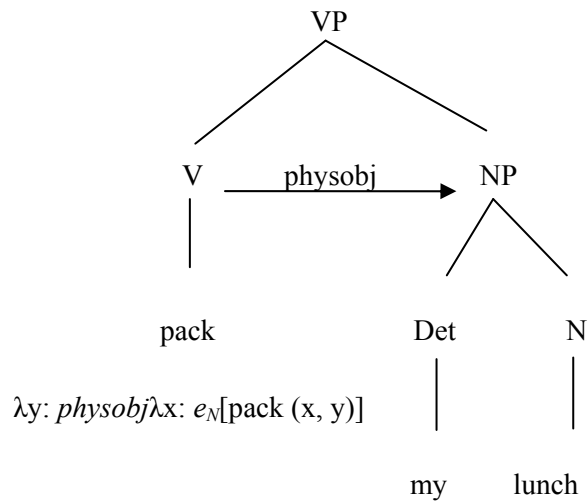
In (30), the predicate *fell* selects a physical object. The subject *the beer* is a liquid whose hierarchical type is a physical object, as shown in (31). The derivation is illustrated in (32).

- (32)
- a. “fall” is of type $phys \rightarrow t$;
 - b. “the beer” is of type $phys \otimes_T \tau$ (modulo GQ type shifting);
 - c. Coercion by Exploitation (CE) applies to $liquid \otimes_T \tau$:
 \Rightarrow “the beer” has type liquid;
 - d. Accommodation Subtyping (AS) applies to head, $liquid \sqsubseteq phys$:
 \Rightarrow “the beer” has type $phys$;
 - e. Function Application applies:
 $\Rightarrow fall(\text{the-beer})$

Complex types are ambiguous, such as construction (process • result), lecture (event • information), breakfast (event • physobj). They are disambiguated in context by the selecting predicate. For example, lunch is a complex type: event • physobj. In (33), *pack* selects a physical object rather than an event, as demonstrated in (34).

- (33) I packed my lunch this morning.

(34)



The derivation is presented in (35).

- (35)
- a. “pack” is of type $\text{phys} \rightarrow (e_N \rightarrow t)$;
 - b. “my lunch” is of type $\text{event} \cdot \text{physobj}$, (modulo GQ type shifting);
 - c. Coercion by Dot Exploitation (CE-•) applies to the type physobj , returning physobj :
 \Rightarrow “the book” has type phys ;
 - d. Function Application applies:
 $\Rightarrow \lambda x[\text{pack}(x, \text{my-lunch})]$

This thesis applies the generative lexicon theory (Pustejovsky 1991, 1995) as the theoretical frame. The reasons for this choice are as follows.

First, GL treats all lexicons in a unified way, namely argument structure, event structure, qualia structure and the lexical inheritance system in the levels of representation.

Second, GL has three semantic transformations in the generative operations, namely type coercion, selective binding and co-composition. “The mechanism responsible for this polymorphic behavior of language is a set of generative devices connecting the different levels of lexical semantics, providing for the compositional interpretation of words in the context.” (Pustejovsky 1995: P105)

Third, GL has an extended event structure. Accomplishments are left-headed; achievements are right-headed; ditransitive transfer verbs are double headed.

Fourth, GL treats compositionality through a finite number of generative devices, such as pure selection, accommodation and type coercion (exploitation and introduction).

GL has rich devices to explain lexical items. Nevertheless, this theory is more restricted to entities, rather than nominal events, so this thesis expands the eventive representation of GL during the investigation of event nouns.

1.4 Research Issues

This thesis tackles the following questions.

(I) How to identify event nouns? How to establish an event-based noun classification system?

Recently, there has been growing interest in identifying event nouns. Some scholars noticed that some classifiers, light verbs and aspectualizers are applicable in finding them. However, first, no systematic research is conducted on the criteria that can identify event nouns. Second, no semantic selectional constraint of each criterion is explored. Thirdly, previous research overlooked the selectional difference between natural and non-natural events, as well as process and instant event nouns. This thesis thoroughly examines the criteria that can identify event nouns.

Nouns in Chinese are usually classified according to classifiers (Chao 1968, Lü 1979, Zhu 1982, Huang et al. 1998, Wang & Zhu 2000). A noun classification system based on eventive features has not yet been established. After examining the criteria that can identify event nouns, this thesis establishes such a system based on the constraint-based linguistic model. This system will facilitate event extraction in natural language processing.

(II) What are the properties of compound event nouns?

Event nouns are typically compound nouns. They have unique event-representing features. This thesis analyzes their morpho-syntactic properties, semantic properties, event representation properties and information inheritance properties.

(III) How to establish the type system of event nouns? What are the contributions of qualia roles to each type?

GL has a tripartite type system (viz. natural types, artifactual types and complex types), which is based on entity nouns, verbal events and attributes. The type system for nominal events is not yet studied. This thesis explores the type system for event nouns. Besides, the qualia role contributions to these types are examined.

(IV) What is the semantic type system of event nouns?

Event nouns have eventive semantics, including eventive and temporal information. The semantic nature of events is that they are temporally anchored and that they take arguments (Huang & Ahrens 2003).

The semantic type system in GL is comprised of argument structure, event structure, and qualia structure. Investigating this system gives an overall view of the eventive information of event nouns.

(V) How to establish an eventive qualia structure for event nouns?

The qualia structure in GL uses objects as examples, but events are quite different from objects. Event nouns are suitable objects for examining how to establish an eventive qualia structure.

One of the most prominent grammatical property of nouns is they can be modified by adjectives. Through investigating the adjectival categories that modify event nouns, an eventive qualia structure can be established.

(VI) What compositional mechanisms are at work in NN compounds, when an event noun is the head or modifier in this compound?

NN compounds are widely studied using the generative method, the semantic relation method or the GL method. There are some problems with these methods. (I) The Generative Method: (i) the recoverably deletable predicates are too vague that they mix up different relations; (ii) some compounds that are listed under some predicates are not suitable; (iii) this method neglects the fact that some compounds that have different relations. (II) The Semantic Relation Method: (i) it is far from sufficient to identify all possible relations; (ii) some of the proposed relations are not accurate. (III) The GL Method: (i) previous research did not examine compositional mechanisms at work; (ii) former research only concerned about the situation when N1 has qualia modification to N2. It did not explain cases when N2 is a qualia role of N1; (iii) it did not give a generalization for such kind of relation; (iv) no study has been carried out when this compound refers to an event.

Comparing the three methods, GL method is more effective in explaining different NN compounds. The thesis examines compositional mechanisms at work in NN compounds when an event noun is the head or modifier in this compound.

1.5 Research Methodology

1.5.1 A Corpus-based Approach

1.5.1.1 Data Sources

Corpus-based analysis has been popular over the decades. The majority of data in this thesis are from three large-scale corpora: Sinica Corpus⁵, Chinese Gigaword Corpus (Second Edition)⁶, and CCL⁷.

Academia Sinica Balanced Corpus of Modern Chinese (simplified as Sinica Corpus) is the world's first POS tagged Mandarin Chinese balanced corpus. Texts were collected from various areas and classified according to five criteria: genre, style, mode, topic, and source. This corpus is a representative sample of modern Chinese language, with a total of 10 million words (Chen et al. 1996).

The Chinese Gigaword Corpus (2nd Edition) is a news corpus, which contains a total of 1.4 billion characters from Taiwan's Central News Agency, China's Xinhua News Agency and Singapore Zaobao. The data are segmented and POS tagged. The size of each sub-corpus is shown in Table 6 (Huang 2006, Ma & Huang 2006, Huang 2009).

Table 6. The Chinese Gigaword Corpus (2nd Edition) (Huang 2006)

Source	Characters	Words	Texts
Taiwan's Central News Agency	792	497	1,769
China's Xinhua News Agency	471	310	992
Singapore Zaobao	28	18	41
Total	1,291	825	2,803

(Unit: Million)

The Center for Chinese Linguistics at Peking University constructed a modern Chinese corpus (simplified as CCL corpus), whose data are largely collected from newspapers, journals, translation works, literary works and oral materials. This corpus now has a total of 477 million characters.

It is commonly accepted that no corpus, no matter how large it is, can include all possible utterances of human beings. Therefore I also collected online and from native speakers. The

⁵ <http://db1x.sinica.edu.tw/kiwi/mkiwi/>

⁶ <http://catalog ldc.upenn.edu/LDC2009T14>

⁷ http://ccl.pku.edu.cn:8080/ccl_corpus/

search engines Google⁸ and Baidu⁹ are used to collect web page data. A few data are from informants whose native language is Mandarin Chinese.

The sentences extracted are marked with their sources in this thesis¹⁰, as shown in (36) and (37). (36) is from the Sinica Corpus and (37) is from CCL.

(36) 新的學期 開始了。(Sinica)

Xīnde *xuéqī* kāishǐ le.
new semester begin ASP

‘The new semester began.’

(37) 綿綿的細雨已經開始下了。(CCL)

Miánmián de *xìyǔ* yǐjīng kāishǐ xià le.
continuous DE drizzle already begin fall ASP

‘The continuous drizzle has begun to fall.’

Sentences in the Sinica corpus and Chinese Gigaword Corpus are segmented. Sentences from CCL and the web are not segmented.

1.5.1.2 A Corpus Query Tool

The Sketch Engine¹¹ is a corpus query system. It has these components: concordance, word sketches, thesaurus and sketch differences, which is much more powerful than traditional corpus interface tools. For example, word sketches automatically extract collocations based on grammatical patterns that the word participates in (Kilgarriff & Tugwell 2002, Kilgarriff et al. 2004). These collocations are ranked by salience (Kilgarriff & Tugwell 2002, Kilgarriff et al. 2004, Rychlý 2008). Salience is the *MI log Frequency*, which is counted like this:

f_x = number of occurrences of word X

f_y = number of occurrences of word Y

f_{xy} = number of co-occurrences of words X and Y

⁸ <http://www.google.com.hk/>

⁹ <http://www.baidu.com/>

¹⁰ Chinese Word Sketch Engine was unavailable when the thesis was about to finish, so some sentences previously extracted were not marked with the source. A few self-made sentences were also not marked.

¹¹ <http://www.sketchengine.co.uk/>

$$\text{MI-score: } \log_2 \frac{f_{xy}N}{f_x f_y}$$

$$\text{MI log Frequency: } MI\text{-score} \times \log f_{xy}$$

Based on The Sketch Engine, The Chinese Word Sketch Engine¹² was developed as a language specific tool for Chinese corpora query (Huang et al. 2005, Hong & Huang 2006, Wang & Huang 2013a). Both Sinica Corpus and Chinese Gigaword Corpus (2nd edition) were loaded into it. It has the same components as The Sketch Engine. It has these grammatical patterns: grammatical patterns: Object / Object_of, SentObject / SentObject_of, Indirect-Object / Indirect-Object_of, Direct-Object / Direct-Object_of, Direct-SentObject, Subject / Subject_of, PP, A_Modifier / Modifies, Modifier, Measure, N_Modifier / Modifies, Possession / Possessor, and / or.

This thesis applies The Chinese Word Sketch Engine to access Sinica Corpus and Chinese Gigaword Corpus (2nd edition).

1.5.2 Adoption of the Generative Lexicon Theory

GL is the ideal theory for analyzing eventive information. This thesis applies it and makes complements to it through investigating event nouns.

1.6 Chapter Arrangements

This thesis is arranged as follows.

Chapter 1 Introduction

This chapter presents an overview of this thesis. It introduces the background, motivation, theoretical framework, research methodology and chapter arrangements.

Chapter 2 A Constraint-based Linguistic Model for Event Noun Identification and an Event-based Noun Classification System

This chapter first reviews the approaches of identifying event nouns in the literature and then does a systematic analysis of event classifiers, aspectualizers and light verbs' selection to nouns. The results indicate that they select event nouns through pure selection/accommodation and they can coerce entity nouns to have an event reading.

By combining with other criteria of finding event nouns, this chapter establishes a

¹² <http://wordsketch.ling.sinica.edu.tw/>, <http://158.132.124.36/>

constraint-based linguistic model for identifying event nouns, which is composed of these criteria:

- (I) Event Classifiers
- (II) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - a. Durative Time Expressions
 - b. Time Points
- (III) Light verbs

Nouns in Chinese are usually classified according to classifiers (Chao 1968, Lü 1979, Zhu 1982, Huang et al. 1998, Wang & Zhu 2000). Differently, this chapter classifies them according to whether a noun has an event reading based on the constraint-based linguistic model.

This chapter further establishes an event-based noun classification system. This analysis shows that that process nominals and pure event nouns in Chinese allow all the eventive features, which is different from Grimshaw (1990)'s analysis in English.

Chapter 3 Properties of Event Nouns

Event nouns are typically compound nouns. This chapter reveals what properties they have. It examines the morpho-syntactic properties, semantic properties, event representation properties and information inheritance properties of these nouns.

Chapter 4 Type Construction of Event Nouns and Qualia Role Contributions

This chapter explores the subclasses of natural and non-natural kinds event nouns and establishes the type system for event nouns. Event nouns are divided into natural types, artifactual types and complex types (including natural complex types and artifactual complex types), which enriches the type system of GL. Then this chapter proposes a scale-based qualia role contribution system, and identifies constructions that can identify qualia role values.

Chapter 5 The Semantic Type System of Event Nouns

The semantic type system in GL is comprised of argument structure, event structure, and qualia structure. This chapter briefly explores these structures of event nouns. Then it carries out a detailed analysis on the typical non-derived noun 會議 *huìyì* ‘conference; meeting’. This is because previous studies on event nouns typically focused on deverbal nominals, such as 游泳 *yóuyǒng* ‘swim’, but event nouns that are not derived from verbs are rarely studied. The results indicate that non-derived nouns carry eventive information, which is the same as derived nominals.

Chapter 6 Establish an Eventive Qualia Structure through Adjective Modification

This chapter first identifies and classifies different categories of adjectives that are capable of modifying event nouns. It then establishes an eventive qualia structure through examining each qualia role’s attributes (the adjectival categories of each qualia role) and each attribute’s role values. It also examines which types of event nouns (NT, AT, NCT, ACT) that each adjectival category can modify.

Chapter 7 Compositionality of Event Nouns according to Nominal Modification

This chapter analyzes the compositional mechanisms at work in NN compounds through the case study on [N1+比賽 *bǐsài* ‘competition’] and [婚禮 *hūnlǐ* ‘wedding’ +N2]. In GL, the compositional mechanisms have been used when a predicate selects an argument. Through the two case studies, this chapter extends their usage in two ways: (i) nominal head selection of a nominal modifier, and (ii) their usage in the nominal event domain. This chapter also proposes a compositional mechanism *sub-composition*.

Chapter 8 Conclusions and Future Work

This chapter summarizes the findings of the thesis, indicates the theoretical significances, and shows directions for future studies and the implications for applications.

Chapter 2 A Constraint-based Linguistic Model for Event Noun Identification and an Event-based Noun Classification System

2.1 Literature Review

Typically, nouns are used to represent concrete or abstract entities, such as 窗戶 *chuānghu* ‘window’ and 思想 *sīxiǎng* ‘thought’. However, there is a type of nouns that lexically encodes eventive information (Wang & Huang 2013d). They are a particular type in Mandarin Chinese. In recent years, there has been growing interest in these nouns. This section reviews the research of Fu (1994), Ma (1995), Chu (2000), Wang and Zhu (2000), Liu (2003, 2004), Han (2004, 2006, 2007b, 2007a, 2010a, 2010b), and Zhao (2006).

2.1.1 Fu (1994)

Grimshaw (1990) compares the differences of process nominals, result nominals, and simple event nouns in English, using determiner system, argument structure, and event structure.

Following Grimshaw (1990), Fu (1994) compares the differences of process nominals, result nominals, and concrete entity nouns in Chinese, using classifiers, argument structure, and event structure. The analysis is conducted through three examples: the process nominal 報導 *bàodǎo* ‘reporting’, the result nominal 報導 *bàodǎo* ‘report’, and the concrete entity noun 文章 *wénzhāng* ‘article’.

2.1.1.1 Classifiers

Grimshaw (1990) find that in English, process nominals only take the (or nothing) as a determiner, while result nominals take any kind of determiner, such as a, the, and that; process nominals cannot be pluralized, but result nominals can. Fu (1994) points out that the determiner and plural marking on nouns in Grimshaw (1990) do not apply to Mandarin. This is because there is no overt contrast between indefinite and definite nouns, nor is there plural marking on nouns. Classifiers can be viewed as something in the determiner system that differentiate process and result readings: (a) process classifiers [e.g., 次 *cì* ‘once (re.

frequency of events), 回 *huí* ‘occurrence (for come and go)’, 遍 *biàn* ‘time (from beginning to the end)’] select process nouns; and (b) non-process classifiers [e.g. 個 *gè* ‘(for most objects)’, 條 *tiáo* (for river, stick), 張 *zhāng* ‘(for paper, table)’] select result nouns.

Most derived nominals can take both process and non-process classifiers (Fu 1994), as shown in (1). 報導 *bàodǎo* ‘reporting’ can take the process classifier 次 *cì* ‘once (re. frequency of event)’ and the non-process classifier 篇 *piān* ‘a piece of writing’.

- (1) 一次報導 / 一篇報導

yī cì bàodǎo / yī piān bàodǎo
a CL reporting / a CL report

‘a reporting / a report’

Some of the derived nominals only have the process reading, and thus only allow process classifiers (Fu 1994), as shown in (2).

- (2) 一次休息 / *一個休息

yī cì xiūxi / *yī gè xiūxi
a CL resting / *a CL resting

I am in favor of her analysis of using classifiers to identify process and result reading nominals. But there are two points we need to note: (a) 次 *cì* ‘once (re. frequency of event)’ is only used to count the frequency of events. It cannot show whether an event has a process or instant reading; (b) as much research has pointed out, 個 *gè* ‘CL’ is a neutral classifier. Thus it is improper to treat 個 *gè* ‘CL’ as a non-process classifier.

2.1.1.2 Argument Structure

This section examines argument structure of process nominals, result nominals, and concrete entity nouns from two respects: argument-taking and subject-oriented adjectives.

2.1.1.2.1 Argument Taking

Fu (1994) uses 對 *duì* ‘to’-PP and 關於 *guānyú* ‘about’-PP to test whether a noun needs an argument, as shown in (3).

- (3) a. 他??(對災情)的報導進行了三個小時。(Fu 1994)

Tā ??(duì zāiqíng) de **bàodǎo** jìnxíng le sān gè xiǎoshí.

He to disaster DE reporting proceed ASP three CL hour

‘His reporting to the disaster lasted three hours.’

b. 他(??對/關於}災情)的**報導**發表了。(Fu 1994)

Tā (?? duì/guānyú} zāiqíng) de **bàodǎo** fābiǎo le.

he to/about disaster DE report publish ASP

‘His report (of the disaster) was published.’

c. 他(*對/關於}災情)的**文章**發表了。(Fu 1994)

Tā (*duì/guānyú} zāiqíng) de **wénzhāng** fābiǎo le.

he to/about disaster DE article publish ASP

‘His article (about the disaster) was published.’

Fu (1994) claims that in (3)a the process nominal 報導 *bàodǎo* ‘reporting’ requires an obligatory argument expressed by 對 *duì* ‘to’-PP. In (3)b the result nominal 報導 *bàodǎo* ‘report’ and in (3)c the concrete entity noun 文章 *wénzhāng* ‘article’ admit the adjunct 關於 *guānyú* ‘about’-PP, not the argument 對 *duì* ‘to’-PP. The difference between (3)a and (3)b, c indicates that 對 *duì* ‘to’-PP introduces arguments, and thus process nominals take obligatory arguments; 關於 *guānyú* ‘about’-PP introduces adjuncts, and thus result nominals do not take obligatory arguments.

I agree that process nominals take arguments, while result nominals and concrete entity nouns take adjuncts. However, I do not agree that 對 *duì* ‘to’-PP introduces arguments and 關於 *guānyú* ‘about’-PP introduces adjuncts.

First, the argument 災情 *zāiqíng* ‘disaster’ of the process nominal 報導 *bàodǎo* ‘reporting’ does not need to be syntactically-expressed obligatorily, as shown in (4).

(4) 他的**報導**進行了三個小時。

Tā de **bàodǎo** jìnxíng le sān gè xiǎoshí.

He DE reporting carry on ASP three CL hour

‘His reporting carried on for three hours.’

Second, process nominals admit both 對 *duì* ‘to’-PP and 關於 *guānyú* ‘about’-PP. For

example, in (5)a and (5)b, the process nominal 說明 *shuōmíng* ‘explanation’ admits 對政策 *duì zhèngcè* ‘to the policy’ and 關於政策 *guānyú zhèngcè* ‘about the policy’ respectively.

- (5) a. 他們對政策的說明進行了三個小時。

Tāmen duì zhèngcè de *shuōmíng* jìnxíng le sān gè xiǎoshí.
they to policy de explanation proceed ASP three CL hour
‘Their explanation to the policy lasted three hours.’

- b. 他們關於政策的說明進行了三個小時。

Tāmen guānyú zhèngcè de *shuōmíng* jìnxíng le sān gè xiǎoshí.
they about policy de explanation proceed ASP three CL hour
‘Their explanation about the policy lasted three hours.’

It is unclear why Fu (1994) regarded the element introduced by 對 *duì* ‘to’-PP as an argument, while the element introduced by 關於 *guānyú* ‘about’-PP as an adjunct.

2.1.1.2.2 Subject-oriented Adjectives

Fu (1994) tests whether process nominals, result nominals, and concrete entity nouns admit subject-oriented adjectives by using 不懷好意的 *bùhuáihǎoyìde* ‘malicious’ as shown in (6).

- (6) a. [他不懷好意的??(對災情)的報導]進行了三個小時。(Fu 1994)

[Tā bùhuáihǎoyìde??(duì zāiqíng) de *bàodǎo*] jìnxíng le sān gè xiǎoshí.
he malicious to disaster DE reporting proceed ASP three CL hour
‘His malicious reporting of the disaster lasted three hours.’

- b. ??他不懷好意的(關於災情的)報導發表了。(Fu 1994)

?? Tā bùhuáihǎoyìde (guānyú zāiqíng de) *bàodǎo* fābiǎo le.
he malicious about disaster DE reporting publish ASP

- c. ??他不懷好意的(關於災情的)文章發表了。(Fu 1994)

?? Tā bùhuáihǎoyìde (guānyú zāiqíng de) *wénzhāng* fābiǎo le.
he malicious about disaster DE article publish ASP

In (6)a the process nominal 報導 *bàodǎo* ‘reporting’ admits the subject-oriented adjective 不

懷好意的 *bùhuáihǎoyìde* ‘malicious’. Neither does the result nominal 報導 *bàodǎo* ‘report’ nor the concrete entity noun 文章 *wénzhāng* ‘article’ admits this adjective, as shown in (6)b and (6)c .

I agree that process nominals admit subject-oriented adjectives. However, our analysis shows that result nominals can also admit them, as shown in (7).

Result Nominal

- (7) 他的那條不懷好意的建議

tāde nà tiáo *bùhuáihǎoyìde* *jiànyì*
his that CL malicious suggestion

‘his that malicious suggestion’

In (7) 不懷好意的 *bùhuáihǎoyìde* ‘malicious’ is a subject-oriented adjective. The result nominal 建議 *jiànyì* ‘suggestion’ can be modified by it.

In sum, through examining argument structure, this section has illustrated that process nominals take arguments and admit subject-oriented adjectives. Result nominals and concrete entity nouns admit subject-oriented adjectives, but do not take arguments.

2.1.1.3 Event Structure

Fu (1994) compared the differences of process nominals, result nominals, and concrete entity nouns using frequency adjectives, durative time expressions and rationale clauses.

2.1.1.3.1 Frequency Adjectives

Fu (1994) uses 經常不斷的 *jīngchángbùduànde* ‘frequent’ to test which type of nouns admits frequency adjectives. She shows that only process nominals admit them as shown in (8).

- (8) a. 他經常不斷的 ??(對災情)的報導十分有用。(Fu 1994)

Tā *jīngchángbùduàn-de*??(Dui zāiqíng) de *bàodǎo* shífēn yǒuyòng.
he frequently to disaster DE reporting very useful

‘His frequent reporting of the disaster is very useful.’

- b. *他經常不斷的(關於災情)的報導發表了。(Fu 1994)

*Tā jīngchángbùduàn-de (guānyú zāiqíng de) **bàodǎo** fābiǎo le.
he frequently about disaster DE report publish ASP

c. *他經常不斷的(關於災情的)文章發表了。(Fu 1994)

*Tā jīngchángbùduàn-de (guānyú zāiqíng de) **wénzhāng** fābiǎo le.
he frequently about disaster DE article publish ASP

In (8)a, the process nominal 報導 *bàodǎo* ‘reporting’ can be modified by 經常不斷的 *jīngchángbùduànde* ‘frequent’. In (8)b and (8)c, this adjective cannot modify the result nominal 報導 *bàodǎo* ‘report’ and the entity noun 文章 *wénzhāng* ‘article’.

I agree with this analysis. That is, process nominals allow frequency adjectives. Result nominals and concrete entity nouns do not allow them.

2.1.1.3.2 Durative Time Expressions

Fu (1994) tests whether process nominals, result nominals, and concrete entity nouns can be modified by durative time expressions, as shown in (9).

(9) a. 他 ??(對災情的)三個小時的報導十分有用。(Fu 1994)

Tā??(duì zāiqíng de) sān gè xiǎoshí de **bàodǎo** shífēn yǒuyòng.
he to disaster DE three GL hour DE reporting very useful

‘His reporting of the disaster for three hours is very useful.’

b. *他關於災情的三個小時的報導發表了。(Fu 1994)

*Tā guānyú zāiqíng de sān gè xiǎoshí de **bàodǎo** fābiǎo le.
he about disaster DE three CL hour DE report publish ASP

c. *他關於災情的三個小時的文章發表了。(Fu 1994)

*Tā guānyú zāiqíng de sān gè xiǎoshí de **wénzhāng** fābiǎo le.
he about disaster DE three CL hour DE article publish ASP

In (9)a the durative time expression 三個小時 *sān gè xiǎoshí* ‘three hours’ can modify the process nominal 報導 *bàodǎo* ‘reporting’; while in (9)b and (9)c it cannot modify either the result nominal 報導 *bàodǎo* ‘report’ or the entity noun 文章 *wénzhāng* ‘article’.

I agree with her analysis. That is, process nominals allow durative time expression’s

modification while result nominals and concrete entity nouns do not allow it.

2.1.1.3.3 Rationale Clauses

Fu (1994) tests whether rationale clauses can modify process nominals, result nominals and concrete entity nouns as shown in (10).

- (10) a. 他為了出風頭的 ??(對災情)的報導進行了三個小時。(Fu 1994)

Tā wèile chūfēngtóu de?? (duì zāiqíng) de *bàodǎo* jìnxíng le sān
he in order to show off DE to disaster DE reporting proceed ASP three
gè xiǎoshí.
CL hour

'His reporting of the disaster in order to show off lasted three hours.'

- b. ??他為了出風頭的(關於災情)的報導發表了。(Fu 1994)

?? Tā wèile chūfēngtóu de (guānyú zāiqíng) de *bàodǎo* fābiǎo le.
he in order to show off DE about disaster DE report publish ASP

- c. ??他為了出風頭的(關於災情)的文章發表了。(Fu 1994)

?? Tā wèile chūfēngtóu de (guānyú zāiqíng) de *wénzhāng* fābiǎo le.
he in order to show off DE about disaster DE article publish ASP

Fu (1994) finds that only process nominals admit rationale clauses as shown in (10)a. The rationale clause 為了出風頭的 *wèile chūfēngtóu de* 'in order to show off' modifies the process nominal 報導 *bàodǎo* 'reporting'. In (10)b and (10)c, neither the result nominal 報導 *bàodǎo* 'report' nor the concrete entity noun 文章 *wénzhāng* 'article' can be modified by the rationale clause.

I agree that process nominals can be modified by rationale clauses. Different from Fu (1994), I found that result nominals and concrete entity nouns can also admit rationale clauses as depicted in (11) and (12). In (11), the result nominal 發明 *fāmíng* 'invention' is modified by the rationale clause 為了解饞 *wèile jiěchán* 'in order to satisfy a craving for delicious food'. In (12), the rationale clause 為了方便交流 *wèile fāngbiàn jiāoliú* 'in order to facilitate communication' modifies the concrete entity noun 手機 *shǒujī* 'mobile phone'.

Result Nominal

- (11) 由此推斷素雞應該就是和尚們為了解饞的發明。(Web)

Yóucǐ tuīduàn sùjī yīnggāi jiù shì héshàngmen wèile
from this infer vegetarian chicken should exactly be monks in order to
jiěchán de *fā míng*.
satisfy a craving for delicious food DE invention

‘From this (we can) infer that vegetarian chicken was the invention of monks to satisfy their craving for delicious food.’

Concrete Entity Noun

- (12) 人們發明了為了方便交流的手機。

Rénmen fā míng le wèile fāngbiàn jiāoliú de *shǒujī*.
people invent ASP in order to facilitate communication DE mobile phone

‘People invented the mobile phone, which can facilitate communication.’

手機 *shǒujī* ‘mobile phone’ as an artifactual-type noun has a telic role, according to GL (Pustejovsky 1995, 2001b, Asher & Pustejovsky 2006, Pustejovsky & Jezek 2008). Non-natural kind nouns allow rationale clauses.

In summary, Fu (1994) has tested whether the three types of eventive features, *frequency adjectives*, *durative time expressions* and *rationale clauses*, can modify process nominals, result nominals, and concrete entity nouns. She finds that only process nominals allow all of them, while result nominals and concrete entity nouns allow neither. Thus she claims that Chinese process nominals and English process nominals are similar in event structure. However, I find that according to GL non-natural kind nouns can allow rationale clauses.

2.1.2 Ma (1995)

Ma (1995) points out that typical nominals and predicates are related to denotative meaning and predicative meaning respectively, and they are located on both ends of a continuum. Atypical nominals and predicates locate in the middle of the continuum. This category includes nouns with predicative meaning and verbs with denotative meaning.

He investigates the combination of nouns and localizers. Localizers are divided into three classes: Class A represents spatial orientations; Class B represents temporal orientations; and

Class C represents either spatial or temporal orientation depending on the nature of the word that is in front of it.

A (spatial): 左 *zuǒ* ‘left’, 右 *yòu* ‘right’, 側 *cè* ‘side’, 旁 *páng* ‘beside’, 內 *nèi* ‘within’, 東 *dōng* ‘east’, 西 *xī* ‘west’, 南 *nán* ‘south’, 北 *běi* ‘north’, 裡 *lǐ* ‘in’, 外 *wài* ‘outside’, 間 *jiān* ‘between’, 左邊 *zuǒbiān* ‘left’, 右邊 *yòubiān* ‘right’, 東邊 *dōngbiān* ‘east’, 西邊 *xībiān* ‘west’, 南邊 *nánbiān* ‘south’, 北邊 *běibiān* ‘north’, 左面 *zuǒmiàn* ‘left’, 右面 *yòumiàn* ‘right’, 東面 *dōngmiàn* ‘east’, 西面 *xīmiàn* ‘west’, 南面 *nánmiàn* ‘south’, 北面 *běimiàn* ‘north’, 以遠 *yǐyuǎn* ‘beyond’, 以近 *yǐjìn* ‘near’, 以東 *yǐdōng* ‘east of’, 以西 *yǐxī* ‘west of’, 以南 *yǐnán* ‘south of’, 以北 *yǐběi* ‘north of’, 以內 *yǐnèi* ‘within’, 以外 *yǐwài* ‘outside’, 裡頭 *lǐtòu* ‘inside’, 外頭 *wàitòu* ‘outside’, 旁邊 *pángbiān* ‘beside’, 背後 *bèihòu* ‘at the back of’, 面前 *miànqián* ‘in (the) face of’, 四周 *sìzhōu* ‘all around’, 附近 *fùjìn* ‘nearby’, 一帶 *yīdài* ‘region’, 對面 *duìmiàn* ‘opposite’

B (temporal): 以前 *yǐqián* ‘before’, 以後 *yǐhòu* ‘after’, 當兒 *dāngér* ‘moment’

C (spatial or temporal): 前 *qián* ‘before’, 前頭 *qiántou* ‘in front of’, 後 *hòu* ‘after’, 後頭 *hòutou* ‘behind’, 上 *shàng* ‘on’, 上面 *shàngmiàn* ‘on top of’, 中 *zhōng* ‘in; in the course of’, 中間 *zhōngjiān* ‘middle’, 當中 *dāngzhōng* ‘among’, 之中 *zhīzhōng* ‘among’, 下 *xià* ‘under; next’, 下面 *xiàmiàn* ‘below; next’

- Words that Class A selects, but Class B does not select: they are common nouns that have a denotational meaning, but do not have a process meaning, such as 橋 *qiáo* ‘bridge’, 門 *mén* ‘door’, 椅子 *yǐzi* ‘chair’
- Words that Class B selects, but Class A does not select: they are process nouns that have both a denotational meaning and a process meaning, such as 戰爭 *zhànzhēng* ‘war’, 雷雨 *léiyǔ* ‘thunderstorm’, 大會 *dàhuì* ‘large conference’, 冰期 *bīngqī* ‘ice age’, 會期 *huìqī* ‘conference period’, 假期 *jiàqī* ‘holiday’, 寒假 *hánjià* ‘winter vacation’.
- Both common nouns and process nouns can be selected by Class C, but the former has a spatial meaning, while the latter has a temporal meaning. For example, 教室前 *jiàoshì qián* ‘in (the) front of a classroom’ shows a spatial orientation, while 手術前 *shǒushù qián* ‘before an operation’ shows a temporal orientation.

Process nouns can be further divided into 持續性過程名詞 *chíxùxìng guòchéng míngcí*

‘durative process nouns’ and 非持續性過程名詞 *fēichíxùxìng guòchéng míngcí* ‘non-durative process nouns’ according to whether they can be followed by 中 *zhōng* ‘in the course of’. Durative process nouns are able to be modified by durative temporal expressions, e.g. 戰爭 *zhànzhēng* ‘war’, 雷雨 *léiyǔ* ‘thunderstorm’, while non-durative process nouns can be modified by time point, e.g. 今天 *jīntiān* ‘today’, 元旦 *yuándàn* ‘New Year's Day’.

Secondly, activity classifiers can select process nouns, as shown from (13) to (15).

(13) 一次會議/戰爭/車禍/事故/手術

yī cì huìyì/ zhànzhēng/ chēhuò/ shìgù/ shǒushù

a CL conference/ war/ car accident/ accident/ operation

‘a conference/a war/a car accident/an accident/an operation’

(14) 一場雨/雪/風/冰雹/病/戲/戰爭

yī chǎng yǔ/ xuě/ fēng/ bīngbáo/ bìng/ xì/ zhànzhēng

a CL rain/ snow/ wind/ hail/ disease / drama/ war

‘rain/snow/wind/hail/a disease /a drama/a war’

(15) 一頓飯

yī dùn fàn

a CL meal

‘a meal’

There are some problems with Ma (1995)’s research. First, he regards temporal nouns, e.g. 冰期 *bīngqī* ‘ice age’, 會期 *huìqī* ‘conference period’, 假期 *jiàqī* ‘holiday’, 寒假 *hánjià* ‘winter vacation’, as process nouns. I argue that these nouns only have temporal properties, but do not have eventive properties. Therefore they are not event nouns.

Secondly, he treats 今天 *jīntiān* ‘today’ and 元旦 *yuándàn* ‘New Year’s Day’ as non-durative process nouns and claims that they can be modified by time points. For one thing, I argue that time point has the function of pointing out the happening time of an event, but it does not have the function of determining whether an event is durative, as shown in (16).

(16) 九點的報告會, 九點半還不見報告人。(CCL)

Jiǔdiǎn de bàogào huì, jiǔdiǎnbàn hái bù jiàn bàogàorén.

9 o'clock DE report meeting 9:30 still not see speaker

‘The report meeting was at 9 o'clock; the speaker has not turned up till 9:30.’

In (16), the 報告會 *bàogàohuì* ‘report meeting’ is a durative process noun. It is modified by the time point *9 o'clock* to show the event’s starting time.

For another, 今天 *jīntiān* ‘today’ and 元旦 *yuándàn* ‘New Year’s Day’ are not process nouns. They only have temporal properties, but do not have eventive properties. Therefore they are not process nouns. Moreover, since they are temporal nouns themselves, they cannot be modified by a time point.

Thirdly, he claims that words that collocate with localizers 上 *shàng* ‘on’, 上面 *shàngmiàn* ‘above’, 下 *xà* ‘under’, 下面 *xiàmiàn* ‘below’ have both a temporal and spatial meaning. I argue that these localizers only collocate with nouns that have a spatial meaning.

2.1.3 Chu (2000)

Chu (2000) proposes three constructions to examine the temporal adaption of nouns, as shown below:

(I) N + 期間 *qī jiān* ‘during’

(II) N + 前 *qián* ‘before’/後 *hòu* ‘after’/以前 *yǐqián* ‘before’/以後 *yǐhòu* ‘after’/之前 *zhīqián* ‘before’/之後 *zhīhòu* ‘after’

(III) N + 時期 *shíqī* ‘period’/時代 *shídài* ‘epoch’, including N + 時候 *shíhou* ‘during’, N + 年代 *niándài* ‘era’, N + 階段 *jiēduàn* ‘period’/時光 *shíguāng* ‘time’

Construction (I) positions time flow from the internal perspective, including starting point, continuity, and ending point. It reflects the process. It cannot record the time that N does not experience. N, as a reference point, is an internal reference.

Construction (II) takes the time that N experiences as a reference point and looks at the time flow from two directions: before and after. It is an external perspective. It does not represent the time the N experiences. N, as a reference point, is an external reference.

Construction (III) reflects the time that N is located at. It is a segment of time flow. N acts both as a reference role and a marking role. For example, 唐太宗時期 *Táng Tàizōng shíqī* ‘the period of Emperor Tang Taizong’ reflects the era when the Emperor 唐太宗 *Táng Tàizōng* ‘Tang Taizong’ was in power. Construction III does not reflect time other than the

time that N marks, so it is an internal perspective.

He divides nouns into A-E classes.

Class A can only enter Construction II, including:

- A1: monosyllabic nouns, e.g. 病 *bìng* ‘disease’, 飯 *fàn* ‘meal’, 會 *huì* ‘meeting; conference’, 課 *kè* ‘lesson’, 事 *shì* ‘thing’, 霜 *shuāng* ‘frost’, 雨 *yǔ* ‘rain’, 雪 *xuě* ‘snow’. Due to the constraints of rhythm, they often only combine with 前 *qián* ‘before’ and 後 *hòu* ‘after’.
- A2: nouns whose last morpheme is 期 *qī* ‘period’, e.g. 會議 *huìyìqī* ‘conference period’, 汛期 *xùnfāqī* ‘flood period’, 危險期 *wēixiǎnqī* ‘dangerous period’, 假期 *jiàqī* ‘holidays’. They are common nouns that represent time. But because they have the morpheme 期 *qī* ‘period’, they cannot combine with 時期 *shíqī* ‘period’/期間 *qījiān* ‘period’.
- A3: activities or events with a short duration, e.g. 閃電 *shǎndiàn* ‘lightening’, 空難 *kōngnàn* ‘air crash’, 敗仗 *bàizhàng* ‘lost battle’, 事故 *shìgù* ‘accident’, 慘案 *cǎn’àn* ‘massacre’, 車禍 *chēhuò* ‘car accident’.
- A4: participants in an event, e.g. 午飯 *wǔfàn* ‘lunch’, 早茶 *zǎochá* ‘morning tea’, 早點 *zǎodiǎn* ‘(light) breakfast’, 夜宵 *yèxiāo* ‘midnight snack’, 作文課 *zuòwénkè* ‘writing class’.

Class B can only enter Construction III. These nouns cannot be event nouns. They are generally nouns that represent people or things. Such a noun is usually an individual in a polymerization. They tend to mark the stages of history. Their adaption to time is relative, artificial and externally exerted, and sometimes it is temporary. For example, the history of biological evolution includes three stages: 三葉蟲時代 *sānyèchóng shídài* ‘trilobite era’ -- 恐龍時代 *kǒnglóng shídài* ‘dinosaur era’ -- 人類時代 *rénlèi shídài* ‘human era’; the primitive society can be divided into the 石器時代 *shíqì shídài* ‘stone age’ -- 銅器時代 *tóngqì shídài* ‘bronze age’ -- 鐵器時代 *tiěqì shídài* ‘iron age’; human growth includes 童年時代 *tóngnián shídài* ‘childhood period’ -- 少年時代 *shàonián shídài* ‘juvenile period’ -- 青年時代 *qīngnián shídài* ‘youth period’.

Class C can enter any two Constructions, including:

C1 (only enter I and II): C1 includes nouns that represent activities or events, e.g. 手術 *shǒushù* ‘operation’, 晚宴 *wǎnyàn* ‘dinner’, 大會 *dàhuì* ‘large conference’, 淋浴 *línǚ* ‘shower’. Their duration is longer than nouns of A3. C1 also includes nouns that have 假 *jià* ‘holidays’ as a morpheme, e.g. 寒假 *hánjiǎ* ‘winter vacation’, 婚假 *hūnjiǎ* ‘marriage leave’, 病假 *bìngjiǎ* ‘sick leave’. These nouns represent time.

- C2 (only enter I and III): only a few nouns, e.g. 大學 *dàxué* ‘universities’, 初中 *chūzhōng* ‘junior high schools’.
- C3 (only enter II and III): these are nouns representing people (e.g. 漢武帝 *Hàn wǔdì* ‘Han Wudi’), works (e.g. 《聖經》 *Shèngjīng* ‘Bible’) and dynasties (e.g. 漢朝 *Hàncháo* ‘Han dynasty’).

Class D can enter Constructions I, II, and III. They represent activities, events or natural phenomena, e.g. 革命 *gémìng* ‘revolution’, 戰爭 *zhànzhēng* ‘war’, 運動 *yùndòng* ‘sports’, 交易 *jiāoyì* ‘trade’, 事變 *shìbiàn* ‘incident’, 比賽 *bǐsài* ‘competition’, 雷雨 *léiyǔ* ‘thunderstorm’, 颱風 *táifēng* ‘typhoon’, 日食 *rìshí* ‘eclipse’.

Class E cannot enter any of the three constructions. (a) non-entity nouns, such as 辦法 *bànfǎ* ‘approach’, 成績 *chéngjī* ‘fruits of work or study’, 技術 *jìshù* ‘technology’, 經驗 *jīngyàn* ‘experience’, 勁兒 *jìn er* ‘strength’, 力量 *lìliàng* ‘power’, 口號 *kǒuhào* ‘watchword’, 理由 *lǐyóu* ‘reason’, 條件 *tiáojiàn* ‘condition’, 任務 *rènwù* ‘task’, 學問 *xuéwèn* ‘knowledge’, 原則 *yuánzé* ‘principle’, and 政策 *zhèngcè* ‘policy’.

(b) nouns that represent ideas or concepts, such as 心理 *xīnlǐ* ‘mentality’, 理想 *lǐxiǎng* ‘ideal’, 想法 *xiǎngfǎ* ‘idea’, 思想 *sīxiǎng* ‘thought’, 概念 *gàiniàn* ‘concept’, 思緒 *sīxù* ‘train of thought’, 心意 *xīnyì* ‘intention’, 意見 *yìjiàn* ‘opinion’, 情緒 *qíngxù* ‘emotion’, 感受 *gǎnshòu* ‘feeling’, and 愛情 *àiqíng* ‘love’. They are also non-entity nouns and do not have any specific time and space.

(c) natural objects, such as 太陽 *tàiyáng* ‘Sun’, 月亮 *yuèliàng* ‘Moon’, 地球 *dìqiú* ‘the Earth’, 江 *jiāng* ‘(large) river’, 河 *hé* ‘river’, 湖 *hú* ‘lake’, 海 *hǎi* ‘sea’, 土 *tǔ* ‘earth’, 山 *shān* ‘mountain’, 水 *shuǐ* ‘river’, 火 *huǒ* ‘fire’, 氣 *qì* ‘air’, 毛 *máo* ‘fur’, 眼睛 *yǎnjīng* ‘eye’, 皮膚 *pífū* ‘skin’, 鼻涕 *bítì* ‘nasal discharge’, and 眼淚 *yǎnlèi* ‘tear’.

With the above analysis, Chu (2000) sums up the temporality of nouns with a sequence from strong to weak: ①according to Classes: D > C > A > B > E; ②according to semantics:

activities, events or phenomena nouns > human or object nouns, concrete nouns > non-concrete nouns, humanity nouns > natural nouns, distinctive feature nouns > non-distinctive feature nouns, internal temporal nouns > external temporal nouns.

In response to Chu (2000), I argue that A2 (nouns whose last morpheme is 期 *qī* ‘period’), C1 (nouns with 假 *jià* ‘holiday’ as a morpheme) and C2 (e.g. 大學 *dàxué* ‘university’, 初中 *chūzhōng* ‘junior middle school’) should belong to the same category, because they all express time. For this reason, they should have the strongest time adaptation, rather than the words belonging to class D. These nouns are not event nouns.

2.1.4 Wang and Zhu (2000)

Wang and Zhu (2000) distinguish nouns according to the classifiers with which nouns can be in collocation. Process nouns can be modified only by activity classifiers (e.g. 一場友誼賽 *yī chǎng yǒuyìsài* ‘a friendly competition’, 一陣雷雨 *yī zhèn léiyǔ* ‘a burst of thunderstorms’, 一頓晚餐 *yī dùn wǎncān* ‘a dinner’) or temporal nouns (十年內戰 *shí nián nèizhàn* ‘a decade of civil war’).

2.1.5 Liu (2003, 2004)

Liu (2003, 2004) finds that typical nouns have these syntactic functions: combining with individual classifiers to count things; combining with localizers to reflect spatial orientation; often acting as subjects and objects. However, nouns with internal temporality have different properties when they combine with localizers and classifiers; they also often act as subjects and objects, but they have special requirements to their predicates. These points are explained below.

First, he examines the selection of localizers and nouns. He divides localizers into three classes:

A (spatial): 外 *wài* ‘outside’, 旁 *páng* ‘beside’, 左 *zuǒ* ‘left’, 右 *yòu* ‘right’, 東 *dōng* ‘east’, 西 *xī* ‘western’, 南 *nán* ‘south’, 北 *běi* ‘north’, 上邊 *shàngbiān* ‘on top of’, 下邊 *xiàbiān* ‘below’, 前邊 *qiánbiān* ‘front’, 後邊 *hòubiān* ‘behind’, 裡邊 *lǐbiān* ‘inside’, 外邊 *wàibiān* ‘outside’, 旁邊 *pángbiān* ‘side’, 左邊 *zuǒbiān* ‘left’, 右邊 *yòubiān* ‘right’, 東邊 *dōngbiān* ‘east’, 西邊 *xībiān* ‘west’, 南邊 *nánbiān* ‘south’, 北邊 *běibiān* ‘north’, 上面 *shàngmiàn* ‘above’, 前面 *qiánmiàn* ‘front’, 後面 *hòumiàn* ‘back’, 外面 *wàimiàn* ‘outside’, 左面 *zuǒmiàn* ‘left’, 右面 *yòumiàn* ‘right’, 東面 *dōngmiàn* ‘east’, 西面 *xīmiàn*

‘west’, 南面 *nánmiàn* ‘south’, 北面 *běimiàn* ‘north’, 上頭 *shàngtóu* ‘above’, 下頭 *xiàtóu* ‘below’, 外頭 *wàitóu* ‘outside’, 東頭 *dōngtóu* ‘east’, 西頭 *xītóu* ‘west’, 南頭 *nántóu* ‘south’, 北頭 *běitóu* ‘north’, 以上 *yǐshàng* ‘above’, 以下 *yǐxià* ‘below’, 面前 *miànqián* ‘in face of’, 背後 *bèihòu* ‘behind’, 底下 *dǐxià* ‘under’

B (temporal): 以前 *yǐqián* ‘before’, 以後 *yǐhòu* ‘after’, 之前 *zhīqián* ‘before’, 之後 *zhīhòu* ‘after’

C (spatial or temporal): 前 *qián* ‘before’, 後 *hòu* ‘after’, 中 *zhōng* ‘middle; in the course of’, 上 *shàng* ‘on’, 下 *xià* ‘under’, 前頭 *qiántóu* ‘ahead’, 後頭 *hòutóu* ‘behind’, 裡 *lǐ* ‘in’, 裡頭 *lǐtóu* ‘inside’, 裡面 *lǐmiàn* ‘inside’, 中間 *zhōngjiān* ‘middle’, 當中 *dāngzhōng* ‘among’, 之中 *zhīzhōng* ‘among’, 中間 *zhōngjiān* ‘middle’

Class A represents spatial orientations; Class B represents temporal orientations; Class C can represent both spatial and temporal orientation.

Typical nouns have spatial properties, rather than temporal properties, so they can collocate with Class A and Class C, but do not collocate with Class B. For example, 房子外 *fángzi wài* ‘outside the house’, 電腦左邊 *diànnǎo zuǒbiān* ‘the left side of the computer’.

A noun with internal temporality has a temporal feature in its semantic structure, so it cannot collocate with Class A. It can collocate with Class B. For instance, 交易之前 *jiāoyì zhīqián* ‘before the trading’, 暑假之前 *shǔjià zhīqián* ‘before the summer vacation’.

Class C can collocate with both typical nouns and nouns with internal temporality. The former represents spatial orientation (e.g. 電視機前頭 *diànshìjī qiántóu* ‘in front of the TV’), while the latter represents temporal orientations (e.g. 暴雨前頭 *bàoyǔ qiántóu* ‘before the torrential rain’).

Second, verbal classifiers can select nouns with internal temporality, as shown from (17) to (19).

(17) 一場雨

yī **chǎng** yǔ
a CL rain
‘rain’

(18) 一場戰爭

yī **chǎng** **zhànzhēng**

a CL war

‘a war’

(19) 兩次颱風

liǎng **cì** **táifēng**

two CL typhoon

‘two typhoons’

Thirdly, typical nouns have a wide choice of verbs, but nouns with internal temporality have a relatively narrow choice of verbs. Verbs that mainly collocate with them are 開始 *kāishǐ* ‘begin’, 進行 *jìnxíng* ‘carry on’, 結束 *jiéshù* ‘end’, 出現 *chūxiàn* ‘appear’, 消失 *xiāoshī* ‘disappear’, 增加 *zēngjiā* ‘increase’, 減少 *jiǎnshǎo* ‘decrease’, 舉行 *jǔxíng* ‘hold’.

Liu (2003, 2004) is similar to Ma (1995) in that he uses localizers to distinguish typical nouns and nouns with internal temporality.

Regarding Liu (2003, 2004), there are two points that we need to note. First, this thesis does not consider temporal nouns such as 暑假 *shǔjià* ‘summer vacation’ as an event noun.

Second, Liu (2003, 2004) lists some verbs that mainly collocate with nouns with internal temporality. I argue that the verbs listed have different properties. They belong to three categories: aspectual verbs 開始 *kāishǐ* ‘begin’, 結束 *jiéshù* ‘end’; light verbs 進行 *jìnxíng* ‘carry on’, 舉行 *jǔxíng* ‘hold’; and change of state verbs 增加 *zēngjiā* ‘increase’, 減少 *jiǎnshǎo* ‘decrease’, 出現 *chūxiàn* ‘appear’, 消失 *xiāoshī* ‘disappear’. Liu (2003, 2004) just lists these words. The list is partial and he did not notice their different selectional properties. Moreover, change of state verbs select numerous nouns that are not event nouns, such as in (20).

(20) 隨著年紀愈大，不少中老年男性腹部**脂肪**會逐漸**增加**。(Sinica)

Suízhe niánjì yù dà, bùshǎo zhōnglǎonián nánxìng fùbù
along with age more old not a few middle and old aged male abdomen
zhīfáng huì zhújiàn **zēngjiā**.
fat can gradually increase

‘As getting older, the abdominal fat of not a few middle and old aged males gradually increases.’

In (20), 增加 *zēngjiā* ‘increase’ is a change of state verb, but the noun 脂肪 *zhīfáng* ‘fat’ is not an event noun, so this research will discard change of state verbs. But I agree that aspectualizers and light verbs can select event nouns, so I will give a detailed analysis of them.

2.1.6 Han (2004, 2006, 2007b, 2007a, 2010a, 2010b)

Han (2004, 2006) determines some event nouns based on prototype theory:

(I) Natural Phenomena

the category of 雨 *yǔ* ‘rain’, 雪 *xuě* ‘snow’, 風 *fēng* ‘wind’, 霜 *shuāng* ‘frost’, 霧 *wù* ‘fog’

(II) Natural and Man-made Disasters

the category of 災 *zāi* ‘catastrophe’, 難 *nàn* ‘tragedy’, 害 *hài* ‘harm’, 禍 *huò* ‘misfortune’ 類;

the category of 亂 *luàn* ‘disorder’, 變 *biàn* ‘turmoil’;

the category of 病 *bìng* ‘disease’, 疫 *yì* ‘epidemic disease’, 傷 *shāng* ‘wound’

(III) Social Activities

the category of 戰 *zhàn* ‘war’, 鬥 *dòu* ‘fight’, 仗 *zhàng* ‘battle’;

the category of 會 *huì* ‘meeting’, 展 *zhǎn* ‘exhibition’;

the category of 禮 *lǐ* ‘propriety’, 典 *diǎn* ‘ceremony’, 儀 *yí* ‘ceremony; rite’, 式 *shì* ‘ritual’;

the category of 課 *kè* ‘class’ ;

the category of 手術 *shǒushù* ‘operation’

(IV) Daily Activities

the category of 飯 *fàn* ‘meal’, 餐 *cān* ‘food; meal’, such as 晚飯 *wǎnfàn* ‘supper’, 野餐 *yěcān* ‘picnic’

(V) Athletics

the category of 賽 *sài* ‘match’, such as 比賽 *bǐsài* ‘competition’, 複賽 *fùsài* ‘intermediary heat’, 半決賽 *bànjuésài* ‘semifinal’

(VI) Time Course

the category of 期 *qī* ‘term’, such as 假期 *jiàqī* ‘vacation, 汛期 *xùnfēi* ‘flood season’, 保險期 *bǎoxiǎnqī* ‘insurance period’

Han (2007b) does a case study on the event noun 雨 *yǔ* ‘rain’ and the classifiers that can collocate with 雨 *yǔ* ‘rain’. She finds that the distance between event nouns and classifiers, the subcategory and the function of classifier constraint the combination of event nouns and classifiers.

Han (2007a) counts the frequency when an event noun combines with a localizer. The result shows that different categories of event nouns vary in what localizers they mostly combine with:

(I) 雨 *yǔ* ‘rain’, 飯 *fàn* ‘meal’, 課 *kè* ‘class’, 會 *huì* ‘meeting’, 戰 *zhàn* ‘war’: 後 *hòu* ‘after’ > 前 *qián* ‘before’ > 中 *zhōng* ‘in the course of’

(II) 病 *bìng* ‘disease’, 災 *zāi* ‘catastrophe’, 手術 *shǒushù* ‘operation’: 後 *hòu* ‘after’ > 中 *zhōng* ‘in the course of’ > 前 *qián* ‘before’

(III) 期 *qī* ‘term’, 禮 *lǐ* ‘propriety’, 亂 *luàn* ‘disorder’, 賽 *sài* ‘competition’: 中 *zhōng* ‘in the course of’ > 後 *hòu* ‘after’ > 前 *qián* ‘before’

Han (2010a) proposes three constructions to identify event nouns: (i) numeral + verbal classifier + ___; (ii) ___ + 後 *hòu* ‘after’; (iii) ___ + 中 *zhōng* ‘in the course of’. Construction I is the best frame and Construction II is a preferred frame in determining event nouns. They have general application to prototype event nouns. Construction III is simply an aiding frame in determining event nouns.

Han (2010b) revises her proposal and gives six constructions to identify event nouns:

(I) a. 這 *zhè* ‘this’ + numeral + verbal classifier + ___;

b. 這 *zhè* ‘this’ + numeral + temporal noun + ___;

(II) a. ___ + 前 *qián* ‘before’ / 之前 *zhīqián* ‘before’ / 以前 *yǐqián* ‘before’ / 後 *hòu* ‘after’ / 之後 *zhīhòu* ‘after’ / 以後 *yǐhòu* ‘after’

b. ___ + 中 *zhōng* ‘during’ / 之中 *zhīzhōng* ‘during’ / 時 *shí* ‘when’ / 期間 *qījiān* ‘period’

(III) a. ___ + 正在 *zhèngzài* ‘in the process of’ + light verb

b. 正在 *zhèngzài* ‘in the process of’ + light verb + ___

She sets a total score of 100 points for the six constructions: Construction (I) has a total of 45 points, with (a) having 30 points and (b) 15 points; Construction (II) has a total of 35 points, with (a) having 25 points and (b) 10 points; Construction (III) has a total of 20 points, with (a) having 15 points and (b) 5 points.

She then classifies event nouns into six categories according to the number of constructions an event noun can occur in:

(I) most typical event nouns are those that enter six constructions, such as 暴雨 *bàoyǔ* ‘rainstorm’, 冷戰 *lěngzhàn* ‘cold war’, 蟲災 *chóngzāi* ‘plague of insects’;

(II) typical event nouns are those that enter five constructions, such as 乒乓球 *pīngpāngqiú* ‘table tennis’, 暴病 *bàobìng* ‘sudden attack of disease’, 春雷 *chūnléi* ‘spring thunder’;

(III) less typical event nouns are those that enter four constructions, such as 旅程 *lǚchéng* ‘journey’, 暴政 *bào zhèng* ‘tyranny’, 婚期 *hūnqī* ‘wedding day’;

(IV) not typical event nouns are those that enter three constructions, such as 大獎 *dàjiǎng* ‘big prize’, 浪潮 *làngcháo* ‘wave’, 軍棋 *jūnqí* ‘military chess’;

(V) atypical event nouns are those that enter two constructions, such as 話 *huà* ‘word’, 回音 *huíyīn* ‘echo’, 黨史 *dǎngshǐ* ‘party’s history’;

(VI) marginal event nouns are those that enter only one construction, such as 巨浪 *jùlàng* ‘surge’, 黨齡 *dǎnglíng* ‘length of time as a party member’, 絕活 *juéhuó* ‘unique skill’.

Regarding Han (2010b), I argue that score given to each of the six constructions is very subjective. There is no evidence that one construction is more important than another. Correspondingly, the six categories of event nouns are not necessarily event nouns. For example, 婚期 *hūnqī* ‘wedding day’ and 黨齡 *dǎnglíng* ‘length of time as a party member’ are temporal nouns; 話 and 巨浪 *jùlàng* ‘surge’ are entity nouns.

2.1.7 Zhao (2006)

Zhao (2006) proposes to use light verbs to detect event nouns. He divides light verbs into four classes.

Va: 施動類 *shīdònglèi* ‘Agentive class’, verbs that mainly occur in the construction ‘對+N1+V+A+的+NV’¹³, which means ‘implement some kind of action to something’, such as 表示 *biǎoshì* ‘express’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 進行 *jìnxíng* ‘conduct; carry out’, 開展 *kāizhǎn* ‘develop; launch’, 展開 *zhǎnkāi* ‘develop; spread; launch; unfold’, 致以 *zhìyǐ* ‘extend’, 給以 *gěiyǐ* ‘give’, 給予 *jǐyǔ* ‘give; grant’, 提供 *tígōng* ‘provide’, 寄予 *jìyǔ* ‘place (hope, etc.) on’, 予以 *yǔyǐ* ‘give; grant’, 造成 *zàochéng* ‘result in’. Examples are shown in (21) and (22).

(21) 對事物的本身和它相關聯的各方面加以周密的分析

Duì shìwù de běnshēn hé tā xiāngguānlián de gè fāngmiàn jiāyǐ
to thing DE itself and it related every aspect impose
zhōumìde fēnxī
thorough analysis

‘do a thorough analysis to the thing itself and all aspects related to it’

(22) 人民對我們寄予深刻的信任。

Rénmíng duì wǒmen jìyǔ shēnkède xìnren.
people to us place (hope, etc.) on deep trust

‘People place deep trust on us.’

The [agentive meaning] of such a verb ensures the object of the preposition 對 *duì* ‘to’ / 為 *wèi* ‘for’ is the patient of the NV. Hence, ‘對+N1+V+A+的+NV’ can be converted to ‘A+地+NV+NI’¹⁴. For example, (21) can be converted to (23) and (22) can be converted to (24).

(23) 周密地分析事物的本身和它相關聯的各方面

zhōumìde fēnxī shìwù de běnshēn hé tā xiāngguānlián de gè fāngmiàn
thoroughly analyze thing DE itself and it related every aspect

‘thoroughly analyze the thing itself and all aspects related to it’

(24) 深刻地信任我們

shēnkède xìnren wǒmen
deeply trust us

¹³ 對 *duì* ‘to’

¹⁴ 地 *de*, auxiliary. It is used after an adjective or phrase to form an adverbial adjunct before the verb.

‘deeply trust us’

Vb: 受動類 *shòudòng lèi* ‘Patient class’, verbs that mainly occur in the construction ‘使/叫/讓+N1+V+A+的+NV’¹⁵, which means ‘make sth. suffer from some kind of action’, such as 經不起 *jīngbùqǐ* ‘cannot stand’, 經得起 *jīngdeqǐ* ‘stand’, 經受 *jīngshòu* ‘withstand’, 受 *shòu* ‘get’, 受到 *shòudào* ‘get’, 遭受 *zāoshòu* ‘suffer’, 遭到 *zāodào* ‘suffer’, 得到 *dédào* ‘get’, 得以 *déyǐ* ‘receive’, 接受 *jiēshòu* ‘accept’, 取得 *qǔdé* ‘obtain’, 贏得 *yíngdé* ‘win’. Examples are shown in (25) and (26).

(25) 使大量閒置的技術、人才、設備得以充分的利用。

Shǐ dàliàng xiánzhìde jìshù, réncái, shèbèi **déyǐ**
make a lot of idle technology personnel equipment so as to
chōngfènde liyòng.
fully utilize

‘(It) makes a lot of idle technology, personnel, and equipment got fully utilized.’

(26) 可使患者不出家門即可每天接受細緻的檢查。

Kě **shǐ** huànzhě bù chū jiāmén jíkě měitiān **jiēshòu**
can make patient not come out door of a house can every day receive
xìzhìde jiǎnchá
meticulous inspection

‘(It) can make patients receive daily meticulous inspection without going out of home.’

The [patient meaning] of the verb ensures that the object of the NV is introduced by 使 *shǐ* ‘make’. Thus ‘使/叫/讓+N1 +V + A+的+NV’ can be converted to ‘A+地+NV+N1’. For example, (25) can be converted to (27) and (26) can be converted to (28).

(27) 充分地利用大量閒置的技術、人才、設備

chōngfènde liyòng dàliàng xiánzhìde jìshù, réncái, shèbèi
fully utilize a lot of idle technology personnel equipment

‘fully utilize a lot of idle technology, personnel, and equipment’

(28) 細緻地檢查患者

¹⁵ 使/叫/讓: *shǐ/jiào/ràng* ‘make’

xìzhìde jiǎnchá huànzhě
meticulously inspect patient

‘meticulously inspect patients’

Vc, 雙動類 *shuāng dòng lèi* [agentive + patient] class: verbs that can occur in the above two constructions, but more frequent in the first construction than the second, such as 產生 *chǎnshēng* ‘produce’, 發生 *fāshēng* ‘occur’, 有 *yǒu* ‘have’, 有了 *yǒule* ‘had’, 作 *zuò* ‘make’, 作出 *zuòchū* ‘make’, 做 *zuò* ‘make’, 做出 *zuòchū* ‘make’. For example, in (29) and (30), 作出 *zuòchū* ‘make’ can occur in both constructions: ‘對+N1+V+A+的+NV’ and ‘使/叫/讓+N1+V+A+的+NV’.

(29) 以前人們對一些現象不能作出科學的解釋。

Yǐqián rénmen duì yīxiē xiànxàng bùnéng zuòchū kēxuéde jiěshì.
previously people to some phenomenon cannot make scientific explanation

‘Previously people cannot make scientific explanations to some phenomenon.’

(30) 這句話以神奇的方式使我作出明智的選擇。

Zhè jù huà yǐ shénqíde fāngshì shǐ wǒ zuòchū míngzhìde xuǎnzé.
this CL sentence with magic way make me make wise choice

‘This sentence, in a magic way, has me make a wise choice’

Vd: 引動類 *yǐndòng lèi* ‘triggering class’, they cannot enter ‘對+N1+V+A+的+NV’ and ‘使 N1 對 N2+V+A+的+NV’, such as 引起 *yǐnqǐ* ‘cause’, 引發 *yǐnfā* ‘trigger’, 導致 *dǎozhì* ‘lead to’.

(31) 邯鄲的經驗已經引起廣泛的重視。(CCL)

Hángāng de jīngyàn yǐjīng yǐnqǐ guǎngfànde zhòngshì.
Handan Iron DE experience already give rise to extensive attention

‘Handan Iron and Steel's experience has already gave rise to extensive attention.’

Zhao (2006)’s classification is problematic. (I) He distinguishes light verbs into four classes: agentive class, patient class, [agentive+patient] class and triggering class. However, these verbs are semantically dummy, so it is impossible that they carry such semantic features.

(II) He claims that both ‘對+N1+V+A+的+NV’ and ‘使/叫/讓+N1+V+A+的+NV’ can be

converted to ‘A+地+NV+N1’. Contrary to his claim that light verbs convey agentive or patient meaning, the conversion shows the fact that such meaning comes from NVs, rather than light verbs. In (23), the verb 分析 *fēnxī* ‘analyze’ conveys the agentive meaning of the omitted subject, rather than the light verb 加以 *jiāyǐ* ‘inflict...on/upon...; impose’ in (21). In (24), 信任 *xìnrèn* ‘trust’ does not have an agentive meaning, the subject of it is an experiencer, so it conveys an experiencing meaning; the light verb 寄予 *jìyǔ* ‘place (hope, etc.) on’ in (22) does not have such a meaning. In (27), the object 技術, 人才, 設備 *jìshù, réncái, shèbèi* ‘technology, personnel, and equipment’ are patients of the verb 利用 *liyòng* ‘utilize’. Its patient meaning does not come from the light verb 得以 *déyǐ* ‘so as to’ in (25). Similarly, in (28), the object 患者 *huànzhe* ‘patient’ is the patient of the verb 檢查 *jiǎnchá* ‘inspect’. Its patient meaning is from the verb 檢查 *jiǎnchá* ‘inspect’, instead of the light verb 接受 *jiēshòu* ‘receive’ in (26).

(III) He uses syntactic test to classify light verbs. Though some light verbs occur in agentive, patient, [agentive+patient] or triggering constructions, it does not mean that these light verbs have such semantic properties. For example, he claims that 進行 *jìnxíng* ‘carry on’ and 造成 *zàochéng* ‘cause’ belong to agentive class, but (32) and (33) show that they do not have any agentive meaning.

(32) 比賽順利進行。(Gigaword) (not 施動 *shīdòng* ‘agentive’)

Bǐsài shùnlì jìnxíng.

competition smoothly carry on

‘The competition carries on smoothly.’

(33) 颱風造成嚴重水災。(Gigaword) (not 施動 *shīdòng* ‘agentive’)

Táifēng zàochéng yánzhòng *shuǐzāi*.

typhoon cause severe flood

‘The typhoon caused severe flood.’

He claims that 取得 *qǔdé* ‘gain’ and 贏得 *yíngdé* ‘win’ belong to patient class. (34) and (35) show that they do not have a patient meaning.

(34) 這次在香港進行的工作性商談取得了很大的進展。(not 受動 *shòudòng* ‘patient’)

Zhè cì zài Xiānggǎng jìnxíng de gōngzuòxìng shāngtán **qǔdé** le
this CL in Hong Kong conduct DE working-level negotiation gain ASP
hěndàde **jìnzǎn**.
great progress

‘This working-level negotiation conducted in Hong Kong gained very great progress.’

(35) 布希 發表 國情諮文 演說 **贏得** 熱烈 **喝采**。(not 受動 *shòudòng* ‘patient’)

Bùxī fābiǎo guóqíngzīwén yǎnshuō **yíngdé** rèliè **hècǎi**.
Bush deliver state of the union address win warm applause

‘Bush delivered a state of the union address, which won warm applauses.’

He claims that some light verbs are [agentive+patient] class. However, verbs such as 作 *zuò* ‘make’, 作出 *zuòchū* ‘make’, 做 *zuò* ‘make’, 做出 *zuòchū* ‘make’ tend to be an action of an agent, rather than a patient, though they do not contribute much semantic information.

(IV) The several constructions are not enough to get all nouns selected by light verbs.

2.1.8 Summary

Sections 2.1.1-2.1.7 have reviewed the major works that make efforts to identify event nouns. By including some other similar works, the criteria that previous studies used to identify event nouns are summarized as follows.

- (I) Activity/Verbal/Process Classifiers
- (II) Argument Structure
 - (i) Argument Taking
 - (ii) Subject-Oriented Adjective
- (III) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers

(iv) Temporal Nouns

(v) Rationale Clauses

(IV) Light Verbs

2.1.8.1 Activity/Verbal/Process Classifiers

(I) Selection by 動量詞 *dòngliàngcí* ‘activity/verbal classifiers’ (Ma 1995, Wang & Zhu 2000, Wang 2000, Shao & Liu 2001, Liu 2003, Zhao 2006)

I argue that activity or verbal classifiers typically refer to the classifier occurring after a verb (e.g. 打了他一下 *dǎ le tā yīxià* ‘hit him once’) and not the classifier occurring before the noun in the canonical classifier position [Numeral CL N]. This is crucial to our study as our claim is that event nouns are true nouns, and therefore they occur in the standard construction of [Numeral CL N]. In this context, “event classifier” is a much better and theoretically defined name to refer to the classifier that occurs before an event noun.

(II) Selection by process classifiers (Fu 1994)

I argue that process classifiers ignore instant event nominals. For example:

(36) a. 這次決定

zhè cì juédìng

this CL decision

‘this decision’

b. 這次分析

zhè cì fēnxī

this CL analysis

‘this analysis’

In (36), 決定 *juédìng* ‘decision’ is an instant nominal and 分析 *fēnxī* ‘analysis’ a process nominal. Both of them can be selected by 次 *cì* ‘once (re. frequency of event)’, which shows that 次 *cì* ‘once (re. frequency of event)’ as a classifier selects both process and instant nominals. In this case, “event classifier” is a better term to refer to classifiers that select nouns with event reading.

Based on the analysis in (I) and (II), this thesis will use the term “event classifiers”.

2.1.8.2 Argument structure

Fu (1994) uses argument structure (argument taking and subject-oriented adjectives) to compare process nominals, result nominals and concrete entity nouns. She claims that process nominals take arguments, while result nominals and concrete entity nouns do not.

(I) Argument Taking

It is possible that you know a noun is an event noun, and then find its argument. However, it is almost impractical to use an argument to decide which noun is an event noun. Therefore this thesis will not use argument taking as a criterion for identifying event nouns.

In GL, (Pustejovsky 1991, 1995) divides arguments into true arguments, default arguments, and shadow arguments. This thesis follows this distinction.

True Arguments: parameters of the lexical item that are syntactically realized. *Tom* is the true argument of *jump* in (37).

(37) Tom jumped.

Default Arguments: parameters of the lexical item that are not syntactically expressed, but participate in the qualia. *War* takes two default arguments which are optional in the syntax. However, they are logically obligatory as shown in (38), so the U.S. and Vietnam are two default arguments.

(38) the war between the U.S. and Vietnam

Shadow Arguments: parameters which are semantically incorporated into the lexical item. *Kick* incorporates *leg* in its meaning, so *with his right leg* is a shadow argument in (39).

(39) He kicked the door with his right leg.

Process nominals and pure event nouns often have default arguments. For instance, 會議 *huìyì* ‘conference’ is a pure event noun and it takes default arguments. In (40)a, no argument of 會議 *huìyì* ‘conference’ is syntactically expressed, but logically it has two default arguments. In (40)b two default arguments are expressed: topic (developing missile technology) and interlocutors (Zhōu'ēnlái, Qian Xuesen, etc.).

(40) a. 對於這次會, 毛澤東在閉幕時的講話中說: “這個會議開得很好。”

Duìyú zhè cì huì, máozédōng zài bìmù shí de jiǎnghuà
About this CL meeting, Mao Zedong in closing session time DE speech

zhōng shuō: “Zhè ge *huìyì* kāi de hěn hǎo.”
in say: ‘this CL meeting hold DE very good’

“For this meeting, Mao Zedong in his closing speech said: ‘This meeting went very well.’”

- b. 周恩來主持中央軍委會議, 聽取錢學森關於在中國發展導彈技術的規劃設想。
(CCL)

Zhōu'ēnlái zhǔchí zhōngyāng jūnwěi *huìyì*, tīngqǔ
Zhou Enlai preside the Central Military Commission meeting, hear
Qián Xuésēn guānyú zài zhōngguó fāzhǎn dǎodàn jìshù de
Qian Xuesen about in China develop missile technology DE
guīhuà shèxiǎng.
planning assumption

‘Zhou Enlai presided over the Central Military Commission meeting to hear Qian Xuesen’s planning assumption on developing missile technology in China.’

(II) Subject-Oriented Adjectives

This criterion can be used in identifying non-natural kind event nouns, but it cannot be used for natural kind event nouns. Thus it is not further discussed in this thesis.

2.1.8.3 Event structure

(I) Selection by 開始 *kāishǐ* ‘begin’ and 結束 *jiéshù* ‘end’ (Liu 2003, 2004)

(Liu 2003, 2004) lists the two verbs 開始 *kāishǐ* ‘begin’ and 結束 *jiéshù* ‘end’, but he has not called them aspectualizers and not given any analysis.

This thesis finds that 開始 *kāishǐ* ‘begin’ and 結束 *jiéshù* ‘end’ are two aspectualizers. Besides them, other aspectualizers have the potential to select events.

(II) frequency adjectives (Fu 1994)

Fu (1994) uses frequency adjectives to distinguish process nominals from result nominals and concrete entity nouns.

I agree that frequency adjectives are useful in identifying event nouns. I further find that besides this type of adjectives, many other types of adjectives can also modify event nouns. This is elaborated in Chapter 6.

(III) Selection by localizers (Ma 1995, Chu 2000, Wang 2000, Shao & Liu 2001, Liu 2003):

I agree that localizers select either nouns with spatial properties or nouns with temporal properties.

(IV) Selection by temporal nouns (Wang & Zhu 2000, Shao & Liu 2001, Han 2007b, Wang 2010)

(41) 十年戰爭

shí nián zhànzhēng

ten year war

‘ten years wars’

In (41), 年 *nián* ‘year’ is regarded as a temporal classifier (Wang & Zhu 2000, Shao & Liu 2001, Han 2007b, Wang 2010). In this thesis, I take it as a temporal noun. I further argue that temporal expressions, including durative time expressions and temporal points, can be useful in identifying event nouns.

In (41), 十年 *shínián* ‘ten years’ is a durative time expression, which shows how long the war lasted.

(42) 去年的戰爭

qùnián de zhànzhēng

last year DE war

‘last year’s war’

In (42), 去年 *qùnián* ‘last year’ is a temporal point, which shows what time the war happened.

(V) Rationale Clauses (Fu 1994)

Fu (1994) uses rationale clauses to show that process nominals have argument control while result nominals and concrete entity nouns do not.

Rationale clause corresponds to the telic role in GL. The telic role has a high contribution to artifactual types and artifactual complex types, while it has a low contribution to natural types and natural complex types. This point is elaborated in Chapter 4.

With this discussion, I conclude that nouns in Chinese can accept rationale clauses. The

difference of natural kinds and non-natural kind nouns is whether the rationale clause expresses an intended purpose or non-intentioned purpose (Wang & Huang 2013e). Therefore this thesis will not use rationale clauses to distinguish event-representing nouns and entity nouns.

2.1.8.4 Selection by Light Verbs

Liu (2003, 2004) lists the two words 進行 *jìnxíng* ‘conduct; carry on’ and 舉行 *jǔxíng* ‘hold’, but he does not call them light verbs or give any further analysis. Zhao (2006) divides light verbs into four classes: agentive class, patient class, [agentive+patient] class and triggering class, but it is impossible that semantically bleached verbs have these semantic features.

From the above-mentioned research, we know there is a consensus that some classifiers and localizers can identify event nouns. However, there are some shortcomings with previous research. First, some scholars noticed that a few light verbs and aspectualizers are also applicable in finding event nouns, but no systematic research or detailed analysis is carried out. Second, no semantic selectional constraints of each method are explored. Thirdly, previous research overlooked the selectional difference between natural and non-natural events, as well as process and instant event nouns

Based on the above analysis, our constraint-based model for event noun identification includes the following linguistic constraints:

- (I) Event Classifiers
- (II) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - a. Durative Time Expressions
 - b. Time Points
- (III) Light verbs

The method of using locals and temporal expressions to identify event nouns are relatively straightforward; besides frequency adjectives, some other categories of adjectives can also modify event nouns, which will be discussed in detail in Chapter 6. Thus this chapter will not discuss them in detail.

The following sections (Section 2.2, Section 2.3, and Section 2.4) will focus on discussing event classifiers, aspectualizers, and light verbs, through answering these questions:

- (I) Within the nominal domain, does a noun represent an event or entity? That is, can the above criteria differentiate event nouns from entities?
- (II) Do these criteria select natural or non-natural event nouns?
- (III) What situation types do event nouns have?
- (IV) What compositional mechanisms are at work?

After examining the criteria of identifying event nouns, Section 2.5 will discuss how to establish an event-based noun classification system.

2.2 Use Event Classifiers to Identify Event Nouns

As stated in Section 2.1, many scholars have a consent that verbal classifiers can collocate with event nouns (Ma 1995, Wang & Zhu 2000, Wang 2000, Shao & Liu 2001, Liu 2003, Zhao 2006). However, verbal classifiers are usually used to count the occurrence of an action rather than the number of nominal events. Nevertheless, event classifier can count the occurrence of nominal events (Huang & Ahrens 2003, Wang & Huang 2011d), so I will use event classifiers to identify event nouns.

The traditional view that nominal classifiers classify individuals is challenged by Huang and Ahrens (2003). They suggest that classifiers coerce nouns to refer to kinds and events as well as to individuals. This finding argues against the view that nouns refer only to entities, and suggests that classifiers do not simply agree with a noun, but instead coerce a particular meaning from it.

With the hypothesis that event classifiers select event-representing nouns, this section focuses on 波 *bō* ‘of staggered event’ and its selected nouns by answering the following questions:

- (I) Does 波 *bō* ‘of staggered event’ select events or entities?
- (II) Do the event nouns selected by 波 *bō* ‘of staggered event’ belong to natural or non-natural kinds?
- (III) What situation types does 波 *bō* ‘of staggered event’ select?

(IV) What compositional mechanisms are at work when 波 *bō* ‘of staggered event’ selects a noun?

2.2.1 Mutual Selection between 波 *bō* ‘of staggered event’ and Nouns

Shao (1993) mentions that when nouns combine with classifiers, the nouns are always in a dominant position. Its presence determines the choice of the classifier. Conversely, classifiers also play an anti-constrained role to the nouns. Theoretically, a noun can choose a number of classifiers, which forms a ‘classifier chosen group’. On the contrary, a classifier can collocate with a number of nouns, which forms ‘noun combination group’. The relationship between these groups is crosscutting and forms a “two-way choice network”.

波 *bō* ‘of staggered event’ is an event classifier in Mandarin Chinese (Huang et al. 1997, Huang & Ahrens 2003). The sense of 波 *bō* ‘of staggered event’ in 說文解字 *ShuōWén Jiězì* ‘Origin of Chinese Characters’ (Xu 121) is ‘波，水湧流也。’ *Bō, shuǐ yǒngliú yě.* ‘*bō*, water surges.’, which is the original sense of 波 *bō* ‘of staggered event’.

Chinese WordNet¹⁶ (Huang et al. 2010) lists seven senses of 波 *bō* ‘of staggered event’, out of which senses ①, ③ and ④ are related to the current research.

① 普通名詞。液體因外力所產生的起伏現象。 *Pǔtōng míngcí. Yètǐ yīn wàilì suǒ chǎnshēng de qǐfú xiànxiàng.*

Common Noun. The phenomenon of ups and downs of liquid generate due to external forces.

② 普通名詞。振動在介質中的傳播過程，介質本身並不隨其前進。 *Pǔtōng míngcí. Zhèndòng zài jièzhì zhōng de chuánbō guòchéng, jièzhì běnshēn bìng bù suí qí qiánjìn.*

Common Noun. The transmission process of vibration in medium; the medium itself does not move forward.

③ 普通名詞。像波浪一樣間續群聚出現的行動或事物。 *Pǔtōng míngcí. Xiàng bōlàng yīyàng jiànxù qúnjù chūxiàn de xíngdòng huò shìwù.*

Common Noun. Actions or things which appear like a continued and clustered wave.

¹⁶ <http://cwn.ling.sinica.edu.tw/>

④量詞。計算像波浪一樣間續群聚出現的行動或事物的單位。*Liàngcí. Jìsuàn xiàng bōlàng yīyàng jiànxù qúnjù chūxiàn de xíngdòng huò shìwù de dānwèi.*

Classifier. A unit used to calculate actions or things which appear like a continued and clustered wave.

⑤及物動詞。氣體迸出而發生聲音。*Jíwù dòngcí. Qìtǐ bèng chū ér fāshēng shēngyīn.*

Transitive Verb. Gas bursts and then generates voice.

⑥語助詞。表氣體迸出的聲音。*Yǔzhùcí. Biǎo qìtǐ bèng chū de shēngyīn.*

Auxiliary Word. The voice generated due to gas burst.

⑦語助詞。表調整頻率的聲音。*Yǔzhùcí. Biǎo tiáozhěng pínlǜ de shēngyīn.*

Auxiliary Word. The voice of adjusting the frequency.

With these descriptions of the senses, 波 *bō* ‘of staggered event’'s semantic features can be shown below.

(a) Semantic features of the original sense: [liquid][ups and downs]

(b) Semantic features of the extended use: [ups and downs][continued and clustered]

波 *bō* ‘of staggered event’ has both a concrete entity reading and an eventive reading, so it is a suitable classifier to examine the mutual selection between an event classifier and nouns.

2.2.1.1 Nouns Selected by 波 *bō* ‘of staggered event’

The nouns selected by 波 *bō* ‘of staggered event’ can be divided into three types: event nominals, pure event nouns, and entity nouns, as shown in (43), (44), and (45).

Event Nominal:

(43) 軍方飛機又發動了第二波攻擊，投擲的炸彈造成約 10 人死亡。(CCL)

Jūnfāng fēijī yòu fādòng le dì'èr bō gōngjī, tóuzhì de zhàdàn
military aircraft again launch ASP second CL attach throw DE bomb
zàochéng yuē 10 rén sǐwáng.
cause about 10 people death

‘Military aircrafts launched a second wave of attacks; thrown bombs caused the death of about 10 people.’

Pure Event Noun:

- (44) 當地警方還封鎖了欽奈市著名的馬麗娜海灘沿線一帶，以防餘震引發的新一波海嘯造成更多的人員傷亡。(CCL)

Dāngdì jǐngfāng hái fēngsuǒ le Qīnnài shì zhùmíngde Mǎlínà hǎitān
local police also block ASP Chennai city famous Marina beach
yánxiàn yīdài, yǐfáng yúzhèn yǐnfā de xīn yī bō **hǎixiào**
along the line area prevent aftershock trigger DE new one CL tsunami
zàochéng gèngduō de rényuán shāngwáng.
cause more DE people casualties

‘Local police also blocked the areas along the famous Marina beach of Chennai in order to prevent more casualties from a new wave tsunami triggered by aftershocks.’

Entity Noun:

- (45) 第一波禮花謝幕，人們才緩過神來。(CCL)

Dìyī bō **lǐhuā** xièmù, rénmen
first CL fireworks respond to a curtain call people
cái huǎn guò shén
indicating something takes place later than expected recuperate ASP expression
lái.
indicating result

‘People recovered after the first wave of fireworks had ended.’

The nouns selected by 波 *bō* ‘of staggered event’ can be natural or non-natural kinds. Natural kinds such as 寒流 *hánliú* ‘cold wave’ and 風暴 *fēngbào* ‘windstorm’ are beyond human control, while non-natural kinds, like 座談會 *zuòtánhuì* ‘symposium’ and 運動 *yùndòng* ‘sports’, are controllable.

The nouns selected by 波 *bō* ‘of staggered event’ are usually activities: 價格戰 *jiàgézhàn* ‘price war’, 婦運 *fùyùn* ‘the women's movement’, 特賣會 *tèmàihuì* ‘special sale’.

2.2.1.2 Nouns that cannot be Selected by 波 *bō* ‘of staggered event’

波 *bō* ‘of staggered event’ does not take all event nouns. Nouns with no sequence or subevents cannot be selected by 波 *bō* ‘of staggered event’. 生日 *shēngrì* ‘birthday’ is such an event noun. For instance:

(46) 他的生日過得很好。

Tā de *shēngrì* guò de hěn hǎo.
he DE birthday spend DE very good

‘He spent a very happy birthday.’

However, *一波生日 *yī bō shēngrì* ‘a series of birthdays’ is not acceptable.

2.2.1.3 The Same Noun’s Selection of Different Classifiers

This section extracts the classifiers of event nouns of different categories in Sinica Corpus or Gigaword. Following Huang and Ahrens (2003), I divide classifiers into three types: individual, kind and event classifier. 個 *gè* ‘a neutral classifier’ is a neutral classifier that does not belong to any type. Almost every noun can be modified by kind classifiers, so just the same as the neutral classifier 個 *gè* ‘a neutral classifier’, kind classifiers do not affect whether a noun expresses an event or not.

Highlighting is used to distinguish different types of classifiers. Classifiers with the same color belong to the same group. Yellow color marks the event classifiers, blue color marks the kind classifiers, and purple color marks the individual classifiers. The neutral classifier 個 *gè* ‘a neutral classifier’ is not colored.

Pure Event Noun:

Natural Kind Pure Event Noun:

Table 7. Classifiers of 寒流 *hánliú* ‘cold wave’ in Sinica Corpus

Classifier			Frequency	Saliency
波	<i>bō</i>	‘of staggered event’	2	13.07
股	<i>gǔ</i>	‘a classifier for strips, gas, odor, strength, etc.’	1	6.9
次	<i>cì</i>	‘once (re. frequency of event)’	1	4.99
個	<i>gè</i>	‘a neutral classifier’	1	2.9

Table 7 shows all of 寒流 *hánliú* ‘cold wave’’s classifiers in Sinica Corpus. The first three most salient classifiers are all event classifiers. It shows that 寒流 *hánliú* ‘cold wave’ is permanently an event noun. A similar example is shown in Table 8.

Table 8. Classifiers of 浪潮 *làngcháo* ‘wave’ in Sinica Corpus

Classifier			Frequency	Salience
股	<i>gǔ</i>	‘a classifier for strips, gas, odor, strength, etc.’	3	15.68
波	<i>bō</i>	‘of staggered event’	1	7.4
個	<i>gè</i>	‘a neutral classifier’	2	5.47
種	<i>zhǒng</i>	‘kind’	1	3.93

Table 8 shows all of 浪潮 *làngcháo* ‘wave’ ’s classifiers in Sinica Corpus. For 浪潮 *làngcháo* ‘wave’, the most salient classifier is 股 *gǔ* ‘a classifier for strips, gas, odor, strength, etc.’, followed by 波 *bō* ‘of staggered event’. Both of them are event classifiers. Moreover, 浪潮 *làngcháo* ‘wave’ can be modified by the neutral classifier 個 *gè* ‘a neutral classifier’ and kind classifier 種 *zhǒng* ‘kind’. These classifiers show that 浪潮 *làngcháo* ‘wave’ tends to be a permanent event noun.

Non-natural Kind Pure Event Noun:

Table 9. Classifiers of 大戰 *dàzhàn* ‘large-scale war’ in Sinica Corpus

Classifier			Frequency	Salience
次	<i>cì</i>	‘once (re. frequency of event)’	132	47.04
場	<i>chǎng</i>	‘a (scheduled) event (with beginning and ending)’	10	17.46
幕	<i>mù</i>	‘cut (of a play)’	1	5.87
盤	<i>pán</i>	‘a serving round (of a dish)’	1	4.89
波	<i>bō</i>	‘of staggered event’	1	4.35
番	<i>fān</i>	‘times (of a repeated event)’	1	4.01
度	<i>dù</i>	‘frequency of events’	1	3.91

The data in Table 9 show that all the classifiers of 大戰 *dàzhàn* ‘large-scale war’ are event classifiers, which means that 大戰 *dàzhàn* ‘large-scale war’ is permanently an event noun.

Both Natural and Non-natural Kind Pure Event Noun:

風暴 *fēngbào* ‘windstorm’ has two senses, with one as the original meaning and the other as the figurative meaning, as shown below:

風暴 *fēngbào* ‘windstorm’

①刮大风而且往往同时有大雨的天气现象。 *Guā dàfēng érqiě wǎngwǎng tóngshí yǒu dàoyǔ de tiānqì xiànxàng.*

windstorm; storm; tempest

②比喻规模大而气势猛烈的事件或现象。 *Bǐyù guīmó dà ér qìshì měngliè de shìjiàn huò xiànxàng.*

large-scale, tumultuous event or phenomenon

In the first sense, 風暴 *fēngbào* ‘windstorm’ is a natural kind event noun, while in the second sense, it is a non-natural kind event noun.

Table 10. Classifiers of 風暴 *fēngbào* ‘windstorm’ in Sinica Corpus

Classifier			Frequency	Salience
波	<i>bō</i>	‘of staggered event’	10	28.09
次	<i>cì</i>	‘once (re. frequency of event)’	13	22.13
場	<i>chǎng</i>	‘a (scheduled) event (with beginning and ending)’	8	19.93
種	<i>zhǒng</i>	‘kind’	1	2.35
個	<i>gè</i>	‘a neutral classifier’	1	1.18

In Table 10, 風暴 *fēngbào* ‘windstorm’ is modified by three event classifiers, one kind classifier and one neutral classifier. The first three are the most salient. While the last two do not affect whether a noun is an event, it is safe to say that 風暴 *fēngbào* ‘windstorm’ is a permanent event noun.

Event Nominals:

Table 11. Top 8 Classifiers of 打擊 *dǎjī* ‘attack; blow’ in Xinhua News of Chinese Gigaword Corpus

Classifier			Frequency	Saliency
次	<i>cì</i>	‘once (re. frequency of event)’	296	42.21
個	<i>gè</i>	‘a neutral classifier’	244	28.85
輪	<i>lún</i>	‘round’	39	26.99
種	<i>zhǒng</i>	‘kind’	78	24.72
場	<i>chǎng</i>	‘a (scheduled) event (with beginning and ending)’	40	22.37
波	<i>bō</i>	‘of staggered event’	7	15.34
類	<i>lèi</i>	‘category’	7	9.97

The data in Table 11 are the top 8 classifiers of 打擊 *dǎjī* ‘attack; blow’ of Xinhua news in Gigaword Corpus (second edition). Out of them, four are event classifiers, two are kind classifiers, and one is a neutral classifier. Thus it is clear that 打擊 *dǎjī* ‘attack; blow’ expresses an event.

Entity Nouns:

Table 12. Classifiers of 廣告 *guǎnggào* ‘advertisement’ in Sinica Corpus

Classifier			Frequency	Saliency
支	<i>zhī</i>	‘a classifier for troops, songs, slender things, etc.’	17	30.22
則	<i>zé</i>	‘a classifier for ads, notices, etc.’	11	18.68
個	<i>gè</i>	‘a neutral classifier’	18	14.15
種	<i>zhǒng</i>	‘kind’	6	9.62
次	<i>cì</i>	‘once (re. frequency of event)’	4	9.09
輯	<i>jí</i>	‘a classifier for set of books or materials divided into various parts according to content or publication time’	1	8.53
篇	<i>piān</i>	‘piece; sheet (‘a classifier for paper, writing, articles, etc.’)’	2	8.37
部	<i>bù</i>	‘a classifier for volumes, dictionaries, automobiles, literature, etc.’	2	7.55
類	<i>lèi</i>	‘category’	2	7.19
波	<i>bō</i>	‘of staggered event’	1	5.1
份	<i>fèn</i>	‘a classifier for grouped things or newspapers, documents, etc.’	1	4.18
句	<i>jù</i>	‘sentence’	1	3.92
些	<i>xiē</i>	‘some; a few; a little’	1	3.79
隻	<i>zhī</i>	‘a classifier for troops, songs, slender things, etc.’	1	3.79

In Table 12, 廣告 *guǎnggào* ‘advertisement’ is modified by 14 classifiers in Sinica Corpus, out of which 9 are individual classifiers, two are event classifiers, two are kind classifiers and one is a neutral classifier. The fact that 廣告 *guǎnggào* ‘advertisement’ has far more individual classifiers than event classifiers indicates that 廣告 *guǎnggào* ‘advertisement’ is an entity noun. But it can get an event reading through coercion when modified by event classifiers.

From the above analysis, I find that the nouns that can be selected by 波 *bō* ‘of staggered event’ can be roughly divided into two types. The first type is nouns that permanently express events: (i) the natural types: 浪潮 *làngcháo* ‘wave’ and 寒流 *hánliú* ‘cold wave’, (ii) the non-natural type 大戰 *dàzhàn* ‘large-scale war’, and (iii) the noun with a figurative meaning 風暴 *fēngbào* ‘wind storm’. These nouns cannot be individualized. The second type is nouns that are entities, such as 廣告 *guǎnggào* ‘advertisement’, which are coerced to express events when 波 *bō* ‘of staggered event’ selects them.

2.2.2 Compositional Mechanisms

(Pustejovsky, 2006; Pustejovsky & Jezek, 2008) propose three mechanisms at work when a predicate selects arguments:

- (I) Pure Selection (Type Matching): The type a function requires is directly satisfied by the argument;
- (II) Accommodation: the type a function requires is inherited by the argument;
- (III) Type Coercion: the type a function requires is imposed on the argument type.

These mechanisms have been used to explore a verb’s selection to its objects in Mandarin Chinese (Wang & Huang 2010b). This part will use it to examine a classifier’s selection to nouns.

波 *bō* ‘of staggered event’ selects anything that can go through the phase of ups and downs or peaks and low points. Moreover, a series of subevents is involved. The following section shows that the above theory is applicable to the classifier 波 *bō* ‘of staggered event’’s selection of nouns. The mechanisms at work are pure selection/accommodation and type coercion.

2.2.2.1 Pure Selection and Accommodation

波 *bō* ‘of staggered event’ directly selects nouns that represent events. The examples are

shown below.

(I) 波 *bō* ‘of staggered event’ + Pure Event Nouns

In the natural kind event noun 寒流 *hánliú* ‘cold wave’, 流 *liú* ‘flow’ is similar to 波浪 *bōlàng* ‘wave’, which is sequential. 流 *liú* ‘flow’ has a sequence variation with ups and downs. People feel it in temporal change. Regarding 一波寒流 *yī bō hánliú* ‘one flow of cold wave’, there must be a coldest day, which represents the lowest point. When the temperature goes up, say, 5°C, 寒流 *hánliú* ‘cold wave’ is gone. The event represented by 一波寒流 *yī bō hánliú* ‘one flow of cold wave’ is the temperature change.

Similar examples are 海浪 *hǎilàng* ‘sea wave’, 熱浪 *rèlàng* ‘heat wave’, 激浪 *jīlàng* ‘raging wave’, 冷氣團 *lěngqìtuán* ‘cold mass’, 氣流 *qìliú* ‘airflow’.

戰爭 *zhànzhēng* ‘warfare’ is an artifactual type event noun. 一波戰爭 *yī bō zhànzhēng* ‘one wave of warfare’ implies that the two sides fight the war for many times and perhaps there is a process of fighting → not fighting → fighting. Compared to the period in which no fighting happens, the fighting period is intensive and at the peak point.

(II) 波 *bō* ‘of staggered event’ + Event nominals

波 *bō* ‘of staggered event’ can select event nominals, such as 打擊 *dǎjī* ‘attack’, through pure selection/accommodation. For example, 一波打擊 *yī bō dǎjī* ‘a series of attacks’ is a series of attacks.

(III) 波 *bō* ‘of staggered event’ + Event Nouns with Figurative Meaning

- (47) 臺灣塑化劑風暴愈演愈烈，兩個星期內已發現有 746 飲品及食品含有有毒塑化劑，涉及 216 間公司，這**波風暴**不僅籠罩全台，也影響到海外。(Web)

Táiwān sùhuàjì fēngbào yùyǎnyùliè , liǎng gè xīngqī nèi yǐ
Taiwan plasticizer crisis storm intensified, two CL week within already
fāxiàn yǒu 746 yǐnpǐn jí shípǐn hányǒu yǒudú sùhuàjì , shèjí 216
find have 746 drinks and foods contain poisonous plasticizer, involve 216
jiān gōngsī , zhè **bō fēngbào** bùjǐn lǒngzhào quán tái , yě
CL company, this CL storm not only envelop whole Taiwan, also
yǐngxiǎngdào hǎiwài.
affect overseas places

‘The plasticizer crisis in Taiwan intensified and within two weeks that 746 kinds of drinks and foods were found to contain toxic plasticizer, involving 216 companies. This turmoil has not only enveloped the whole Taiwan, but also affected overseas places.’

風暴 *fēngbào* ‘turmoil’ is a natural phenomenon. In the above sentence, it is used metaphorically. 這波風暴 *zhè bō fēngbào* ‘this turmoil’ refers to the storm-like plasticizer crisis.

波 *bō* ‘of staggered event’ selects these event nouns mentioned above through pure selection/accommodation. Here I show one example in (48): 波 *bō* ‘of staggered event’ ’s selection to 寒流 *hánliú* ‘cold wave’.

- (48) a. 波 *bō* ‘of staggered event’ is of type event \rightarrow t;
b. 寒流 *hánliú* ‘cold wave’ is of type natural event;
c. Accommodation subtyping applies, natural event \sqsubseteq event:
 \Rightarrow 寒流 *hánliú* ‘cold wave’ is of type event;
d. Function Application (Type Matching) applies:
 \Rightarrow *bō* (*hánliú*)

波 *bō* ‘of staggered event’ ’ selection to other event nouns has similar derivation.

2.2.2.2 Type Coercion

波 *bō* ‘of staggered event’ selects event-representing nouns. When the nouns that follow it are not such nouns, there is a clash in their types. In such a case, type coercion happens. For instance, when the nouns followed by 波 *bō* ‘of staggered event’ are entity nouns, there will be event coercion.

(IV) 波 *bō* ‘of staggered event’ + Entity nouns

The Contemporary Chinese Dictionary (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012) explains 廣告 *guǎnggào* ‘advertisement’ as this: public promotion of a product, service, entertainment or sports program, generally appearing in the medium of print, television, radio, posters, etc.

廣告 *guǎnggào* ‘advertisement’ is a concrete entity noun. When it appears on newspapers, posters, window displays, or store displays, it only refers to the information, as shown in (49). The 廣告 *guǎnggào* ‘advertisement’ is a picture, which has the information that a

young girl carries a plate of steaming roasted chicken.

- (49) 飯店廣告上畫著一個少女端著一盤子冒著熱氣的烤雞。(Web)

Fàndiàn **guǎnggào** shàng huà zhe yī gè shàonǚ duān zhe yī
restaurant advertisement on draw ASP one CL young girl carry ASP one
pánzi mào zhe rèqì de kǎojī.
plate emit ASP hot steam DE roasted chicken

‘The advertisement of the restaurant is a young girl carrying a plate of steaming roasted chicken.’

However, when 廣告 *guǎnggào* ‘advertisement’ appears on radio, television, film, and slides, it is coerced to have an event reading, as shown in (50). 廣告 *guǎnggào* ‘advertisement’ is selected by the durative time expression 兩分鐘 *liǎng fēnzhōng* ‘two minutes’.

- (50) 奧巴馬不甘示弱，製作了一個長達兩分鐘的電視廣告。(Web)

Àobāmǎ bùgānshìruò, zhìzuò le yī gè chǎngdá
liǎng
Obama refuse to admit being inferior produce ASP one CL as long as two
fēnzhōng de diànshì **guǎnggào**.
minute DE television advertisement

‘Obama refused to admit being inferior, and produced a two-minute long television advertisement.’

No matter an advertisement appears in printing materials or broadcasts, when it is selected by the event classifier 波 *bō* ‘of staggered event’, the construction means a series of activities that serve as a promotional purpose, as shown in (51) and (52). (51) shows an advertisement on a magazine, while (52) shows an advertisement on TV.

- (51) iPad 第一波廣告在雜誌上登出來了。

iPad dìyī **bō guǎnggào** zài zázhì shàng dēng chūlái le.
iPad first CL advertisement on magazine on post out ASP

‘iPad has posted the first series of advertisements in magazines.’

- (52) 微軟先前打了一波電視廣告對蘋果還以顏色，如今這波廣告攻勢已延燒到網路來。(Web)

Wēiruǎn xiānqián dǎ le yī **bō** diànshì guǎnggào duì Píngguǒ
Microsoft previously do ASP one CL TV advertisement to Apple
hái yǐ yánsè , rújīn zhè bō guǎnggào gōngshì yǐ yánshāo dào
go against, currently this CL advertisement attack already spread and burn to
wǎngluò lái.
network come

‘Microsoft previously took action against Apple through a series of TV advertisements, and this wave has now spread to the network.’

(51) and (52) do not refer to the information aspect of the advertisements, but the series of advertising events. The difference between (50) and (52) is this: in (50), one advertisement is regarded as an event; in (52), there are many advertising events.

(51) and (52) depict that 波 *bō* ‘of staggered event’ has the coercive power of changing an entity noun to have a reading of a series of events. The construction “波 *bō* ‘of staggered event’ + Entity nouns” have two characteristics: (a) type coercion happens, and (b) these nouns are the most prominent objects in the implicate events.

2.2.2.3 Similarities and Differences of Event Representation

For 波 *bō* ‘of staggered event’+Noun, the mechanisms of pure selection/accommodation and type coercion share some similarities.

(I) Approximate Number

For example, 一波浪潮 *yī bō làngcháo* ‘a series of waves’ does not encode any specific numeral information of the tide.

(II) Continuous

(53) 慕名來看桃花的人走了一波又來了一波。(Web)

mù míng lái kàn táo huā de rén zǒu le yī bō
out of admiration for come look at peach flower DE people leave ASP one CL
yòu lái le yī bō.
again come ASP one CL

‘Wave after wave of interested people come to admire the peach flowers.’

Pure selection/accommodation and type coercion also have many differences. First, nouns

under pure selection/accommodation are usually mass nouns. For example, in 一波浪潮 *yī bō làngcháo* ‘a series of waves’, 浪潮 *làngcháo* ‘wave’ is a whole and a mass noun. Nouns under coercion are individualized. For example:

(54) 我們這一波人開始沖上來了。(Web)

Wǒmen zhè yī **bō rén** kāishǐ chōng shànglái le.
we this one CL people begin rush up ASP

‘We, this wave of people, started to rush up.’

In (54), 一波人 *yī bō rén* as a coerced event, 人 *rén* ‘people’ is individualized.

Second, nouns under pure selection/accommodation can express one event that lasts for some time. For instance, in 一波寒流 *yī bō hánliú* ‘a series of cold wave’, 寒流 *hánliú* ‘cold wave’ can be counted as one event which has a long duration. Nouns under coercion usually have a series of subevents. A case in point is 一波地雷 *yī bō dìléi* ‘a series of (exploding) landmines’, in which many exploding events happen.

2.2.3 Summary

This section explores the event classifier 波 *bō* ‘of staggered event’ and the nouns it selects. The main findings are: (i) 波 *bō* ‘of staggered event’ can select pure event nouns, event nominals and entity nouns. 波 *bō* ‘of staggered event’ has coercion power to change an entity noun to express an event. Though some nouns are not event nouns, they are prominent parts, period, or state of events; (ii) [波 *bō* ‘of staggered event’ + N] represents events by pure selection/accommodation or coercion; (iii) 波 *bō* ‘of staggered event’ selects event nouns that have a duration.

These findings also fit other event classifiers other than 波 *bō* ‘of staggered event’.

Mandarin Chinese Classifier and Noun-Classifier Collocation Dictionary (Huang et al. 1997) and Huang and Ahrens (2003) list 35 event classifiers in Mandarin Chinese: 波 *bō* ‘of staggered event’, 班 *bān* ‘of shift, scheduled flight/bus etc’, 筆 *bǐ* ‘of transaction’, 步 *bù* ‘step (event procedures)’, 泡 *pào* ‘a brewing (of tea etc.)’, 盤 *pán* ‘a serving round (of a dish)’, 幕 *mù* ‘cut (of a play)’, 番 *fān* ‘times (of a repeated event)’, 道 *dào* ‘of dishes of procedures’, 檔 *dàng* ‘duration of run (of play, movie etc.)’, 段 *duàn* ‘section (of play, etc.)’, 頓 *dùn* ‘the process of a meal’, 台 *tái* ‘a run of a traveling troupe’, 堂 *táng* ‘a class’, 趟 *tàng*

‘indicating trips or trips made’, 通 *tōng* ‘a phone call’, 輪 *lún* ‘a round’, 回 *huí* ‘indicating frequency of occurrence, time’, 節 *jié* ‘a class, a session’, 屆 *jiè* ‘number of times, used for regular meetings’, 件 *jiàn* ‘for individual matters or things’, 局 *jú* ‘game’, 期 *qī* ‘term’, 起 *qǐ* ‘event (especially a happening, an accident)’, 圈 *quān* ‘round (of majong)’, 席 *xí* ‘lecture’, 折 *zhé* ‘an act (in a Chinese play)’, 陣 *zhèn* ‘one of a sporadic event(s)’, 樁 *zhuāng* ‘of events’, 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’, 齣 *chū* ‘a play’, 任 *rèn* ‘term (of a termed position)’, 宗 *zōng* ‘trade/transaction’, 餐 *cān* ‘a meal’, 次 *cì* ‘once (re. frequency of event)’.

Following the research on 波 *bō* ‘of staggered event’, I examined the selectional restrictions of all the 35 event classifiers. The results are shown below.

(I) Selection of Events or Entities:

Event classifiers that Select both Event Nouns and Entities (entities are coerced to be events.): 波 *bō* ‘of staggered event’, 筆 *bǐ* ‘of transaction’, 局 *jú* ‘game’, and 期 *qī* ‘term’.

Event Classifiers that only Select Event Nouns: 幕 *mù* ‘cut (of a play)’, 番 *fān* ‘times (of a repeated event)’, 檔 *dàng* ‘duration of run (of play, movie etc.)’, 段 *duàn* ‘section (of play etc.)’, 頓 *dùn* ‘the process of a meal’, 台 *tái* ‘a run of a traveling troupe’, 堂 *táng* ‘a class’, 通 *tōng* ‘a phone call’, 輪 *lún* ‘a round’, 節 *jié* ‘a class, a session’, 屆 *jiè* ‘an annual event’, 件 *jiàn* ‘for individual matters or things’, 起 *qǐ* ‘event (especially a happening, an accident)’, 席 *xí* ‘lecture’, 折 *zhé* ‘an act (in a Chinese play)’, 陣 *zhèn* ‘one of a sporadic event(s)’, 樁 *zhuāng* ‘of events’, 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’, 齣 *chū* ‘a play’, 宗 *zōng* ‘trade/transaction’, 餐 *cān* ‘a meal’, 次 *cì* ‘once (re. frequency of event)’, 盤 *pán* ‘a serving round (of a dish)’.

Event Classifiers that only Select Entities (but coerce them to events): 班 *bān* ‘of shift, scheduled flight/bus etc.’, 步 *bù* ‘step (event procedures)’, 泡 *pào* ‘a brewing (of tea etc.)’, 道 *dào* ‘of dishes of procedures’, 趟 *tàng* ‘a journey’, 回 *huí* ‘indicating frequency of occurrence, time’, 圈 *quān* ‘round (of mahjong)’, 任 *rèn* ‘term (of a termed position)’.

(II) Selection of Natural or Non-Natural Kind Event Nouns:

Event Classifiers that Select both Natural and Non-natural kind Event nouns:

波 *bō* ‘of staggered event’, 陣 *zhèn* ‘one of a sporadic event(s)’, 場 *chǎng* ‘a (scheduled)

event (with beginning and ending)', 次 *cì* 'once (re. frequency of event)', 泡 *pào* 'a brewing (of tea etc.)'

Event Classifiers that Only Select Non-natural Event Nouns:

班 *bān* 'of shift scheduled flight/bus etc', 筆 *bǐ* 'of transaction', 步 *bù* 'step (event procedures)', 盤 *pán* 'a serving round (of a dish)', 幕 *mù* 'cut (of a play)', 番 *fān* 'times (of a repeated event)', 道 *dào* 'of dishes of procedures', 檔 *dàng* 'duration of run (of play movie etc.)', 段 *duàn* 'section (of play etc.)', 頓 *dùn* 'the process of a meal', 台 *tái* 'a run of a traveling troupe', 堂 *táng* 'a class', 趟 *tàng* 'a journey', 通 *tōng* 'a phone call', 輪 *lún* 'a round', 回 *huí* 'indicating frequency of occurrence, time', 節 *jié* 'a class a session', 屆 *jiè* 'an annual event', 件 *jiàn* 'for individual matters or things', 局 *jú* 'game', 期 *qī* 'term', 起 *qǐ* 'event (especially a happening an accident)', 圈 *quān* 'round (of majong)', 席 *xí* 'lecture', 折 *zhé* 'an act (in a Chinese play)', 樁 *zhuāng* 'of events', 齣 *chū* 'a play', 任 *rèn* 'term (of a termed position)', 宗 *zōng* 'trade/transaction', 餐 *cān* 'a meal'

(III) Selection of Durative or Instant Event Nouns:

Event Classifiers that Select both Durative and Instant Event Nouns: 次 *cì* 'once (re. frequency of event)'. In (55), 調查 *diàochá* 'investigation' is a durative event, while in (56), 判決 *pànjué* 'judgement' is an instant event.

(55) 這次 **調查** (durative)

zhè cì **diàochá**
this CL investigation
'this investigation'

(56) 這次 **判決** (instant)

zhè cì **pànjué**
this CL judgement
'this judgement'

Other 34 event classifiers only select durative events.

Although event classifiers are useful for identifying event nouns, there exist some problems. First, some selected nouns are not event nouns. Their event reading comes from coercion.

Second, the majority of event classifiers has quite restricted selectional requirements. Therefore the number of nouns they select is limited.

2.3 Use Event Structure to Identify Event Nouns

Eventive features such as aspectualizers, localizers, temporal expressions, and frequency adjectives can be used to identify event nouns.

2.3.1 Aspectualizers

2.3.1.1 Literature Review

Freed (1979) points out that aspectualizers take ‘events’ as complements, not propositions or objects. Events can be temporarily segmented into different stages: an onset, a nucleus and a coda. Different aspectualizers evoke different event stages.

Freed (1979) also finds that aspectualizers take events as complements. Aspectualizers are considered to take verbal complements even if they are followed by derived nominals or primitive nouns. Derived nominals, such as ‘conversation’, ‘entertainment’ or ‘walk’ are understood to be derived from verbs that name events; primitive nouns point to the existence of an event: either the verbal part of the complainant has been deleted, or the noun denotes an event (e.g. concert, war) can be associated with an event (apple and ‘eating’) or is the product or result of an event (wall-hanging).

Brinton (1988) lists different aspectualizers with their complement constructions and particles. These aspectualizers’ phrasal equivalents are also given for comparison, as shown in Table 13.

Table 13. Aspectualizers in Modern English (Brinton 1988: P61)

Ingressive Aspectualizers

begin to V, V-ing

commence to V, V-ing, to V-ing

start (in/out) to V, (off) V-ing

set (about/in) to V, off/about V-ing, to V-ing

get to V, V-ing, to V-ing

proceed to V, V-ing

grow to V

come on to V

fall to V, V-ing, to V-ing

break out V-ing

burst out V-ing

resume V-ing

recommence V-ing

Continuative/Iterative Aspectualizers

keep (on) V-ing

go on V-ing

remain V-ing

persist in V-ing

continue to V, V-ing

lie V-ing

sit V-ing

stay V-ing

Egressive Aspectualizers

cease to V, V-ing

finish V-ing

quit V-ing

stop V-ing

desist (from) V-ing

forsake V-ing

cut out V-ing

lay off V-ing

leave off V-ing

break off V-ing

knock off V-ing

give up/over V-ing

chuck V-ing

discontinue V-ing

complete V-ing

cf. be finished V-ing

get/be through V-ing

have/get/be done V-ing

Habitual Aspectualizers

used to V

take to V, to V-ing

cf. be used/accustomed to V, V-ing

be wont to V

be given to V-ing

make a practice/habit of V-ing

be in the habit/custom of V-ing

have a habit of V-ing

Brinton (1988) summarizes the meaning of aspectualizers that most scholars agree on: ingressive aspectualizers, including begin, start and commence, focus on the beginning point or initiation of a situation; continuative aspectualizers, including continue, go on and keep on, focus on the continuation of a situation; egressive aspectualizers including stop, quit, cease and finish, focus on the endpoint or cessation of a situation. She recognizes a fourth category of habitual aspectualizers including used, take and some phrasal equivalents.

Wierzbicka (1988) states that aspectual verbs' complements refer to a stretch of time. This stretch of time is considered as ongoing, progressing, rather than as a static period. She further points out that the 'stretch of time' referred to by the verbal gerund is defined with

reference to the aspectual verbs. This is manifested in three ways: (a) regarding inceptive aspectual verbs, the moment that the main verbs refers to is identical with the beginning of the stretch of time that the complement refers to (e.g. I began/started talking to her); (b) regarding egressive aspectual verbs, the moment that the main verb refers to is identical with the end of the stretch of time that the complement refers to (e.g. I stopped/finished peeling); (c) regarding continuative aspectual verbs, the time that the main verb refers to is co-extensive with the time that the complement refers to.

I agree with these analyses. However, few studies have explored the aspectualizers in Mandarin Chinese. Mei et al. (1983b) list some words that have aspectual meanings.

Initiation: 開始 *kāishǐ* ‘begin; start; commence’, 肇始 *zhàoshǐ* ‘start; initiate’, 托始 *tuōshǐ* ‘origin’, 開端 *kāiduān* ‘beginning; start; outset’, 肇端 *zhàoduān* ‘beginning’, 造端 *zàoduān* ‘start; begin; originate’, 發端 *fāduān* ‘initiative; make a start’, 開頭 *kāitóu* ‘begin; start’, 上馬 *shàngmǎ* ‘mount, get on a horse; start’, 發軔 *fārèn* ‘set sth. afoot; commence an undertaking’, 入手 *rùshǒu* ‘start with’, 著手 *zhuóshǒu* ‘put one’s hand to; set about’, 動手 *dòngshǒu* ‘start work, get to work’, 下手 *xiàshǒu* ‘put one's hand to; start’, 開工 *kāigōng* ‘go into operation; start to work’, 興工 *xīnggōng* ‘start construction’, 動工 *dònggōng* ‘begin construction; begin a project; start building; break ground’, 上工 *shànggōng* ‘start work’, 破土 *pòtǔ* ‘break ground (in starting a building project, etc.)’, 破土動工 *pòtǔdònggōng* ‘begin a construction project by digging for the foundation’, 開學 *kāixué* ‘school opens; term begins’, 始業 *shǐyè* ‘the beginning of the school year’, 開市 *kāishì* ‘the first transaction of a day's business’, 開秤 *kāichèng* ‘begin business’, 開動 *kāidòng* ‘start; set in motion; bring into operation’, 開行 *kāixíng* ‘start a car, train, etc.’, 起步 *qǐbù* ‘start’, 啟程 *qǐchéng* ‘start on a journey’, 起程 *qǐchéng* ‘start on a journey’, 登程 *dēngchéng* ‘start off on a journey’, 上路 *shànglù* ‘set out on a journey’, 動身 *dòngshēn* ‘go to a place; set out on a journey’, 起身 *qǐshēn* ‘start on a journey’, 起行 *qǐháng* ‘start on a journey’, 出發 *chūfā* ‘set out; set off; start off’, 就道 *jiùdào* ‘start off; leave’, 首途 *shǒutú* ‘start a journey’, 發車 *fāchē* ‘depatch a vehicle’, 起航 *qǐháng* ‘set sail’

Interruption: 中斷 *zhōngduàn* ‘interrupt; discontinue; suspend; come to stop; break down (off)’, 中止 *zhōngzhǐ* ‘break; interrupt; discontinue’, 中輟 *zhōngchuò* ‘stop(doing sth.) halfway; give up halfway’, 停頓 *tíngdùn* ‘pause’, 間斷 *jiànduàn* ‘be disconnected; discontinuous; inconsecutive; intermittent’, 拋錨 *pāomáo* ‘drop anchor; cast anchor’, 剎車 *shāchē* ‘put on the brakes; brake a vehicle suddenly by applying the brakes’, 攔淺 *gēqiǎn*

‘take the ground; be stranded’, 半途而廢 *bàntúérfèi* ‘give up halfway’, 戛然而止 *jiáránérzhǐ* ‘screeching halt’, 輟學 *chuòxué* ‘discontinue one’s studies’, 輟演 *chuòyǎn* ‘stop performing’, 輟筆 *chuòbǐ* ‘stop in the middle of writing or painting’, 休學 *xiūxué* ‘suspend one’s schooling without losing one’s status as a student’, 休會 *xiūhuì* ‘adjourn; stand adjourned’, 休戰 *xiūzhàn* ‘truce; armistice; ceasefire’

Continuity: 繼續 *jìxù* ‘continue’, 延續 *yánxù* ‘continue; last; go on’, 接續 *jiēxù* ‘continue; follow; follow up’, 蟬聯 *chánlián* ‘continue to hold a post or title’, 繼武 *jìwǔ* ‘follow the trail blazed by one’s predecessor’, 繼承 *jìchéng* ‘succeed; inherit’

Cessation: 停止 *tíngzhǐ* ‘stop’, 終止 *zhōngzhǐ* ‘terminate’, 休止 *xiūzhǐ* ‘stop’, 止息 *zhǐxī* ‘cease’, 停息 *tíngxī* ‘cease’, 停歇 *tíngxiē* ‘close down; stop doing business’, 消停 *xiāotíng* ‘stop; rest’, 打住 *dǎzhù* ‘come to a halt’, 止住 *zhǐzhù* ‘halt’, 煞住 *shàzhù* ‘brake’, 下馬 *xiàmǎ* ‘dismount; discontinue (a project, etc.)’, 偃息 *yǎnxī* ‘cease’, 平息 *píngxī* ‘quiet down’, 停滯 *tíngzhì* ‘stagnate’, 僵化 *jiānghuà* ‘desiccate’, 打烊 *dǎyàng* ‘close the store for the night’, 熄滅 *xīmiè* ‘extinguish’, 停戰 *tíngzhàn* ‘armistice; truce; cessation of hostilities’, 停火 *tínghuǒ* ‘cease fire’

Termination: 結束 *jiéshù* ‘end’, 收束 *shōushù* ‘bring to a close’, 終止 *zhōngzhǐ* ‘terminate’, 終了 *zhōngliǎo* ‘end’, 告終 *gào zhōng* ‘come to an end; end up’, 收尾 *shōuwěi* ‘wind up’, 掃尾 *sǎowěi* ‘round off; wind up’, 終結 *zhōngjié* ‘end’, 散會 *sànhuì* ‘meeting terminate’, 閉會 *bìhuì* ‘close a meeting’, 閉幕 *bì mù* ‘close the conference; conclude the meeting’, 畢業 *bìyè* ‘graduate’

Completion: 完成 *wánchéng* ‘complete’, 完結 *wánjié* ‘complete; end; finish; close’, 告成 *gào chéng* ‘accomplish; complete’, 交卷 *jiāojuàn* ‘hand in an examination paper’, 完工 *wángōng* ‘complete a project’, 脫稿 *tuōgǎo* ‘(of a piece of writing) be completed; manuscript is completed’, 定稿 *dìnggǎo* ‘finalize a manuscript, text, etc.’, 殺青 *shāqīng* ‘completion of a book manuscript’, 脫手 *tuōshǒu* ‘get off one’s hands; sell; dispose of’, 出手 *chūshǒu* ‘(of hoarded goods) be disposed of’

Though all these words have aspectual meanings, some of them are VO compounds and cannot select another noun. For example:

Initiation: 開學 *kāixué* ‘school opens; term begins’, 始業 *shǐyè* ‘the beginning of the school year’, 開市 *kāishì* ‘the first transaction of a day’s business’, 開秤 *kāichèng* ‘begin business’,

發車 *fāchē* ‘depatch a vehicle’, 起航 *qǐháng* ‘set sail’

Interruption: 拋錨 *pāomáo* ‘drop anchor; cast anchor’, 剎車 *shāchē* ‘put on the brakes; brake a vehicle suddenly by applying the brakes’, 輟學 *chuòxué* ‘discontinue one’s studies’, 輟演 *chuòyǎn* ‘stop performing’, 輟筆 *chuòbǐ* ‘stop in the middle of writing or painting’, 休學 *xiūxué* ‘suspend one's schooling without losing one's status as a student’, 休會 *xiūhuì* ‘adjourn; stand adjourned’, 休戰 *xiūzhàn* ‘truce; armistice; ceasefire’

Cessation: 下馬 *xiàmǎ* ‘dismount; discontinue (a project, etc.)’, 停戰 *tíngzhàn* ‘armistice; truce; cessation of hostilities’, 停火 *tínghuǒ* ‘cease fire’

Termination: 散會 *sànhuì* ‘meeting terminate’, 閉會 *bìhuì* ‘close a meeting’, 閉幕 *bì mù* ‘close the conference; conclude the meeting’

Completion: 交卷 *jiāojiàn* ‘hand in an examination paper’, 脫稿 *tuōgǎo* ‘(of a piece of writing) be completed; manuscript is completed’, 定稿 *dìnggǎo* ‘finalize a manuscript, text, etc.’, 殺青 *shāqīng* ‘completion of a book manuscript’

From the words with aspectual meanings that can select another noun, I choose one word from each group. This word chosen is the most typical and generic aspectualizer in that group. The aspectualizers I examine include: the initiation word 開始 *kāishǐ* ‘begin’, the interruption word 中斷 *zhōngduàn* ‘interrupt’, the continuity word 繼續 *jìxù* ‘continue’, the cessation word 停止 *tíngzhǐ* ‘stop’, the termination word 結束 *jiéshù* ‘end’, and the completion word 完成 *wánchéng* ‘completion’. With the hypothesis that aspectualizers in Mandarin Chinese select events (Wang & Huang 2013b), the following sections survey two constructions that these aspectualizers usually occur in: “Subject+Aspectualizer+Object”, and “Subject+Aspectualizer”. I will answer the two questions: (a) What kind of nouns do aspectualizers select? (b) If the selected noun is an entity, does it violate our hypothesis?

2.3.1.2 Nouns Selected by Aspectualizers

This section examines the nouns selected by aspectualizers: the initiation word 開始 *kāishǐ* ‘begin’, the interruption word 中斷 *zhōngduàn* ‘interrupt’, the continuity word 繼續 *jìxù* ‘continue’, the cessation word 停止 *tíngzhǐ* ‘stop’, the termination word 結束 *jiéshù* ‘end’, and the completion word 完成 *wánchéng* ‘completion’.

2.3.1.2.1 Nouns Selected by 開始 *kāishǐ* ‘begin’

開始 *kāishǐ* ‘begin’ presupposes that the event does not pre-exist and refers to the initiation of the event (Nagy 2009, Wang & Huang 2013c).

Subject+開始 *kāishǐ* ‘begin’+Object

In the object position, words that 開始 *kāishǐ* ‘begin’ select include pure event nouns and event nominals, as shown in (57) and (58).

(57) 大多數 中國 選手 剛 開始 冬訓。(Gigaword)

Dàduōshù zhōngguó xuǎnshǒu gāng kāishǐ dōngxùn.
most China player just start winter training

‘Most Chinese players just started winter training.’

(58) 先期 到達 的 運動員 已經 開始 了 適應性 訓練。(Gigaword)

Xiānqī dàodá de yùndòngyuán yǐjīng kāishǐ le shìyìngxìng xùnlìan.
in advance arrive DE athlete already begin ASP adaptive training

‘Athletes who arrived early have begun adaptive training.’

In (57), 冬訓 *dōngxùn* ‘winter training’ is a pure event noun. In (58), 訓練 *xùnlìan* ‘training’ is an event nominal.

Human or organization can appear in the subject position, such as in (59) and (60).

(59) 於是 就在 弟弟 的 指導 下 , 她 開始 學 開車。(Sinica)

Yúshì jiù zài dìdì de zhǐdǎo xià, tā kāishǐ xué kāichē.
hence exactly under brother DE guidance under she begin learn drive a car

‘Hence under the guidance of her brother, she began to learn to drive.’

(60) 政府 開始 鼓勵 民間 辦學。(Sinica)

Zhèngfǔ kāishǐ gǔlì mínjiān bànxué.
government begin encourage non-governmental run a school

‘The government began to encourage people to run non-governmental schools.’

In (59) 她 *tā* ‘she’ is the agent of an action. In (60), the sentence has a logical metonymy,

using the organization 政府 *zhèngfǔ* ‘government’ to stand for the officers. The two examples indicate that the construction “Subject+開始 *kāishǐ* ‘begin’+Object” requires that the subject is a sentient agent, so in this construction 開始 *kāishǐ* ‘begin’ only selects non-natural events.

Subject+開始 *kāishǐ* ‘begin’

In the construction “subject + 開始 *kāishǐ* ‘begin’”, pure event nouns, event nominals, entities and time expressions can occur in the subject position, as shown from (61) to (64).

- (61) 升旗 典禮 準時 開始。(Gigaword)

Shēngqí *diǎnlǐ* zhǔnshí kāishǐ.

flag-raising ceremony on time start

‘The flag-raising ceremony started on time.’

- (62) 因為 一切 都 正在 規劃 中，設計 還沒 開始。(Gigaword)

Yīnwèi yīqiè dōu zhèngzài guīhuà zhōng, *shèjì* hái
because everything all now planning in the process of design still
méi kāishǐ.

not begin

‘Because everything is under planning, the design has not yet begun.’

- (63) 這項偉大工程開始了。(CCL)

Zhè xiàng wěidà *gōngchéng* kāishǐ le.

this CL great project begin ASP

‘This great project started.’

- (64) 新的學期 開始了。(Sinica)

Xīnde *xuéqī* kāishǐ le.

new semester begin ASP

‘The new semester began.’

In (61), 典禮 *diǎnlǐ* ‘ceremony’ is a pure event noun. 設計 *shèjì* ‘design’ in (62) is an event nominal. Both 典禮 *diǎnlǐ* ‘ceremony’ and 設計 *shèjì* ‘design’ are event nouns. In (63), 工

程 *gōngchéng* ‘project’ is an entity noun. In (64), 學期 *xuéqī* ‘semester’ is a temporal expression and 開始 *kāishǐ* ‘begin’ refers to the starting of the temporal period 學期 *xuéqī* ‘semester’. 學期 *xuéqī* ‘semester’ is not an event noun.

In the construction “Subject+開始 *kāishǐ* ‘begin’”, 開始 *kāishǐ* ‘begin’ selects not only non-natural events [(61) to (64)], but also natural events (65).

(65) a. 暴雨開始了。(Web)

Bàoyǔ **kāishǐ** le.
rainstorm begin ASP
‘Rainstorm began.’

b. *雨開始了。

***Yǔ** **kāishǐ** le.
rain begin ASP
* ‘Rain began.’

In (65)a, 暴雨 *bàoyǔ* ‘rainstorm’ is a natural event noun. But not all natural event nouns can be selected. In (65)b, though 雨 *yǔ* ‘rain’ is a natural event noun, (65)b is unacceptable. Because when 開始 *kāishǐ* ‘begin’ selects natural event nouns, it requires that the event is individualized as an episode or the event should have a strong effect. 雨 *yǔ* ‘rain’ is a general term, so (65)b is invalid.

(66) 選舉還沒開始。(Gigaword)

Xuǎnjǔ hái méi **kāishǐ**.
election still not start
‘The election has not started.’

In (66) 選舉 *xuǎnjǔ* ‘election’ is a non-natural kind event noun.

To summarize, this section has explored two constructions that 開始 *kāishǐ* ‘begin’ usually occurs in and the nouns it selects. In the construction “Subject+開始 *kāishǐ* ‘begin’ +Object”, the subject is an agent while the object is an event noun. In the construction “Subject+開始 *kāishǐ* ‘begin’”, the subject can be an event noun, entity noun or a temporal expression.

2.3.1.2.2 Nouns Selected by 中斷 *zhōngduàn* ‘interrupt’

中斷 *zhōngduàn* ‘interrupt’ means something is temporarily delayed or stopped from functioning.

Subject + 中斷 *zhōngduàn* ‘interrupt’ + Object

An agent or theme can be the subject of the construction “Subject + 中斷 *zhōngduàn* ‘interrupt’ + Object”. In (67) and (69), 英方 *yīngfāng* ‘Britain side’ and 公司 *gōngsī* ‘company’ stand for the officers. In (70), 梅傑 *Méijié* ‘Major’ is an agent. 英方 *yīngfāng* ‘Britain side’, 公司 *gōngsī* ‘company’ and 梅傑 *Méijié* ‘Major’ all have control over the events. In (68), 總統 *zǒngtǒng* ‘president’ is a theme. In either of the four cases, the subject is an animate being. The events that they have power on are non-natural events.

In the construction “Subject + 中斷 *zhōngduàn* ‘interrupt’ + Object”, pure event nouns, event nominals, entities and temporal expressions can appear in the object position, as shown from (67) to (70).

- (67) 後來，中英雙方就此舉行了十七輪談判，也由於英方中斷談判而沒有達成協議。(Gigaword)

Hòulái, zhōngyīng shuāngfāng jiùcǐ jǔxíng le shíqī lún tánpàn, yě
later Sino-Britain two sides on this hold ASP 17 round negotiation also
yóuyú yīngfāng zhōngduàn tánpàn ér
because Britain interrupt negotiation used to connect cause and effect
méiyǒu dáchéng xiéyì.
do not have achieve agreement

‘Later, Sino-Britain held 17 rounds of negotiations. Because Britain interrupted the negotiation, no agreement has been reached.’

- (68) 在法國治病的蒙博托總統被迫中斷治療回國。(Gigaword)

Zài fàguó zhìbìng de Méngbótuo zǒngtǒng bèipò zhōngduàn
in France treat an illness DE Mobutu president be forced to interrupt
zhìliáo huíguó.
treatment return country

‘President Mobutu, who was having medical treatment in France, was forced to interrupt the treatment and return to his country.’

- (69) 公司_決定 暫時 中斷 往返 沙特 阿拉伯 的 航班。(Gigaword)

Gōngsī juéding zànshí zhōngduàn wǎngfǎn Shātè'ālabó de hángbān.

company decide temporarily interrupt to and from Saudi Arabia DE flight

‘The Company decided to temporarily interrupt the flights to and from Saudi Arabia.’

- (70) 梅傑 昨天 中斷 假期， 回到 倫敦 主持 今天 的 緊急 會議。

Méijié zuótiān zhōngduàn jiàqī, huídào Lúndūn zhǔchí jīntiān de
Major yesterday interrupt holiday go back to London preside today DE
jǐnjí huìyì.

emergency meeting

‘Major interrupted his holiday yesterday, and went back to London to preside over today's emergency meeting.’

In (67), 談判 *tánpàn* ‘negotiation’ is a pure event noun. In (68), 治療 *zhìliáo* ‘treatment’ is an event nominal. 航班 *hángbān* ‘flight’ in (69) refers to an entity. 假期 *jiàqī* ‘holiday’ in (70) is a temporal expression. Both 談判 *tánpàn* ‘negotiation’ and 治療 *zhìliáo* ‘treatment’ are event nouns, while 航班 *hángbān* ‘flight’ and 假期 *jiàqī* ‘holiday’ are not.

In (71) -(73), the subjects 暴雨 *bàoyǔ* ‘rainstorm’, 颶風 *jùfēng* ‘hurricane’, 地震 *dìzhèn* ‘earthquake’ are all natural events. The objects selected by 中斷 *zhōngduàn* ‘interrupt’ can be pure event nouns, event nominals and entities.

- (71) 暴雨 中斷了 交通。(Web)

Bàoyǔ zhōngduàn le jiāotōng.

rainstorm interrupt ASP traffic

‘The rainstorm interrupted traffic.’

- (72) 颶風 中斷了 運輸。

Jùfēng zhōngduàn le yùnshū.

hurricane interrupt ASP transport

‘The hurricane interrupted the transport.’

- (73) 地震 中斷了 網絡。(Web)

Dìzhèn *zhōngduàn* le *wǎngluò*.
earthquake interrupt ASP network

‘The earthquake interrupted the network.’

In (71), 交通 *jiāotōng* ‘traffic’ is a pure event noun. In (72) 運輸 *yùnshū* ‘transport’ is an event nominal. In (73), 網絡 *wǎngluò* ‘network’ is an entity. All the three objects of 中斷 *zhōngduàn* ‘interrupt’ are non-natural.

Things that can be 中斷 *zhōngduàn* ‘interrupt’ normally have the feature [+controllable]. Thus no matter the subject is an animate being or a natural event noun, the nouns selected by 中斷 *zhōngduàn* ‘interrupt’ are non-natural.

Subject + 中斷 *zhōngduàn* ‘interrupt’

In the construction “Subject + 中斷 *zhōngduàn* ‘interrupt’”, the subject can be a pure event noun, an event nominal or an entity, as shown from (74) to (76).

(74) 俄羅斯外匯交易全面中斷。(Gigaword)

Èluósī wàihuì *jiāoyì* quánmiàn *zhōngduàn*.
Russia foreign exchange transaction fully interrupt

‘Russia’s foreign exchange transactions are fully interrupted.’

(75) 自一九八八年以來，幾乎國際社會對緬甸的所有經濟援助均已中斷。
(Gigaword)

Zì yījiǔbābā nián yǐlái, jīhū guójìshèhuì duì miǎndiàn de
since 1998 year since almost international community to Myanmar DE
suǒyǒu jīngjì *yuánzhù* jūn yǐ *zhōngduàn*.
all economic assistance without exception already interrupt

‘Since 1988, almost all economic assistances of the international community to Myanmar have interrupted.’

(76) 西部幹線南下北上列車都中斷。(Gigaword)

Xībù gànxiàn nán xià běi shàng *lièchē* dōu *zhōngduàn*.
Western trunk line south come down north come up train all interrupt

‘The western line south to north trains are all interrupted.’

In (74), 交易 *jiāoyì* ‘transaction’ is a pure event noun. In (75), 援助 *yuánzhù* ‘assistance’ is an event nominal. In (76), 列車 *lièchē* ‘train’ is an entity. The events selected by 中斷 *zhōngduàn* ‘interrupt’ are usually controllable, so it only selects non-natural events.

2.3.1.2.3 Nouns Selected by 繼續 *jìxù* ‘continue’

繼續 *jìxù* ‘continue’ presupposes that the event in concern has already taken place. Brinton (1991) argues that continuative aspectualizers behave similarly to progressive *be* by imperfectivizing the eventuality type they are operating on. In such a case, the event has no interruption, and therefore 繼續 *jìxù* ‘continue’ has a continuous reading. In Chinese, an event can be interrupted and then resume, which can also be called 繼續 *jìxù* ‘continue’ an event. For this case, 繼續 *jìxù* ‘continue’ has an inchoative reading. It depends on context whether 繼續 *jìxù* ‘continue’ has a continuous or inchoative reading.

Subject + 繼續 *jìxù* ‘continue’ + Object

In the construction “Subject + 繼續 *jìxù* ‘continue’ + Object”, the object can be a pure event noun, an event nominal or an entity, as shown in (77)-(79).

(77) 俄羅斯與車臣繼續激戰。(Gigaword)

Éluósī yǔ Chēchén jìxù jīzhàn.

Russia and Chechnya continue fierce fighting

‘Russia and Chechnya continue the fierce fighting.’

(78) 至於整個社會主義社會歷史時期是否始終存在某種階級鬥爭，這裡包括許多理論上和實踐上複雜和困難的問題，不是只靠引證前人的書本所能夠解決的，大家可以繼續研究。(CCL)

Zhìyú zhěnggè shèhuìzhǔyì shèhuì lìshǐ shíqí shìfǒu shǐzhōng
as for entire socialism society historical period whether or not all the time
cúnzài mǒuzhǒng jiējí dòuzhēng, zhèlǐ bāokuò xǔduō lǐlùnshàng hé
exist certain kind class struggle here include many theoretical and
shíjiànshàng fùzá hé kùnnán de wèntí, bùshì zhǐ kào yǐnzhèng
practical complex and difficult DE issue not only depend on cite
qián rén de shūběn suǒ nénggòu jiějué de, **dàjiā** kěyǐ
former people DE book Auxiliary can solve DE everyone can
jìxù yánjiū.

continue study

‘As for whether there exists some kind of class struggle during the historical period of the entire socialism society, here it includes many complex and difficult issues in theory and practice, which cannot be solved only by replying on citing previous books. Everyone can continue the study.’

- (79)將可以探知莫斯科新執政者在對外政策上是否繼續戈巴契夫的和平共存方針(Gigaword)

.....jiāng kěyǐ tànzīhī Mòsīkē xīn zhízhèngzhě zài duìwài zhèngcè
will can find out by inquiry Moscow new ruler on foreign policy
shàng shìfǒu jìxù Gēbāqífū de hépíng gòngcún fāngzhēn.
on whether or not continue Gorbachev DE peaceful coexistence policy

‘..... will be able to ascertain whether the new rulers of Moscow will continue Gorbachev's peaceful coexistence principle in foreign policy.’

In (77), 激戰 *jīzhàn* ‘fierce fighting’ is a pure event noun. In (78), 研究 *yánjiū* ‘study’ is an event nominal. In (79), 方針 *fāngzhēn* ‘policy’ is an abstract entity.

The subject of this construction can be an agent or theme. In (77), the two regions 俄羅斯與車臣 *Éluósī yǔ Chēchén* ‘Russia and Chechnya’ stand for the army of each party, which are agents. In (78) and (78), 大家 *dàjiā* ‘everybody’ and 新執政者 *xīn zhízhèngzhě* ‘new rulers’ are agents. The construction “Subject + 繼續 *jìxù* ‘continue’ + Object” requires an agent to continue an event, so 繼續 *jìxù* ‘continue’ here only selects non-natural event nouns.

Subject + 繼續 *jìxù* ‘continue’ + Verb

繼續 *jìxù* ‘continue’ usually does not occur in the construction “Subject+繼續 *jìxù* ‘continue’”. Rather, it requires a verb that follows 繼續 *jìxù* ‘continue’ to describe the status of the selected event.

- (80) 法國瘋牛症風波繼續擴大。(Gigaword)

Fàguó Fēngniúzhèng fēngbō jìxù kuòdà.
France Bovine Spongiform Encephalopathy disturbance continue expand

‘In French the disturbance of Bovine Spongiform Encephalopathy continues expanding.’

- (81) 拉斯穆森在哥本哈根發表的一份書面聲明說，如果社民黨內這場圍繞更換領導人問題所產生的爭論繼續發展下去，將對該黨產生非常不利的影響。

Lāsīmùsēn zài gēběnhāgēn fābiào de yī fēn shūmiàn
Anders Fogh Rasmussen in Copenhagen release DE one CL written
shēngmíng shuō, rúguǒ shè míndǎng nèi zhè chǎng wéirào
statement say if Social Democratic Party inside this CL around
gēnghuàn língdǎorén wèntí suǒ chǎnshēng de zhēnglùn jìxù
change leader issue Auxiliary arise DE debate continue
fāzhǎn xiàqù, jiāng duì gāi dǎng chǎnshēng fēicháng bùlìde yǐngxiǎng.
develop go on will to this party produce very adverse impact

‘Anders Fogh Rasmussen said in a written statement released by Copenhagen, if the debate arising from the change of leaders continues developing within Social Democratic Party, it will have a very adverse impact on the Party.’

- (82) 歐佩克 油價繼續 下跌。(Gigaword)

Ōupèikè yóujià jìxù xiàdiē.
OPEC oil price continue fall

‘The OPEC oil price continues falling.’

In the construction “Subject +繼續 *jìxù* ‘continue’ +Verb”, the subject is an event noun or a noun that has a range of value. In (80), 風波 *fēngbō* ‘disturbance’ is a pure event noun. In (81), 爭論 *zhēnglùn* ‘debate’ is an event nominal. They both are event nouns. In (82), 油價 *yóujià* ‘oil price’ is an entity noun, which has a value that can fall or rise.

This construction can select both natural and non-natural event nouns as subjects. In (80)-(82), 風波 *fēngbō* ‘disturbance’, 爭論 *zhēnglùn* ‘debate’ and 油價 *yóujià* ‘oil price’ are all non-natural events. When 繼續 *jìxù* ‘continue’ in this construction selects natural nouns as subjects, the verb is usually a light verb, as shown in (83).

- (83) 雨繼續 下。

Yǔ jìxù xià.
rain continue fall

‘The rain continues falling.’

In (83), 雨 *yǔ* ‘rain’ is a natural event noun and the verb 下 *xià* ‘fall’ is light in meaning.

2.3.1.2.4 Nouns Selected by 停止 *tíngzhǐ* ‘stop’

停止 *tíngzhǐ* ‘stop’ refers to bring an action to an end or an event comes to an end in itself.

There is a potential that the event may resume in the future.

Subject + 停止 *tíngzhǐ* ‘stop’ + Object

Pure event nouns, event nominals and entities can occur in the object position, as shown from (84) to (86).

- (84) 由十五位法官組成的國際法庭判決北約盟軍對南斯拉夫三十六天以來的轟炸行動違反國際法，並下令北約立即停止空襲。(Gigaword)

Yóu shíwǔ wèi fǎguān zǔchéng de guójífǎtíng pànjué
By 15 CL judge compose DE International Tribunal adjudicate
Běiyuē méngjūn duì Nánslāfū sānshíliù tiān yǐlái de hōngzhà xíngdòng wéifǎn
NATO Allies to Yugoslavia 36 day since DE bombing campaign violate
guójífǎ, bìng xiàlìng Běiyuē lìjǐ tíngzhǐ kōngxí.
International Law also order NATO immediately stop air strikes

‘The International Tribunal composed by 15 judges adjudicated that 36 days’ bombing campaign of NATO Allies to Yugoslavia violated International Law, and ordered NATO to stop air strikes immediately.’

- (85) 華盛頓決定停止對安曼的援助。(Gigaword)

Huáshèngdùn juédìng tíngzhǐ duì ānmàn de yuánzhù.
Washington decide stop to Amman DE aid

‘Washington decided to stop the aid to Amman.’

- (86) 今年四月，祕魯總統藤森謙也在軍方支持下，停止憲法，解散國會，獨攬大權。(Gigaword)

Jīnnián sìyuè, Bìlǔ zǒngtǒng Téngsēnqiān yě zài jūnfāng zhīchí
this year April Peruvian President Alberto Fujimori also under military support
xià, tíngzhǐ xiànfǎ, jiěsàn guóhuì, dúlǎn dàquán.
under stop constitution dissolve parliament arrogate all powers

‘In the April of this year, with military support, Peruvian President Alberto Fujimori also stopped the constitution, dissolved the parliament, and arrogated all powers.’

In (84), the noun selected by 停止 *tíngzhǐ* ‘stop’ is 空襲 *kōngxí* ‘air strikes’, which is a pure event noun. In (85), the selected noun 援助 *yuánzhù* ‘aid’ is an event nominal. In (86), the selected noun 憲法 *xiànfǎ* ‘constitution’ is an entity noun.

In (84), the subject 北約 *Běiyuē* ‘NATO’ has a logical metonymy, using the organization 北約 *Běiyuē* ‘NATO’ to stand for the people in NATO. In (85), the subject 華盛頓 *Huáshèngdùn* ‘Washington’ also goes through logical metonymy, using the capital 華盛頓 *Huáshèngdùn* ‘Washington’ to refer to the officers. In (86), 藤森謙 *Téngsēnqiān* ‘Alberto Fujimori’ is an agent. These examples show that the construction “subject + 停止 *tíngzhǐ* ‘stop’ + object” requires the subject has control over the event, so it only selects non-natural event nouns as objects.

Subject + 停止 *tíngzhǐ* ‘stop’

Pure event nouns, event nominals and entities can occur in the subject position, as shown from (87) to (89).

(87) 公司 希望 巴以 衝突 能 早日 停止, 以避免 平民 的 傷亡。 (Gigaword)

Gōngsī xīwàng BāYǐ *chōngtū* néng zǎorì tíngzhǐ, yǐ bimiǎn
company hope Israeli-Palestinian conflict can early stop to avoid
píngmín de shāngwáng.
civilian DE casualties

‘The company hopes that the Israeli-Palestinian conflict can stop as soon as possible, in order to avoid civilian casualties.’

(88) 戰亂 歲月, 基礎 研究 被迫 停止, 我 開始 了 應用 光學 研究。 (CCL)

Zhànluàn suìyuè, jīchǔ *yánjiū* bèipò tíngzhǐ, wǒ kāishǐ
chaos caused by war years basic research be forced to stop I begin
le Yìngyòng Guāngxué yánjiū.
ASP Applied Optics research

‘During the war years, basic research is forced to stop; I began the study on Applied Optics.’

- (89) 根據督導各級人民團體實施辦法的規定，人民團體經主管機關限期整理者，其理監事之**職權**應即**停止**。(Gigaword)

Gēnjù dūdǎo gèjí rénmíntuántǐ shíshī
in accordance with supervise all levels people's organizations implementation
bànfǎ de guīdìng, rénmíntuántǐ jīng zhǔguǎn jīguān
rule DE regulation people's organization via be in charge organization
xiànrī zhěnglǐ zhě, qí lǐjiānshì zhī
within a time limit rectification that which their directors and supervisors DE
zhíquán yīng jí **tíngzhǐ**.
function and power should promptly stop

‘In accordance with the provisions of the measures for implementation of the supervision of the people's organizations at all levels, regarding people's organizations that are required to make rectifications within a time limit by the organizations in charge, their directors and supervisors’ function and power should stop promptly.’

In (87), the pure event noun 衝突 *chōngtú* ‘conflict’ is selected by 停止 *tíngzhǐ* ‘stop’. In (88), 停止 *tíngzhǐ* ‘stop’ selects the event nominal 研究 *yánjiū* ‘study’. In (89), the selected noun 職權 *zhíquán* ‘function and power’ is an abstract entity.

停止 *tíngzhǐ* ‘stop’ describes the ending of an event, so in the construction “Subject + 停止 *tíngzhǐ* ‘stop’”, 停止 *tíngzhǐ* ‘stop’ can select either a natural or non-natural events as subjects. From (87) to (89), the subjects 衝突 *chōngtú* ‘conflict’, 研究 *yánjiū* ‘study’, 職權 *zhíquán* ‘function and power’ are all non-natural events. 停止 *tíngzhǐ* ‘stop’ can also select natural events, such as (90).

- (90) 由於**豪雨**還未**停止**，災情還會繼續擴大。(Gigaword)

Yóuyú **háoyǔ** hái wèi **tíngzhǐ**, zāiqíng hái huì jìxù kuòdà.
because heavy rain still not stop disaster situation still can continue expand

‘Because the heavy rain has not stopped, the disaster situation will continue to expand.’

In (90), the noun 豪雨 *háoyǔ* ‘heavy rain’ selected by 停止 *tíngzhǐ* ‘stop’ is a natural event.

2.3.1.2.5 Nouns Selected by 結束 *jiéshù* ‘end’

結束 *jiéshù* ‘end’ means an event terminates completely.

Subject + 結束 *jiéshù* ‘end’ + Object

- (91) 南斯拉夫 政府 要求 立刻 結束 暴亂。

Nánsīlāfū zhèngfǔ yāoqiú lìkè jiéshù bàoluàn.
Yugoslav government require immediately end riot

‘The Yugoslav government called for ending the riots immediately.’

- (92) 關於 中東 問題， 雙方 都 認為， 國際 社會 應 繼續 敦促 以 巴 雙方 盡 早 結束 以 暴制暴 的 惡性 循環， 政治 解決 中東 問題 是 唯一 可行 的 途徑。

Guānyú zhōngdōng wèntí, shuāngfāng dōu rènwéi, guójì shèhuì
as for Middle East issue both sides both think international community
yīng jìxù dūncù YǐBā shuāngfāng jǐnzǎo jiéshù
should continue urge Israel and Pakistan both sides ASAP end
yǐbào zhìbào de èxìng xúnhuán, zhèngzhì jiějué zhōngdōng
violence with violence DE vicious cycle political solve Middle East
wèntí shì wéiyī kěxíngde tújìng.
issue be sole feasible way

‘As for the Middle East issue, both sides think that the international community should continue to urge Israel and Pakistan to end the vicious cycle of violence with violence; political solution to the problems in the Middle East is the only feasible way.’

- (93) 目前 香港 已 結束 復活節 假期。 (Gigaword)

Mùqián Xiānggǎng yǐ jiéshù Fùhuójié jiàqī.
currently Hong Kong already end Easter holiday

‘Currently Hong Kong has ended the Easter holidays.’

In (91), the noun 暴亂 *bàoluàn* ‘riot’ selected by 結束 *jiéshù* ‘end’ is a pure event noun. In (92), the selected noun 循環 *xúnhuán* ‘circulation’ is an event nominal. In (93), the selected abstract entity noun 假期 *jiàqī* ‘holiday’ is a temporal expression. Both 暴亂 *bàoluàn* ‘riot’ and 循環 *xúnhuán* ‘circulation’ are event nouns, while 假期 *jiàqī* ‘holiday’ is not.

The subjects 政府 *zhèngfǔ* ‘government’, 雙方 *Yī Bā shuāngfāng* ‘two sides’, and 香港 *Xiānggǎng* ‘Hong Kong’ in (91), (92) and (93) have a logical metonymy, so they all refer to the officers. In the construction “Subject + 結束 *jiéshù* ‘end’ + Object”, the subject has control over the event, so this construction of 結束 *jiéshù* ‘end’ only selects non-natural events as objects.

Subject + 結束 *jiéshù* ‘end’

結束 *jiéshù* ‘end’ can select pure event nouns, event nominals, entity nouns and time expressions as its subject, as shown in (94) -(97).

- (94) 一九七五年 越戰結束。(Gigaword)

Yījiǔqīwǔ nián *yuèzhàn* *jiéshù*.

1975 year the Vietnam War end

‘In 1975, the Vietnam War ended.’

- (95) 今天的 演出結束 後受到現場觀眾如雷的掌聲。(Gigaword)

Jīntiān de *yǎnchū* *jiéshù* hòu shòudào xiànchǎng guānzhòng rú léi

today DE performance end after get on the spot audience like thunder
de zhǎngshēng.

DE applause

‘When the performance ended today, (they) got thunderous applause from the audience on the spot.’

- (96) 到 1932 年第一個五年 計劃結束 時，蘇聯的工業產量已從世界的第五位上升到第二位。(CCL)

Dào 1932 nián dìyīgè wǔ nián *jìhuà* *jiéshù* shí, Sūlián de

till 1932 year first five year plan end when the Soviet Union DE

gōngyè chǎnliàng yǐ cóng shìjiè de dìwǔwèi shàngshēngdào

industrial production already from world DE fifth place rise to

dìèrwèi.

second place

‘Till 1932, when the first 5-year plan ended, the Soviet Union's industrial production rose from fifth in the world to the second.’

(97) 對於我來說，**賽季**已經**結束**，現在最重要的是身體。

Duìyú wǒ láishuō, **sàiji** yǐjīng **jiéshù**, xiànzài zuìzhòngyào
as for me to say competition season already end now the most
important
de shì shēntǐ.
DE be body

‘For me, the competition season has ended, and now the most important is my body.’

In (94), the noun 越戰 *yuèzhàn* ‘the Vietnam War’ selected by 結束 *jiéshù* ‘end’ is a pure event noun. In (95), the selected noun 演出 *yǎnchū* ‘performance’ is an event nominal. In (96), the selected noun 計劃 *jìhuà* ‘plan’ is an entity noun. In (97), the noun 賽季 *sàiji* ‘competition season’ is a temporal expression.

2.3.1.2.6 Nouns Selected by 完成 *wánchéng* ‘complete’

完成 *wánchéng* ‘complete’ means an event comes to an end and especially to a perfected state.

Subject + 完成 *wánchéng* ‘complete’ + Object

In this construction, 完成 *wánchéng* ‘complete’ selects pure event nouns, event nominals and entity nouns as its objects, as shown from (98) to (100).

(98) 台大醫院 **完成** 首次冠狀動脈 **手術**。(Gigaword)

Táidà Yīyuàn **wánchéng** shǒuci guānzhuàngòngmài
National Taiwan University Hospital complete first time coronary artery
shǒushù.
surgery

‘National Taiwan University Hospital completed the first coronary surgery.’

(99) 俄羅斯原子能源部 **專家們**已**完成** 儲藏地的 **設計**。(Gigaword)

Èluósī yuánzǐnéngyuánbù **zhuānjiāmen** yǐ **wánchéng** chǔcángdì
Russian Atomic Energy Department experts already complete storage site
de **shèjì**.
DE design

‘Russian Atomic Energy Department experts have completed the design of the storage sites.’

- (100) 他們已完成了人類基因圖譜的初稿。(Gigaword)

Tāmen yǐ wánchéng le rénlei jīyīn túpǔ
they already complete ASP human genome a collection of illustrative plates
de chūgǎo.
DE first draft

‘They have completed the first draft of the human genome.’

In (98), the noun 手術 *shǒushù* ‘surgery’ selected by 完成 *wánchéng* ‘complete’ is a pure event noun. In (99), the selected noun 設計 *shèjì* ‘design’ is an event nominal. In (100), the selected noun 初稿 *chūgǎo* ‘first draft’ is an entity noun.

In “Subject + 完成 *wánchéng* ‘complete’ + Object”, the subject is either an agent or a theme. In (98), the organization 醫院 *yīyuàn* ‘hospital’ is a logical metonymy, standing for the doctors. They are the agent of the event because they carried out the operation.

- (101) 拉傷膝蓋的柯林頓今天順利完成手術。(Gigaword)

Lāshāng xīgài de Kēlìndùn jīntiān shùnlì wánchéng shǒushù.
strain knee DE Clinton today smoothly complete surgery

‘Clinton, who had his knee strained, smoothly completed a surgery today.’

- (102) 外交報告書在去年七月完成初稿。(Gigaword)

Wàijiāo Bào gào shū zài qùnián qīyuè wánchéng chūgǎo.
Foreign Affairs Report in last year July complete first draft

‘The first draft of the Foreign Affairs Report was completed in July last year.’

In (101), 柯林頓 *Kēlìndùn* ‘Clinton’ is the patient who underwent the operation. Similarly in (102), 外交報告書 *wàijiāo bàogào shū* ‘diplomacy report’ is what the 初稿 *chūgǎo* ‘first draft’ is about, so it is a theme. In the construction “Subject + 完成 *wánchéng* ‘complete’ + Object”, the event selected always involves human participants, so 完成 *wánchéng* ‘complete’ only selects non-natural events as objects.

Subject+ 完成 wánchéng ‘complete’

In this construction, 完成 wánchéng ‘complete’ can select pure event nouns, event nominals and entity nouns as its subjects, as shown in (103) -(105).

- (103) 接著 新人 拜見 男方 父母， 陳幸好 向 公婆 奉茶， 整個 儀式 圓滿 完成。

Jiēzhe xīnrén bàijiàn nánfāng fùmǔ, Chén Xīngyú xiàng
next new person pay a formal visit to male side parents Chen Xingyu to
gōngpó fèngchá, zhěnggè yíshì yuánmǎn wánchéng.
mother-in-law serve tea entire ceremony successfully complete

‘Next the bride paid a formal visit to the bridegroom’s parents, Chen Xingyu served tea to her mother-in-law, the entire ceremony successfully completed.’

- (104) 巴拉圭 地方 選舉 順利 完成。

Bālāguī dìfāng xuǎnjǔ shùnlì wánchéng.
Paraguay local election smoothly complete

‘Paraguay smoothly completed the local election.’

- (105) 行政 改革 基本 方案 已 完成。(Gigaword)

Xíngzhèng gǎigé jīběn fāng'àn yǐ wánchéng.
administrative reform basic scheme already complete

‘The basic scheme of administrative reform has already been completed.’

In (103), the noun selected by 完成 wánchéng ‘complete’ is 儀式 yíshì ‘ceremony’, which is a pure event noun. In (104), the selected noun 選舉 xuǎnjǔ ‘election’ is an event nominal. In (105), the selected noun 方案 fāng'àn ‘scheme’ is an abstract entity. The aspectualizer 完成 wánchéng ‘complete’ requires strong human involvement, so it only selects non-natural events as subjects.

To summarize, this section has investigated six aspectualizers: 開始 kāishǐ ‘begin’, 中斷 zhōngduàn ‘interrupt’, 繼續 jìxù ‘continue’, 停止 tíngzhǐ ‘stop’, 結束 jiéshù ‘end’, and 完成 wánchéng ‘complete’. I have the following findings:

First, 開始 kāishǐ ‘begin’, 中斷 zhōngduàn ‘interrupt’, 停止 tíngzhǐ ‘stop’, 結束 jiéshù ‘end’, and 完成 wánchéng ‘complete’ usually occur in two constructions:

“Subject+Aspectualizer+Object” and “Subject+Aspectualizer”. 繼續 *jìxù* ‘continue’ only appears in the first construction. When it occurs in the second construction, it requires an explicit manifestation of a verb related to the event, such as (106).

(106) 研討會繼續進行。(Web)

Yántǎohuì jìxù jìnxíng.
seminar continue proceed

‘The seminar continues proceeding.’

In (106), the light verb 進行 *jìnxíng* ‘carry out’ is explicitly expressed. It sounds incomplete without 進行 *jìnxíng* ‘carry out’. The results are shown in Table 14.

Table 14. Two Constructions of Aspectualizers

Aspectualizers		Subject+Aspectualizer+Object	Subject+Aspectualizer
Initiation	開始 <i>kāishǐ</i> ‘begin’	+	+
Interruption	中斷 <i>zhōngduàn</i> ‘interrupt’	+	+
Continuity	繼續 <i>jìxù</i> ‘continue’	+	-
Cessation	停止 <i>tíngzhǐ</i> ‘stop’	+	+
Termination	結束 <i>jiéshù</i> ‘end’	+	+
Completion	完成 <i>wánchéng</i> ‘complete’	+	+

Secondly, aspectualizers can select pure event nouns, event nominals, entity nouns or temporal expressions. Both pure event nouns and event nominals are event nouns, while entity nouns and temporal expressions are not. The results are shown in Table 15.

Table 15. Nouns that Aspectualizers Select

Aspectualizers		Event Nouns		Entity Nouns	Temporal Expressions
		Pure Event Nouns	Event Nominals		
Initiation	開始 <i>kāishǐ</i> ‘begin’	+	+	+	+
Interruption	中斷 <i>zhōngduàn</i> ‘interrupt’	+	+	+	+

Continuity	繼續 <i>jìxù</i> 'continue'	+	+	+	-
Cessation	停止 <i>tíngzhǐ</i> 'stop'	+	+	+	+
Termination	結束 <i>jiéshù</i> 'end'	+	+	+	+
Completion	完成 <i>wánchéng</i> 'complete'	+	+	+	-

In the construction “Subject+Aspectualizer+Object”, event nouns appear in the object position and there is always human involvement in the event, so aspectualizers here only select non-natural events as objects. In the construction “Subject+Aspectualizer”, event nouns occur in the subject position and the aspectualizer indicates the stage of the event, so aspectualizers 開始 *kāishǐ* ‘begin’, 停止 *tíngzhǐ* ‘stop’, and 結束 *jiéshù* ‘end’ select both natural and non-natural events as subjects. 中斷 *zhōngduàn* ‘interrupt’ and 完成 *wánchéng* ‘complete’ do not select natural kind events. These are indicated in Table 16.

Table 16. Natural and Non-Natural Events that Aspectualizers select in Different Constructions

Aspectualizers		Subject+Aspectualizer+Object	Subject+Aspectualizer
Initiation	開始 <i>kāishǐ</i> 'begin'	Non-Natural events	Non-Natural events, Natural events
Interruption	中斷 <i>zhōngduàn</i> 'interrupt'	Non-Natural events	Non-Natural events
Continuity	繼續 <i>jìxù</i> 'continue'	Non-Natural events	-
Cessation	停止 <i>tíngzhǐ</i> 'stop'	Non-Natural events	Non-Natural events, Natural events
Termination	結束 <i>jiéshù</i> 'end'	Non-Natural events	Non-Natural events, Natural events
Completion	完成 <i>wánchéng</i> 'complete'	Non-Natural events	Non-Natural events

Table 16 can be re-represented as Table 17. 開始 *kāishǐ* ‘begin’, 繼續 *jìxù* ‘continue’, 停止 *tíngzhǐ* ‘stop’ and 結束 *jiéshù* ‘end’ select both natural and non-natural events. 中斷 *zhōngduàn* ‘interrupt’ and 完成 *wánchéng* ‘complete’ only select non-natural events.

Table 17. Natural and Non-Natural Events that Aspectualizers Select

Aspectualizers		Natural Events	Non-natural Events
Initiation	開始 <i>kāishǐ</i> ‘begin’	+	+
Interruption	中斷 <i>zhōngduàn</i> ‘interrupt’	-	+
Continuity	繼續 <i>jìxù</i> ‘continue’	+	+
Cessation	停止 <i>tíngzhǐ</i> ‘stop’	+	+
Termination	結束 <i>jiéshù</i> ‘end’	+	+
Completion	完成 <i>wánchéng</i> ‘complete’	-	+

Besides event nouns, entity nouns are also selected by aspectualizers, which seems to be contrary to the hypothesis that aspectualizers select events. In the following section, I will examine the compositional mechanisms of aspectualizers, which will show that entity nouns being selected actually undergo type coercion.

2.3.1.3 Compositional Mechanisms

GL proposes a rich compositional representation through generative devices (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). Under a tripartite system of the domain of individuals (i.e., natural types, artifactual types and complex types), GL establishes three mechanisms at work when a predicate selects an argument.

- (i) Pure Selection (Type Matching): the type a function requires is directly satisfied by the argument;
- (ii) Accommodation: the type a function requires is inherited by the argument;
- (ii) Type Coercion: the type a function requires is imposed on the argument type. This is accomplished by either:
 - (a) Exploitation: taking a part of the argument’s type to satisfy the function;
 - (b) Introduction: wrapping the argument with the type required by the function.

This section examines the compositional mechanisms of aspectualizers and their selected nouns.

2.3.1.3.1 Pure Selection and Accommodation

Aspectualizers demonstrate the stage of an event. Thus when the nouns they select are event nouns (i.e., pure event nouns and event nominals), the compositional mechanism at work is

pure selection/accommodation.

(107) shows the derivation when the aspectualizer 結束 *jiéshù* ‘end’ selects the event noun 內戰 *nèizhàn* ‘civil war’.

- (107) a. 結束 *jiéshù* ‘end’ is of type event→t;
b. 內戰 *nèizhàn* ‘civil war’ is of type artifactual event;
c. Accommodation Subtyping applies, artifactual event \sqsubseteq event:
⇒ 內戰 *nèizhàn* ‘civil war’ is of type event;
d. Function Application (Type Matching) applies:
⇒ *jiéshù* (*nèizhàn*)

Other aspectualizers’ selection to event nouns has similar derivation.

In the construction “Subject + Aspectualizer+Object”, when the object is a pure event noun or event nominal, the aspectualizer selects it through pure selection/accommodation. In (108), the pure event noun 內戰 *nèizhàn* ‘civil war’ is selected by 結束 *jiéshù* ‘end’ through pure selection/accommodation. In (109), the event nominal 夢想 *mèngxiǎng* ‘dream’ is also selected through pure selection/accommodation.

- (108) 黎巴嫩 最近 結束 長達 十六年 的 內戰。 (Gigaword)

Líbanèn zuìjìn jiéshù zhǎngdá shíliù nián de *nèizhàn*.
Lebanon recently end as long as 16 year DE civil war

‘Lebanon recently ended the civil war that is as long as 16 years.’

- (109) 「想飛的小孩」背景是 50 年代的 鄉間，描述 一群 懷抱 夢想 的小孩 同心協力，發揮 想像力 和 創造力，完成 飛行的 夢想。 (Gigaword)

‘Xiǎng fēi de xiǎohái’ bèijǐng shì 50 niándài de xiāngjiān, miáoshù
want fly DE children background be 1950s DE countryside describe
yī qún huáibào mèngxiǎng de xiǎohái tóngxīn xiélì,
a group embrace dream DE children through make concerted efforts
fāhuī xiǎngxiànglì hé chuàngzàolì, wánchéng fēixíng
develop (an idea, a theme, etc.) imagination and creativity complete flight
DE dream
de *mèngxiǎng*.

‘Children who Want to Fly’ sets the story in the countryside in the 1950s. It

describes a group of children, who embraced a dream, made concerted efforts, developed their imaginations and creativity, and completed the dream of flight.’

In the construction “Subject+Aspectualizer”, when the subject is a pure event noun or an event nominal, the aspectualizer selects it by means of pure selection/accommodation. In (110), the pure event noun 戰爭 *zhànzhēng* ‘war’ is selected by 開始 *kāishǐ* ‘begin’ in the way of pure selection/accommodation. In (111), the event nominal 建設 *jiànshè* ‘construction’ is selected by 完成 *wánchéng* ‘complete’ through pure selection/accommodation.

- (110) 美國對伊拉克的 **戰爭** **開始** 了。(Gigaword)

Měiguó duì Yīlākè de **zhànzhēng** **kāishǐ** le.
America to Irap DE war begin ASP

‘The U.S. war with Iraq began.’

- (111) 南安遊客中心目前正在興建中，硬體 **建設** 今年底可 **完成**，明年四月將可落成啟用。

Nán’ān yóukè zhōngxīn mùqián zhèngzài xīngjiàn zhōng,
Nan’an Visitor Center currently in the process of construct in the course of
yìngtǐ **jiànshè** jīnnián dǐ kě **wánchéng**, míngnián sìyuè jiāng kě
hardware construction this year end can complete next year April will can
luòchéng qǐyòng.
complete start using

‘Nan’an Visitor Center is currently under construction; hardware construction will be completed by the end of this year and will start using from April next year.’

When an event noun is selected by an aspectualizer, a light verb related to the event noun may appear. They form a construction “Subject+ Aspectualizer +Light Verb”. The event noun being selected is in the subject position, which can be either a natural or non-natural event, as shown in (112) and (113).

- (112) 綿綿的 **細雨** 已經 **開始** 下了。(CCL)

Miánmián de **xìyǔ** yǐjīng **kāishǐ xià** le.
continuous DE drizzle already begin fall ASP

‘The continuous drizzle has begun to fall.’

(113) 怕人的戰鬥開始進行了。(CCL)

Pàrénde *zhàndòu* kāishǐ jìnxíng le.
terrifying battle begin proceed ASP

‘The terrifying battle began to proceed.’

In (112) 開始 *kāishǐ* ‘begin’ selects a natural event noun 細雨 *xìyǔ* ‘drizzle’ and the light verb 下 *xià* ‘fall’ that appears after 開始 *kāishǐ* ‘begin’ is related to 細雨 *xìyǔ* ‘drizzle’. In (113), 開始 *kāishǐ* ‘begin’ selects a non-natural event noun 戰鬥 *zhàndòu* ‘battle’ and the light verb 進行 *jìnxíng* ‘carry out’ that follows 開始 *kāishǐ* ‘begin’ is related to 戰鬥 *zhàndòu* ‘battle’. The two sentences are equally acceptable without the light verbs.

2.3.1.3.2 Type Coercion

In the above section, we have noticed that aspectualizers sometimes select entity nouns. It seems to contradict the hypothesis that they only select events. In this section, I will show that actually these entity nouns go through type coercion, and therefore have an event reading.

2.3.1.3.2.1 Telic Role Coercion

In the construction ‘Subject + Aspectualizer + Object’, when the object is an entity, it can have an event reading through telic role coercion. For example, in (114), the aspectualizer 中斷 *zhōngduàn* ‘interrupt’ selects an entity noun 航線 *hángxiàn* ‘airline’.

(114) 波斯灣戰爭期間，沙國因約旦親伊拉克而中斷沙約航線。

Bōsīwānzhànzhēng qījiān, shāguó yīn yuēdàn
the Persian Gulf War period Saudi Arabia because Jordan
qīn Yīlākè ér zhōngduàn Shā Yuē
be on intimate terms with Iraq so that interrupt Saudi Arabia Jordan
hángxiàn.
airline

‘During the Persian Gulf War, due to Jordan pro-Iraq, Saudi Arabia interrupted the Saudi Arabia-Jordan airline.’

航線 *hángxiàn* ‘airline’ has a telic role ‘fly’ as illustrated in (115).

$$(115) \left[\begin{array}{l} \text{航線 } hángxiàn \text{ 'airline'} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{airplane}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{route} \\ \text{TELIC} = \text{fly on } (x, y) \end{array} \right] \end{array} \right]$$

In fact, in (114), 航線 *hángxiàn* ‘airline’ is coerced by 中斷 *zhōngduàn* ‘interrupt’ to have an event reading through its telic role. That is, the flying function is interrupted.

This is proved by the fact that aspectualizers can occur in the construction ‘Subject+ Aspectualizer + Verb’. The verb is a qualia role of the subject and an event is related to the subject, as shown in (116).

- (116) a. 此次泥石流導致橫南線旅客列車臨時中斷運行。(CCL)

Cǐ cì níshíliú dǎozhì héngnán xiàn lǚkè *lièchē* línshí
 this CL mudslide cause Hengfeng-Nanping line passenger train temporarily
zhōngduàn yùnxíng.
 interrupt running

‘This mudslides caused Hengfeng-Nanping line trains temporarily being interrupted from running.’

- b. 此次泥石流導致橫南線旅客列車臨時中斷。

Cǐ cì níshíliú dǎozhì héngnán xiàn lǚkè *lièchē* línshí
 this CL mudslide cause Hengfeng-Nanping line passenger train temporarily
zhōngduàn.
 interrupt

‘This mudslides caused Hengfeng-Nanping line trains temporarily being interrupted’

In (116)b, 列車 *lièchē* ‘train’ is an entity which is scheduled along a timeline. In (116)a, 運行 *yùnxíng* ‘running’ is the telic role of 列車 *lièchē* ‘train’ as illustrated in (117).

$$(117) \left[\begin{array}{l} \text{列車 } lièchē \text{ 'train'} \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x: \text{vehicle} \\ \text{TELIC} = \text{run}(x) \end{array} \right] \end{array} \right]$$

The telic role 運行 *yùnxíng* ‘running’ can be syntactically expressed or not. In (116)a, it is explicitly expressed, while in (116)b, it is not. Both sentences are valid.

In the construction ‘Subject + Aspectualizer’, the subject selected by the aspectualizer can be an entity noun. For example, 中斷 *zhōngduàn* ‘interrupt’ selects non-eventive entity nouns as subjects, such as 電力 *diànlì* ‘electric power’, 通訊 *tōngxùn* ‘communication’, 關係 *guānxi* ‘relationship’, 信號 *xìnhào* ‘signal’, 電路 *diànlù* ‘circuit’. These nouns are coerced to have an event reading through qualia exploitation of the telic role. An example is shown in (118).

(118) 山崩造成部分道路中斷。(Gigaword)

Shānbēng zàochéng bùfèn dàolù zhōngduàn.

landslide cause some road cut off

‘Landslides caused the cutoff of some roads.’

In (118), 道路中斷 *dàolù zhōngduàn* ‘roads cut off’ refers to the disability of the traffic function of the roads. The reading comes from 道路 *dàolù* ‘road’’s telic role, as shown in (119). 道路 *dàolù* ‘road’ is used for travelling by vehicles or individuals.

(119)
$$\left[\begin{array}{l} \text{道路 } dàolù \text{ ‘road’} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{vehicle or individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{path} \\ \text{TELIC} = \text{travel on } (x, y) \end{array} \right] \end{array} \right]$$

2.3.1.3.2.2 Agentive Role Coercion

In the construction ‘Subject + Aspectualizer + Object’, when the object is an entity noun, it can be coerced to have an event reading through agentive role coercion. For instance, the aspectualizer 繼續 *jìxù* ‘continue’ selects some entity nouns, such as 路線 *lùxiàn* ‘route’, 議程 *yìchéng* ‘agenda’, 進程 *jìnchéng* ‘process’, 航程 *hángchéng* ‘voyage’, 行程 *xíngchéng* ‘itinerary’, and 旅程 *lǚchéng* ‘journey’. As a matter of fact, they are coerced to be events through Qualia Exploitation of the agentive role.

For example, in (120), 政策 *zhèngcè* ‘policy’ is coerced to mean carrying out the policy, which is the agentive role of 政策 *zhèngcè* ‘policy’, as illustrated in (121). 繼續……政策 *jìxù……zhèngcè* ‘continue……policy’ means to continue implementing the policy.

(120) 聯邦儲備局在會中可能決定繼續目前的信用政策。

Liánbāngchǔbèijú zài huì zhōng kěnéng juéding jìxù

Federal Reserve Board in meeting in course of possible decide continue

mùqián de xìnyòng zhèngcè.

current DE credit policy

‘Federal Reserve Board may decide to continue the current credit policy in their meeting.’

- (121)
$$\left[\begin{array}{l} \text{政策 } zhèngcè \text{ ‘policy’} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{abstract entity} \\ \text{AGENTIVE} = \text{implement}(x, y) \end{array} \right] \end{array} \right]$$

The aspectualizer 完成 *wánchéng* ‘complete’ also selects entity nouns, such as 初稿 *chūgǎo* ‘first draft’, 作業 *zuòyè* ‘work, task’, 草案 *cǎo'àn* ‘draft’, 計劃 *jìhuà* ‘plan’, 項目 *xiàngmù* ‘item’, and 法案 *fǎ'àn* ‘bill’. These nouns undergo coercion with Qualia Exploitation of the agentive role.

- (122) 美國宣佈已 完成 人類基因圖譜的 草圖。(Gigaword)

Měiguó xuānbù yǐ wánchéng rénlèi jīyīn
The United States announce already complete human genome
túpǔ de cǎotú.
a collection of illustrative plates DE sketch

‘The United States announced that it has already completed a sketch of the human genome.’

In (122), 草圖 *cǎotú* ‘sketch’ is coerced to represent the drawing up event, which is the agentive role of 草圖 *cǎotú* ‘sketch’, as illustrated in (123).

- (123)
$$\left[\begin{array}{l} \text{草圖 } cǎotú \text{ ‘sketch’} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{diagram} \\ \text{AGENTIVE} = \text{draw}(x, y) \end{array} \right] \end{array} \right]$$

In the construction ‘Subject + Aspectualizer’, when the subject is an entity noun, it can be coerced to have an event reading through agentive role coercion. The following provides examples of the aspectualizers 開始 *kāishǐ* ‘begin’, 停止 *tíngzhǐ* ‘stop’ and 完成 *wánchéng* ‘complete’.

- (124) 在 項目開始 之前, 臨朐縣婦女聯合會圍繞女性參與政治的意願、女性參政的比較優勢、農村婦女的組織需求進行了調查。(CCL)

Zài xiàngmù kāishǐ zhīqián, línqú xiàn fùnǚliánhéhuì wéirào nǚxìng

On item begin before Linqu couty Women's Federation around female
 cānyù zhèngzhì de yìyuàn, nǚxìng cānzhèng de bǐjiào
 participate in politics DE wish female participate in politics DE comparative
 yōushì, nóngcūn fùnǚ de zǔzhī xūqiú jìnxíng le diàochá.
 advantage rural women DE organization demand carry out ASP investigation

‘Prior to the start of the item, Linqu Women's Federation conducted an investigation on the willingness of women to participate in politics, the comparative advantage of women in politics, and rural women's organization demand.’

In (124), the aspectualizer 開始 *kāishǐ* ‘begin’ selects the abstract entity 項目 *xiàngmù* ‘item’ as a subject. 項目 *xiàngmù* ‘item’ has an agentive role ‘carry out’, as illustrated in (125).

$$(125) \left[\begin{array}{l} \text{項目 } xiàngmù \text{ 'item'} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{abstract entity} \\ \text{AGENTIVE} = \text{carry out } (x, y) \end{array} \right] \end{array} \right]$$

In (124), 項目 *xiàngmù* ‘project’ undergoes type coercion from an entity to the carrying out event.

(126) shows an example that the aspectualizer 停止 *tíngzhǐ* ‘stop’ selects an entity noun 工程 *gōngchéng* ‘project’.

(126) 二期 工程也絕不能 停止。(Gigaword)

Èr qī ***gōngchéng*** yě jué bùnéng ***tíngzhǐ***.
 second phase project also absolutely cannot stop

‘The second phase of the project also absolutely cannot stop.’

工程 *gōngchéng* ‘project’ has an agentive role ‘carry out’ as illustrated in (127).

$$(127) \left[\begin{array}{l} \text{工程 } gōngchéng \text{ 'project'} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{abstract entity} \\ \text{AGENTIVE} = \text{carry out } (x, y) \end{array} \right] \end{array} \right]$$

In (126), 工程 *gōngchéng* ‘project’ is coerced to have the event reading of carrying out an event through agentive role coercion.

(128) shows an example that the aspectualizer 完成 *wánchéng* ‘complete’ selects an entity

noun 草案 *cǎo'àn* 'draft'.

(128) 公務人員 考試法 修正 **草案** 已經 **完成**。(Gigaword)

Gōngwùrényuán kǎoshìfǎ xiūzhèng **cǎo'àn** yǐjīng **wánchéng**.
civil servants Examination Act amendment draft already complete

'The amendment draft of Civil Service Examination Act has already been completed.'

草案 *cǎo'àn* 'draft' has an agentive role 'lay down' as illustrated in (129).

(129)
$$\left[\begin{array}{l} \text{草案 } cǎo'àn \text{ 'draft'} \\ \text{ARGSTR} = [\text{D-ARG1} = x: \text{individual}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = y: \text{scheme} \\ \text{AGENTIVE} = \text{lay down } (x, y) \end{array} \right] \end{array} \right]$$

In (128), 草案 *cǎo'àn* 'draft' is coerced to the event *laying down the draft*. This is agentive role coercion.

To sum up, this section has explained that in both the constructions 'Subject + Aspectualizer + Entity' and 'Entity + Aspectualizer', the entity is coerced to have an event reading through either telic role coercion or agentive role coercion. This leads support to the hypothesis that in Mandarin Chinese, the aspectualizers select events.

2.3.1.4 Situation Types

This section examines the situation types that aspectualizers select.

The aspectualizer 開始 *kāishǐ* 'begin' selects complements with duration and dynamism. Thus it can co-occur with activities and accomplishments, rather than states and achievements.

(130) 玄武湖 西南湖 已經 **開始** **抽水**。(Gigaword)

Xuánwǔhú xīnánhú yǐjīng **kāishǐ chōushuǐ**.
Xuanwu Lake the Southwest Lake already begin pumping

'The Southwest Lake of Xuanwu Lake has already begun pumping.'

In (130), 抽水 *chōushuǐ* 'pumping' is an activity and 開始抽水 *kāishǐ chōushuǐ* 'begin pumping' refers to the beginning of pumping.

- (131) 卡夫卡一回到家就開始寫那封信，就跟寫自己的小說時一樣專注。(Web)

Kǎfūkǎ yīhúidàojiā jiù kāishǐ xiě nà fēng xìn, jiù gēn
Kafka on arriving home at once begin write that CL letter exactly same as
xiě zìjǐ de xiǎoshuō shí yīyàng zhuānzhù.
write his own DE novel when the same as focused

‘On arriving home, Kafka began to write that letter, as focused as he was writing his own novels.’

In (131), 寫那封信 *xiě nà fēng xìn* ‘write that letter’ is an accomplishment and 開始寫那封信 *kāishǐ xiě nà fēng xìn* ‘begin to write that letter’ refers to the starting of writing that letter.

Rarely are there event nouns that represent accomplishments, so aspectualizers do not have a choice of accomplishment type event nouns.

There are process event nouns (activities) and instant event nouns (achievements). Since aspectualizers refer to a certain stage of an event, they tend to select activities, rather than achievements, as shown in (132) and (133).

- (132) 舊金山股市要收盤時，剛好新加坡股市開始交易。(Gigaword)

Jiùjīnshān gǔshì yào shōupán shí,
San Francisco stock market will closing quotation (on the exchange, etc.) time
gānghǎo Xīnjiāpō gǔshì kāishǐ jiāoyì.
just Singapore stock market begin trading

‘When stock markets in San Francisco are about to close, the stock markets in Singapore are just to start trading.’

In (132), 交易 *jiāoyì* ‘trading’ is an activity and 開始交易 *kāishǐ jiāoyì* ‘start trading’ means the beginning of trading.

- (133) ! 叛變開始了。

! Pànbìan kāishǐ le.
mutiny begin ASP

! ‘The mutiny began.’

In (133), 叛變 *pànbìan* ‘mutiny’ is an achievement, and it is weird to say it starts.

2.3.1.5 Summary

This section analyzed the selectional restrictions of aspectualizers. The hypothesis that in Mandarin Chinese aspectualizers select events is verified. This is achieved either through pure selection/accommodation or type coercion.

2.3.2 Other Eventive Features

Localizers, temporal expressions and frequency adjectives are all very useful criteria of identifying event nouns. Since former studies have made adequate analysis, I do not discuss them here.

2.4 Use Light Verbs to Identify Event Nouns

Light verbs are a special class of verbs in Mandarin Chinese. They have been the focus of linguistic research for a long time (Wang 1959, Gong 1961, Yin 1980, Song 1982, Mei et al. 1983a, Yuan & Xia 1984, Zhou 1985, Zhu 1985a, Cai 1986, Chen 1987, Peng 1987, Zhou 1987a, Zhou 1987b, Li 1990, Hu & Fan 1995, Guo 2002, Xing 2003, Diao 2004a, 2004b, Song 2005, Yu et al. 2005, Yu 2008, Yang 2009, Du 2010, Huang et al. 2011, Huang & Lin 2013). These verbs have many names in the literature: 形式動詞 *xíngshì dòngcí* ‘dummy/form verb’ (Lü 1980, Hu & Fan 1995, Yu et al. 2005), 先導動詞 *xiāndǎo dòngcí* ‘pilot verb’ (Fan et al. 1987), 無色動詞 *wú sè dòngcí* ‘colorless verb’ (Song 1982), 准謂賓動詞 *zhǔnwèibīn dòngcí* ‘quasi-predicate-as-object verb’ (Huang & Liao 1991), 虛義動詞 *xūyì dòngcí* ‘light meaning verb’ (Yuan & Xia 1984, Diao 2004a, 2004b), 虛化動詞 *xūhuà dòngcí* ‘dummy verb’ (Zhu 1985a). In this study, I call them light verbs, because they are semantically bleached.

2.4.1 Literature Review

2.4.1.1 Words that are Light Verbs

Many light verbs have been identified. For example:

Yin (1980): 進行 *jìnxíng* ‘conduct; carry out’, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 給以 *gěiyǐ* ‘give; grant’, 予以 *yǔyǐ* ‘give; grant’, 給予 *jǐyǔ* ‘give; render’, 作 *zuò* ‘do’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 受到 *shòudào* ‘receive; get; suffer; come under; be subject to’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’, 展開 *zhǎnkāi*

‘develop; spread; launch; unfold’, 開展 *kāizhǎn* ‘develop; launch’, 作出 *zuòchū* ‘make (a decision, etc.)’, 致以 *zhìyǐ* ‘extend’, 得到 *dédào* ‘get; obtain; gain; receive’, 寄予 (與) *jìyǔ (yǔ)* ‘place (hope, etc.) on’, 致力 *zhìlì* ‘dedicate to; work for’, 遭受 *zāoshòu* ‘suffer; be subject to’, 遭到 *zāodào* ‘suffer; meet with; encounter’, 接受 *jiēshòu* ‘accept’, 促進 *cùjìn* ‘promote; advance; boost’, 經受 *jīngshòu* ‘stand’, 禁不起 *jīnbùqǐ* ‘be unable to stand (tests, trials, etc.)’, 禁得起 *jīndeǐ* ‘be able to stand (tests, trials, etc.); withstand’, 有 *yǒu* ‘have; possess; there is; exist’;

Zhu (1985a): 進行 *jìnxíng* ‘conduct; carry out’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給予 *jǐyǔ* ‘give; render’, 給以 *gěiyǐ* ‘give; grant’, 予以 *yǔyǐ* ‘give; grant’, 作 *zuò* ‘do’;

Cai (1986): 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給以 *gěiyǐ* ‘give; grant’, 致以 *zhìyǐ* ‘extend’, 予以 *yǔyǐ* ‘give; grant’;

Chen (1987): 作出 *zuòchū* ‘make (a decision, etc.)’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 進行 *jìnxíng* ‘conduct; carry out’ in;

(Zhou 1987a): 加以 *jiāyǐ* type: 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給以 *gěiyǐ* ‘give; grant’, 予以 *yǔyǐ* ‘give; grant’, 給予 *jǐyǔ* ‘give; render’ and 進行 *jìnxíng* type: 進行 *jìnxíng* ‘conduct; carry out’, 作 *zuò* ‘do’;

Diao (2004a), and Diao (2004b): 做 *zuò* ‘do’ type: 進行 *jìnxíng* ‘conduct; carry out’, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 做 *zuò* ‘do’, 作 *zuò* ‘do’, 搞 *gǎo* ‘do; be engaged in; be in’, 幹 *gàn* ‘do; work; be engaged in’, 弄 *nòng* ‘do; manage; get; fetch’ and 處置 *chǔzhì* ‘dispose’ type: 加(以) *jiā (yǐ)* ‘inflict...on/upon...; impose’, 給予 *jǐyǔ* ‘give; render’, 予(以) *yǔ (yǐ)* ‘give; grant’, 給以 *gěiyǐ* ‘give; grant’.

These words are more or less semantically void and do not contribute much information to the meaning of a construction.

Aspectualizers are sometimes also taken as light verbs. Since they express aspectual meaning and have their own selectional restrictions as stated in *Section 2.3.1 Aspectualizers*. This section will not include them.

2.4.1.2 Syntactic Features of Light Verbs

Different from typical verbs, light verbs have less verbal features. This is shown in the analysis of Du (2010), as depicted in Table 18. He analyses the syntactic feature differences

between typical verbs and two kinds of light verbs: DVa and DVb. DVb has more verbal features than DVa.

Table 18. Differences between Typical Verbs and Light Verbs (Du 2010: P18)

Verbs \ Grammatical Features		Reduplicate	Followed by Aspectual Marker	Be Negated by 沒 <i>méi</i> 'not have'	Answer Questions Individually
Common verbs		+	+	+	+
Dummy Verbs (DV)	DVa: 加以 <i>jiāyǐ</i> 'inflict...on/upon...; impose', 予以 <i>yǔyǐ</i> 'give; grant', 給以 <i>gěiyǐ</i> 'give; grant', 給予 <i>jǐyǔ</i> 'give; render'	-	(+)	-	-
	DVb: 進行 <i>jìnxíng</i> 'conduct; carry out', 從事 <i>cóngshì</i> 'be engaged in; go in for; devote oneself to'	-	+	(+)	(+)

Yang (2009) argues that light verbs are a type of verbs whose meaning weakening leads to the weakening of their verbal functions. Their weakening degree can be judged according to their verbal syntactic functions. The more weakening these verbs are, the simpler their verbal syntactic functions are. Their syntactic features are shown in Table 19. The more “+” a light verb has, the farther it is from the prototype light verb. On the contrary, the less “+” a light verb has, the nearer it is from the prototype light verb. The results show that DVb has more verbal properties than DVa. The findings are shown in Table 19.

Table 19. Syntactic Functions of Dummy Verbs (Yang 2009: P27)

Dummy Verbs		DVa				DVb	
		加以 <i>jiāyǐ</i> 'inflict...on/up on...; impose'	予以 <i>yǔyǐ</i> 'give; grant'	給以 <i>gěiyǐ</i> 'give; grant'	給予 <i>jǐyǔ</i> 'give; render'	進行 <i>jìnxíng</i> 'conduct; carry out'	作 <i>zuò</i> 'do'
Syntactic Functions							
Reduplicate		-	-	-	-	-	-
Questioned by V 不 V		-	-	-	-	±	±
Free		-	-	-	±	±	±
Aspectual Marker	著 <i>zhe</i> 'progressive aspect'	-	-	-	-	+	+
	了 <i>le</i> 'perfective aspect'	-	-	±	+	+	+
	過 <i>guò</i> 'experiential aspect'	-	-	-	-	+	+
complements		-	-	-	-	+	+

The research of Yang (2009), and Du (2010) indicates that light verbs are more like non-typical verbs.

2.4.1.3 Syntactic Categories of the Objects of Light Verbs

Light verbs take objects of different syntactic categories, such as verbal objects, nominal objects and verbal objects that have a complex modifier. Most studies have a consensus that the objects of light verbs are nominalized (Wang 1959, Gong 1961, Wang 1980, Zhu 1985a, Peng 1987, Li 1990, Guo 2002). I agree with this idea.

2.4.1.4 Semantic Properties of the Objects of Light Verbs

The objects of light verbs show different semantic properties. Zhou (1987b) compares the semantic features of the objects of 進行 *jìnxíng* 'conduct; carry out' and 加以 *jiāyǐ* 'inflict...on/upon...; impose', as shown in Table 20.

Table 20. Comparison between 進行 *jìnxíng* ‘conduct; carry out’ and 加以 *jiāyǐ* ‘inflict...on/upon...; impose’ (Zhou 1987b: P5)

Selection to different words and phrases		進行			加以		
		進行	Example		加以	Example	
Verbs	intransitive verb	+	進行合作 <i>jìnxíng hézuò</i>	‘carry out cooperation’	-	*加以合作 <i>*jiāyǐ hézuò</i>	*‘inflict operation’
	mental transitive verb	-	*進行信任 <i>*jìnxíng xìnren</i>	*‘carry out trust’	+	加以信任 <i>jiāyǐ xìnren</i>	*‘inflict trust’
	durative transitive verbs	+	進行討論 <i>jìnxíng tāolùn</i>	‘carry out discussion’	+	加以討論 <i>jiāyǐ tāolùn</i>	inflict discussion’
	non-durative transitive verbs	-	*進行解決 <i>*jìnxíng jiějué</i>	*‘carry out resolution’	+	加以解決 <i>jiāyǐ jiějué</i>	‘inflict resolution’
Adverbs	temporal adverbs	+	曾經進行討論 <i>céngjīng jìnxíng tāolùn</i>	‘once carried out a discussion’	-	*曾經加以討論 <i>*céngjīng jiāyǐ tāolùn</i>	*‘once inflict discussion’
	mood adverbs	+	竟然進行訓練 <i>jìngrán jìnxíng xùnlìan</i>	‘unexpectedly carry out training’	+	竟然加以訓練 <i>jìngrán jiāyǐ xùnlìan</i>	‘unexpectedly inflict training’
	modal verbs	+	可以進行審查 <i>kéyǐ jìnxíng shēnchá</i>	‘can carry out a check’	+	能加以審查 <i>néng jiāyǐ shēnchá</i>	‘can inflict check’
	adjectives	+	認真進行教育 <i>rènzhēn jìnxíng jiàoyù</i>	‘seriously carry out education’	+	認真加以教育 <i>rènzhēn jiāyǐ jiàoyù</i>	‘seriously inflict education’
Prepositions on Phrases	對-PP	+	對提案進行審議 <i>duì tī'àn jìnxíng shěnyì</i>	‘carry out examination to the proposal’	+	對提案加以審議 <i>duì tī'àn jiāyǐ shěnyì</i>	‘inflict examination to the proposal’
	向+NP	+	向學生進行宣傳 <i>xiàng xuéshēng jìnxíng xuānchuán</i>	‘carry out publicity to the students’	-	*向學生加以宣傳 <i>*xiàng xuéshēng jiāyǐ xuānchuán</i>	*‘inflict publicity to students’
	在+NP	+	在學員中進行輔導 <i>zài xuéyuán zhōng jìnxíng fūdǎo</i>	‘carry out counseling to trainees’	-	*在學員中加以輔導 <i>*zài xuéyuán zhōng jiāyǐ fūdǎo</i>	*‘inflict counseling to trainees’
	把-PP	-	*把帳目進行清查 <i>*bǎ zhàngmù jìnxíng qīngchá</i>	*‘carry out a check to the accounts’	+	把帳目加以清查 <i>bǎ zhàngmù jiāyǐ qīngchá</i>	‘inflict check to accounts’
Attributes	numeral+classifier construction	+	進行兩星期的培訓 <i>jìnxíng liǎng xīngqī de péixùn</i>	‘carry out a two-week training’	-	加以兩星期的培訓 <i>jiāyǐ liǎng xīngqī de péixùn</i>	‘inflict a two-week training’
	nouns and noun phrases	+	進行機構調整 <i>jìnxíng jīgòu tiáozhěng</i>	‘carry out adjustments to the institutions’	-	加以機構調整 <i>jiāyǐ jīgòu tiáozhěng</i>	‘inflict adjustments to the institutions’
	verbs and verb	+	進行畢業教育 <i>jìnxíng</i>	‘carry out graduation’	-	*加以畢業 <i>*jiāyǐ bìyè</i>	*‘inflict graduation’

	phrases		育	<i>biyè jiàoyù</i>	education'		教育	<i>jiàoyù</i>	education'
	adjectives and adjective phrases	+	進行認真討論	<i>jìnxíng rènzhēn tāolùn</i>	'carry out careful discussion'	+	加以認真討論	<i>jiāyǐrènzhēn tāolùn</i>	'inflict careful discussion'
		+	進行對家長的教育	<i>jìnxíngduìjiā chángdejiàoyù</i>	'carry out education to parents'	-	*加以對家長的教育	<i>*jiāyǐduìjiā chángdejiàoyù</i>	*'inflict education to parents'

Zhou (1987a) argues that DVa expresses exerting and granting meanings. The semantic features of the objects of DVa can be denoted by [+ complete] [- continuous] [- process] [+ requirements Patient]; the semantic features of the objects of DVb can be denoted by [- complete] [+ continuous] [+ process] [± requirements Patient], as shown in Table 21.

Table 21. Semantic Features of the Objects of DVa and DVb (Zhou 1987a: P11)

Semantic Features of the Objects	DVa: 加以 <i>jiāyǐ</i> 'inflict...on/upon...; impose', 予以 <i>yǔyǐ</i> 'give; grant', 給以 <i>gěiyǐ</i> 'give; grant', 給予 <i>jǐyǔ</i> 'give; render'	DVb: 進行 <i>jìnxíng</i> 'conduct; carry out', 作 <i>zuò</i> 'do'
[short-time completion]	+	-
[durative]	-	+
[process]	-	+
[require patient]	+	±

Hu and Fan (1995) compare DVa and DVb, as shown in Table 22.

Table 22. Semantic Features of the Objects of DVa and DVb (Hu & Fan 1995: P271)

Semantic Features of the Objects	DVa: 加以 <i>jiāyǐ</i> 'inflict...on/upon...; impose', 予以 <i>yǔyǐ</i> 'give; grant', 給以 <i>gěiyǐ</i> 'give; grant', 給予 <i>jǐyǔ</i> 'give; render'	DVb: 進行 <i>jìnxíng</i> 'conduct; carry out', 作 <i>zuò</i> 'do'
[short-time completion]	+	-
[dynamic]	±	+
[require patient]	+	±

Yu (2008) has these findings. (I) Both DVa and DVb's objects are 自主動詞 *zìzhǔ dòngcí* 'volitional verbs'. (II) valence of the objects: (i) DVa cannot take one-place predicates, while DVb can. When DVa takes two-place predicates, they always have the following

restrictions: (a) verb with obvious positive or negative polarity, such as 表揚 *biǎoyáng* ‘praise’, 駁斥 *bóchì* ‘refute’, 歪曲 *wāiqū* ‘distort’; (b) verbs with obvious change meaning, such as 提高 *tígāo* ‘improve’, 改造 *gǎizào* ‘transform’, 推廣 *tuīguǎng* ‘promote’; (c) verbs that often take abstract patient objects, such as 分析 *fēnxī* ‘analyze’, 研究 *yánjiū* ‘research’, 克服 *kèfú* ‘overcome’. (ii) DVb can take both monovalent and bivalent verbs, except mental verbs. The analysis is shown in Table 23.

Table 23. Objects of DVa and DVb (Yu 2008: P25)

Dummy Verbs	Objects of Dummy Verbs		
	Volitional Verb	Monovalent Verbs	Bivalent Verbs
DVa: 加以 <i>jiāyǐ</i> ‘inflict...on/upon...; impose’, 予以 <i>yǔyǐ</i> ‘give; grant’, 給以 <i>gěiyǐ</i> ‘give; grant’, 給予 <i>jǐyǔ</i> ‘give; render’	+	-	(a) verbs with obvious positive or negative polarity; (b) Verbs with obvious change meaning; (c) verbs that often take abstract patient objects
DVb: 進行 <i>jìnxíng</i> ‘conduct; carry out’, 作 <i>zuò</i> ‘do’	+	+ (except mental verbs)	

Previous research has explored the semantic properties of the objects of two kinds of light verbs: DVa and DVb. I agree with most of the analysis, except that 進行 *jìnxíng* ‘conduct; carry out’ and 作 *zuò* ‘do’ do not take mental verbs (Zhou 1987b, Yu 2008). For example, 進行思考 *jìnxíng sīkǎo* ‘conduct thinking’ and 作思考 *zuò sīkǎo* ‘do thinking’ are both acceptable.

This thesis examines a larger number of light verbs based on corpus data. The 21 light verbs I will explore are listed in Table 24.

Table 24. Light Verbs

進行	<i>jìnxíng</i>	‘conduct; carry out’
從事	<i>cóngshì</i>	‘be engaged in; go in for; devote oneself to’
做	<i>zuò</i>	‘do’
作	<i>zuò</i>	‘do’
作出	<i>zuòchū</i>	‘make (a decision, etc.)’
搞	<i>gǎo</i>	‘do; be engaged in; be in’

幹	<i>gàn</i>	‘do; work; be engaged in’
弄	<i>nòng</i>	‘do; manage; get; fetch’
加以	<i>jiāyǐ</i>	‘inflict...on/upon...; impose’
給予	<i>jǐyǔ</i>	‘give; render’
予以	<i>yǔyǐ</i>	‘give; grant’
給以	<i>gěiyǐ</i>	‘give; grant’
受到	<i>shòudào</i>	‘receive; get; suffer; come under; be subject to’
遭到	<i>zāodào</i>	‘suffer; meet with; encounter’
遭受	<i>zāoshòu</i>	‘suffer; be subject to’
禁得起	<i>jīn de qǐ</i>	‘be able to stand (tests, trials, etc.); withstand’
禁不起	<i>jīn bù qǐ</i>	‘be unable to stand (tests, trials, etc.)’
展開	<i>zhǎn kāi</i>	‘develop; spread; launch; unfold’
開展	<i>kāi zhǎn</i>	‘develop; launch’
引起	<i>yǐn qǐ</i>	‘give rise to; lead to; cause; touch off’
促進	<i>cù jìn</i>	‘promote; advance; boost’

The following sections are arranged as follows. Section 2.4.2 shows the sense of light verbs on which they are light. Section 2.4.3 examines objects of light verbs. Section 2.4.4 examines the selectional properties of light verbs.

2.4.2 Senses of Light Verbs

Most verbs in Table 24 are polysemous in dictionaries, with one or more senses representing the dummy feature. That is, being light in meaning.

Table 25 shows the senses of 做 ‘do; make’ in *The Contemporary Chinese Dictionary* (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012). The senses on which this verb is light is marked with “Yes” in the third column “Light Verb or not”.

The criterion for deciding which sense is light is to see whether it is an action that has a direct impact on the complement. It seems that when the complement is an entity, these verbs always have a concrete meaning, while when the complement expresses an event, these verbs are light.

For example, in Table 25, 做 *zuò* has a sense ‘be; become’ in 做官 *zuò guān* ‘hold an official post; be an official’. In this sense, 做 *zuò* is not a light verb. On the other hand, 做 *zuò* can

simply mean engaged in an activity, such as 做買賣 *zuò mǎimài* ‘do business; buy and sell’. Here 做 *zuò* ‘do; make’ is a light verb.

Table 25. Senses of 做 *zuò*

Sense No.	Sense	Example	Light Verb or not
①	製造 <i>zhìzào</i> ‘do; make; produce; manufacture’	做衣服 <i>zuò yīfu</i> ‘make clothes’	No
②	寫作 <i>xiězuò</i> ‘write; compose’	做文章 <i>zuò wénzhāng</i> ‘write an article’	No
③	從事某種工作或活動 <i>cóngshì mǒu zhǒng gōngzuò huò huódòng</i> ‘do; act; engage in’	做買賣 <i>zuò mǎimài</i> ‘do business; buy and sell’	Yes
④	舉行家庭的慶祝或紀念活動 <i>jǔ xíng jiātíng de qìngzhù huò jìniàn huódòng</i> ‘hold a family or home celebration’	做壽 <i>zuòshòu</i> ‘hold a birthday party for an elder’	Yes
⑤	充當; 擔任 <i>chōngdāng; dānrèn</i> ‘be; become’	做官 <i>zuòguān</i> ‘hold an official post; be an official’	No
⑥	用做 <i>yòngzuò</i> ‘be used as’	做教材 <i>zuò jiàocái</i> ‘be used as teaching material’	No
⑦	結成(關係) <i>jiéchéng (guānxi)</i> ‘form or contract a (relationship)’	做朋友 <i>zuò péngyou</i> ‘make friends with’	No
⑧	假裝出(某種模樣) <i>jiǎzhuāng chū (mǒu zhǒng múyàng)</i> ‘pretend; feign; make believe; do sth. for appearance’s sake’	做鬼臉 <i>zuò guǐliǎn</i> ‘make faces’	No

2.4.3 Objects of Light Verbs

Huang et al. (2011) find that 進行 *jìnxíng* ‘conduct; carry out’ has three kinds of objects: (i) derived event nominal: 討論 *tǎolùn* ‘discussion’, 直播 *zhíbō* ‘live broadcast’, 修憲 *xiūxiàn* ‘constitutional amendment’; (ii) simple noun: 決賽 *juésài* ‘final contest’; (iii) VP: 驗票 *yàn piào* ‘vote inspection’. The first two kinds are event nouns.

Same with 進行 *jìnxíng* ‘conduct; carry out’, other light verbs also usually take these kinds of objects. For instance, 做 takes: (i) event nominals: 運動 *yùndòng* ‘sports’, 詮釋 *quánshì* ‘interpretation’, 裝飾 *zhuāngshì* ‘decoration’; (ii) pure event nouns: 早操 *zǎocāo* ‘morning

exercises’, 發財夢 *fācáimèng* ‘the dream of getting rich’, 日光浴 *rìguāngyù* ‘sunbathing’;

(iii) VP. 搞 takes: (i) event nominals: 設計 *shèjì* ‘design’, 實驗 *shíyàn* ‘experiment’, 選舉 *xuǎnjǔ* ‘election’, 訓練 *xùnlìan* ‘training’; (ii) pure event nouns: 手術 *shǒushù* ‘surgery’, 舞臺劇 *wǔtái jù* ‘stage play’, 陰謀 *yīnmóu* ‘conspiracy’; (iii) VP.

A light verb and its selected event noun have different contributions. The light verb gives the event shape, but it does not select actual event content. The event noun specifies the actual event content and event structure.

2.4.4 Selectional Properties of Light Verbs

This section examines light verbs selectional properties from five respects:

- (I) Selection to natural and non-natural kind event nouns;
- (II) Selection to instant and durative event nouns;
- (III) Selection to individual-level and stage-level event nouns;
- (IV) Selection to event nouns with polarity properties;
- (V) Selection to mental activity nouns and social activity nouns.

2.4.4.1 Selection to Natural and Non-natural Kind Event Nouns

Light verbs differ in their ability in selecting natural and non-natural kinds of event nouns. For instance, 做 *zuò* ‘do’ can select both natural and non-natural kinds, while 搞 *gǎo* ‘do; be engaged in; be in’ only selects non-natural kinds as shown in (134) and (135).

(134) Natural Kinds:

a. 於是她們 做 著 甜美的 夢, 進入 夢鄉。(Sinica)

Yúshì tāmen zuò zhe tiánměide mèng, jìnrù mèngxiāng.

hence they do ASP sound dream enter sleep

‘Hence they go to sleep while dreaming a sweet dream, to sleep.’

Non-natural Kinds:

b. 曾有兩位醫師以自己 做 實驗 分別服食該菌而導致急性胃炎。(Sinica)

Céng yǒu liǎng wèi yīshī yǐ zìjǐ zuò shíyàn fēnbéi

Once have two CL physicians use themselves do experiment respectively
fúshí gāi jūn ér dǎozhì jíxìng wèiyán.
take this fungus and that cause acute gastritis

‘Once two physicians use themselves to do an experiment; they took this fungus respectively, which caused acute gastritis.’

(135) Non-natural Kinds:

您在大學時代曾經**搞**過學生**運動**，這是否也相對影響到您後來的寫作？(Sinica)

Nín zài dàxué shídài céngjīng **gǎo** guò xuéshēng **yùndòng**, zhè
you in college time once do ASP student movement this
shìfǒu yě xiāngduì yǐngxiǎngdào nín hòulái de xiězuò?
whether or not also relatively affect you later DE writing

‘You have been engaged in the student movement in college. Does it also relatively affect you later writing?’

(134) shows the kinds of nouns that 做 zuò ‘do’ selects. In (134) a, 夢 mèng ‘dream’ is a series of imaginary events occurring during one’s sleep. It is a natural kind event noun. In (134) b, 實驗 shíyàn ‘experiment’ is a pure event noun, which is a non-natural kind event noun. 搞 gǎo ‘do; be engaged in; be in’ only selects non-natural kind. In (135), it selects the event nominal 運動 yùndòng ‘movement’.

I explored the selection of all light verbs. The results are: (i) light verbs that select natural and non-natural kind event nouns: 做 zuò ‘do’, 作 zuò ‘do’, 受到 shòudào ‘receive; get; suffer; come under; be subject to’, 遭到 zāodào ‘suffer; meet with; encounter’, 遭受 zāoshòu ‘suffer; be subject to’, 禁得起 jīndeqǐ ‘be able to stand (tests, trials, etc.); withstand’, 禁不起 jīnbùqǐ ‘be unable to stand (tests, trials, etc.)’, 引起 yǐnqǐ ‘give rise to; lead to; cause; touch off’; (ii) light verbs that select non-natural kind event nouns: 進行 jìnxíng ‘conduct; carry out’, 從事 cóngshì ‘be engaged in; go in for; devote oneself to’, 作出 zuòchū ‘make (a decision, etc.)’, 搞 gǎo ‘do; be engaged in; be in’, 幹 gàn ‘do; work; be engaged in’, 弄 nòng ‘do; manage; get; fetch’, 加以 jiāyǐ ‘inflict...on/upon...; impose’, 給予 jǐyǔ ‘give; render’, 予以 yǔyǐ ‘give; grant’, 給以 gěiyǐ ‘give; grant’, 展開 zhǎnkāi ‘develop; spread; launch; unfold’, 開展 kāizhǎn ‘develop; launch’, 促進 cùjìn ‘promote; advance; boost’.

Most natural events have their own specific light verbs. For example, the light verb that describes 風 *fēng* ‘wind’ is 刮 *guā* ‘blow’. The light verb that describes 雨 *yǔ* ‘rain’ and 雪 *xuě* ‘snow’ is 下 *xià* ‘fall’.

When a light verb selects non-natural kinds, its subject normally has no control over the event. For example, in (134) a, one has no say in whether to experience a dream. However, light verbs differ in the controlling ability in selecting artifactual type and artifactual complex type event nouns. Some light verbs such as 遭受 *zāoshòu* ‘suffer; be subject to’ are permanently passive, so they have no control over the object, as shown in (136).

- (136) 雖然許多旅遊業者都 遭受 金融風暴的 打擊，但是今年的旅遊展卻受到業者非常熱烈的反應。(Sinica)

Suīrán xǔduō lǚyóuyèzhě dōu zāoshòu jīnróng fēngbào de dǎjī,
although many people in tourism all suffer financial turmoil DE attack
dànshì jīnnián de lǚyóuzhǎn què shòudào yèzhě fēicháng
but this year DE tourism exhibition but get people in tourism very
rèliède fǎnyìng.
impassioned reaction

‘Although many tourism suffered financial turmoil, but this year's tourism exhibition got an impassioned reaction of this industry.’

In (136), the attack of financial turmoil is something that the tour operators are unwilling to undergo. Hence the subject has no control over the event.

On the other hand, some light verbs have more power over the event as shown in (137). 作決定 *zuò juéding* ‘make a decision’ is an event that the subject can make by himself/herself.

- (137) 你一定要早 作 決定。(Sinica)

Nǐ yīdìng yào zǎo zuò juéding.
you must should early make decision

‘You must make an early decision.’

Here I provide the result of all light verbs I examined:

- (I) No control when selecting natural kinds: 做 *zuò* ‘do’, 作 *zuò* ‘do’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’

(II) No control when selecting any type: 受到 *shòudào* ‘receive; get; suffer; come under; be subject to’, 遭到 *zāodào* ‘suffer; meet with; encounter’, 遭受 *zāoshòu* ‘suffer; be subject to’, 禁得起 *jīndeqǐ* ‘be able to stand (tests, trials, etc.); withstand, 禁不起 *jīnbùqǐ* ‘be unable to stand (tests, trials, etc.)’

(III) Subject control when selecting non-natural kinds: 做 *zuò* ‘do’, 作 *zuò* ‘do’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’, 進行 *jìnxíng* ‘conduct; carry out’, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 作出 *zuòchū* ‘make (a decision, etc.)’, 搞 *gǎo* ‘do; be engaged in; be in’, 幹 *gàn* ‘do; work; be engaged in’, 弄 *nòng* ‘do; manage; get; fetch’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給予 *jǐyǔ* ‘give; render’, 予以 *yǔyǐ* ‘give; grant’, 給以 *gěiyǐ* ‘give; grant’, 展開 *zhǎnkāi* ‘develop; spread; launch; unfold’, 開展 *kāizhǎn* ‘develop; launch’, 促進 *cùjìn* ‘promote; advance; boost’.

The differences in controlling ability can be explained by the Module-Attribute Representation of Verbal Semantic (MARVS) theory. It is a theory for the representation of verbal semantics based on Mandarin Chinese (Huang et al. 2000, Wang & Huang 2010e, 2011e). MARVS classifies lexical knowledge into two types of modules: event modules and role modules, as well as two sets of attributes: event-internal attributes and role-internal attributes.

The event modules are comprised of five atomic event structures: boundary[.], punctuality[/], process[///], state[__] and stage[^^^]. They are the only building blocks necessary to capture the range of complex linguistic event structure. Event-internal attributes refer to the semantics of the event itself, such as [control], [effect] etc. Role modules are the focused roles of an event and typically include all required arguments and can include optional arguments and adjuncts. These roles are identified as Agent, Cause, Causer, Comparison, Experiencer, Goal, Instrument, Incremental Theme, Location, Locus, Manner, Range, Recipient, Source, Target, Theme, etc. Role-internal attributes refer to the internal semantics of a particular focused role (of the event), such as [sentience], [volition], [affectedness], [design], etc.

In (I) the subject and the complement are both themes. In (II) the subject is a patient that undergoes the event represented by the complement. In (III), the subject is an agent and the complement is a theme or patient, so the former has control over the latter.

2.4.4.2 Selection to Instant and Durative Event Nouns

Light verbs vary in their ability in taking instant or durative events. Some LVCs express

events that are too short to be considered durative. For instance, 做決定 *zuò juéding* ‘make a decision’ can happen in a very limited period of time. Some other light verbs, however, only select durative events, such as 受到攻擊 *shòudào gōngjī* ‘suffer from an attack’.

I investigated all the light verbs about whether they select instant or durative event nouns. The results are: (i) both Instantaneous and durative event noun selector: 做 *zuò* ‘do’, 作 *zuò* ‘do’, 作出 *zuòchū* ‘make (a decision, etc.)’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給予 *jǐyǔ* ‘give; render’, 予以 *yǔyǐ* ‘give; grant’, 給以 *gěiyǐ* ‘give; grant’; (ii) durative event noun selector: 進行 *jìnxíng* ‘conduct; carry out’, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 搞 *gǎo* ‘do; be engaged in; be in’, 幹 *gàn* ‘do; work; be engaged in’, 弄 *nòng* ‘do; manage; get; fetch’, 受到 *shòudào* ‘receive; get; suffer; come under; be subject to’, 遭到 *zāodào* ‘suffer; meet with; encounter’, 遭受 *zāoshòu* ‘suffer; be subject to’, 禁得起 *jīndeǒ* ‘be able to stand (tests, trials, etc.); withstand’, 禁不起 *jīnbùqǐ* ‘be unable to stand (tests, trials, etc.)’, 展開 *zhǎnkāi* ‘develop; spread; launch; unfold’, 開展 *kāizhǎn* ‘develop; launch’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’.

2.4.4.3 Selection to Individual-Level and Stage-Level Event Nouns

The differences between the individual level and stage level adjectives and nouns are observed by many scholars (Carlson 1977, Chierchia 1995, Pustejovsky 1995, Johnston & Busa 1996). Individual level words have permanent properties while stage level words have temporary properties.

I will show the distinction through 進行 *jìnxíng* ‘conduct; carry out’ and 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’. Freed (1979) assumes that an event can be described as various stages which consist of three time segments: onset, nucleus, and coda, and an event does not necessarily consists of all of these three parts. The onset of an event is a temporal segment that occurs prior to the initial temporal part of the nucleus of that event. It is a so-called preparatory stage that precedes the initiated point of the nucleus.

But in the example of the event “open a can”, the onset of this event can be interpreted as follows: someone picks up a can opener, place it close to a can, but then puts the can opener down to do something else, and this person has gone through the onset of “opening a can”.

Freed uses an aspectualizer to illustrate this situation:

(138) He *started* to open the can.

This sentence only claims that this person has gone through the onset of the event of

“opening a can”, but not necessarily that he was opening the can. In other words, the aspectualizer *start* helps to indicate the onset of the event “opening a can”.

Second, the nucleus is defined as follows. For example of the same event “opening a can”, while the can is being open, we are in the nucleus of the event.

In general, the nucleus of an event is a time segment during which the event is in progress without reference to its beginning, its ends or its duration, which means the various time intervals of the nucleus of an event are indistinguishable, even if the event is carried out over a period of time.

Third, the coda is a separate temporal part of an event and serves to indicate the definite completion and termination of that event.

進行 *jìnxíng* ‘conduct; carry out’ indicates the nucleus of an event. In (139) 進行手術 *jìnxíng shǒushù* ‘conduct an operation’ is about the ongoing of the operation, which is the nucleus of the operation. Such an event is temporary, so [進行 *jìnxíng* ‘conduct; carry out’ +Complement] expresses a stage level event.

(139) 今天醫生再為他 進行 另一次移植 手術。(Gigaword)

Jīntiān yīshēng zài wèi tā jìnxíng lìng yī cì yízhí shǒushù.
today doctor again for him conduct another one CL transplant operation

‘Today the doctors give him another transplant operation again.’

On the contrary, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ tends to select individual level words. First, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ always collocates with professional field nouns, such as 房地產 *fāngdìchǎn* ‘real estate’, 醫學 *yīxué* ‘medical science’, 貿易業 *màoyìyè* ‘trade industry’. Though these nouns can hardly be taken as event nouns, it is obvious that when a person undertakes a field, he has a tendency of being long time engaged. Hence 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ indicates that the complement has an individual level property. Second, the typical event nouns like 貿易 *màoyì* ‘trade’, 翻譯 *fānyì* ‘translation’, 攝影 *shèyǐng* ‘photography’ are events of different fields. 貿易 *màoyì* ‘trade’ is an event of the economy; 翻譯 *fānyì* ‘translation’ is an event of service; 攝影 *shèyǐng* ‘photography’ is an event of entertainment.

When 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ selects these words, the

construction represents that a person is engaged in an occupation, which has a tendency of being more permanent. Therefore 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ regularly selects individual level complements.

2.4.4.4 Selection to Event Nouns with Polarity Properties

The polarity of a lexical item is about whether it is positive, negative or neutral. Some light verbs are prone to select negative complements. In (140), 傷害 *shānghài* ‘damage’ is a negative word which is selected by 遭受 *zāoshòu* ‘suffer; be subject to’.

(140)以免 附近 居民 遭受 輻射 傷害。 (Sinica)

.....yǐmiǎn fùjìn jūmín zāoshòu fúshè *shānghài*.

in order to avoid nearby residence suffer from radiation damage

..... in order to avoid nearby residence’ suffering from radiation damage.

Some light verbs are flexible in taking complements with any kind of polarity. (141) shows words selected by 搞 *gǎo* ‘do; be engaged in; be in’. In (141)a, 陰謀 *yīnmóu* ‘conspiracy’ is a negative word. In (141)b, 設計 *shèjì* ‘design’ is neutral and 革新 *géxīn* ‘innovation’ is positive. (141) proves that 搞 *gǎo* ‘do; be engaged in; be in’ has the ability of taking any kind of complements.

(141) a. 你說這次學運是不是有人在 搞 陰謀啊？ (Sinica)

Nǐ shuō zhè cì xuéyùn shìbùshì yǒurén
you say this CL student movement whether or not someone
zài gǎo *yīnmóu* a?
indicating action in progress do conspiracy ah

‘Do you think this student movement is a conspiracy carried out by someone?’

b. 然後要 搞 設計，要 搞 什麼新的 革新，那這些人出的力氣就很大。
(Sinica)

Ránhòu yào gǎo *shèjì*, yào gǎo shénme xīnde *géxīn*, nà zhèxiē
then will do design, will make what new innovation then those
rén chūdeliqì jiù hěn dà.
people make efforts in that case very large

‘Then (they) will make designs, make somewhat new innovations, and those

people make great efforts.’

Some light verbs, such as 促進 *cùjìn* ‘promote’ are positive in themselves. Though the complement is not necessarily positive, the LVC is certainly a positive construction. In (142), 促進……循環 *cùjìn …… xúnhuán* ‘promote …… circulation’ is positive.

(142) 薏仁的利尿作用還有助於 促進 血液 循環。(Sinica)

Yírén de liniào zuòyòng hái yǒuzhùyú cùjìn xiěyè xúnhuán.
barley DE diuretic effect also contribute to promote blood circulation

‘Barley’s diuretic effect also contributes to promote blood circulation.’

I examined the polarity that all light verbs select. The results are: (I) select negative event nouns: 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 遭到 *zāodào* ‘suffer; meet with; encounter’, 遭受 *zāoshòu* ‘suffer; be subject to’, 禁得起 *jīndeqǐ* ‘be able to stand (tests, trials, etc.); withstand’, 禁不起 *jīnbùqǐ* ‘be unable to stand (tests, trials, etc.)’; (II) select positive event nouns: 展開 *zhǎnkāi* ‘develop; spread; launch; unfold’, 開展 *kāizhǎn* ‘develop; launch’, 促進 *cùjìn* ‘promote; advance; boost’; (III) select negative, positive, and neutral event nouns: 進行 *jìnxíng* ‘conduct; carry out’, 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 做 *zuò* ‘do’, 作 *zuò* ‘do’, 作出 *zuòchū* ‘make (a decision, etc.)’, 搞 *gǎo* ‘do; be engaged in; be in’, 幹 *gàn* ‘do; work; be engaged in’, 弄 *nòng* ‘do; manage; get; fetch’, 給予 *jǐyǔ* ‘give; render’, 予以 *yǔyǐ* ‘give; grant’, 給以 *gěiyǐ* ‘give; grant’, 受到 *shòudào* ‘receive; get; suffer; come under; be subject to’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’.

2.4.4.5 Selection to Mental Activity Nouns and Social Activity Nouns

Mental activity words are words such as 思考 *sīkǎo* ‘thinking’ and 想像 *xiǎngxiàng* ‘imagination’. Some light verbs can select either mental activity nouns or social activity nouns, while some others tend not to select mental activity words. In (143) 作 *zuò* ‘do’ can select the mental word 思考 *sīkǎo* ‘thinking’. Some light verbs such as 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’ in (144) are resistant to mental activity nouns.

(143) 時間已容不得他多作思考, 他必須立刻作出決斷。(CCL)

Shíjiān yǐ róngbùdé tā duō zuò *sīkǎo*, tā bixū lìkè
time already not allowed him more make thinking he have to immediately
zuòchū juéduàn.

make decision

‘Time already does not allow him to do more thinking; he has to make a decision immediately.’

(144) *他從事思考。

*Tā cóngshì sīkǎo.

he engage in thinkiing

‘He is engaged in thinking.’

I examined all light verbs’ selection to mental activity nouns and social activity nouns. The results are: (I) light verbs that can select mental activity nouns and social activity nouns: 進行 *jìnxíng* ‘conduct; carry out’, 做 *zuò* ‘do’, 作 *zuò* ‘do’, 作出 *zuòchū* ‘make (a decision, etc.)’, 加以 *jiāyǐ* ‘inflict...on/upon...; impose’, 給予 *jǐyǔ* ‘give; render’, 予以 *yǔyǐ* ‘give; grant’, 給以 *gěiyǐ* ‘give; grant’, 引起 *yǐnqǐ* ‘give rise to; lead to; cause; touch off’; (II) light verbs that usually do not select mental activity nouns: 從事 *cóngshì* ‘be engaged in; go in for; devote oneself to’, 搞 *gǎo* ‘do; be engaged in; be in’, 幹 *gàn* ‘do; work; be engaged in’, 弄 *nòng* ‘do; manage; get; fetch’, 遭受 *zāoshòu* ‘suffer; be subject to’, 受到 *shòudào* ‘receive; get; suffer; come under; be subject to’, 遭到 *zāodào* ‘suffer; meet with; encounter’, 禁得起 *jīndeqǐ* ‘be able to stand (tests, trials, etc.); withstand’, 禁不起 *jīnbùqǐ* ‘be unable to stand (tests, trials, etc.)’, 展開 *zhǎnkāi* ‘develop; spread; launch; unfold’, 開展 *kāizhǎn* ‘develop; launch’, 促進 *cùjìn* ‘promote; advance; boost’.

2.4.5 Summary

Light verbs are usually semantically void. Their objects tend to be pure event nouns or event nominals. I examined the selectional properties of light verbs from five perspectives:

- (I) natural and non-natural kind event nouns;
- (II) instant and process event nouns;
- (III) individual level and stage level event nouns;
- (IV) polarity;
- (V) selection of mental activity nouns and social activity nouns.

The results show that light verbs differ from each other in their ability of selecting different event nouns (Wang & Huang 2012b). The investigation to light verb constructions not only enriches the research on the interaction between light verbs and their selected objects, but also has the implication for event noun detection based on light verbs.

2.5 Establish an Event-Based Noun Classification System

It is commonly accepted that nouns represent entities and verbs stand for actions. Traditionally nouns are usually classified semantically or syntactically using classifiers (Chao 1968, Lü 1979, Zhu 1982, Wang & Zhu 2000). However, such classifications ignore the fact that some nouns can express events, in a way that is similar to verbs. In recent years, there has been growing interest in these event-representing nouns.

However, a noun classification system based on eventive features has not yet been established. Such a system will facilitate nominal event detection in natural language processing. In turn, it will help us to make event-based temporal inferences, which will support information extraction, question answering and text summarization. This section will examine the characteristics of different types of nouns and establish an event-based classification system for nouns.

2.5.1 Literature Review

2.5.1.1 Classify Nouns Using Classifiers

It is widely accepted that words in Mandarin Chinese do not have a fixed grammatical function, so it is hard to determine what a noun is according to its grammatical function. Nevertheless, Chinese is a classifier language and thus it is common practice to use classifiers to classify nouns.

Chao (1968) holds that a noun is a substantive which can be modified by a D-M compound. He divides nouns into classes according to the D-M compound. (I) Entity nouns, which are related to specific classifiers, such as 一支筆 *yī zhī bǐ* ‘a pen’, 一扇門 *yī shàn mén* ‘a door’, 一位先生 *yī wèi xiānshēng* ‘a gentleman’. (II) Mass nouns, which can be modified by the following classifiers: (a) a standard measure: 一尺布 *yī chǐ bù* ‘a foot of cloth’; (b) a container measure or a temporary measure: 一杯茶 *yī bēi chá* ‘a cup of tea’ and 一身雪 *yī shēn xuě* ‘a body of snow’; (c) a partitive measure: 一點水 *yī diǎn shuǐ* ‘a little water’, 那些酒 *nà xiē jiǔ* ‘those wines’; and (d) a shape in which the mass can be gathered: 一塊布 *yī*

kuài bù ‘A piece of cloth’, 兩堆土 *liǎng duī tǔ* ‘two bulldozers’, 一灘水 *yī tān shuǐ* ‘a pool of water’. (III) Collective nouns, which take temporary or partitive measures, such as 一隊兵 *yī duì bīng* ‘A team of soldiers’ and 一套衣服 *yī tào yīfú* ‘A suit of clothes’. (IV) Abstract nouns, which do not take specific classifiers and standard measure, but take: (a) kind classifiers: 一種病 *yī zhǒng bìng* ‘a kind of disease’, (b) verbal classifiers: 三場戲 *sān chǎng xì* ‘three scenes of a drama’, 一場大禍 *yī chǎng dà huò* ‘a great misfortune, and (c) partitive measures: 一些想法 *yī xiē xiǎngfǎ* ‘some ideas’.

Lü (1979) finds that in addition to common nouns that refer to specific things, proper nouns, collective nouns, and abstract nouns are special subclasses of nouns. They are all related to whether or not they can be modified by numeral-classifiers and which numeral-classifiers can be applied.

Zhu (1982) divides nouns into five categories according to the relationship between the noun and its classifier. (I) Countable nouns, which have their own individual classifiers. (II) Uncountable nouns, which can only select the following three kinds of classifiers: (a) standard measure, (b) temporary classifiers that are transferred from nouns, and (c) indefinite classifiers. (III) Collective nouns, which can only take collective classifiers or indefinite classifiers. (IV) Abstract nouns, which only take certain kinds of classifiers, indefinite classifiers and verbal classifiers. (V) Proper nouns, which are generally not modified by numeral-classifiers.

Huang et al. (1998) first exhaustively list the collocational relationship of classifiers and nouns. Then they calculate the information load of these collocations. Next based on the information load, they calculate the affinity of noun classes to establish a noun class system encoded by the classifiers. This approach can automatically extract nominal semantic structures from corpora.

Wang and Zhu (2000) describe the collocation ability of 27,397 nouns with hundreds of classifiers when they develop *the Grammatical Knowledge-base of Contemporary Chinese* (Yu et al. 2003). According to the collocation relationship between nouns and nine kinds of classifiers (individual classifiers, collective classifiers, standard classifiers, container classifier, kind classifiers, shape classifiers, indefinite classifiers, verbal classifiers, and temporal classifiers), they find that the subclasses of nouns are not at the same level, and there are some no-classifier-taking nouns and process nouns, as illustrated in Figure 1.

Chapter 2 A Constraint-based Linguistic Model for Event Noun Identification and an Event-based Noun Classification System

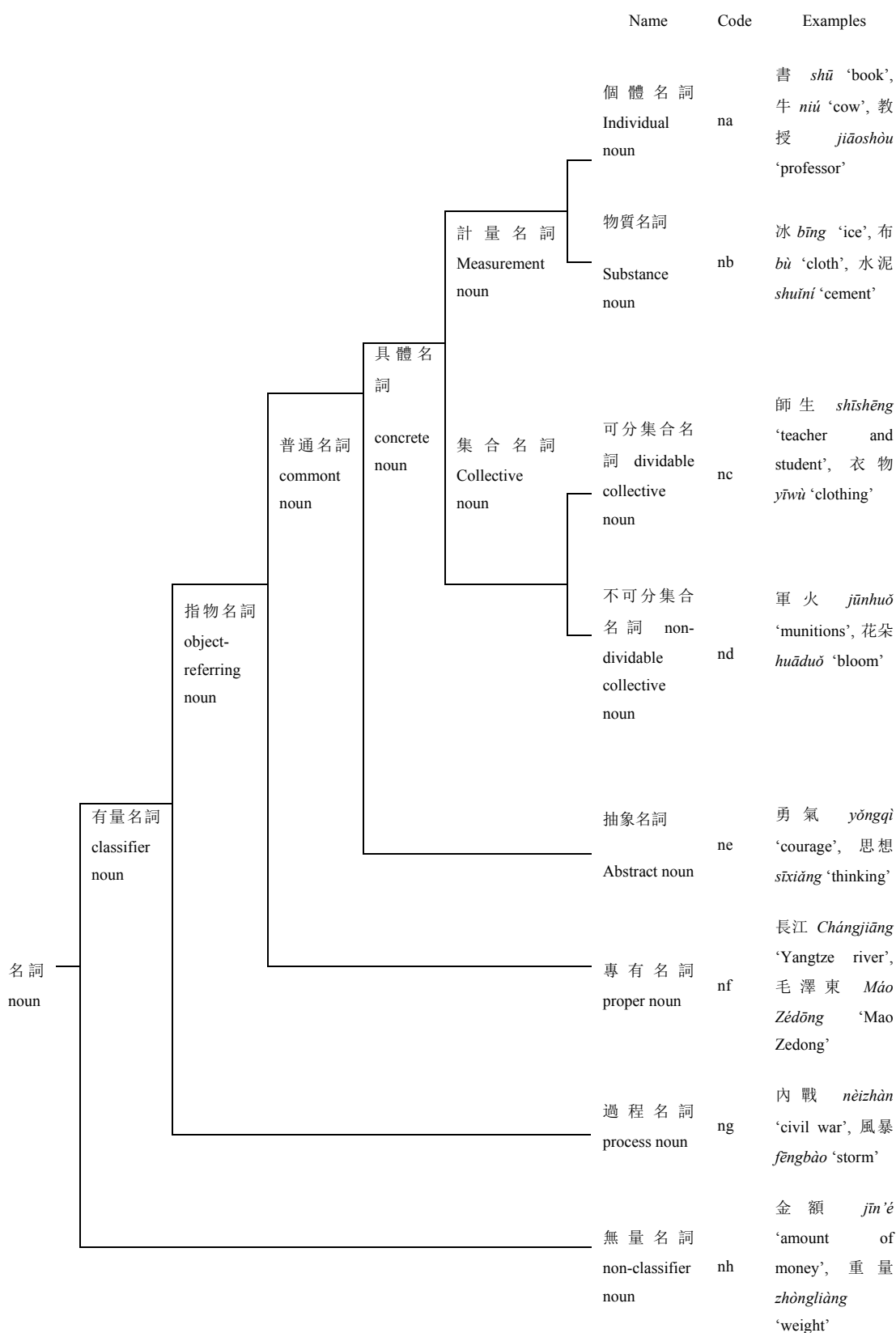


Figure 1: Subclasses of Nouns

2.5.1.2 Differences between Complex Event Nominals and Result Nominals

Borer (2003) refers to Grimshaw (1990)'s complex event nominals as argument structure nominals and result nominals as referential nominals, as illustrated in Table 26.

Table 26. Examples of Argument Structure Nominals and Referential Nominals

Argument Structure Nominals	Referential Nominals
The instructor's (intentional) examination of the student	The instructor's examination/exam
The frequent collection of mushrooms (by students)	John's collections
The monitoring of wild flowers to document their disappearance	
The destruction of Rome in a day	These frequent destructions took their toll

Their properties are shown in Table 27.

Table 27. Properties of Argument Structure Nominals and Referential Nominals

Argument Structure Nominals	Referential Nominals
a. θ -assignors, Obligatory arguments	a. Non- θ -assignors, No obligatory arguments
b. Event reading	b. No event reading
c. Agent-oriented modifiers	c. No agent-oriented modifiers
d. Subjects are arguments	d. Subjects are possessives
e. <i>by</i> phrases are arguments; In Hebrew, selects <i>al-yedey</i>	e. <i>by</i> phrases are non-arguments; in Hebrew selects <i>šel (of) me'et</i>
f. Implicit argument control	f. No implicit argument control
g. Aspectual modifiers	g. No aspectual modifiers
h. frequent, constant etc. possible without plural	h. frequent, constant etc. possible only with plural nouns
i. Mass nouns	i. Count nouns

Fu (1994) summarizes Grimshaw (1990)'s research on the difference between process nominals and result nominals, as shown in Table 28.

Table 28. Differences between Process Nominals and Result Nominals (Grimshaw 1990)

Nominal	Determiner System		Argument structure		Event structure		
	Determiner	Plural	Subject-oriented Adjective	Argument Taking	Frequency Adjective	Durative Time Expression	Rational Clause
Process	the/Ø	-	+	+	+	+	+
Result	the, a, that	+	-	-	-	-	-

Grimshaw (1990) claims that simple event nominals denote events in some sense. They occur or take place, and they occur over time. However, they act like result nominals because they share the determiner system of result nominals, occur only with optional modifiers and not with arguments, disallow *frequent* and *constant* unless they are in the plural, and disallow event control (Grimshaw 1990: P58-59):

(145) That trip/event took five days.

That trip/those trips took five days.

(146) * The frequent trip/event was a nuisance.

The frequent trips/events were a nuisance.

(147) * That trip/event in order to

Furthermore, simple event nominals disallow aspectual modifiers of any kind:

(148) * Mary's trip in six days/for six days was interesting.

* The process in five hours/for five hours.

Only complex event nominals have an event structure and a syntactic argument structure like verbs. The argument structure of complex nominals licenses (and requires) arguments. Complex event nominals are distinguished from simple event nominals and result nominals in the range of determiners and adjuncts they occur with as well as in event control and predication (Grimshaw 1990: P59).

Following Grimshaw (1990)'s research, Fu (1994) compares process nominals, result nominals, and concrete entity nouns in Chinese, and finds that they have the same behavior as those in English.

However, instant nominals, simple event nouns, and abstract entity nouns in Chinese have not yet been studied. Using the criteria of identifying event nouns presented in the previous

sections of this chapter, the following section will systematically examine the differences of the nouns in Table 29.

Table 29. Different Types of Nouns

Nominal	Process Nominal
	Result Nominal
	Instant Nominal
Pure Event Noun	
Entity Noun	Concrete Entity Noun
	Abstract Entity Noun

For the reader's convenience, I list the criteria again:

- (I) Event Classifiers
- (II) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - a. Durative Time Expressions
 - b. Time Points
- (III) Light verbs

Pustejovsky (2001a, 2006), and Pustejovsky and Jezek (2008) separate the domain of individuals into three distinct levels: (a) natural types, which direct at the formal and constitutive qualia roles; (b) artifactual types, which refer to telic or agentive roles; (c) complex types, which make reference to the relation between types. Pustejovsky (2006) further discusses three linguistic diagnostics which motivate a fundamental distinction between natural and unnatural kinds. These diagnostics are: (a) Nominal Predication: How the common noun behaves predicatively; (b) Adjectival Predication: How adjectives modifying the common noun can be interpreted; (c) Interpretation in Coercive Contexts: How NPs with the common noun are interpreted in coercive environments. Since natural and non-natural kinds have significant differences, the following sections discuss how to establish an event-based classification system for both natural and non-natural kind nouns respectively.

2.5.2 An Event-Based Classification System for Non-Natural Kind Nouns

2.5.2.1 Definition

The definitions of different nouns are as follows.

Nominal: the noun that has a verbal form. Nominals include three types.

(a) Process Nominal: the noun that has a process reading, which can last for a period.

(b) Result Nominal: the noun that expresses a result, which is similar to an entity.

For example, 調查 *diàochá* ‘investigation’ is both a process nominal and a result nominal.

(c) Instant Nominal: the noun that has an instant event reading, such as 叛變 *pànbìàn* ‘mutiny’ and 獎勵 *jiǎnglì* ‘rewarding’. Both process nominals and instant nominals are called event nominals.

Pure Event Noun: the noun that has a process reading but does not have a verbal form, such as 會議 *huìyì* ‘conference’ and 婚禮 *hūnlǐ* ‘wedding’. Grimshaw (1990), and Fu (1994) call it *simple event noun*.

Entity Noun: the noun that refers to an entity, which normally does not have an event reading or a verbal form. This type of nouns comprises Concrete Entity Nouns like 黑板 *hēibǎn* ‘blackboard’ and Abstract Entity Nouns like 政策 *zhèngcè* ‘policy’.

Here I provide the comparison of the names of different terms in this thesis and other scholars, as shown in Table 30. Event Nouns in this thesis refer to the event nominals (viz. process nominals and instant nominals) and pure event nouns.

Table 30. Different Names of Terms

This Thesis		Grimshaw (1990)	Fu (1994)
Nominal/Deverbal Nominal/Derived Nominal	Event Nominal	Process Nominal	Process Nominal
		Instant Nominal	/
	Result Nominal		Result Nominal
Pure Event Noun		Simple Event Nominal	/

2.5.2.2 Data Analysis

This section applies event classifiers, event structure and light verbs to establish an event-based noun classification system for non-natural kind nouns.

2.5.2.2.1 Event Classifiers

Non-natural kind event nouns can be selected by event classifiers. 報告 *bàogào* ‘reporting; report’ has both a process reading and a result reading. In (149), the event classifier 次 *cì* ‘once (re. frequency of event)’ selects the process nominal 報告 *bàogào* ‘reporting’. Result nominals cannot be selected by event classifiers. In (150), the individual classifier 篇 *piān* ‘CL’ selects 報告 *bàogào* ‘report’, which shows 報告 *bàogào* ‘report’ is not an event noun. In (151), the event classifier 次 *cì* ‘once (re. frequency of event)’ selects the instant nominal 判決 *pànjué* ‘verdict’. In (152), the event classifier 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’ selects the pure event noun 貿易戰 *màoyìzhàn* ‘trade war’.

Process Nominal:

- (149) 本 次 報告以個人資料保護法為主。(Sinica)

Běn cì *bàogào* yǐ Gèrén Zīliào Bǎohùfǎ wéizhǔ.
this CL report according to Personal Data Protection Act give priority to
‘This report is mainly about Personal Data Protection Act.’

Result Nominal:

- (150) 修課同學於期末要繳交一篇報告。(Sinica)

Xiū kè tóngxué yú qí mò yào jiǎojiāo yī piān
Take course classmate at the end of a semester will submit a CL
bàogào.
report

‘Students who take this course should submit a report at the end of this semester.’

Instant Nominal:

- (151) 此案今天宣判後，不少市民認為此次判決比較公正。(CCL)

Cǐ àn jīntiān xuānpàn hòu, bùshǎo shìmín rènwéi cǐ
this case today announce the judgement after not a few citizen think this

cì pànjué bǐjiào gōngzhèng.

CL verdict comparatively fair

‘After the judgment of this case was announced today, not a few citizens think that this verdict is relatively fair.’

Pure Event Noun:

- (152) 最近中美兩國又簽署了關於知識產權的協議，避免了一場貿易戰。(CCL)

Zuìjìn zhōngměi liǎng guó yòu qiānshǔ le guānyú
recently Sino-US two country again sign ASP about
zhīshì chǎnquán de xiéyì, bimiǎn le yī chǎng màoyìzhàn.
intellectual property DE agreements avoid ASP one CL trade war

‘Recently Sino-US also signed an agreement on intellectual property, which avoided a trade war.’

Entity nouns cannot collocate with event classifiers, but they can collocate with individual classifiers. In (153), the individual classifier 隻 *zhī* ‘CL’ collocates with the concrete entity noun 鳥 *niǎo* ‘bird’. In (154), the individual classifier 股 *gǔ* ‘CL’ collocates with the abstract entity noun 力量 *lìliàng* ‘force’.

Concrete Entity Noun:

- (153) 如果我可以隨意變成別的動物，我希望變成一隻鳥。(Sinica)

Rúguǒ wǒ kěyǐ suíyì biàncéng biéde dòngwù, wǒ xīwàng biàncéng
if I can at will change to other animal I hope change to
yī zhī niǎo.
one CL bird

‘If I could turn into other animals at will, I hope to become a bird.’

Abstract Entity Noun:

- (154) 我們似乎被一股無形的力量牽制著往上飛。(Sinica)

Wǒmen sìhū bèi yī gǔ wúxíng de lìliàng qiānzhi zhe
we seem BEI one GL invisible DE force restrain ASP
wǎngshàng fēi.
upward fly

‘We seem to be restrained to fly upward by an invisible force.’

In sum, this section shows that event classifiers can select process nominals, instant nominals and pure event nouns, but do not select result nominals, concrete entity nouns and abstract entity nouns.

2.5.2.2.2 Event Structure

The section examines aspectualizers, frequency adjectives, localizers and temporal expressions' selection to different types of non-natural kind nouns.

2.5.2.2.2.1 Aspectualizers

Non-natural kind event nouns can be selected by aspectualizers. 調查 *diàochá* 'survey' has both a processing reading and a result reading. In (155), the aspectualizer 結束 *jiéshù* 'end' selects the process nominal 調查 *diàochá* 'survey'. In (156), the result nominal 調查 *diàochá* 'survey' cannot collocate with the aspectualizer 結束 *jiéshù* 'end'. In (157), the aspectualizer 繼續 *jìxù* 'continue' selects the instant nominal 叛變 *pànbàn* 'mutiny'. In (158), the aspectualizer 開始 *kāishǐ* 'begin' selects the pure event noun 晚會 *wǎnhuì* 'evening party'.

Process Nominal:

(155) 關於浙江人度假生活的調查結束了。(Web)

Guānyú Zhèjiāng rén dùjià shēnghuó de *diàochá* jiéshù
about Zhejiang people spend one's holiday living DE survey end
le.
ASP

'The survey about the resort living of Zhejiang People has ended.'

Result Nominal:

(156) ! 那份調查結束了。

! Nà fèn *diàochá* jiéshù le.
that CL survey end ASP

! 'That survey is over.'

Instant Nominal:

(157) ! 叛變在繼續。

! *Pànbìàn* zài jìxù.

Mutiny ASP continue

! ‘Mutiny is continuing.’

Pure Event Noun:

(158) 同志們，晚會開始了。(CCL)

Tóngzhìmen, *wǎnhuì* kāishǐ le.

comrade evening party begin ASP

‘Comrades, the evening party begins.’

Entity nouns usually cannot be selected by aspectualizers. Thus (159) is odd. Though (160) is a valid sentence, this does not mean 制度 *zhìdù* ‘system’ has an event reading. The aspectualizer 開始 *kāishǐ* ‘start’ coerced 制度 *zhìdù* ‘system’ to have an event reading through its telic role.

Concrete Entity Noun:

(159) ! 這顆蘋果完成了。

! Zhè kē píngguǒ wánchéng le.

this CL apple complete ASP

! ‘This apple completed.’

Abstract Entity Noun:

(160) 星級評價制度開始了嗎？(Web)

Xīngjí píngjià *zhìdù* kāishǐ le ma?

star level rate system start ASP auxiliary

‘Does Star rating system start?’

In sum, this section shows that aspectualizers select process nominals, instant nominals and pure event nouns, but do not select result nominals, concrete entity nouns and abstract entity nouns.

2.5.2.2.2 Frequency Adjectives

Frequency adjectives can select event nouns to indicate the time of occurrences of an event. In (161), the frequency adjective 頻繁 *pínfán* ‘frequent’ selects the process nominal 影響

yǐngxiǎng ‘affection’. In (162), the frequency adjective 頻繁 *pínfán* ‘frequent’ cannot select the result nominal 調查 *diàochá* ‘survey’. In (163), the frequency adjective 屢次 *lǚcì* ‘repeated’ selects the instant nominal 叛變 *pànbìan* ‘mutiny’. In (164), the frequency adjective 接連不斷 *jiēliánbùduàn* ‘successive’ selects the pure event noun 舞會 *wǔhuì* ‘ball’.

Process Nominal:

- (161) 由於冷空氣的頻繁影響，北方大部地區的氣溫將比常年同期偏低。(CCL)

Yóuyú lěng kōngqì de pínfán yǐngxiǎng, běifāng dàbù dìqū de
Due to cold air DE frequent affection The North most area DE
qìwēn jiāng bǐ chángnián tóngqí piāndī.
temperature will compare normal years same period lower

‘Due to cold air’s frequent affection, the temperature in most areas of The North is lower than the same period of normal years.’

Result Nominal:

- (162) !一份頻繁的調查

! yī fèn pínfánde *diàochá*
one CL frequent survey

! ‘a frequent survey’

Instant Nominal:

- (163) 但因叛徒的屢次叛變，1932年10月15日，陳獨秀與彭述之等被捕。(Web)

Dàn yīn pàntú de lǚcì pànbìan, 1932 nián 10 yuè 15 rì,
But because of traitor DE repeated mutiny 1932 year October 15th
Chén Dúxiù yǔ Péng Shùzhī děng bèi bǔ.
Chen Duxing and Peng Shuzhi etc. BEI arrest

‘But because of traitors’ repeated mutinies, on October 15, 1932, Chen Duxiu, Peng Shuzhi, etc. were arrested.’

Pure Event Noun:

- (164) 其他國家代表在漫長的等待中，只能用接連不斷的舞會、宴會、觀劇、狩獵去消磨時光。(CCL)

Qítā guójiā dàibiǎo zài mànchángde děngdài zhōng, zhǐnéng
yòng
other contry representative ASP long wait during can only use
jiēlián bùduànde wǔhuì, yànhuì, guānjù, shòuliè
successive ball banquet watch operas hunting
qù xiāomó shíguāng.
indicating the latter is the purpose of the former kill time

‘In the long wait representatives of other countries can only kill time with successive balls, banquets, opera, and hunting.’

Entity nouns have nothing to do with an occurrence, and therefore neither (165) nor (166) is valid.

Concrete Entity Noun:

(165) ! 屢次的櫻桃

lǚcìde yīngtao
repeated cherry

! ‘repeated cherries’

Abstract Entity Noun:

(166) ! 頻繁的友情

! **pínfánde yǒuqíng**
frequent friendship

! ‘frequent friendship’

In sum, this section shows that frequency adjectives select process nominals, instant nominals and pure event nouns, but do not select result nominals, concrete entity nouns and abstract entity nouns.

2.5.2.2.2.3 Localizers

When a localizer collocates with an event noun, this construction has a temporal reading. 分析 *fēnxī* ‘analysis’ has both a process reading and a result reading. In (167), the process nominal 分析 *fēnxī* ‘analysis’ can collocate with the localizer 中 *zhōng* ‘during; in the course of’, while in (168), the result nominal 分析 *fēnxī* ‘analysis’ cannot collocate with the

localizer 前 *qián* ‘before’. In (169), the instant nominal 判決 *pànjué* ‘verdict’ can collocate with the localizer 後 *hòu* ‘after’. In (170), the pure event noun 宴會 *yànhuì* ‘banquet’ can collocate with the localizer 中 *zhōng* ‘during; in the course of’. (167), (169), and (170) all have temporal readings.

Process Nominal:

- (167) 筆者在上次分析中已經從技術面上給予了美元走高的預測。(Web)

Bǐzhě zài shàng cì *fēnxī* zhōng yǐjīng cóng jìshù miàn shàng
the author in last CL analysis during already from technical side on
jǐyǔ le měiyuán zǒugāo de yùcè.
give ASP US dollar go high DE predication

‘In the last analysis, I have given a predication that the US dollars will go high from a technological side.’

Result Nominal:

- (168) !這份分析前

! zhè fèn *fēnxī* qián
this CL analysis before

! ‘before this analysis’

Instant Nominal:

- (169) 國際奧委會道德委員會則將等待瑞士法庭的判決後再做決定。(CCL)

Guójì Àowěihuì Dàodé Wěiyuánhui
International Olympic Committee The Ethics Commission
zé jiāng děngdài Ruìshì fǎtíng de *pànjué*
indicating one action follows another will wait Swiss court DE verdict
hòu zài zuò
after indicating one action taking place after the completion of another make
juéding.
decision

‘The Ethics Commission of International Olympic Committee will wait after the Swiss court's verdict to make a decision.’

Pure Event Noun:

(170) 梅吉，你是宴會中最漂亮動人的姑娘。(CCL)

Méijí, nǐ shì *yànhuì* **zhōng** zuì piàoliang dòngrén de gū'niang.

Meggie you be banquet during most beautiful moving DE girl

‘Meggie, you are the most beautiful and moving girl during the party.’

Localizers collocating with entity nouns have a spatial reading. In (171), the concrete entity noun 山 *shān* ‘hill’ collocates with the localizer 前 *qián* ‘in front of’, and this construction has a spatial reading. In (172), the abstract entity noun 知識 *zhīshi* ‘knowledge’ cannot collocate with the localizer 後 *hòu* ‘at the back of’.

Concrete Entity Noun:

(171) 這裡冷的早，山前的草還青著，山後的草就發白了。(CCL)

Zhèlǐ lěng de zǎo, *shān* **qián** de cǎo hái qīng zhe, shān

here cold DE early hill in front of DE grass still green ASP hill

hòu de cǎo jiù fābái le.

at the back of DE grass indicating comparison turn white ASP

‘Here becomes cold early. The grass in front of the hill is still green, while the grass at the back of the hill turns white.’

Abstract Entity Noun:

(172) !知識後

! *zhīshi* **hòu**

knowledge at the back of

! ‘at the back of knowledge’

In sum, this section shows that when localizers can select process nominals, instant nominals and pure event nouns to express a temporal meaning. When localizers are in collocation with result nominals, concrete entity nouns and abstract entity nouns, the constructions are either invalid or expressing a spatial meaning.

2.5.2.2.4 Temporal Expressions

This section uses durative time expressions and time points to compare different types of nouns.

2.5.2.2.4.1 Durative Time Expressions

Durative time expressions can select event nouns that have a process reading. 研究 *yánjiū* ‘research’ has both a process reading and a result reading. In (173), the durative time expression 一個多月 *yī gè duō yuè* ‘more than one month’ selects the process nominal 研究 *yánjiū* ‘research’. In (174), 研究 *yánjiū* ‘research’ is a result nominal, which cannot collocate with time expressions. In (175), 判決 *pànjué* ‘verdict’ is an instant nominal, so it cannot collocate with a durative time expression. In (176), the pure event noun 宴會 *yànhuì* ‘banquet’ is selected by the durative time expression 兩三個小時 *liǎng sān gè xiǎoshí* ‘two to three hours’.

Process Nominal:

- (173) 經過一個多月的研究，秘密終於被馮斯特教授發現了。(CCL)

Jīngguò yī gè duō yuè de *yánjiū*, mìmì zhōngyú

go through one CL more month DE research secret finally

bèi Féng Sītè jiàoshòu fāxiàn le.

BEI Feng Site Professor discover ASP

‘After more than a month’s research, the secret was finally discovered by Professor Feng Site.’

Result Nominal:

- (174) a. 他那尚未發表的研究或許可以告訴我們究竟哪種情形是正確的。
(Sinica)

Tā nà shàngwèi fābiǎo de *yánjiū* huòxǔ kěyǐ gàosu wǒmen

he that not yet publish DE research perhaps can tell us

jiùjìng nǎ zhǒng qíngxíng shì zhèngquède.

on earth which CL situation be correct

‘His unpublished research perhaps can tell us exactly which kind of situation is correct.’

- b. *這是一份三個月的研究。

* Zhè shì yī fèn sān gè yuè de *yánjiū*.

this be one CL three CL month DE research

Instant Nominal:

(175) ! 三個小時的判決

! sān gè xiǎoshí de pànjué
three CL hour DE verdict

! 'three hours' verdict'

Pure Event Noun:

(176) 比起我們這裡各處常見的兩三個小時的宴會來，吃麵條顯然要節省時間。

(CCL)

Bǐqǐ wǒmen zhèlǐ gèchù chángjiàn de liǎng sān gè
compared to we here everywhere commonly see DE two three CL
xiǎoshí de yànhuì lái, chī miàntiáo xiǎnrán
hour DE banquet indicating result eat noodles obviously
yào jiéshěng shíjiān.
indicating an estimate save time

'Compared to the common two to three hours' banquets around here, eating noodles obviously save time.'

Entity nouns do not happen during a period, so they cannot be selected by durative time expressions. Both (177) and (178) are odd.

Concrete Entity Noun:

(177) ! 兩個小時的桌子

! liǎng gè xiǎoshí de zhuōzi
two CL hour DE table

! 'two hours' table'

Abstract Entity Noun:

(178) ! 三天的重力

! sān tiān de zhònglì
three day DE gravity

! 'three days' gravity'

However, it is possible that we encounter cases that a durative expression modifies an entity noun, as shown in (179) and (182). It is definitely true that everything in the world is present in certain time and space, but this does not mean that everything has an event reading.

In (179), 房子 *fángzi* ‘house’ is a concrete entity noun. 十多年的房子 *shí duō nián de fángzi* ‘more than ten years’ house’ means the house has been in existence for more than ten years since it is built. There is an implicit predicate 蓋 *gài* ‘build’, which is the agentive role of 房子 *fángzi* ‘house’, as shown in (180). Thus (179) is a simplified saying of (181).

(179) 十多年的房子值得買嗎? (Web)

Shí duō nián de **fángzi** zhídé mǎi ma?
 ten more year DE house worth buy auxiliary
 ‘Does more than ten years’ house worth buying?’

(180)
$$\left[\begin{array}{l} \text{房子 } fángzi \text{ 'house'} \\ \text{ARGSRT} = \left[\begin{array}{l} \text{ARG1} = x: \text{building} \\ \text{D-ARG1} = y: \text{human} \end{array} \right] \\ \text{QUALIA} = [\text{AGENTIVE} = \text{build}(y, x)] \end{array} \right]$$

(181) 蓋了十多年的房子值得買嗎?

Gài le **shí duō nián** de **fángzi** zhídé mǎi ma?
 build ASP ten more year DE house worth buy auxiliary
 ‘Does the house that was built for more than ten years worth buying?’

In (182), 措施 *cuòshī* ‘measure’ is an abstract entity noun. 近幾年的措施 *jìnjǐnián de cuòshī* ‘recent years’ measures’ refers to the measures that were carried out in recent years. There is an implicit predicate 實施 *shíshī* ‘carry out’, which is the telic role of 措施 *cuòshī* ‘measure’, as shown in (183).

(182) 近幾年的措施, 對改善民生, 穩定大局非常有效。 (Web)

Jìnjǐnián de **cuòshī**, duì gǎishàn mínshēng, wěndìng
 recent years DE measure to improve people’s livelihood stabilize
 dàjú fēicháng yǒuxiào.
 the general situation very effective

‘Recent years’ measures are very effective in improving people’s livelihood and stabilize the general situation.’

$$(183) \left[\begin{array}{l} \text{措施 } cuòshī \text{ 'measure'} \\ \text{ARGSRT} = \left[\begin{array}{l} \text{ARG1} = x: \text{rule} \\ \text{D-ARG1} = y: \text{human} \end{array} \right] \\ \text{QUALIA} = [\text{TELIC} = \text{carry out } (y, x)] \end{array} \right]$$

In sum, this section shows that durative time expressions directly select process nominals and pure event nouns. It is possible that they can sometimes collocate with some result nominals, concrete entity nouns and abstract entity nouns, but this is because there are implicit events. Thus they do not directly select these nouns, but select them through coercion by qualia exploitation.

2.5.2.2.4.2 Time Points

Events happen at certain time, and hence event nouns can be selected by time points. In (184), the process nominal 表演 *biǎoyǎn* 'performance' collocates with the time point 9pm to indicate its happening time. In (185), the instant nominal 判決 *pànjué* 'verdict' collocates with the time point 今天 *jīntiān* 'today' to show when it happens. In (186), the time point GMT 9:00 am on the 22nd shows that the wedding starts at this time.

Process Nominal:

(184) 每天晚上 9點的表演吸引了無數的遊客。(Web)

Měitiān wǎnshàng 9 diǎn de *biǎoyǎn* xīyǐn le wúshù de
 every day night 9 O'clock DE performance attract ASP numerous DE
 yóukè.
 tourist

'9 pm daily performances attracted numerous tourists.'

Instant Nominal:

(185) 沖繩居民對今天的判決表示了強烈的關注。(CCL)

Chōngshéng jūmíng duì jīntiān de *pànjué* biǎoshì le qiángliède
 Okinawa resident to today DE verdict express ASP strong
 guānzhù.
 concern

'Residents of Okinawa expressed strong concern to today's verdict.'

Pure Event Noun:

- (186) 婚禮於格林尼治時間 22 日上午 9 時 準時開始。(CCL)

Hūnlǐ yú Gélínnízhì shíjiān 22 rì shàngwǔ 9 shí zhǔnshí kāishǐ.
wedding at Greenwich time 22th morning 9 O'clock on time start

‘The wedding started on time at GMT 9:00 am on the 22nd.’

Besides event nouns, we can notice that there are sentences in which result nominals, concrete entity nouns, and abstract entity nouns collocate with time points, as shown in (187), (188), and (189) respectively. However, this phenomenon does not mean these nouns have an event reading. This is because there are implicit events behind these nouns.

In (187), the 調查 *diàochá* ‘survey’ refers to the result of an investigation event, which is the telic role of 調查 *diàochá* ‘survey’. In (188), the 電腦 *diànnǎo* ‘computer’ in 2034 refers to the computer created then, which is the agentive role of 電腦 *diànnǎo* ‘computer’. In (189), the 方法 *fāngfǎ* ‘approach’ refers to the method conducted in 1940, which is the telic role of 方法 *fāngfǎ* ‘approach’. These nouns can collocate with time points coming from the fact that there is coercion through qualia expoliation. This confirms that result nominals, concrete entity nouns, and abstract entity nouns do not have a temporal frame in themselves.

Result Nominal:

- (187) 該委員會 2008 年 7 月的一份調查顯示，絕大多數參與調查的人對中國的成就表示讚美。(Web)

Gāi wěiyuánhùi 2008 nián 7 yuè de yī fèn *diàochá* xiǎnshì,
this council 2008 year July DE one CL survey show
jué dàduōshù cānyù diàochá de rén duì zhōngguó de
the vast majority of participate in survey DE people to China DE
chéngjiù biǎoshì zànměi.
achievement express admiration

‘A survey conducted by the Council in July 2008 showed that the vast majority of respondents expressed admiration for China's achievements.’

Concrete Entity Noun:

- (188) 專家展望 2034 年的電腦。(Web)

Zhuānjiā zhǎnwàng 2034 nián de *diànnǎo*.

expert look into 2034 year DE computer

‘Experts looked into computers in 2034.’

Abstract Entity Noun:

- (189) 因此納粹黨人又採取了 **1940 年**的**方法**，組織了一家“大陸影片公司”來生產一些由法國人導演的影片。(CCL)

Yīncǐ Nàcuìdǎngrén yòu cǎiqǔ le **1940 nián** de **fāngfǎ**, zǔzhī
So Nazis again adopt ASP 1940 year DE approach organize
le yī jiā “Dàlù Yǐngpiàn Gōngsī”
ASP one CL Mainland Film Company
lái

indicating that the former is the way of doing things and the latter is the purpose
shēngchǎn yīxiē yóu Fàguórén dǎoyǎn de yǐngpiàn.
produce some by French direct DE film

‘So the Nazis adopted the 1940 approach again; organized Mainland Film Company to produce some films directed by French.’

In sum, this section shows that durative time expressions directly select process nominals, instant nominals and pure event nouns. It appears true that they collocate with result nominals, concrete entity nouns and abstract entity nouns, but this is because there are implicit events behind these nouns. Therefore they do not directly select these nouns, but select them through coercion by qualia exploitation.

2.5.2.2.3 Light Verbs

Light verbs can select event nouns. In (190), the light verb 進行 *jìnxíng* ‘conduct’ selects the process nominal 測試 *cèshì* ‘test’, while in (191), it cannot select the result nominal 測試 *cèshì* ‘test’. In (192) the light verb 做 *zuò* ‘do’ selects the instant nominal 決定 *juédìng* ‘decision’ and in (193) it selects the pure event noun 手術 *shǒushù* ‘operation’.

Light verbs do not select entity nouns. In (194), the light verb 受到 *shòudào* ‘suffer from’ cannot select the concrete entity noun 籃球 *lánqiú* ‘basketball’. In (195), the light verb 引起 *yǐnqǐ* ‘cause’ cannot select the abstract entity noun 策略 *cèlüè* ‘strategy’.

Process Nominal:

- (190) 要真覺得十分必要，我同意對他進行一次測試。(CCL)

Yào zhēn juéde shífēn bìyào, wǒ tóngyì duì tā jìnxíng yī cì
if really feel very necessary I agree to him conduct one CL
cèshì.
test

‘If (you) feel it is really necessary, I agree to conduct a test to him.’

Result Nominal:

(191) ! 進行一份 *cèshì*

! jìnxíng yī fèn *cèshì*
conduct one CL test

Instant Nominal:

(192) 他打算先去看看那些房子，再 做 *juédìng*。(Sinica)

Tā dǎsuàn xiān qù kànkàn nàxiē fángzi, zài zuò *juédìng*.
he plan first go have a look those house then do decision

‘He plans first to have a look at those houses, and then makes a decision.’

Pure Event Noun:

(193) 當他生命非常危險的時候，加拿大的朋友請他到加拿大去 做 *shǒushù*。(CCL)

Dāng tā shēngmìng fēicháng wéixiǎn de shíhou, Jiānádàde péngyǒu
when he life very dangerous DE period Canadian friend
qǐng tā dào Jiānádà qù zuò *shǒushù*.
invite him get to Canada go do operation

‘When his life is very dangerous, his Canadian friends invited him to go to Canada to have an operation.’

Concrete Entity Noun:

(194) * 受到 *lánqiú*

* shòudào *lánqiú*
suffer from basketball

* ‘suffer from basketballs’

Abstract Entity Noun:

(195) * 引起策略

* yǐnqǐ cèlüè

cause strategy

* ‘caused strategies’

In sum, this section shows that light verbs select process nominals, instant nominals and pure event nouns, but they do not select result nominals, concrete entity nouns and abstract entity nouns.

2.5.2.3 Summary

This section has looked at the following parameters to examine different non-natural kind nouns:

(I) Event Classifiers

(II) Event Structure

(i) Aspectualizers

(ii) Frequency Adjectives

(iii) Localizers

(iv) Temporal Expressions

a. Durative Time Expressions

b. Time Points

(III) Light verbs

All of these parameters can directly select non-natural kind event nouns of these types: process nominals and pure event nouns (Wang & Huang 2012a). Aspectualizers and durative time expressions do not select instant nominals.

At the same time, event classifiers, aspectualizers, and temporal expressions can coerce some non-event representing nouns to have an event reading through qualia exploitation. But this does not mean that these nouns represent events in themselves. The coerced cases are not considered as direct selection to an event.

Based on these parameters, I propose establishing an event-based classification system for non-natural kind nouns, as demonstrated in Table 31.

Table 31. An Event-Based Classification System for Non-Natural Kind Nouns

Non-Natural Kind Nouns		Event Classifier	Event Structure					Light Verbs	Example
			Aspectualizer	Frequency Adjective	Localizer	Durative Time Expression	Time Point		
Nominal	Process Nominal	+	+	+	+	+	+	+	報導 <i>bàodǎo</i> 'reporting'
	Result Nominal	-	-	-	-	-	-	-	報導 <i>bàodǎo</i> 'report'
	Instant Nominal	+	-	+	+	-	+	+	判決 <i>pànjúe</i> 'verdict'
Pure Event Noun		+	+	+	+	+	+	+	婚禮 <i>hūnlǐ</i> 'wedding'
Entity Noun	Concrete Entity Noun	-	-	-	-	-	-	-	桌子 <i>zhuōzi</i> 'table'
	Abstract Entity Noun	-	-	-	-	-	-	-	政策 <i>zhèngcè</i> 'policy'

("+" means that nouns in this category have a high tendency of having this feature. It does not mean every noun in this category has such a feature. By contrast, "-" means nouns in this category have a low tendency of having this feature. It does not mean that no noun in this category has such a feature.)

Table 31 indicates that process nominals and pure event nouns have the same behavior; instant nominal behave similarly to process nominals and pure event nouns, except that they cannot be selected by aspectualizers and durative time expressions; result nominals, concrete entity nouns and abstract entity nouns have the same behavior.

Different from Grimshaw (1990)'s analysis in English, our analysis finds that process nominals and pure event nouns in Chinese allow all the eventive features as shown in Table 31.

Grimshaw (1990) claims that complex process nominals have a verbal form and license argument structure and event structure. Simple event nominals act similarly to result nominals and thus do not license argument structure and event structure.

However, our analysis have shown that that in Mandarin Chinese, process nominals and pure event nouns behave similarly in taking arguments and licensing event structure, so the *complex* and *simple* contrast in English does not exist in Chinese. Thus, it is necessary to re-define what is *complex* and what is *simple* for Chinese (Wang & Huang 2012c, 2013e). Following Pustejovsky (1995) I treat complex process nominals as nouns with more than one subevent, such as accomplishments. The new term for this type of nouns is process nominals. Simple event nouns are nouns with only one subevent or many similar subevents, such as activities. The new term for this type of nouns is pure event nouns.

2.5.3 An Event-Based Classification System for Natural Kind Nouns

2.5.3.1 Definition

This section explores the differences among nominals, pure event nouns and entity nouns that are natural kinds.

Nominal: the noun that has a verbal form. Nominals include two types.

(i) Process Nominal: the noun that has a process reading, which can last for a period, such as 感冒 *gǎnmào* ‘cold’.

(ii) Instant Nominal: the noun that has an instant event reading, such as 死亡 *sǐwáng* ‘death’ and 咳嗽 *késou* ‘cough’.

Both process nominals and instant nominals are called event nominals.

Nature kind nouns usually do not have the process and result reading contrast as the non-natural kind nouns do. For example, 感冒 *gǎnmào* ‘cold’ is a process in all circumstances.

Pure Event Noun: the noun that has a process reading but does not have a verbal form, such as 風 *fēng* ‘wind’.

Both event nominals and pure event nouns are event nouns.

Entity Noun: the noun that refers to an entity, which normally does not have an event reading and a verbal form. It is composed of two types: (i) Concrete Entity Nouns, such as 太陽 *tàiyáng* ‘Sun’; (ii) Abstract Entity Nouns, such as 磁場 *cíchǎng* ‘magnetic field’.

2.5.3.2 Data Analysis

This section applies event classifiers, event structure and light verbs to establish an event-based classification system for natural kind nouns.

2.5.3.2.1 Event Classifiers

Natural kind event nouns can be selected by event classifiers. In (196), the process nominal 感冒 *gǎnmào* ‘cold’ is selected by the event classifier 次 *cì* ‘once (re. frequency of event)’. In (196), the instant nominal 死亡 *sǐwáng* ‘death’ is selected by the event classifier 次 *cì* ‘once (re. frequency of event)’. In (198), the pure event noun 風 *fēng* ‘wind’ collocates with the event classifier 陣 *zhèn* ‘one of a sporadic event(s)’.

Process Nominal:

(196) 一次感冒

yī cì *gǎnmào*

a CL cold

‘a cold’

Instant Nominal:

(197) 他面對過很多次死亡，都沒有這次恐怖。(CCL)

Tā miànduì guò hěnduō cì *sǐwáng*, dōu méiyǒu zhè cì kǒngbù.

he face ASP many CL death all not have this CL horrible

‘He faced death many times; none is as horrible as this one.’

Pure Event Noun:

(198) 一陣風

yī zhèn *fēng*

a CL wind

‘a gust of wind’

Entity nouns cannot collocate with event classifiers. In (199), the event classifier 陣 *zhèn* ‘one of a sporadic event(s)’ cannot collocate with the concrete entity noun 太陽 *tàiyáng* ‘Sun’. In (200), the event classifier 場 *chǎng* ‘a (scheduled) event (with beginning and

ending)’ cannot collocate with the abstract entity noun 磁場 *cíchǎng* ‘magnetic field’.

Concrete Entity Noun:

(199) ! 一陣太陽

! yī zhèn *tàiyáng*

a CL sun

! ‘a burst of sun’

Abstract Entity Noun:

(200) ! 一場磁場

yī chǎng *cíchǎng*

a CL magnetic field

! ‘a scheduled magnetic field’

2.5.3.2.2 Event Structure

The section examines aspectualizers, frequency adjectives, localizers and temporal expressions’ selection to different types of natural kind nouns.

2.5.3.2.2.1 Aspectualizers

Natural kind event nouns can be selected by some aspectualizers, stated in *Section 2.3.1.2 Nouns Selected by Aspectualizers*. In (201), the process nominal 感冒 *gǎnmào* ‘influenza’ is selected by the aspectualizer 結束 *jiéshù* ‘end’. In (202), the instant nominal 咳嗽 *késou* ‘cough’ is selected by the aspectualizer 停止 *tíngzhǐ* ‘stop’. In (203), the pure event noun 暴雨 *bàoyǔ* ‘rainstorm’ can collocate with the aspectualizer 結束 *jiéshù* ‘end’.

Process Nominal:

(201) 病毒性感冒結束後一直咳嗽該怎麼辦? (Web)

Bìngdúxìng *gǎnmào* jiéshù hòu yīzhí késou gāi zěnmébàn?

viral influenza end after all the time cough should how to do

‘How to deal with the all the time coughing after the end of a viral influenza?’

Instant Nominal:

- (202) 祖父的咳嗽停止了，人顯得很疲倦，便倒下去，漸漸地閉上了眼睛。(CCL)

Zǔfù de késou tíngzhǐ le, rén xiǎnde hěn píjuàn, biàn
grandfather DE cough stop ASP people look very tired then
dàoxiàqù, jiànjiànde bishàng le yǎnjīng.
go down gradually close ASP eye

‘Grandfather’s cough stopped; he looked very tired, then went down, and gradually closed his eyes.’

Pure Event Noun:

- (203) 隨著持續多日的暴雨結束，重慶大範圍的洪水也漸漸退去。(CCL)

Suízhe chíxù duōrì de bàoyǔ jiéshù, Chóngqing dàfànwéide hóngshuǐ
With last many days DE rainstorm end Chongqing large scale flood
yě jiànjiàn tuìqù.
also gradually recede

‘With the ending of the many days’ rainstorm, a large range of Chongqing’s large scale flood gradually receded.’

Natural kind entity nouns cannot be selected by aspectualizers. In (204), the concrete entity noun 太陽 *tàiyáng* ‘Sun’ does not end, so this sentence is odd. In (205), the abstract entity noun 磁場 *cíchǎng* ‘magnetic field’ is there all the time, so it cannot collocate with 停止 *tíngzhǐ* ‘stop’.

Concrete Entity Noun:

- (204) ! 太陽結束了。

! *Tàiyáng* jiéshù le.
Sun end ASP

! ‘The Sun ends.’

Abstract Entity Noun:

- (205) ! 磁場停止了。

! *Cíchǎng* tíngzhǐ le.

magnetic field stop ASP

! ‘The magnetic field stops.’

2.5.3.2.2.2 Frequency Adjectives

Natural kind event nouns can be modified by frequency adjectives, as shown in (206) and (207). In (206), the process nominal 感冒 *gǎnmào* ‘cold’ is modified by the frequency adjective 頻繁 *pínfán* ‘frequent’. In (207), the instant nominal 死亡 *sǐwáng* ‘death’ is modified by the frequency adjective 太多 *tàiduō* ‘too many’. In (208), the pure event noun 水災 *shuǐzāi* ‘flood’ is modified by the frequency adjective 頻繁 *pínfán* ‘frequent’.

Process Nominal:

(206) 頻繁的感冒會引發鼻息肉，不及時治療危害很大。(Web)

Pínfánde *gǎnmào* huì yǐnfā bǐxīròu, bù jíshí zhìliáo wēihài hěn
frequent cold can cause nasal polyps no timely treatment harm very
dà.
great

‘Frequent colds can cause nasal polyps; there is a very great harm if it does not get timely treatment.’

Instant Nominal:

(207) 陳先生經歷了近一個世紀的時代風雲，面對了太多太多的死亡，他稱得上是：歷盡滄桑。(CCL)

Chén xiānshēng jīnglì le jìn yī gè shìjì de shídài
Chen Mister experience ASP nearly one CL century DE era
fēngyún, miànduì le tàiduō tàiduō de *sǐwáng*, tā
changeable situation face ASP too many too many DE death he
chēngdeshàngshì: lìjìn cāngsāng.
deserve to be called experience many vicissitudes of life

‘Mr. Chen has gone through nearly a century’s changeable situations, faced too much death. He deserves to be called: having experienced many vicissitudes of life.’

Pure Event Noun:

(208) 頻繁的水災，使王家壩貧窮落後。(Gigaword)

Pínfánde shuǐzāi, shǐ Wángjiābà pínqióng luòhòu.
frequent flood make Wangjiaba poverty backwardness

‘Frequent floods cause Wangjiaba’s poverty and backwardness.’

Entity nouns do not permit modification of frequency adjectives as shown in (209) and (210). In (209), the concrete entity 山 *shān* ‘mountain’ does not allow modification of 頻繁 *pínfán* ‘frequent’. Similarly, in (210), the abstract entity 磁場 *cíchǎng* ‘magnetic field’ does not permit modification by 頻繁 *pínfán* ‘frequent’.

Concrete Entity Noun:

(209) ! 頻繁的 山

! pínfánde *shān*
frequent mountain
! ‘frequent mountains’

Abstract Entity Noun:

(210) ! 頻繁的 磁場

! pínfánde *cíchǎng*
frequent magnetic field
! ‘frequent magnetic fields’

2.5.3.2.2.3 Localizers

When a localizer collects with a noun to express a temporal meaning, then this noun is an event noun. In (211), the process nominal 發燒 *fāshāo* ‘fever’ is selected by the localizer 後 *hòu* ‘after’. In (212), the instant nominal 死亡 *sǐwáng* ‘death’ is selected by the localizer 前 *qián* ‘before’. In (213), the pure event noun 雨 *yǔ* ‘rain’ is selected by the localizer 前 *qián* ‘before’. (211)- (213) all have temporal meanings.

Process Nominal:

(211) 皇帝輕微 發燒後 身體有些虛弱。(CCL)

Huángdì qīngwéi *fāshāo* hòu shēntǐ yǒuxiē xūruò.
Emperor slight fever after body a bit weak

‘After a slight fever, the Emperor’s body is a bit weak.’

Instant Nominal:

- (212) 這些服用過該種蛋白質的老鼠比其他老鼠壽命高出 5-10%，而且它們在死亡前一直保持旺盛的精力。(CCL)

Zhèxiē fúyòng guò gāi zhǒng dànbaízhi de lǎoshǔ bǐ qítā
these take ASP this kind protein DE mice compare other
lǎoshǔ shòumìng gāochū 5-10%, érqǐě tāmen zài sǐwáng qián
mice life span higher than 5-10% and they at death before
yīzhí bǎochí wàngshèngde jīnglì.
all the time maintain exuberant energy

‘These mice who have taken this kind of protein have a life span 5-10% higher than other mice, and they maintain exuberant energy all the time before death.’

Pure Event Noun:

- (213) 許多農民還把雨前搶收的好麥子賣給國家。(Gigaword)

Xǔduō nóngmín hái bǎ yǔ qián qiǎngshōu de hǎo màizi màigěi
many farmer also BA rain before rush to gather DE good wheat sell to
guójiā.
country

‘Many farmers also sold the wheat to the country that was rushed to gather in before the rain.’

In (214), when the concrete entity 太陽 *tàiyáng* ‘Sun’ collocates with the localizer 前 *qián* ‘in front of’, it has a spatial meaning, not a temporal meaning. In (215), the abstract entity noun 重力 *zhònglì* ‘gravity’ cannot collocate with a localizer.

Concrete Entity Noun:

- (214) 金星在太陽前橫過。(Gigaword)

Jīnxīng zài tàiyáng qián héngguò.
Venus on Sun in front of cross

‘Venus passed in front of the sun.’

Abstract Entity Noun:

(215) !重力前

! *zhònglì qián*

gravity in front of

! ‘in front of the gravity’

2.5.3.2.2.4 Temporal Expressions

2.5.3.2.2.4.1 Durative Time Expressions

Event nouns can be selected by durative time expressions. In (216), the process nominal 感冒 *gǎnmào* ‘cold’ is selected by the durative time expression 11 天 *11 tiān* ‘11 days’.

In (217), the instant nominal 死亡 *sǐwáng* ‘death’ cannot be modified by the durative time expression 三天 *sān tiān* ‘three days’. In (218), the pure event noun 高燒 *gāoshāo* ‘high fever’ is modified by the durative time expression 幾天 *jǐtiān* ‘several days’.

Process Nominal:

(216) 持續 11天的感冒終於好啦! (Web)

Chíxù 11 tiān de *gǎnmào* zhōngyú hǎo la!

last 11 day DE cold finally good expressing exclamation

‘The cold that lasted 11 days finally recovered!’

Instant Nominal:

(217) !三天的死亡

sān tiān de sǐwáng

three day DE death

‘three days’ death’

Pure Event Noun:

(218) 他病得不輕，幾天的高燒，看上去十分憔悴。(CCL)

Tā bìng de

bù

he ill used after a verb to introduce a complement of result or degree not

qīng, jǐ tiān de *gāoshāo*, kàn shàngqù shífēn qiáocuì.
light several day DE high fever look RVC very haggard

‘He was very ill; several days’ high fever makes him look very haggard.’

Entity nouns cannot be selected by durative expressions. Thus both (219) and (220) are invalid.

Concrete Entity Noun:

(219) ! 三年的太陽

! sān nián de *tàiyáng*
three year DE Sun
! ‘three years’ Sun’

Abstract Entity Noun:

(220) ! 兩天的萬有引力

! liǎng tiān de *wànyǒuyǐnlì*
two day DE universal gravitation
! ‘two days’ universal gravitation’

It is possible that we meet with cases that instant nominals and entity nouns are modified by durative time expressions, as shown in (221) and (222). In (221), though the instant nominal 咳嗽 *késou* ‘cough’ is modified by the durative time expression 半年一年 *bànnián yīnián* ‘half a year or one year’. However, it does not refer to one single event, but many coughing event. When referring to a single coughing event, 咳嗽 *késou* ‘cough’ cannot be modified by a durative time expression. In (222), the durative time expressions 幾十年、上百年 *jǐshínián, shàngbǎinián* ‘several decades, almost a century’ refers to the growing event of the forest. It does not mean the forest is an event which lasts a long time.

Instant Nominal:

(221) 一到兩週的中藥治療往往使長達半年一年的咳嗽治愈。(Web)

Yī dào liǎng zhōu de zhōngyào zhiliáo wǎngwǎng shǐ
one to two week DE Chinese herbal medicine treatment often make
chǎngdá bànnián yī nián de *késou* zhiyù.
as long as half a year one year DE cough cure

‘One of two weeks’ herbal treatment tends to cure six months to one year’s coughs.’

Concrete Entity Noun:

- (222) 十年封山，不一定成林。但一把大火，就可以讓幾十年、上百年的森林消失殆盡。(Web)

Shí nián fēng shān, bù yī dìng chéng lín. Dàn yī bǎ dà huǒ,
ten year close hill not necessarily form forest but one CL big fire
jiù kě yǐ ràng
indicating a natural result under certain conditions or circumstances can make
jǐshínián, shàng bǎinián de sēnlín xiāoshīdàijìn.
several decades up to a hundred years DE forest disappear thoroughly

‘Ten years’ hillside closing does not necessarily lead to a forest. But a big fire can make a several decades or almost a century’s forest disappear thoroughly.’

2.5.3.2.2.4.2 Time Points

Event nouns refer to events that happen at certain time, so they can be selected by time points.

In (223), 感冒 *gǎnmào* ‘cold’ is a process nominal. In (224), 死亡 *sǐwáng* ‘death’ is an instant nominal. In (225), 低燒 *dīshāo* ‘low fever’ is a pure event noun. (223) refers to the cold on August 26. (224) refers to the death on that day. (225) refers to the low fever on 8th.

Process Nominal:

- (223) 正是這一點說明拿破崙八月二十六日的感冒沒有什麼意義。(CCL)

Zhèng shì zhè yī diǎn shuō míng Nápòlún bā yuè èrshíliù rì de
exactly be this one point illustrate Napoleon August 26th DE
gǎnmào méi yǒu shén me yì yì.
cold not have what sense

‘It is exactly this point that illustrates Napoleon’s cold on August 26 did not make any sense.’

Instant Nominal:

- (224) 看守所稱，黎亞平患有高血壓，平時就喜歡做俯臥撐，那天的死亡屬於意外。(Web)

Kānshǒusuǒ chēng, Lǐ Yàpíng huànyǒu gāoxuèyā, píngshí
The Detention House claim Li Yaping suffer from high blood pressure usually
jiù xǐhuan zuò fǔwòchēng, nàtiān de sǐwáng shǔyú yìwài.
exactly like do push-up that day DE death belong to accident

‘The Detention House claimed that Li Yaping suffered from high blood pressure; he usually liked doing push-ups. That day’s death was an accident.’

Pure Event Noun:

(225) 8號那天的低燒可能就是因為長牙。(Web)

8 hào nà tiān de dīshāo kěnéng jiù shì yīnwèi zhǎng yá.
8 date that day DE low fever probably exactly be because grow tooth

‘The low fever on the 8th is probably because of teething.’

Entity nouns do not have a time frame, and therefore (226) and (227) are odd.

Concrete Entity Noun:

(226) ! 九點的黃河

jiǔ diǎn de Huánghé
9 O’clock DE Yellow River

‘9 O’clock’s Yellow River’

Abstract Entity Noun:

(227) ! 八點的浮力

! bādiǎn de fúli
eight o’clock DE buoyancy

! ‘eight o’clock’s buoyancy’

It is possible that we come across sentences in which a time point collocates with an entity noun, as shown in (228) and (229). However, in (228), 八九點的太陽 bājiǔ diǎn de tàiyáng ‘the Sun at eight or nine O’clock’ actually refers to the rising event, not the Sun itself. In (229), 去年的政策 qùnián de zhèngcè ‘last year’s policy’ refers to carrying out of the policy last year, not the policy itself.

Concrete Entity Noun:

- (228) 青少年嘛，是早晨八九點的太陽，他們代表著未來，決定著 21 世紀。(CCL)

Qīngshàonián ma, shì zǎochén bājiǔ diǎn
the youth auxiliary, indicating a pause be morning eight or nine O'clock
de tàiyáng, tāmen dàibiǎo zhe wèilái, juédìng zhe 21 shìjì.
DE Sun they represent ASP future decide ASP 21st century

‘The youth are the Sun at eight or nine O’clock in the morning. They represent the future and decide the 21st century.’

Abstract Entity Noun:

- (229) 警方報告顯示政府去年的政策並沒有減少犯罪率。(Web)

Jǐngfāng bàogào xiǎnshì zhèngfǔ qùnián de zhèngcè bìng
police report show government last year DE policy actually
méiyǒu jiǎnshǎo fànzùilǜ.
not have reduce crime rate

‘A police report shows that the Government’s policy last year did not reduce the crime rate.’

2.5.3.2.3 Light Verbs

Light verbs can select event nouns. In (230), the light verb 引起 *yǐnqǐ* ‘cause’ selects the process nominal 感冒 *gǎnmào* ‘cold’. In (231), the light verb 引起 *yǐnqǐ* ‘cause’ selects the instant nominal 死亡 *sǐwáng* ‘death’. In (232), the light verb 發 *fā* ‘get’ selects the pure event noun 高燒 *gāoshāo* ‘high fever’.

Process Nominal:

- (230) 的確，冬季感冒的人比夏季多，但這決不意味著寒冷就能 引起感冒。(CCL)

Díquè, dōngjì gǎnmào de rén bǐ xiàjì duō, dàn zhè
indeed winter cold DE people compare summer more but this
juébù yìwèi zhe hánlěng
definitely not mean ASP coldness
jiù néng yǐnqǐ
indicating a natural result under certain conditions or circumstances can cause

gǎnmào.

cold

‘Indeed, more people catch a cold in winter than in summer, but this definitely does not mean that coldness can cause a cold.’

Instant Nominal:

- (231) 長時間在冷空氣中，人體深部體溫經過降低會引起死亡。(CCL)

Cháng shíjiān zài lěng kōngqì zhōng, réntǐ shēnbù
long time in cold air within human body deep part
tǐwēn jīngguò jiàngdī huì yǐnqǐ sǐwáng.
body temperature go through reduce can cause death

‘In the cold air for a long time, the deep part of the body’s temperature goes through reduction and can cause death.’

Pure Event Noun:

- (232) 有一年深秋，他發了高燒，仍然像牛一樣在田野裡拼命幹活。(CCL)

Yǒu yī nián shēnqiū, tā fā le gāoshāo, réngrán xiàng niú
have one year late autumn he get ASP high fever still like cattle
yīyàng zài tiányě lǐ pīnmìng gànhuó.
same in field inside with all one’s might work

‘In the late autumn one year, he got a high fever, but he still worked like a cattle with all his might in the field.’

Entity nouns usually cannot be selected by light verbs. Therefore, (233) and (234) are both wrong.

Concrete Entity Noun:

- (233) *遭到長江

* ***zāodào chángjiāng***
suffer the Yangtze River

* ‘suffer the Yangtze River’

Abstract Entity Noun:

(234) * 受到引力

shòudào yǐnlì

subject to gravitation

* ‘subject to the gravitation’

2.5.3.3 Summary

This section has looked at the following parameters of to examine different natural kind nouns:

- (I) Event Classifiers
- (II) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - (a) Durative Time Expressions
 - (b) Time Points
- (III) Light Verbs

All of these parameters can directly select natural kind event nouns of these types: process nominals and pure event nouns. Aspectualizers and durative time expressions do not select instant nominals.

At the same time, event classifiers, aspectualizers, and temporal expressions can coerce some non-event representing nouns to have an event reading. But this does not mean that these nouns represent events in themselves. The coerced cases are not considered as direct selection to an event.

Based on these parameters, I propose establishing an event-based classification system for natural kind nouns, as demonstrated in Table 32.

Table 32. An Event-Based Classification System for Natural Kind Nouns

Natural Kind Nouns		Event Classifier	Event Structure					Light Verbs	Example
			Aspectualizer	Frequency Adj.	Localizer	Durative Time Expression	Time Point		
Nominal	Process Nominal	+	+	+	+	+	+	+	感冒 <i>gǎnmào</i> ‘cold’
	Instant nominal	+	-	+	+	-	+	+	死亡 <i>sǐwáng</i> ‘death’
Pure Event Noun		+	+	+	+	+	+	+	風 <i>fēng</i> ‘wind’, 雨 <i>yǔ</i> ‘rain’, 雪 <i>xuě</i> ‘snow’
Entity Noun	Concrete Entity Noun	-	-	-	-	-	-	-	太陽 <i>tàiyáng</i> ‘Sun’, 月亮 <i>yuèliàng</i> ‘Moon’
	Abstract Entity Noun	-	-	-	-	-	-	-	磁場 <i>cíchǎng</i> ‘magnetic field’, 電 <i>diàn</i> ‘electricity’, 重力 <i>zhònglì</i> ‘gravity’

(“+” means that nouns in this category have a high tendency of having this feature. It does not mean every noun in this category has such a feature. By contrast, “-” means nouns in this category have a low tendency of having this feature. It does not mean that no noun in this category has such a feature.)

2.6 Conclusions

This chapter first reviewed the approaches of identifying event nouns in the literature (Fu 1994, Ma 1995, Chu 2000, Wang & Zhu 2000, Liu 2003, Han 2004, Liu 2004, Han 2006, Zhao 2006, Han 2007a, 2007b, 2010a, 2010b), and found there are some problems. First, some scholars noticed that a few classifiers, light verbs and aspectualizers are applicable in finding event nouns, but no systematic research or detailed analysis is carried out. Second, no semantic selectional constraints of each method are explored. Thirdly, previous research overlooked the selectional difference between natural and non-natural events, as well as process and instant event nouns.

This chapter then did a systematic analysis of event classifiers, aspectualizers and light verbs’

selection to nouns. The results show that they select event nouns through pure selection/accommodation and they can coerce entity nouns to have an event reading. Event classifiers and light verbs select both process event nouns and instant event nouns. Different event classifiers, aspectualizers and light verbs have varied selection to natural and non-natural type event nouns.

By combining with other criteria of finding event nouns, this chapter established a constraint-based linguistic model for identifying event nouns, which is composed of these criteria:

- (I) Event Classifiers
- (II) Event Structure
 - (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - a. Durative Time Expressions
 - b. Time Points
- (III) Light verbs

These criteria can facilitate the detection of non-natural kind nominal events in texts.

Nouns in Chinese are usually classified according to classifiers (Chao 1968, Lü 1979, Zhu 1982, Huang et al. 1998, Wang & Zhu 2000). Differently, this chapter classified nouns into different types according to whether a noun has an event reading, as shown in Table 33.

Table 33. Different Types of Nouns

Nouns		Non-natural Kind Nouns	Natural Kind Nouns
Nominal	Process Nominal	報導 <i>bàodǎo</i> ‘reporting’	感冒 <i>gǎnmào</i> ‘cold’
	Result Nominal	報導 <i>bàodǎo</i> ‘report’	-
	Instant Nominal	決定 <i>juédìng</i> ‘decision’	死亡 <i>sǐwáng</i> ‘death’
Pure Event Noun		婚禮 <i>hūnlǐ</i> ‘wedding’	風 <i>fēng</i> ‘wind’
Entity Noun	Concrete Entity Noun	狗 <i>gǒu</i> ‘dog’	太陽 <i>tàiyáng</i> ‘Sun’
	Abstract Entity Noun	主意 <i>zhǔyì</i> ‘idea’	磁場 <i>cíchǎng</i> ‘magnetic field’

Grimshaw (1990) claimed that simple event nominals denote events in some sense. They occur or take place, and they occur over time. However, they act like result nominals because they share the determiner system of result nominals, occur only with optional modifiers and not with arguments, disallow *frequent* and *constant* unless they are in the plural, and disallow event control (Grimshaw 1990: P58-59).

She claimed that only complex event nominals have an event structure and a syntactic argument structure like verbs. The argument structure of complex nominals licenses (and requires) arguments. Complex event nominals are distinguished from simple event nominals and result nominals in the range of determiners and adjuncts they occur with as well as in event control and predication (Grimshaw 1990: P59).

Following Grimshaw (1990)'s research, Fu (1994) compared process nominals, result nominals, and concrete entity nouns in Chinese, and found that they have the same behavior as those in English. However, for one thing, instant nominals, simple event nouns, and abstract entity nouns in Chinese have not yet been studied. For another, the natural and non-natural kind nouns are not distinguished.

To fill in the gap, this chapter examined non-natural kind and natural kind nouns, through applying the eventive constraint-based linguistic model. An event-based noun classification system is established, as shown in Table 34.

Table 34 indicates that process nominals and pure event nouns have the same behavior; instant nominal behave similarly to process nominals and pure event nouns, except that they cannot be selected by aspectualizers and durative time expressions; result nominals, concrete entity nouns and abstract entity nouns have the same behavior. This analysis shows that that process nominals and pure event nouns in Chinese allow all the eventive features, which is different from Grimshaw (1990)'s analysis in English.

Table 34. An Event-based Noun Classification System

Nouns		Event Classifier	Event Structure					Light Verbs	Non-natural Kind	Natural Kind
			Aspectualizer	Frequency Adjective	Localizer	Durative Time Expression	Time Point			
Nominal	Process Nominal	+	+	+	+	+	+	+	報導 <i>bàodǎo</i> ‘reporting’	感冒 <i>gǎnmào</i> ‘cold’
	Result Nominal	-	-	-	-	-	-	-	報導 <i>bàodǎo</i> ‘report’	-
	Instant Nominal	+	-	+	+	-	+	+	判決 <i>pànjué</i> ‘verdict’	死亡 <i>sǐwán</i> ‘death’
Pure Event Noun		+	+	+	+	+	+	+	婚禮 <i>hūnlǐ</i> ‘wedding’	雪 <i>xuě</i> ‘snow’
Entity Noun	Concrete Entity Noun	-	-	-	-	-	-	-	桌子 <i>zhuōzi</i> ‘table’	月亮 <i>yuèliàng</i> ‘Moon’
	Abstract Entity Noun	-	-	-	-	-	-	-	政策 <i>zhèngcè</i> ‘policy’	重力 <i>zhònglì</i> ‘gravity’

(“+” means that nouns in this category have a high tendency of having this feature. It does not mean every noun in this category has such a feature. By contrast, “-” means nouns in this category have a low tendency of having this feature. It does not mean that no noun in this category has such a feature.)

Chapter 3 Properties of Event Nouns

Event nouns are typically compound nouns. There are very few one syllable event nouns, which are mainly weather nouns, such as 風 *fēng* ‘wind’, 雨 *yǔ* ‘rain’, 雪 *xuě* ‘snow’. Therefore it is very important to look at the properties of compound event nouns. Chang and Tang (2009) analyzes the internal modification structure of compounds and divides them into seven functional types: modifier-head, coordinative, predicate-object, subject-predicate (topic-comment), predicate-complement, reduplicative, abbreviatory. Event nouns mainly fall into the first four groups. The predicate-complement type words are not nouns, but verbs, such as 揭開 *jiēkāi* ‘uncover’. The reduplicative type event nouns are not productive, such as 風風雨雨 *fēngfēngyǔyǔ* ‘winds and rains’. Event nouns seldom have abbreviatory.

Following the functional types in Chang and Tang (2009), this chapter examines properties of the four types of event nouns: modifier-head, coordinative, predicate-object, subject-predicate (topic-comment) type. The following sections will explore the morpho-syntactic properties, semantic properties, event representation properties, and information inheritance properties.

3.1 Morpho-Syntactic Properties

This section analyses the morpho-syntactic properties of event nouns from two angles: (i) bound-free morpheme combination, and (ii) grammatical categories of the morphemes according to functional types of the compounds.

3.1.1 Bound-Free Morpheme Combination

Leonard Bloomfield is the first who raised the concept morpheme. He defined it as a linguistic form which bears no partial phonetic-semantic resemblance to any other form (Bloomfield 1933). Based on Bloomfield’s definition, Nida (1949) proposes six principles to identify morphemes:

“Principle 1: Forms which have a common semantic distinctiveness and an identical phonemic form in all their occurrences constitute a single morpheme.

Principle 2: Forms which have a common semantic distinctiveness but which differ in phonemic form (i.e. the phonemes or order of the phonemes) may constitute a morpheme

provided the distribution of formal differences is phonologically definable.

Principle 3: Forms which have a common semantic distinctiveness but which differ in phonemic form in such a way that their distribution cannot be phonologically defined constitute a single morpheme if the forms are in complementary distribution in accordance with the following restrictions: (i) Occurrence in the same structural series has precedence over occurrence in different structural series in the determination of morphemic status. (ii) Complementary distribution in different structural series constitutes a basis for combining possible allomorphs into one morpheme only if there also occurs in these different structural series a morpheme which belongs to the same distribution class as the allomorphic series in question and which itself has only one allomorph or phonologically defined allomorphs. (iii) Immediate tactical environments have precedence over nonimmediate tactical environments in determining morphemic status. (iv) Contrast in identical distributional environments may be treated as submorphemic if the difference in meaning of the allomorphs reflects the distribution of these forms.

Principle 4: An overt formal difference in a structural series constitutes a morpheme if in any member of such a series, the overt formal difference and a zero structural difference are the only significant features for distinguishing a minimal unit of phonetic-semantic distinctiveness.

Principle 5: Homophonous forms are identifiable as the same or different morphemes on the basis of the following conditions: (i) Homophonous forms with distinctly different meanings constitute different morphemes. (ii) Homophonous forms with related meanings constitute a single morpheme if the meaning classes are paralleled by distributional differences, but they constitute multiple morphemes if the meaning classes are not paralleled by distributional differences.

Principle 6: A morpheme is isolatable if it occurs under the following conditions: (i) In isolation. (ii) In multiple combinations in at least one of which the unit with which it is combined occurs in isolation or in other combinations. (iii) In a single combination provided the element with which it is combined occurs in isolation or in other combinations with nonunique constituents.” (Nida 1949: P7-61)

These principles have been used to identify English morphemes. In Mandarin Chinese, since the concept *morpheme* was introduced, there has been a large amount of debate on how to determine a morpheme. Huang and Liao (2002) state that a morpheme is the smallest combination of sound and meaning in a language. According to them, the replacement method can be used to determine a morpheme, using the known morpheme to replace the

lexical unit whose status is uncertain. In the word 蠟燭 *làzhú* ‘candle’, the left and right characters can be replaced by other known morphemes, as shown below:

蠟 *là* ‘wax’——蠟燭 *làzhú* ‘wax candle’, 花燭 *huāzhú* ‘fancy candles lit in the bridal chamber at wedding’, 香燭 *xiāngzhú* ‘joss sticks and candles’, 火燭 *huǒzhú* ‘things that may cause a fire’

燭 *zhú* ‘candle’——蠟燭 *làzhú* ‘wax candle’, 蠟人 *làrén* ‘wax figure’, 蠟紙 *làzhǐ* ‘wax paper’, 蠟染 *làrǎn* ‘wax printing; batik’

Huang and Liao (2002) further point out that a free morpheme is able to stand alone as a word and can also combine with another morpheme to form a compound. A bound morpheme cannot stand alone as a word.

The following section follows Huang and Liao (2002). It uses the replacement method to determine a morpheme and divides them into free and bound morphemes.

The left and right morphemes of compound event nouns can either be bound or free. The possible combinations of them are shown in Table 35.

Table 35. Possible Combinations of Free and Bound Morphemes in Compound Event Nouns

No.	Left Morpheme	Right Morpheme
(a)	bound	free
(b)	free	bound
(c)	bound	bound
(d)	free	free

The following section analyses the morphological structure of four types of event nouns: the modifier-head type, the coordinative type, the predicate-object type, and the subject-predicate (topic-comment) type.

(I) The Modifier-Head Type

bound morpheme + free morpheme: 瑞雪 *ruì-xuě* auspicious-snow ‘auspicious snow’, 劇痛 *jù-tòng* sharp-pain ‘sharp pain’

free morpheme + bound morpheme: 工作餐 *gōngzuò-cān* work-lunch ‘working lunch’, 書法展 *shūfǎ-zhǎn* handwriting-exhibition ‘handwriting exhibition’

bound morpheme + bound morpheme: 便宴 *biàn-yàn* informal-dinner ‘informal dinner’, 蝗災 *huáng-zāi* locust-plague ‘plague of locusts’

free morpheme + free morpheme: 海風 *hǎi-fēng* sea-breeze ‘sea breeze’, 團圓飯 *tuányuán-fàn* reunion-dinner ‘reunion dinner’

(II) The Coordinative Type

bound morpheme + free morpheme: 訪談 *fǎng-tán* interview-discussion ‘interview and discussion’, 宣傳 *xuān-chuán* announce-convey ‘publicity’, 感染 *gǎn-rǎn* affect-affect ‘infection’

free morpheme + bound morpheme: 改革 *gǎi-gé* change-change ‘reform’, 選擇 *xuǎn-zé* choose-choose ‘choice’, 領導 *lǐng-dǎo* lead-lead ‘leadership’

bound morpheme + bound morpheme: 研究 *yán-jiū* research-research ‘research’

free morpheme + free morpheme: 測試 *cè-shì* test-test ‘testing’, 訓練 *xùn-liàn* train-practise ‘training’, 談判 *tán-pàn* talk-judge ‘negotiation’, 改變 *gǎi-biàn* change-change ‘change’ 建設 *jiàn-shè* construct-establish ‘construction’, 收藏 *shōu-cáng* collect-store ‘collection’

(III) The Predicate-Object Type

free morpheme + bound morpheme: 剪綵 *jiǎn-cǎi* cut-ribbon ‘ribbon-cutting’, 喝彩 *hè-cǎi* cheer-applause ‘cheers’, 免疫 *miǎn-yì* exempt-epidemic disease ‘immunity’

free morpheme + free morpheme: 募款 *mù-kuǎn* raise-fund ‘fundraising’, 抗旱 *kàng-hàn* resist-drought ‘drought resisting’, 傷風 *shāng-fēng* injury-cold ‘cold’, 踏青 *tà-qīng* tread-dark green or light blue ‘spring outing’

bound morpheme + bound morpheme: 起哄 *qǐ-hòng* stir up-hubbub ‘creating a disturbance’

(IV) The Subject-Predicate (Topic-Comment) Type

free morpheme + bound morpheme: 海嘯 *hǎi-xiào* sea-roar ‘tsunami’, 月食 *yuè-shí* moon-eclipse ‘eclipse’, 霜寒 *shuāng-hán* frost-cold ‘frostbite’

free morpheme + free morpheme: 兵亂 *bīng-luàn* army-turmoil ‘turmoil caused by war’, 海震 *hǎi-zhèn* sea-quake ‘seaquake’

I have surveyed the morphological structure of event nouns according to whether their

morphemes are free or bound. The results are depicted in Table 36. The morpheme of different types of event nouns differs in their ability of being free or bound. (a) Modifier-head type and coordinative type: either the left or the right morpheme can be free. (b) Predicate-object type: it is rare to have a bound left morpheme and a free right morpheme. (c) Subject-Predicate (Topic-Comment): the left morpheme tends to be free and the right morpheme can be either free or bound.

Table 36. Morphological Structure of Compound Event Nouns

Compound Event Nouns	Bound Morpheme + Free Morpheme	Free Morpheme + Bound Morpheme	Bound Morpheme + Bound Morpheme	Free Morpheme + Free Morpheme
Modifier-Head	+	+	+	+
Coordinative	+	+	+	+
Predicate-Object	-	+	+	+
Subject-Predicate (Topic-Comment)	-	+	-	+

(“+” means such a case is common; “-” means such a case rarely exists.)

3.1.2 Grammatical Categories of the Morphemes

Concerning whether morphemes have grammatical categories, there are two opposite opinions. The first opinion is that the structure of words is highly consistent with that of phrases; morphemes have grammatical categories, which are analyzable (Lü 1962a, 1962b, Yin 1984, Dong 2005). The other opinion claims that a morpheme does not have a grammatical category. Because a morpheme of a compound does not have a morphological change; it does not have a transparent meaning to combine with the adjacent morpheme; it does not have a syntactic function; its morpheme status is not determined by grammatical features (Liu 1990, Ke 1992, Shi 1992). In this research, I am in favor of the first opinion.

Chinese does not have morphological marking, so it is not easy to determine the grammatical category of a word. There are mainly three criteria that are suggested to decide a word's grammatical category: meaning criteria (Ma 1898, Wang 1951, Lü 1953, Wang 1985, Lü 1990), generalized morphological criteria (Fang 1997c, 1997a, 1997b) and functional/distributional criteria (Wenlian & Hufu 1954a, 1954b, Chen 1978, Zhu 1985b, Hu 1995). In the following section, I take the last criteria to determine a morpheme's grammatical category in the four types of compound event nouns: the modifier-head type,

the coordinative type, the predicate-object type, and the subject-predicate (topic-comment) type.

(I) The Modifier-Head Type

N+N: 核戰爭 *hé-zhànzhēng* nuclear-war ‘nuclear war’, 直腸炎 *zhícháng-yán* rectum-inflammation ‘rectitis’, 春汛 *chūn-xùn* spring-flood ‘spring flood’

Adj+N: 大雨 *dà-yǔ* heavy-rain ‘heavy rain’, 美餐 *měi-cān* delicious-meal ‘delicious meal’

V+N: 團圓飯 *tuányuán-fàn* reunion-dinner ‘reunion dinner’, 搖擺舞 *yáobǎi-wǔ* rock and roll-dance ‘rock and roll dance’

Numeral+N: 百戰 *bǎi-zhàn* hundred-battle ‘hundreds of battles’

(II) The Coordinative Type

N+N: 風雨 *fēng-yǔ* wind-rain ‘wind and rain’, 歌舞 *gē-wǔ* song-dance ‘song and dance’

V+V: 改變 *gǎi-biàn* change-change ‘change’ 建設 *jiàn-shè* construct-establish ‘construction’
收藏 *shōu-cáng* collect-store ‘collection’

(III) The Predicate-Object Type

V+N: 賑災 *zhèn-zāi* relieve-disaster ‘disaster relief’

(IV) The Subject-Predicate (Topic-Comment) Type

N+V: 海嘯 *hǎi-xiào* sea-roar ‘tsunami’, 月食 *yuè-shí* moon-eclipse ‘eclipse’, 虎嘯 *hǔ-xiào* tiger-roar ‘tiger roaring’, 海震 *hǎi-zhèn* sea-quake ‘seaquake’

N+A: 春寒 *chūn-hán* spring-chill ‘spring chill’, 霜寒 *shuāng-hán* frost-chill ‘frostbite’, 糧荒 *liáng-huāng* food-shortage ‘food shortage’, 兵亂 *bīng-luàn* army-turmoil ‘turmoil caused by a war’

This section has explored the grammatical categories of morphemes in four types of compound event nouns as shown in Table 37. (a) Modifier-head type has four kinds of structure: N+N, Adj+N, V+N, Numeral+N; (b) coordinative type has two kinds of structure: N+N, V+V; (c) predicate-object type has one kind of structure: V+N; (d) Subject-Predicate type has two kinds of structure: N+V and N+A. The result indicates that different types of compound event nouns vary in their syntactic structure.

Table 37. Grammatical Categories of Morphemes in Compound Event Nouns

Compound Noun Types	N+N	Adj+N	V+N	Numeral+N	V+V	V+A	N+V	N+A
Modifier-Head	+	+	+	+	-	-	-	-
Coordinative	+	-	-	-	+	-	-	-
Predicate-Object	-	-	+	-	-	-	-	-
Subject-Predicate (Topic-Comment)	-	-	-	-	-	-	+	+

3.2 Semantic Properties

3.2.1 Literature Review

Zhong (2010a) states the following properties of event nouns. First, agent, patient, and participant involve differently in different event nouns. Regarding wars, people are agents, patients and participants. For conferences, games, sports and entertainment, people are either both agent and participant, or both participant patient. For disaster, disease, people are patients. Second, all event nouns have process property. This is shown syntactically in their ability of combining with verbal classifiers and temporal classifiers. Third, simplicity and complexity of event nouns. A war is a complex event, which involves a long time, space changing and a lot of people. It also causes tremendous losses. Fourth, concreteness and generality of event nouns. A war is a general term. An ambush war and a lightning war are more concrete. The former reflects the way of fighting, while the latter reflects the short duration of the battle. Fifth, a social influence, which is an important factor in determining whether an action or phenomenon, can be an event.

With respect to the research of Zhong (2010a), I do not agree that all event nouns have process property, because some event nouns express instant events.

Shao and Liu (2001), and Shao (2007) believe that the most basic way to distinguish between static and dynamic nouns is to see whether the word can be modified by activity classifiers. Many nouns in Mandarin Chinese can fit into the structure [一 *yī* ‘one’ + activity classifier + N], and form a modifier-head noun phrase which can freely act as a subject, object and attribute. These nouns are 動量動態名詞 *dòngliàng dòngtài míngcí* ‘dynamic momentum nouns’, e.g. 雨 *yǔ* ‘rain’, 風 *fēng* ‘wind’, 飯 *fàn* ‘meal’, 球賽 *qiú sài* ‘ball game’, and 宴會 *yànhuì* ‘banquet’. Some dynamic momentum nouns can combine with 前 *qián*/之

前 *zhīqián*/以前 *yǐqián* ‘before’ or 後 *hòu*/ 之後 *zhīhòu*/以後 *yǐhòu* ‘after’; these nouns are 時間動態名詞 *shíjiān dòngtài míngcí* ‘temporal dynamic nouns’, e.g. 雨 *yǔ* ‘rain’, 飯 *fàn* ‘meal’, 球賽 *qiú sài* ‘ball game’, 會 *huì* ‘meeting’. There are some other nouns which can enter the sentence N 正在進行之中 *N zhènzài jìnxíng zhīzhōng* ‘N is now underway’. These nouns are 進行動態名詞 *jìnxíng dòngtài míngcí* ‘progressive dynamic nouns’, e.g. 球賽 *qiú sài* ‘ball game’, 戰爭 *zhànzhēng* ‘war’, 會議 *huìyì* ‘conference’, and 手術 *shǒushù* ‘operation’.

Based on the above analysis, they established a continuum to express the dynamics of nouns, as shown in Figure 2.

static	100	75	50	25	0
	A	B	C	D	E
dynamic	0	25	50	75	100

Figure 2: Continuum of the Dynamics of Nouns

A is a typical static noun [100% static, 0% dynamic], while E is a typical verb [0% static, 100% dynamic]. There is a trade-off between static factors and dynamic factors: when static components increase, dynamic components will correspondingly decrease; when dynamic components increase, static components will decrease.

However, we find that many event nouns can enter all three structures, e.g. 會議 *huìyì* ‘conference’, 球賽 *qiú sài* ‘ball game’, and 宴會 *yànhuì* ‘banquet’. In such a case, they are dynamic momentum nouns, temporal dynamic nouns and progressive dynamic nouns simultaneously. Consequently, none of them is on a continuum (Wang & Huang 2010d).

3.2.2 The Time Frame of Event Nouns

Process event nouns have a time frame. A sentence may refer to the starting point, duration, or ending point of a process event (Wang & Huang 2010d, 2012e). The following part shows this point by taking 寒流 *hánliú* ‘cold wave’ selected by the event classifier 波 *bō* ‘of staggered event’ as an example. This is shown from (1) to (4).

Starting Point

- (1) 今年入冬最冷的一波寒流將在今日到達。(Web)

Jīnnián rùdōng zuǐlěng de yī bō hánliú
 this year after the drawing of this winter coldest DE one CL cold wave
 jiāng zài jīnrì dàodá.
 will on today arrive

‘The coldest series of cold waves since the beginning of this winter will arrive today.’

In (1), 今日 *jīnrì* ‘today’ refers to the starting point of this coldest series of cold waves.

Duration

(2) 這波寒流將持續好幾天。(Sinica)

zhè bō hánliú jiāng chíxù hǎojǐtiān.
 this CL cold wave will last several days

‘This series of cold waves will last for several days.’

(3) 這波寒流最冷的時段是週六和週一清晨。(Web)

zhè bō hánliú zuǐlěng de shídùan shì zhōuliù hé zhōuyī qīngchén.
 this CL cold wave coldest DE period be Saturday and Monday morning

‘The coldest period for this series of cold wave is Saturday and Monday morning.’

波 *bō* ‘of staggered event’ selects event nouns with duration. Sentence (2) and (3) show this property. In (2), 好幾天 *hǎojǐtiān* ‘several days’ refer to the duration of the cold wave. Similarly, in (3), 時段 *shídùan* ‘period’ shows the duration.

Ending Point

(4) 預計這波寒流將在 12 號結束。(Web)

yùjì zhè bō hánliú jiāng zài 12 hào jiéshù 。
 expect this CL cold wave will on 12nd end

‘This series of cold wave are expected to end on 12nd.’

In (4), 結束 *jiéshù* ‘end’ indicates the ending of the cold waves.

3.2.3 Individual-Level and Stage-Level Event Nouns

Carlson (1977) introduces stage-level and individual-level predicates. Stage-level predicates, such as hungry, sleeping, awake, drunk, and available, have temporary properties. Individual-level predicates, such as fat, tall, clever, and obnoxious, are more permanent. Chierchia (1995) holds that individual-level predicates are inherently generic. Pustejovsky (1995) further states that habitual and generic nominals are individual-level nominals. Busa (1996) examines the stage-level and individual-level agentive nominals. The event that characterizes the class of individual-level nominals is opaque, because it modally depends on a dispositional or non-dispositional stative predicate. Examples are like *violinist* and *mayor*. Stage-level nominals, such as driver and pedestrian, describe an individual in action and impose restrictions on the relation that ought to be established with the matrix verb. Following Carlson (1977), Chierchia (1995), and Pustejovsky (1995), I argue that event nouns also show the distinction between individual-level and stage-level. An individual-level event noun shows the generic property of an event, while a stage-level event noun has a temporary property, as shown in (5) and (6).

- (5) a. 雨_{Yǔ}的成因多種多樣，形態也各不相同。(individual level)

Yǔ de chéngyīn duōzhǒngduōyàng, xíngtài yě gè bù
rain DE cause of formation varied shape also individual not
xiāngtóng.
same

‘Rain’s formation has a variety of reasons, and the shape of rain also varies.’

- b. 這雨_{zhè yǔ}下了兩天了。(stage level)

Zhè yǔ xià le liǎng tiān le.
this rain fall ASP two day ASP

‘The rain has been falling for two days.’

In (5), 雨 *yǔ* ‘rain’ is a natural phenomenon. (5)a introduces the generic properties of rain, so 雨 *yǔ* ‘rain’ is an individual level noun. (5)b describes the duration of the raining event, so 雨 *yǔ* ‘rain’ is a stage level noun.

- (6) a. 婚禮_{hūnlǐ}是人生中最美好的事，充滿青春、美麗、活力、希望、愛情與承諾。
(individual level)

Hūnlǐ shì rénsēng zhōng zuì měihǎode shì, chōngmǎn qīngchūn,
 wedding be life in the course of most glorious thing full of youth
 měili, huóli, xīwàng, àiqíng yǔ chéngnuò.
 beauty vitality hope love and commitment

‘The **wedding** is the most glorious thing in life, full of youth, beauty, vitality, hope, love and commitment.’

- b. 新郎、新娘交換信物及互行三鞠躬禮，在悠揚的奏樂聲中完成了**婚禮**。
 (stage level)

Xīnláng, xīnniáng jiāohuàn xīnwù jí hù xíng sān
 bride groom exchange authenticating object and mutually do three
 jūgōnglǐ, zài yōuyángde zòuyuè shēng zhōng wánchéng
 bow salute in melodious play music sound in the process of complete
 le **hūnlǐ**.
 ASP wedding

‘The bride and groom exchanged the token and bowed three times to each other. In the melodious music the **wedding** completed.’

In (6), 婚禮 *hūnlǐ* ‘wedding’ is a social activity. (6)a introduces the feature and role of a wedding, so 婚禮 *hūnlǐ* ‘wedding’ is an individual level event. (6)b states the procedure of one particular wedding, so 婚禮 *hūnlǐ* ‘wedding’ is a stage level event.

Most event nouns have both an individual-level property and a stage-level property. The exceptions are proper nouns, such as historical events. They only have a stage-level property. For example, 安史之亂 *ĀnShǐzhīluàn* ‘the rebellion of An Lushan and Shi Siming’.

3.3 Event Representation Properties

Section 3.3.1 examines each morpheme’s event representation ability in compound event nouns. Section 3.3.2 surveys the event representation properties of compound event nouns.

3.3.1 Each Morpheme’s Event Representation Ability of Compound Event Nouns

This section explores each morpheme’s event representation ability in the four types of compound event nouns: the modifier-head type, the coordinative type, the predicate-object

type, and the subject-predicate (topic-comment) type.

(I) The Modifier-Head Type

Modifier-head type event nouns are morphologically productive, with the right morpheme as an event stem. Examples are shown below.

~戰 *zhàn* ‘battle’: 資訊戰 *zīxùnzhàn* ‘information warfare’, 細菌戰 *xìjūnzhàn* ‘germ warfare’, 化學戰 *huàxuézhàn* ‘chemical warfare’, 貿易戰 *màoyìzhàn* ‘trade war’

~賽 *sài* ‘match’: 世乒賽 *shìpīngsài* ‘the world Table Tennis game’, 象棋賽 *xiàngqísài* ‘chess match’

~餐 *cān* ‘meal’: 番茄餐 *fānqiécān* ‘tomato meal’, 法國餐 *fǎguócān* ‘French food’, 學生餐 *xuéshengcān* ‘student meal’

~會 *huì* ‘meeting, gathering; council’: 音樂會 *yīnyuèhuì* ‘concert’, 舞蹈會 *wǔdǎohuì* ‘dancing party’, 演奏會 *yǎnzòuhuì* ‘music playing party’

~病 *bìng* ‘disease’: 心臟病 *xīnzàngbìng* ‘heart disease’, 心血管病 *xīnxuèguǎnbìng* ‘cardiovascular disease’, 胃病 *wèibìng* ‘gastric disease’

These examples show that Modifier-head type event nouns have double roots (Wang & Huang 2011b, 2011a). The right root is the head of an event noun, expressing generic event types, while the modifying left root elaborates information on the event.

(II) The Coordinative Type

In a coordinative event noun, the left morpheme and right morpheme can either express similar events or different events. 測試 *cè-shì* test-test ‘testing’, 訓練 *xùn-liàn* train-practice ‘training’, 談判 *tán-pàn* talk-judge ‘negotiation’ are examples that both morphemes represent similar events. 風雨 *fēng-yǔ* wind-rain ‘wind and rain’, 歌舞 *gē-wǔ* song-dance ‘song and dance’ are examples that both morphemes represent different events.

(III) The Predicate-Object Type

Predicate-object Type event nouns express nominalized events. The gerundive verb gives the event type, while the noun specifies the actual object that the event has power on. For example, 募款 *mù-kuǎn* raise-fund ‘fund-raising’ and 抗旱 *kàng-hàn* resist-drought ‘drought resisting’.

(IV) The Subject-Predicate (Topic-Comment) Type

In a subject-predicate (topic-comment) type event noun, the predicate represents an event. The subject is the agent or theme of the event. For example, 海嘯 *hǎi-xiào* sea-roar ‘tsunami’, 月食 *yuè-shí* moon-eclipse ‘eclipse’, 霜寒 *shuāng-hán* frost-cold ‘frostbite’.

This section has analyzed the event-representing abilities of different types of compound event nouns as illustrated in Table 38.

Table 38. Event Representation of Morphemes

Compound Event Nouns	Left morpheme	Right morpheme
Modifier-Head	elaborate information on the event	a generic event type
Coordinative	similar events or different events	
Predicate-Object	event information	specify the actual object that the event has power on
Subject-Predicate (Topic-Comment)	the agent or theme of the event	event information

Table 38 shows this information. (I) The right morpheme expresses the main event information: Modifier-Head type, Subject-Predicate type. (II) The left morpheme elaborates eventual information: Modifier-Head, Subject-Predicate type. (III) The right morpheme is a theme: Predicate-Object type. (IV) Both the left and the right morpheme represent events: Coordinative type.

3.3.2 Event Representation Properties of Compound Event Nouns

Compound event nouns either represent one or two events. For predicate-object type and subject-predicate (topic-comment) type event nouns, only the predicate shows event information, so they only represent one event.

The event represented by the modifier-head type has two characteristics. First, the head represents a generic event and the modifier restricts the event scope. For example, 雪災 *xuězāi* ‘snow disaster’ is a subtype of 災 *zāi* ‘disaster’, as illustrated in Figure 3.



Figure 3: The Scope of 雪災 *xuězāi* 'snow disaster' and 災 *zāi* 'disaster'

雪災 *xuězāi* 'snow disaster' is a disaster caused by the snowing event. Snowing happens first. As time goes on, the heavy snow continues and consequently it becomes a disaster. The disaster lasts even after snowing ends. The relation between the two events is demonstrated in Figure 4.

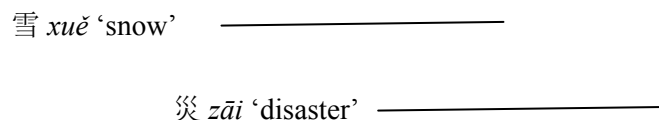


Figure 4: Event Overlapping of 雪 *xuě* 'snow' and 災 *zāi* 'disaster'

Second, the modifier-head type usually represents one event with two event types. That is, the two event types are merged as one event. For example, in 攀岩賽 *pānyánsài* 'rock climbing competition', 攀岩 *pānyán* 'rock climbing' and 賽 *sài* 'competition' happens at the time, the process of climbing the rock is the same as the event competing.

The event(s) represented by a coordinative type have several conditions:

- (i) one event as a whole, such as 試驗 *shì-yàn* test-test 'test'. 試驗 *shì-yàn* test-test 'test' has two morphemes which have similar meanings, and as a whole it represents one event.
- (ii) two ordered events, such as 收藏 *shōu-cáng* collect-keep 'collecting'. The event collecting happens first, and it is followed by the keeping event.
- (iii) two simultaneous events, such as 風雨 *fēng-yǔ* wind-rain 'wind and rain' and 歌舞 *gē-wǔ* song-dance 'song and dance'. In 風雨 *fēng-yǔ* wind-rain 'wind and rain', wind blowing and snowing happen together. In 歌舞 *gē-wǔ* song-dance 'song and dance', singing and dancing are carried out together.

3.4 Information Inheritance Properties

It is common that the information load is on the head or the predicate of a compound noun. For example, the main information in predicate-object type and subject-predicate (topic-comment) type is from the predicate. Generally, the major information of the modifier-head type is from the head. However, it is very interesting that in some cases, the information load of the modifier-head type is from the modifier. The following section will discuss semantic information inheritance of ‘modifier-head’ type event nouns.

3.4.1 Inheriting Information from the Modifier or the Head

Righthand Head Rule states that the head of a morphologically complex word is the righthand member of that word (Williams 1981). This entails that the properties of a word are determined by the rightmost constituent. This section examines the compounds 音樂會 *yīnyuèhuì* ‘concert’ and 地雷戰 *dìléi zhàn* ‘landmine war’. Different from Righthand Head Rule, the results demonstrate that in many cases the left side modifier contributes more semantic information than the right side head.

In *The Contemporary Chinese Dictionary* (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012), 會 *huì* has ten senses, as shown in Table 39. Among these senses, senses 3, 5, 6 refer to a nominal event of meeting or gathering.

Table 39. Senses of 會 *huì*

No.	Sense	Example
①	聚合；合在一起 <i>jùhé; hé zài yīqǐ</i> ‘gather; congregate; assemble’	會齊 <i>huìqí</i> ‘join together’
②	[動詞] 見面；會見 <i>jiànmiàn; huìjiàn</i> ‘[verb] meet; see’	會客 <i>huìkè</i> ‘receive a guest’
③	[名詞] 有一定目的的聚會 <i>yǒu yīdìng mùdì de jùhuì</i> ‘[noun] rally; assemblage; assembly; congregation; gathering with a specific purpose’	晚會 <i>wǎnhuì</i> ‘evening party’
④	某些團體 <i>mǒu xiē tuántǐ</i> ‘association; society; organization’	工會 <i>gōnghuì</i> ‘trade union’
⑤	廟會 <i>miào huì</i> ‘temple fair’	趕會 <i>gǎn huì</i> ‘go to a temple fair’
⑥	民間朝山進香或酬神求年成時所組織的集體活動，如香會、迎神賽會等 <i>mínjiān cháoshān jìnxiāng huò chóu shén qiú niáncheng shí suǒ zǔzhī de jítǐ huódòng, rú xiānghuì, yíngshénsàihuì děng</i> ‘popular gathering at a temple to worship	/

	Buddha or pray for a bumper harvest, e. g. gathering of worshippers, festival to pacify the spirits'	
⑦	[名詞] 民間一種小規模經濟互助組織，入會成員按期平均交款，分期輪流使用 <i>mínjiān yī zhǒng xiǎo guīmó jīngjì hùzhù zúzhī, rù huì chéngyuán ànqī píngjūn jiāo kuǎn, fēnqī lúnliú shǐyòng</i> '[noun] small credit association, where members regularly contribute an equal amount to a common fund and draw from it by turns'	/
⑧	主要的城市 <i>zhǔyào de chéngshì</i> 'main city'	省會 <i>shěnghuì</i> 'provincial capital'
⑨	時機 <i>shíjī</i> 'chance; opportunity'	機會 <i>jīhuì</i> 'chance; opportunity'
⑩	[副詞] 恰巧；正好 <i>qiàqiǎo; zhènghǎo</i> '[adverb] happen; coincide with; it happens ...'	會有客來。 <i>Huì yǒu kè lái.</i> 'At that moment, a guest happened to visit.'

The qualia structure of 會 *huì* 'meeting' is depicted in (7).

(7)	<div style="border-bottom: 1px solid black; padding-bottom: 5px;">會 <i>huì</i> 'meeting'</div> <div style="padding: 5px 0 5px 20px;"> ARGSTR = D-ARG1 = x: attendee D-ARG2 = y: topic D-ARG3 = z: organizer </div> <div style="padding: 5px 0 5px 20px;"> EVENTSTR = [E₁ = e₁: process] </div> <div style="padding: 5px 0 5px 20px;"> QUALIA = FORMAL = r: event CONSTITUTIVE = {x, y, presentation, discussion} TELIC = communicate information ∨ reach a decision AGENTIVE = organize (z, r) </div>
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The qualia structure of 音樂 *yīnyuè* 'music' is illustrated in (8).

(8)	<div style="border-bottom: 1px solid black; padding-bottom: 5px;">音樂 <i>yīnyuè</i> 'music'</div> <div style="padding: 5px 0 5px 20px;"> ARGSTR = D-ARG1 = x: player D-ARG2 = y: singer D-ARG3 = z: composer D-ARG4 = r: individual </div> <div style="padding: 5px 0 5px 20px;"> QUALIA = FORMAL = s: sound TELIC = listen (r, s) AGENTIVE = play (x, s) ∨ sing (y, s) ∨ compose (z, s) </div>
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The qualia structure of 音樂會 *yīnyuèhuì* 'concert' is shown in (9).

$$(9) \left[\begin{array}{l} \text{音樂會 } yīnyuèhuì \text{ 'concert'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{event} \\ \text{ARG2} = y: \text{music} \\ \text{D-ARG1} = z: \text{player} \\ \text{D-ARG2} = r: \text{singer} \\ \text{D-ARG2} = s: \text{organizer} \\ \text{D-ARG1} = t: \text{audience} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{event} \cdot \text{music_lcp} \\ \text{FORMAL} = \text{exist in } (y, x) \\ \text{TELIC} = \text{listen } (t, x \cdot y) \\ \text{AGENTIVE} = \text{play } (z, y) \vee \text{sing } (r, y) \vee \text{organize}(r, x \cdot y) \end{array} \right] \end{array} \right]$$

In the following part, seven evidences show that 音樂會 *yīnyuè huì* ‘concert’ usually inherits information from the modifier 音樂 *yīnyuè* ‘music’.

(I) Nominal Modifier of 音樂會 *yīnyuè huì* ‘concert’

In (10), Beethoven here refers to a German musician (December 1770 – 26 March 1827).

- (10) 對於是否會像郎朗一樣進軍影視界，李云迪坦言目前最重要的還是貝多芬音樂會。(Web)

Duìyú shìfǒu huì xiàng Lánglǎng yīyàng jìnjūn
 as to whether or not sure to like Lang Lang same enter
 yǐngshìjiè, Lǐ Yúndí tǎnyán mùqián zuì zhòngyào
 film and television industry Li Yundi frankly say at present most important
 de hái shì **Bèiduōfēn yīnyuèhuì**.
 DE still is Beethoven concert

‘As to whether he will enter the film and television industry like Lang Lang, Li Yundi frankly said that at present the most important thing is the Beethoven concert.’

In (10), 貝多芬音樂會 *Bèiduōfēn yīnyuèhuì* ‘Beethoven concert’ refers to a concert which plays the music composed by 貝多芬 *Bèiduōfēn* ‘Beethoven’. That is, 貝多芬 *Bèiduōfēn* ‘Beethoven’ is the composer.

$$(11) \left[\begin{array}{l} \text{貝多芬音樂會 } Bèiduōfēn \text{ yīnyuèhuì 'Beethoven concert'} \\ \text{ARGSTR} = [\text{D-ARG1} = m: \text{music of Beethoven}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \left[\begin{array}{l} \text{音樂會 } yīnyuèhuì \text{ 'concert'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{event} \\ \text{ARG2} = y: \text{music} \\ \text{D-ARG1} = z: \text{player} \end{array} \right] \end{array} \right] \\ \text{AGENTIVE} = \text{play } (z, m) \end{array} \right] \end{array} \right]$$

(11) shows that the agentive role of 貝多芬音樂會 *Bèiduōfēn yīnyuèhuì* ‘Beethoven concert’ is the same as the ‘compose’ agentive role of 音樂 *yīnyuè* ‘music’ as shown in (8). This indicates that Beethoven modifies the modifier 音樂 *yīnyuè* ‘music’ rather than the head 會 *huì* ‘meeting’ in the compound 音樂會 *yīnyuèhuì* ‘concert’.

In (12), Chan Yik-Shun refers to the Hong Kong singer born in 1974.

(12) 最近，我聽了兩場陳奕迅音樂會。(Web)

Zuìjìn, wǒ tīng le liǎng chǎng Chén Yìxùn yīnyuèhuì.
Recently, I listen to ASP two CL Chan Yik-Shun concert

‘Recently, I listened to two Chan Yik-Shun concert.’

In (12), 陳奕迅音樂會 *Chén Yìxùn yīnyuèhuì* ‘the concert of Chan Yik-Shun’, the nominal modifier 陳奕迅 *Chén Yìxùn* ‘Chan Yik-Shun’ is the singer. 陳奕迅音樂會 *Chén Yìxùn yīnyuèhuì* ‘the concert of Chan Yik-Shun’ is a concert on which 陳奕迅 *Chén Yìxùn* ‘Chan Yik-Shun’ sings.

(13)
$$\left[\begin{array}{l} \text{陳奕迅音樂會 } Chén Yìxùn yīnyuèhuì \text{ ‘the concert of Chan Yik-Shun’} \\ \text{ARGSTR} = [\text{ARG1} = c: \text{Chan Yik-Shun}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{音樂會 } yīnyuèhuì \text{ ‘concert’} \\ \text{FORMAL} = \left[\begin{array}{l} \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{event} \\ \text{ARG2} = y: \text{music} \end{array} \right] \end{array} \right] \\ \text{AGENTIVE} = \text{sing}(c, y) \end{array} \right] \end{array} \right]$$

In (13), the agentive role of 陳奕迅音樂會 *Chén Yìxùn yīnyuèhuì* ‘the concert of Chan Yik-Shun’ is the same as the ‘sing’ agentive role of 音樂 *yīnyuè* ‘music’ as shown in (8). Therefore, Chan Yik-Shun modifies 音樂 *yīnyuè* ‘music’ rather than 會 *huì* ‘meeting’. In 小提琴音樂會 *xiǎotíqín yīnyuèhuì* ‘violin concert’, the nominal modifier 小提琴 *xiǎotíqín* ‘violin’ is the exclusive instrument used to play music on a concert. The constitutive role of 小提琴音樂會 *xiǎotíqín yīnyuèhuì* ‘violin concert’ is the songs played by a violin, which is identical with the constitutive role ‘songs’ of 音樂 *yīnyuè* ‘music’. Thus 小提琴 *xiǎotíqín* ‘violin’ modifies 音樂 *yīnyuè* ‘music’ rather than 會 *huì* ‘meeting’.

(II) Adjectival Modifiers of 音樂會 *yīnyuèhuì* ‘concert’

精彩的音樂會 *jīngcǎide yīnyuèhuì* ‘splendid concert’ expresses the splendid music at a

concert, not a splendid meeting. Thus, 精彩 *jīngcǎi* ‘splendid’ inherits information from 音樂 *yīnyuè* ‘music’ rather than 會 *huì* ‘meeting’.

(III) Verbal Modifier of 音樂會 *yīnyuèhuì* ‘concert’

The agentive role of 獨唱音樂會 *dúchàng yīnyuèhuì* ‘solo-singing concert’ is ‘sing by oneself’; the agentive role of 獨奏音樂會 *dúzòu yīnyuèhuì* ‘solo-playing concert’ is ‘play by oneself’. They refer to the agentive role of 音樂 *yīnyuè* ‘music’ as depicted in (8).

(IV) Nouns Modified by 音樂會 *yīnyuèhuì* ‘concert’

The constitutive role of 音樂會曲目 *yīnyuèhuì qǔmù* ‘concert songs’ is the songs at a concert, which is part of the constitutive role of 音樂 *yīnyuè* ‘music’.

(V) 音樂會 *yīnyuèhuì* ‘concert’ as a Subject

In 音樂會演出 *yīnyuèhuì yǎnchū* ‘concert performance’, 演出 *yǎnchū* ‘performance’ refers to the agentive role “play” of 音樂 *yīnyuè* ‘music’, not 會 *huì* ‘meeting’.

(VI) 音樂會 *yīnyuèhuì* ‘concert’ as an Object

In 聆聽音樂會 *língtīng yīnyuèhuì* ‘listen carefully to a concert’, 聆聽 *língtīng* ‘listen carefully’ refers to the 音樂 *yīnyuè* ‘music’ and definitely not 會 *huì* ‘meeting’. 音樂 *yīnyuè* ‘music’ has a constitutive role “songs”, which can be listened to.

(VII) Classifiers of 音樂會 *yīnyuèhuì* ‘concert’

In 這台音樂會 *zhè tái yīnyuèhuì* ‘this concert’, 台 *tái* ‘stage’ is a stage where the performance takes place. Thus it is related to 音樂 *yīnyuè* ‘music’. Regarding 會 *huì* ‘meeting’, it is related to the gathering of audience who seats in the concert hall, not the 台 *tái* ‘stage’.

In sum, different from Righthand Head Rule, the ‘modifier-head’ event noun 音樂會 *yīnyuèhuì* ‘concert’ indicates that the modifier, which is on the left, holds more semantic information and gives the event structure of the whole noun, while the head, which is on the right, is more bleached and generic in meaning. Other similar examples are 舞蹈會 *wǔdǎohuì* ‘dancing party’, 演奏會 *yǎnzòuhuì* ‘music playing party’, 圖片展 *túpiàn zhǎn* ‘photo exhibition’.

We should also note that these nouns are double rooted. Although sometimes their semantic information can be inherited from the modifier, it is not to say they do not permit information inheritance from the head. For instance, in 舉行音樂會 *jǔxíng yīnyuèhuì* ‘hold a concert’, 出席音樂會 *chūxí yīnyuèhuì* ‘be present at a concert’ and 參加音樂會 *cānjiā yīnyuèhuì* ‘attend a concert’, the verbs 舉行 *jǔxíng* ‘hold’, 出席 *chūxí* ‘be present at’ and 參加 *cānjiā* ‘attend’ selects information from the head 會 *huì* ‘meeting’ rather than the modifier 音樂 *yīnyuè* ‘music’.

Another example of such kind is 地雷戰 *dìléi zhàn* ‘landmine war’. The semantic information can be inherited either from the modifier or the head. In 地雷戰 *dìléi zhàn* ‘landmine war’, the left morpheme 地雷 *dìléi* ‘landmine’ is a physical object, while the right morpheme 戰 *zhàn* ‘war’ is an event.

(I) Inheriting information from the head

(14) 地雷- 戰 英雄

dìléi zhàn yīngxióng
landmine warfare hero

‘hero(es) in the landmine warfare’

(15) 地雷-戰 越 打 越 大

dìléi-zhàn yuè dǎ yuè dà
landmine warfare more fight more large

‘The Landmine warfare becomes larger and larger.’

(14) refers to hero(es) in 戰 *zhàn* ‘war’ rather than 地雷 *dìléi* ‘landmine’. In (15), 大 *dà* ‘large’ modifies the right morpheme 戰 *zhàn* ‘war’ rather than the left morpheme 地雷 *dìléi* ‘landmine’.

(II) Inheriting information from the modifier

(16) 地雷- 戰 炸 破 敵 膽。 (Web)

Dìléi-zhàn zhà pò dí dǎn.
landmine warfare explode broken enemy gallbladder

‘The landmine warfare frightens the enemy and defeats their morale.’

In (16), 炸 *zhà* ‘explode’ indicates the exploding event of 地雷 *dìléi* ‘landmine’ rather than the warfare event of the head 戰 *zhàn* ‘war’.

The above examples illustrate that the semantic information of 地雷戰 *dìléi zhàn* ‘landmine warfare’ can be inherited either from the modifier or the head. A similar example is 地道戰 *dìdào zhàn* ‘tunnel warfare’.

3.4.2 Inheriting Information from the Head

It is more conventional that the main information of a compound noun is inherited from the head, which is in conformity with Righthand Head Rule. Examples are shown in (17) and (18).

(17) 陽春三月京城普降鵝毛雪。(Web)

yángchūn sānyuè jīngchéng pǔ jiàng é máo xuě。
spring March capital city widespread fall goose feather snow

‘Goose feather snow falls widely in the capital city in March of the spring.’

(18) 成都下起了鵝毛雪。(Web)

Chéngdū xià qǐ le é máo xuě 。
Chengdu fall RVC ASP goose feather snow

‘Chengdu began to fall goose feather snow.’

In both (17) and (18), 降 *jiàng* ‘fall’ and 下 *xià* ‘fall’ selects 雪 *xuě* ‘snow’ rather than 鵝毛 *émáo* ‘goose feather snow’ as their arguments. 鵝毛 *émáo* ‘goose feather’, as a modifier, gives the shape of the snow, which is the formal quale of snow.

3.5 Conclusions

This chapter has explored the following properties of compound event nouns: (I) morpho-syntactic properties, grammatical categories of the morphemes, (II) semantic properties, (III) event representation properties, and (IV) information inheritance properties.

First, this chapter analyzed the morpho-syntactic properties of event nouns from two angles: (i) bound-free morpheme combination, and (ii) grammatical categories of the morphemes according to functional types of the compounds.

(i) Bound-Free Morpheme Combination

The morpheme of different types of event nouns differs in their ability of being free or bound. (a) Modifier-head type and coordinative type: either the left or the right morpheme can be free. (b) Predicate-object type: it is rare to have a bound left morpheme and a free right morpheme. (c) Subject-Predicate (Topic-Comment): the left morpheme tends to be free and the right morpheme can be either free or bound.

(ii) Grammatical Categories of the Morphemes

(a) modifier-head type has four kinds of structure: N+N, Adj+N, V+N, Numeral+N; (b) coordinative type has two kinds of structure: N+N, V+V; (c) predicate-object type has one kind of structure: V+N; (d) Subject-Predicate type has two kinds of structure: N+V and N+A. The result indicates that different types of compound event nouns vary in their syntactic structure.

Second, this chapter explored the semantic properties of event nouns. (i) Process event nouns have a time frame, including starting point, duration, and ending point. (ii) Event nouns show the distinction between individual-level and stage-level. An individual-level event noun shows the generic property of an event, while a stage-level event noun has a temporary property.

Third, this chapter studies the event representation properties of event nouns.

The event representation ability of each morpheme in compound event nouns is different. (i) The right morpheme expresses the main event information: Modifier-Head type, Subject-Predicate type. (ii) The left morpheme elaborates eventual information: Modifier-Head, Subject-Predicate type. (iii) The right morpheme is a theme: Predicate-Object type. (iv) Both the left and the right morpheme represent events: Coordinative type.

Compound event nouns either represent one or two events. For predicate-object type and subject-predicate (topic-comment) type event nouns, only the predicate shows event information, so they only represent one event. The event(s) represented by a coordinative type have several conditions. (i) one event as a whole, such as 試驗 *shì-yàn* test-test ‘test’. 試驗 *shì-yàn* test-test ‘test’ has two morphemes which have similar meanings, and as a whole it represents one event. (ii) two ordered events, such as 收藏 *shōu-cáng* collect-keep ‘collecting’. The event collecting happens first, and it is followed by the keeping event. (iii) two simultaneous events, such as 風雨 *fēng-yǔ* wind-rain ‘wind and rain’. In 風雨 *fēng-yǔ* wind-rain ‘wind and rain’, wind blowing and snowing happen together. These results are

shown in Table 40.

Table 40. Event Representation Properties of Compound Event Nouns

Compound Event Nouns	Property	Example
Modifier-Head	(i) the head represents a generic event and the modifier restricts the event scope	雪災 <i>xuězāi</i> ‘snow disaster’
	(ii) represents one event with two event types	攀岩賽 <i>pānyánsài</i> ‘rock climbing competition’
Coordinative	(i) one event as a whole	試驗 <i>shì-yàn</i> test-test ‘test’
	(ii) two ordered events	收藏 <i>shōu-cáng</i> collect-keep ‘collecting’
	(iii) two simultaneous events	風雨 <i>fēng-yǔ</i> wind-rain ‘wind and rain’
Predicate-Object	Only the predicate shows event information, so they only represent one event.	
Subject-Predicate (Topic-Comment)		

Fourth, this chapter studies the information inheritance properties of event nouns.

The main information in predicate-object type and subject-predicate (topic-comment) type is from the predicate. Generally, the major information of the modifier-head type is from the head. However, in some cases the information load of this type is from the modifier, as shown in (19) and (20). In (19), 聆聽 *língtīng* ‘listen to sth. respectfully’ refers to the modifier 音樂 *yīnyuè* ‘music’. In (20), 炸 *zhà* ‘explode’ refers to the modifier 地雷 *dìléi* ‘landmine’.

(19) 聆聽音樂會

língtīng *yīnyuè huì*
listen to sth. respectfully music meeting

‘listen to a concert respectfully’.

(20) 地雷戰炸破敵膽

dìléi *zhàn* zhà pò dí dǎn
landmine warfare explode broken enemy gallbladder

‘The landmine warfare frightens the enemy and defeats their morale.’

Chapter 4 The Type System of Event Nouns and Qualia Role Contributions

4.1 The Type System of Event Nouns

A considerable amount of research has been conducted into event nouns in Mandarin Chinese (Ma 1995, Chu 2000, Wang & Zhu 2000, Han 2010a, Wang & Huang 2011a, 2011d, 2011c, 2012e, 2012a, 2012c, 2012d). Previous research on the classification of these nouns is based on their semantic categories (Han 2004, Liu 2004, Han 2010b, Wang 2010, Zhong 2010b). However, such classification conceals the shared characteristics of different categories of event nouns. This section aims to construct the type system of event nouns based on GL.

The following sections are arranged as follows. *Section 4.1.1* reviews the type system in GL and the linguistic diagnostics that motivate a fundamental distinction between natural and non-natural kinds. Then *Section 4.1.2* compares the natural and non-natural kind event nouns by complementing GL's diagnostics. *Section 4.1.3* enriches the type system of GL through exploring event nouns, which further divides complex types into natural complex types and artifactual complex types. *Section 4.1.4* explores the constructions that can identify complex types. *Section 4.1.5* summarizes the research.

4.1.1 Literature Review

Pustejovsky (2001b, 2006), and Pustejovsky and Jezek (2008) establish a type system for the three upper concepts (entity, event and quality) as depicted in Figure 5.

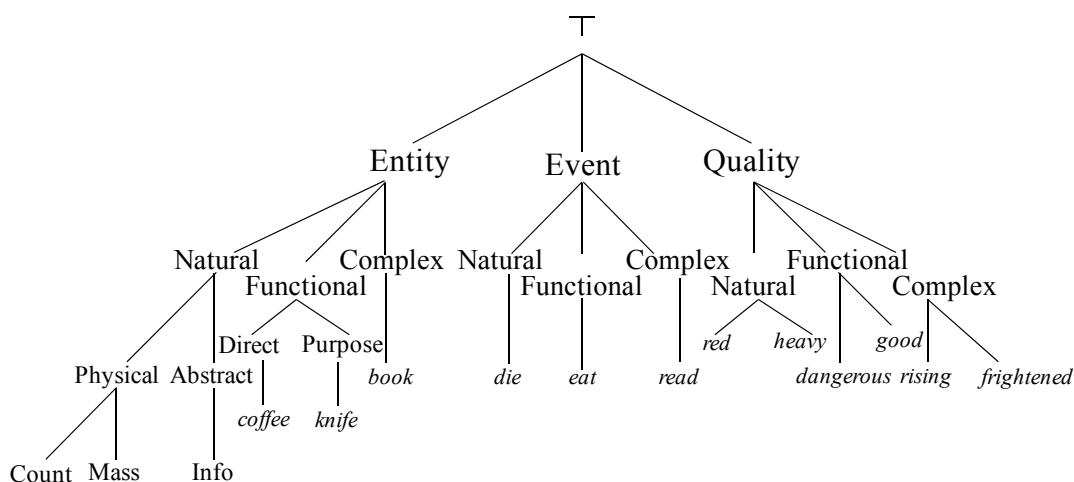


Figure 5. Tripartite Concept Lattice

Each concept is divided into three subtypes (natural, artifactual and complex) by using qualia structure as a typing specification. Entities are distinguished into three types: (a) Natural Types: Predication from the domain of substance, e.g., the qualia formal or constitutive. (b) Functional Types¹⁷: Predication includes reference to either agentive or telic qualia. (c) Complex Types: Cartesian type formed by Dot Object Construction. Similarly, the domains of relations and properties are also partitioned into three ranks: (a) Natural Events: Arguments in the predicate or relation are only from the domain of substance, e.g., the qualia formal or constitutive. (b) Functional Events: At least one argument in the predicate or relation is a functional type, e.g., makes reference to either agentive or telic qualia. (c) Complex Events: At least one argument in the predicate or relation is a complex type, e.g., a type formed by Dot Object Construction.

Pustejovsky (2006) further discusses three linguistic diagnostics which motivate a fundamental distinction between natural and unnatural kinds. These diagnostics are: (a) Nominal Predication: How the common noun behaves predicatively; (b) Adjectival Predication: How adjectives modifying the common noun can be interpreted; (c) Interpretation in Coercive Contexts: How NPs with the common noun are interpreted in coercive environments. These analyses are shown from (1) to (4).

- (1) a. Gizmo is a dog.
 b. ! Gizmo is a dog and a cat.
 c. Gizmo is a dog and therefore an animal.

Natural kinds permit singular predication as shown in (1)a. However, they only permit unique predication, so the co-predication in (1)b is odd. In (1)a, the predication *a dog* states

¹⁷ It is also called Artifactual Types.

what Gizmo is, while in (1)b, it is contradictory to say that Gizmo is a dog and a cat. (1)c is valid because dogs are a subtype of animals.

- (2) a. It is a pen.
- b. It is both a pen and a knife.
- c. It is a pen and therefore a tool.

Non-natural kinds not only permit singular predication, but also permit co-predication, as shown in (2)a and (2)b respectively. In (2)a, the predication *a pen* tells us what it is. In (2)b, a pen and a knife are both artifacts and they can be co-predicated. (2)c is valid because pens are a subtype of tools.

- (3) a. a young bird
- b. a black pen

(3) shows adjectival modification of both natural and non-natural kinds. In (3)a, the adjective *young* behaves in a subsective manner and modifies one distinct semantic aspect of the head *bird*, so it is unambiguous. In (3)b, the adjective *black* modifies aspects of the head: it can modify the color of the pen or the color of the ink, so (3)b is ambiguous.

- (4) a. ! Brant began a lion.
- b. Allison began her thesis.

(4) shows the contrast between natural and non-natural kinds in coercive context. In (4)a, the natural kind term *lion* carries no prior information to have a coerced reading, so (4)a is odd. In (4) b, the non-natural kind term *thesis* is coerced to be a writing event.

The analysis in Pustejovsky (2006) from (1) to (4) is summarized in Table 41.

Table 41. Diagnostics between Natural and Unnatural Kinds

Diagnostics		Natural Kind	Non-Natural Kinds
Nominal Predication	singular predication	yes	yes
	nominal co-predication	no	yes
	and-therefore-construction	yes	yes
Adjectival Predication	adjectival modification	unambiguous in their modification of the nominal head	modify aspects of the nominal head other than the physical object; ambiguous
Interpretation in Coercive Contexts	selection of NPs in type coercive contexts	NPs carry no prior information to undergo type coercion	NPs carry their own default interpretation in coercive contexts

4.1.2 Natural and Non-natural Kind Event Nouns

Pustejovsky (2006) has used the three diagnostics to test entity nouns, as have been illustrated in (1)-(4). In the following, I will use them to test event nouns, as depicted in (5)-(8).

- (5) a. 這是地震。(Gigaword)

Zhè shì dìzhèn.
this be earthquake

‘This is an earthquake.’

- b. ! 這是地震和海嘯。

! Zhè shì dìzhèn hé hǎixiào.
this be earthquake and tsunami

! ‘This is an earthquake and a tsunami.’

- c. 這是地震，所以是自然災害。

Zhè shì dìzhèn, suǒyǐ shì zìrán zāihài.
this be earthquake, therefore be natural disaster

‘This is an earthquake, and therefore a natural disaster.’

(5) shows cases of nominal predication of natural-kind event nouns. They permit singular predication as shown in (5)a. Same with entity nouns in (1), natural event noun requires predicative uniqueness, so the nominal co-predication in (1)b is an anomaly. The predication in (5)b is contradictory. In (5)c, the construction 所以是 *suǒyǐ shì* ‘therefore (it) is’ is valid with the first noun as a subtype of the second. Since 地震 *dìzhèn* ‘earthquake’ is a subtype of 自然災害 *zìrán zāihài* ‘natural disaster’, the construction in (5)c is acceptable.

- (6) a. 這是婚禮。

Zhè shì hūnlǐ.
this be wedding

‘This is a wedding.’

b. 這是婚禮和宴會。

Zhè shì hūnlǐ hé yànhuì.

this be wedding and banquet

‘This is a weddings and a banquet.’

c. 這是婚禮，所以是社會活動。

Zhè shì hūnlǐ, suǒyǐ shì shèhuì huódòng.

this be wedding, therefore be social activity

‘This is a wedding, and therefore a social activity.’

Sentences in (6) show cases of nominal predication of non-natural kind event nouns. Non-natural kind event nouns permit both singular predication and co-predication as shown in (6)a and (6)b respectively. (6)a tells us what this (activity) is. (6)b shows this activity has the function of both a wedding and a banquet. In (6c), a wedding is a subtype of social activities, so (6)c is valid when 所以是 *suǒyǐ shì* ‘therefore (it) is’ links the two event nouns.

(7) a. 猛烈的地震

měngliède dìzhèn

violent earthquake

‘a violent earthquake’

b. 很長的早餐

hěn cháng de zǎocān

very long DE breakfast

‘a very long breakfast’

Examples in (7) are adjectival modifications to both natural and non-natural event nouns. In (7) a, the adjective 猛烈的 *měngliède* ‘violent’ modifies the intensity of the earthquake and is unambiguous. In (7)b, the modifier 很長的 *hěn cháng de* ‘very long’ can refer to both the eating event and the food itself, so (7)b is ambiguous.

(8) a. ! 他們開始了風。

! Tāmen kāishǐ le fēng.

they begin ASP wind

! ‘They began the wind.’

b. 他們開始了體操比賽。

Tāmen kāishǐ le tícāo bǐsài.
They begin ASP gymnastics competition

‘They began the gymnastics competition.’

(8) shows the difference between natural and non-natural event nouns in coercive context. In (8)a, the natural event noun 風 *fēng* ‘wind’ has no prior information to get coerced, so this sentence is odd. In (8)b, however, the non-natural event noun 體操 *tícāo* ‘gymnastics’ is coerced to be performing gyms through agentive role exploitation.

Examples (5)-(8) indicate that event nouns display clear differences between natural and non-natural kinds. This is the similar to entity nouns.

However, the discussion on nominal co-predication and adjectival predication in (Pustejovsky 2006) is not sufficient. First, let’s look at cases of nominal co-predication. Though non-natural kinds permit nominal co-predication, it is impossible to co-predicate any two artifacts at random, as shown in (9).

(9) ! 這是鋼筆和桌子。

! Zhè shì gāngbǐ hé zhuōzi.
this be pen and table

! ‘This is a pen and a table.’

A pen is a long thin object that is used for writing, while a table is a piece of furniture with a flat top that is used for putting things on. It is rarely possible that an entity can have either the form or function that both a pen and a table have. The basis for nominal co-predication of artifacts is that the artifacts describe a different form (the formal role) or function (the telic role) of one entity from different perspectives. This argument also holds for event nouns, as shown in (10).

(10) ! 這是戰爭和海水浴。

! Zhè shì zhànzhēng hé hǎishuǐyù.
this be war and seawater bath

! ‘This is a war and a seawater bath.’

A war is a violent fight between different parties that last long, while a seawater bath is a way that you wash yourself in seawater. The two artificial events are too divergent to be co-predicated and refer to one social event.

Second, let's turn to adjectival modification. It is not the case that all natural kinds are unambiguous when they are modified by adjectives, as shown in (11).

(11) 大雨

dà yǔ
heavy rain
'heavy rain'

In (11), the adjective 大 *dà* 'heavy' can modify the raining event and the raindrops. This is because 雨 *yǔ* 'rain' is a complex type and thus inherently ambiguous, referring to either an event or raindrop(s).

Besides, it is not true that all non-natural kinds are ambiguous when they are modified by adjectives, as shown in (12).

(12) 白色的牆

báisède qiáng
white wall
'a white wall'

In (12), the adjective 白色的 *báisède* 'white' modifies the artifact 牆 *qiáng* 'wall', which means that the wall has a white color. It is not ambiguous at all.

Based on these analyses, I made some modifications to nominal co-predication and adjectival modification in (Pustejovsky 2006). (i) Nominal co-predication of non-natural kinds requires that the co-predicated nouns must share a property of the item being predicated, such as the formal role or the telic role. (ii) When an adjective modifies a complex-type natural noun, this construction could be ambiguous, as shown in (11). When an adjective modifies an artifactual-type non-natural noun, this construction is not necessarily ambiguous, as depicted in (12).

This section has indicated that natural kind and non-natural kind event nouns have different properties. The following section will explore the type system of event nouns based on the natural and non-natural distinction.

4.1.3 Enriching the Type System of GL

Previous research classifies event nouns according to their semantic categories (Han 2004, Liu 2004, Han 2010b, Wang 2010, Zhong 2010b). The main categories include natural phenomenon, wars, conferences, competitions, entertainments, ceremonies, etc. These semantic categories, however, cover the shared properties of event nouns from different categories. For example, wars, conferences, and competitions are all non-natural kinds and have more features in common compared to natural kinds.

Different from the semantic classification system, Pustejovsky (2001a, 2006), and Pustejovsky and Jezek (2008) separate the domain of individuals into three distinct levels: (a) Natural Types direct at the Formal and Constitutive qualia roles; (b) Artifactual Types refer to Telic or Agentive roles; (c) Complex Types make references to the relation between types. Based on this analysis, this section will explore the type system of GL based on natural kind and non-natural kind event nouns.

4.1.3.1 Natural Kinds: Natural Types and Natural Complex Types

Though intuitively all natural occurring events should have physical object manifestations, not all of them are linguistically represented. For example, 地震 *dìzhèn* ‘earthquake’ occurs due to seismic waves caused by a sudden release of the crust’s energy. The corpus data of 地震 *dìzhèn* ‘earthquake’ shows that linguistically only the ‘event’ aspect of 地震 *dìzhèn* ‘earthquake’ is expressed, while the ‘wave’ aspect is not. This is shown from Table 42 to Table 44.

First, let’s look at the classifiers of 地震 *dìzhèn* ‘earthquake’.

Table 42. Classifiers of 地震 *dìzhèn* ‘earthquake’ in Sinica Corpus (frequency ≥ 1)

Classifier	<i>pīnyīn</i>	Translation	Frequency	Saliency
次	<i>cì</i>	once (re. frequency of event)	59	39.04
級	<i>jí</i>	magnitude	5	16.16
場	<i>chǎng</i>	a (scheduled) event (with beginning and ending)	3	9.15
起	<i>qǐ</i>	event (especially a happening, an accident)	1	4.44

Table 42 shows all the classifiers of 地震 *dìzhèn* ‘earthquake’ in Sinica Corpus. All of them are event classifiers (Huang & Ahrens 2003), so the noun they select must represent an event.

Second, the verbs that have 地震 *dìzhèn* ‘earthquake’ as their subjects in Sinica Corpus (frequency ≥ 2) are illustrated in Table 43.

Table 43. Verbs with 地震 *dìzhèn* ‘earthquake’ as a Subject in Sinica Corpus (frequency ≥ 2)¹⁸

<u>Subject of</u>	<i>pīnyīn</i>	Translation	Frequency	Saliency
發生	<i>fāshēng</i>	occur	18	22.29
造成	<i>zàochéng</i>	cause	19	21.71
模擬	<i>mónǐ</i>	simulate	5	17.06
繼續	<i>jìxù</i>	continue	9	15.48
引致	<i>yǐnzhì</i>	lead to	2	12.47
破壞	<i>pòhuài</i>	damage	4	11.87
釋放	<i>shìfàng</i>	release	2	9.4
停止	<i>tíngzhǐ</i>	stop	2	7.54
導致	<i>dǎozhì</i>	result in	2	6.5
影響	<i>yǐngxiǎng</i>	affect	2	4.1
來	<i>lái</i>	come	2	2.3

In Table 43, 地震 *dìzhèn* ‘earthquake’ is the subject of these verbs in Sinica Corpus. The first verb 發生 *fāshēng* ‘occur’ is the most salient predicate of 地震 *dìzhèn* ‘earthquake’. It is an event-selecting verb as shown in Table 44. This table lists the words that are the subjects of 發生 *fāshēng* ‘occur’. These words either represent events in themselves or are coerced to refer to events. For example, 事件 *shìjiàn* ‘event’, 事故 *shìgù* ‘accident’, and 車禍 *chēhuò* ‘car accident’ refer to events directly. 問題 *wèntí* ‘problem’ is an entity noun, but it is coerced to be an event when it is selected by 發生 *fāshēng* ‘occur’. Therefore, in Table 43, the subject 地震 *dìzhèn* ‘earthquake’ selected by 發生 *fāshēng* ‘occur’ has an event reading, rather than a wave reading.

¹⁸ Example sentences for each of the verbs in Table 43 are shown in Appendix 1.

Table 44. Subjects of 發生 *fāshēng* ‘occur’ in Sinica Corpus (frequency ≥ 5)¹⁹

Subject	<i>pīnyīn</i>	Translation	Frequency	Saliency
事件	<i>shìjiàn</i>	event	52	27.38
地震	<i>dìzhèn</i>	earthquake	18	21.78
事故	<i>shìgù</i>	accident	13	20.53
事情	<i>shìqing</i>	affair	27	20.36
悲劇	<i>bēijù</i>	tragedy	11	19.24
情形	<i>qíngxíng</i>	situation	23	18.39
事	<i>shì</i>	matter	29	16.42
車禍	<i>chēhuò</i>	car accident	6	14.18
意外	<i>yìwài</i>	accident	7	12.12
現象	<i>xiànxàng</i>	phenomenon	11	11.81
情況	<i>qíngkuàng</i>	situation	11	10.49
案	<i>àn</i>	case	5	8.83
狀況	<i>zhuàngkuàng</i>	status	6	7.81
問題	<i>wèntí</i>	problem	12	6.36
行為	<i>xíngwéi</i>	behavior	5	5.96

In Table 43, similar with 發生 *fāshēng* ‘occur’, verbs 造成 *zàochéng* ‘cause’, 繼續 *jìxù* ‘continue’, 引致 *yǐnzhì* ‘lead to’, 破壞 *pòhuài* ‘damage’, 停止 *tíngzhǐ* ‘stop’, 導致 *dǎozhì* ‘result in’, and 來 *lái* ‘come’ also only select the event aspect of 地震 *dìzhèn* ‘earthquake’ rather than the wave aspect. Verbs 模擬 *mónǐ* ‘simulate’, 釋放 *shìfàng* ‘release’ and 影響 *yǐngxiǎng* ‘affect’ could have either the earthquake event or seismic waves as their subjects, so their selectional status is undecided.

Thirdly, the verbs that have 地震 *dìzhèn* ‘earthquake’ as their objects in Sinica Corpus (frequency ≥ 2) are presented in Table 45.

In Table 45, 地震 *dìzhèn* ‘earthquake’ is the object of these verbs (frequency ≥ 2) in Sinica Corpus. Most of the verbs are event-selecting words, such as 發生 *fāshēng* ‘occur’, 觸發 *chùfā* ‘trigger’, 引發 *yǐnfā* ‘initiate’, 經過 *jīngguò* ‘go through’, 造成 *zàochéng* ‘cause’. Thus they predict that the object 地震 *dìzhèn* ‘earthquake’ is an event. Seismic waves are

¹⁹ Example sentences for each of the verbs in Table 44 are shown in Appendix 2.

invisible, so it is impossible that the verb 觀看 *guānkàn* ‘watch’ selects them; this verb can only select the event aspect of 地震 *dìzhèn* ‘earthquake’. The verb 等 *děng* ‘wait for’ could select either the event aspect of 地震 *dìzhèn* ‘earthquake’ or waves, so its selectional status is undecided.

Table 45. Verbs with 地震 *dìzhèn* ‘earthquake’ as an Object in Sinica Corpus (frequency ≥ 2)²⁰

Object of	<i>pīnyīn</i>	Translation	Frequency	Salience
發生	<i>fāshēng</i>	occur	10	19.07
觸發	<i>chùfā</i>	trigger	2	13.58
觀看	<i>guānkàn</i>	watch	2	10.58
引發	<i>yǐnfā</i>	initiate	2	8.47
等	<i>děng</i>	wait for	2	8.09
經過	<i>jīngguò</i>	go through	2	6.93
造成	<i>zàochéng</i>	cause	2	5.75

In sum, three evidences have been explored to discover whether 地震 *dìzhèn* ‘earthquake’ has an event reading or a seismic waves reading linguistically. They are: (i) all its classifiers are event classifiers; (ii) when it is a subject, most of its predicates select event-reading words, except that 模擬 *mónǐ* ‘simulate’ and 釋放 *shìfàng* ‘release’ and 影響 *yǐngxiǎng* ‘affect’ have a undecided status; (iii) when it is an object, the majority of the predicates selects an event, except that 等 *děng* ‘wait for’ has an undecided status. These evidences indicate that no verbs exclusively select the wave aspect of 地震 *dìzhèn* ‘earthquake’. We know the existence of the ‘wave’ aspect due to our world knowledge. Linguistically 地震 *dìzhèn* ‘earthquake’ only has an event reading. For natural-kind nouns like 地震 *dìzhèn* ‘earthquake’, which only have an event reading and no physical manifestation linguistically represented, I classify them into natural types.

Different from the natural phenomenon 地震 *dìzhèn* ‘earthquake’, 雪 *xuě* ‘snow’ can be linguistically expressed as both an event and a physical object (physobj), as shown in Table 46 through Table 48.

First, all the classifiers of 雪 *xuě* ‘snow’ in Sinica Corpus are illustrated in Table 46.

²⁰ Example sentences for each of these verbs in Table 45 are shown in Appendix 3.

Table 46. Classifiers of 雪 *xuě* ‘snow’ in Sinica Corpus (frequency ≥ 1)

Classifier	<i>pīnyīn</i>	Translation	Frequency	Saliency	雪 <i>xuě</i> ‘Snow’
場	<i>chǎng</i>	a (scheduled) event (with beginning and ending)	5	16.84	event
堆	<i>duī</i>	pile	2	11.36	physobj
次	<i>cì</i>	once (re. frequency of event)	2	7.37	event
捧	<i>pěng</i>	handful	1	7.17	physobj
團	<i>tuán</i>	lump	1	6.64	physobj
把	<i>bǎ</i>	handful	1	6.43	physobj
重	<i>chóng</i>	layer	1	6.17	physobj
層	<i>céng</i>	layer	1	5.86	physobj
片	<i>piàn</i>	chunk	1	5.36	physobj

場 *chǎng* ‘a (scheduled) event (with beginning and ending)’ and 次 *cì* ‘once (re. frequency of event)’ are event classifiers which indicate that 雪 *xuě* ‘snow’ is an event. Differently, 堆 *duī* ‘pile’, 捧 *pěng* ‘handful’, 團 *tuán* ‘lump’, 把 *bǎ* ‘handful’, 重 *chóng* ‘layer’, 層 *céng* ‘layer’, and 片 *piàn* ‘chunk’ are individual classifiers, which select entities. Hence 雪 *xuě* ‘snow’ is a physical object when selected by them.

Secondly, the verbs that have 雪 *xuě* ‘snow’ as their subject in Sinica Corpus (frequency ≥ 2) are depicted in Table 47.

Table 47. Verbs with 雪 *xuě* ‘snow’ as a Subject in Sinica Corpus (frequency ≥ 2)²¹

Subject_of	<i>pīnyīn</i>	Translation	Frequency	Saliency	雪 <i>xuě</i> ‘Snow’
紛飛	<i>fēnfēi</i>	fall in flakes	4	20.95	physobj
落下	<i>luòxià</i>	fall	3	15.8	physobj
停	<i>tíng</i>	stop	3	13.13	event
下	<i>xià</i>	fall	4	12	event
停止	<i>tíngzhǐ</i>	stop	3	11.43	event
覆蓋	<i>fùgài</i>	cover	2	10.81	physobj
埋	<i>mái</i>	bury	2	10.36	physobj
來臨	<i>láilín</i>	come around	2	10.17	event
封	<i>fēng</i>	close	2	9.03	physobj
來	<i>lái</i>	come	3	4.83	event

²¹ Example sentences for each of these verbs in Table 47 are shown in Appendix 4.

紛飛 *fēnfēi* ‘fall in flakes’, 落下 *luòxià* ‘fall’, 覆蓋 *fùgài* ‘cover’, 埋 *mái* ‘bury’, and 封 *fēng* ‘close’ describes 雪 *xuě* ‘snow’ as physical objects: snowflakes. By contrast, 停 *tíng* ‘stop’, 停止 *tíngzhǐ* ‘stop’, 下 *xià* ‘fall’, 來臨 *láilín* ‘advent’, and 來 *lái* ‘come’ depict the snowing event.

Thirdly, the verbs that have 雪 *xuě* ‘snow’ as their objects in Sinica Corpus (frequency ≥ 2) are illustrated in Table 48.

Table 48. Verbs with 雪 *xuě* ‘snow’ as an Object in Sinica Corpus (frequency ≥ 2)²²

Object_of	<i>pīnyīn</i>	translation	Frequency	Salience	雪 <i>xuě</i> ‘Snow’
賞	<i>shǎng</i>	appreciate	12	27.33	event • physobj, or physobj
下	<i>xià</i>	fall	9	19.27	event
玩	<i>wán</i>	play	6	15.74	physobj
看	<i>kàn</i>	look at	9	12.42	event • physobj, or physobj
躲避	<i>duǒbì</i>	avoid	2	11.43	event
夾	<i>jiā</i>	mix	2	9.89	physobj
冒	<i>mào</i>	risk; brave (danger, harsh condition, etc.)	2	9.87	event
降	<i>jiàng</i>	drop	2	9.86	event
避	<i>bì</i>	avoid	2	9.82	event
落	<i>luò</i>	drop	2	9.68	event • physobj
像	<i>xiàng</i>	resemble	2	5.15	physobj
無	<i>wú</i>	not have	2	4.94	event • physobj, or physobj

玩 *wán* ‘play’, 夾 *jiā* ‘mix’, and 像 *xiàng* ‘resemble’ treats 雪 *xuě* ‘snow’ as snowflakes. 下 *xià* ‘fall’, 躲避 *duǒbì* ‘avoid’, 冒 *mào* ‘risk; brave (danger, harsh condition, etc.)’, 降 *jiàng* ‘drop’, 避 *bì* ‘avoid’ depict 雪 *xuě* ‘snow’ as an event. 落 *luò* ‘drop’ describes 雪 *xuě* ‘snow’ as a dot object event • physobj. 賞 *shǎng* ‘appreciate’, 看 *kàn* ‘look at’, and 無 *wú* ‘not have’ can either refer to event • physobj or simply snowflakes. Moreover, the event reading and physical object reading of 雪 *xuě* ‘snow’ can be represented in one sentence as shown in (13).

(13) 這場下了三天三夜的大雪覆蓋了整片森林。

²² Example sentences for each of these verbs in Table 48 are shown in Appendix 5.

Zhè chǎng xià le sān tiān sān yè de dàxuě fùgài le zhěng
 this CL fall ASP three day three night DE heavy snow cover ASP entire
 piàn sēnlín.
 CL forest

‘The snow that lasted three days and three nights covered the entire forest.’

In (13), 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’ is an event classifier which indicates that 雪 *xuě* ‘snow’ is an event. 覆蓋 *fùgài* ‘cover’ selects a physical object as shown in (14).

(14) 豆苗被雜草覆蓋。

Dòumiáo bèi zácao fùgài.
 bean seedling BEI weed cover

‘Bean seedlings are covered by weeds.’

In (14) 雜草 *zácao* ‘weed’ is an entity rather than an event. It is selected by 覆蓋 *fùgài* ‘cover’. Hence, in (13), 覆蓋 *fùgài* ‘cover’ selects the snowflakes reading of 雪 *xuě* ‘snow’.

In sum, three evidences have indicated that linguistically 雪 *xuě* ‘snow’ can either direct at the snowing event or the physical objects *snowflakes*. They are: (i) its classifiers can be both event classifiers and individual classifiers; (ii) when it is a subject, its predicates select either the event reading or the physical object reading; (iii) when it is an object, its predicates select the snowing event, physical objects *snowflakes* or event • physobj. For natural-kind nouns like 雪 *xuě* ‘snow’, which have both an event reading and a physical object reading encoded in one lexical item, I classify them into natural complex types.

To summarize, the corpus data prove that natural phenomenon can fall into either natural types or natural complex types. 地震 *dìzhèn* ‘earthquake’ only refers to an event and thus it is a natural type, while 雪 *xuě* ‘snow’ can be either an event or a physical object and thus it is a complex type.

4.1.3.2 Non-Natural Kinds: Artifactual Types and Artifactual Complex Types

Social activities can be either artifactual types or complex types. Some social activities such as 戰爭 *zhànzhēng* ‘war’ and 比賽 *bǐsài* ‘match’ are only artifactual types, as shown in (15) and (16).

- (15) 這場 曠日持久 的 戰爭 不僅造成嚴重的人員傷亡和財產損失，而且成為影響俄社會穩定與安寧的重要因素。(Gigaword)

Zhè chǎng *kuàngrìchíjiǔde* zhànzhēng bùjǐn zàochéng yánzhòngde
 this CL protracted war not only cause serious
 rényuánshāngwáng hé cáichǎn sǔnshī, érqǐè chéngwéi yǐngxiǎng É
 casualties and property loss, but also become affect Russia
 shèhuì wěndìng yǔ ānníng de zhòngyào yīnsù.
 society stability and tranquility DE important factor.

‘This protracted war not only caused serious casualties and property losses, but has also become an important factor that affects the stability and tranquility of the Russian society.’

- (16) 馬拉松式 的 比賽 及火熱氣溫是球員體力和球技的大考驗。(Gigaword)

Mǎlāsōngshì de bǐsài jí huǒrè qìwēn shì qiúyuán
 Marathon-style DE match and hot temperature be player
 tǐlì hé qiújì de dà kǎoyàn.
 physical strength and ball skills DE big challenge

‘Marathon-style match and high temperature are big challenges to the physical strength and ball skills of players.’

Both 戰爭 *zhànzhēng* ‘war’ and 比賽 *bǐsài* ‘match’ represent events. In (15) 戰爭 *zhànzhēng* ‘war’ is modified by 曠日持久的 *kuàngrìchíjiǔde* ‘protracted’ and in (16) 比賽 *bǐsài* ‘match’ is modified by 馬拉松式 *mǎlāsōngshì* ‘Marathon-style’. The two adjectives refer to the duration of the war and the game respectively, which indicates that both war and game are events.

Some other social activities such as Event • Information (演講 *yǎnjiǎng* ‘lecture’), Event • Music (音樂會 *yīnyuèhuì* ‘concert’), Event • Physobj (早餐 *zǎocān* ‘breakfast’), and Process • Result (分析 *fēnxī* ‘analysis’) are complex types. These event nouns refer to more than one aspect.

- (17) 這場 演講 很有意義。(Web)

Zhè chǎng yǎnjiǎng hěn yǒu yìyì.
 this CL speech very has meaningful

‘This speech is very meaningful.’

For example, in (17), 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’ is an event classifier, which indicates that 演講 *yǎnjiǎng* ‘lecture’ is an event noun. 很有意義 *hěn yǒu yìyì* ‘of great significance’ states the information aspect of 演講 *yǎnjiǎng* ‘lecture’.

To summarize, event nouns of non-natural kinds can be divided into artifactual types and artifactual complex types. For example, 戰爭 *zhànzhēng* ‘war’ only has an event reading, so it is an artifactual type. 演講 *yǎnjiǎng* ‘speech’ can direct at either the speaking event or the information, so it is an artifactual complex type.

4.1.4 Constructions to Identify Complex Types

Pustejovsky and Jezek (2008) argue that co-predication is a property of complex types. This section provides syntactic patterns to identify complex types in Mandarin Chinese, such as 既 又 *jì.....yòu.....* ‘not only.....but also.....’, 不但 而且 *bùdàn.....érqiě.....* ‘not only.....but also.....’, (雖然)..... 但是 *(suīrán).....dànshì.....* ‘(although) but’, 又 又 *yòu.....yòu.....* ‘(both) and’.

Natural Complex Types:

(18) 好大的雪, 又密又急。(Web)

Hǎo dà de *xuě*, *yòu* mì *yòu* jí.
how heavy DE snow, and dense and rapid

‘What a heavy snow! (It is) dense and rapid.’

Artifactual Complex Types:

(19) 這次早餐雖然很冗長, 但是很好吃。

Zhè cì *zǎocān* *suīrán* hěn rǒngcháng, *dànshì* hěn hào chī.
this CL breakfast although very tediously long, but very good eat

‘The breakfast, although it is tediously long, was tasty.’

Examples (18) and (19) illustrate complex types of natural and artifactual event nouns respectively. In (18), 密 *mì* ‘dense’ is about the physical object aspect of snow; 急 *jí* ‘rapid’

is about the event aspect of snow. The conjunctions 又.....又..... *yòu.....yòu.....* ‘(both).....and.....’ connects both 密 *mì* ‘dense’ ‘dense’ and 急 *jí* ‘rapid’, which indicates that 雪 *xuě* ‘snow’ is a complex type. In (19), 冗長 *rǒngcháng* ‘tediously long’ modifies the breakfast’s event aspect; 好吃 *hào chī* ‘good to eat’ modifies its physical object aspect. They are connected by the conjunctions 雖然.....但是..... *suīrán.....dànshì.....* ‘although..... but.....’, which proves that 早餐 *zǎocān* ‘breakfast’ is a complex type.

Though co-predication is an important property of complex type, it is not a necessary property. Example (20) is from Pustejovsky (2005).

- (20) appointment (Event • Human)
 a. Your next appointment is at 3:00 pm.
 b. Your next appointment is a blonde.

(20)a refers to an event, while (20)b refers to a human. The event and human aspects of *appointment* cannot get co-predication.

4.1.5 Summary

This study finds that natural kinds can be divided into natural types and natural complex types; non-natural kinds fall into artifactual types or artifactual complex types. This is shown in Table 49.

Table 49. Event Nouns: Natural Kinds and Non-Natural Kinds

Event Nouns	Natural Kinds	Natural Types
		Natural Complex Types
	Non-Natural Kinds	Artifactual Types
		Artifactual Complex Types

Table 49 can be re-represented in Table 50 in order to fit into the tripartite type system in (Pustejovsky 2001b, 2006, Pustejovsky & Jezek 2008). Event nouns are divided into natural types, artifactual types and complex types, with complex types further classifying into natural complex types and artifactual complex types.

Table 50. The Type System of Event Nouns

Event Nouns	Natural Types	
	Artifactual Types	
	Complex Types	Natural Complex Types
		Artifactual Complex Types

The results indicate that event nouns of the same semantic category can be from different types (Wang & Huang 2012f). (I) Event nouns that represent a natural phenomenon can either belong to natural types or natural complex types. For example, 地震 *dìzhèn* ‘earthquake’ only refers to an event and thus it is a natural type, while 雪 *xuě* ‘snow’ can be either an event or a physical object and thus it is a complex type. (II) Event nouns that represent social activities can be either artifactual types or artifactual complex types. For example, 戰爭 *zhànzhēng* ‘war’ only has an event reading, so it is an artifactual type. 演講 *yǎnjiǎng* ‘speech’ can direct at either the speaking event or the information, so it is an artifactual complex type.

This work has enriched the type system of GL by classifying complex types into both natural complex types and artifactual complex types. The type system constructed based on event nouns should be applicable to other upper concepts (entity, event and quality). The new classification, which is based on types rather than semantic categories, can help to capture the characteristics of different types of event nouns.

4.2 Qualia Role Contributions to the Type System of GL

4.2.1 Introduction

Qualia structure is one of the most important concepts in the generative lexicon theory (Pustejovsky 1991, 1995). There are three assumptions under the concept of qualia: (i) lexical items encode semantic information in what the qualia structure conveys; (ii) qualia structure drives our basic understanding of an object or a relation in the world, and they furthermore contribute to (or, in fact, determine) our ability to name an object with a certain predication; (iii) in terms of Mental Lexicon, the qualia can be viewed as ‘distinguished’ links between lexical concepts in the lexicon (Hsieh 2010).

Pustejovsky (1991, 1995) shows how lexical items encode semantic information in the qualia structure. There are four qualia roles in qualia structure, and each is associated with

some values. (i) The constitutive role is about the relation between an object and its constituents or parts. Its role values include material, weight, parts and component elements. (ii) The formal role can distinguish the object within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values; (iii) the telic role is about the purpose and function of the object. (iv) The agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, causal chain.

Based on qualia structure, Pustejovsky (2001a, 2006), and Pustejovsky and Jezek (2008) separate the domain of individuals into three distinct levels: (a) Natural Types direct at the Formal and Constitutive qualia roles; (b) Artifactual Types refer to Telic or Agentive roles; (c) Complex Types make references to the relation between types.

However, I find that qualia roles do not have clear-cut contributions to natural types, artifactual types and complex types. To re-evaluate their contributions, the following sections are arranged as follows. Section 4.2.2 re-examines the contributions of qualia roles to the tripartite type system; Section 4.2.3 proposes a scale-based qualia role contribution system.

4.2.2 Reexamine the Contributions of Qualia Roles

Pustejovsky (2001a, 2006), and Pustejovsky and Jezek (2008) separate the domain of individuals into three distinct levels: (a) Natural Types, which direct at the formal and constitutive qualia roles; (b) Artifactual Types, which refer to telic or agentive roles; (c) Complex Types, which make references to the relation between types. This is presented in Table 51.

Table 51. Qualia Role Contributions to Domain of Individuals (Pustejovsky 2001a, 2006, Pustejovsky & Jezek 2008)

Qualia Role Domain of Individuals	Formal	Constitutive	Telic	Agentive
Natural Types	+	+	-	-
Artifactual Types	-	-	+	+
Complex Types	the relation between types			

Event nouns lexically encode eventive information (Wang & Huang 2013d). *Section 4.1 The Type System of Event Nouns* divided event nouns into natural types, artifactual types, and complex types (including natural complex types and artifactual complex types). This

Section will re-examine the contributions of qualia roles to these types of event nouns.

Whether Natural Types (NT) and Natural Complex Types (NCT) have telic and agentive role?

The Telic Role of NT and NCT: Pustejovsky and Jezek (to appear) point out that the telic of a natural kind can encode unintentional actions and properties of an object. It is the same with event nouns. NT and NCT can have certain functions. However, they do not have any intended aim or purpose. For example, the NT breeze can make people feel pleasantly cool in the summer. The 海嘯 *hǎixiào* ‘tsunami’ in Indian Ocean in 2004 deprived of the life of a tremendous number of people.

The Agentive Role of NT and NCT: It is quite common that event nouns have agentive roles. For instance, the NT 風 *fēng* ‘wind’ is formed owing to the flow of air.

Whether artifactual types (AT) and artifactual complex types (ACT) have formal and constitutive role?

The Formal Role of AT and ACT: AT have formal roles like scale. For example, 戰爭 *zhànzhēng* ‘war’, 戰役 *zhànyì* ‘battle’, and 戰鬥 *zhàndòu* ‘fight’ have different scales, from large to small.

The Constitutive Role of AT and ACT: AT and ACT event nouns have constitutive roles that reflect the event’s internal structure. For instance:

(21) 這場比賽進行了四個多小時。(Web)

Zhè chǎng bǐsài jìnxíng le sì gè duō xiǎoshí.

this CL match carry on ASP four CL more hour

‘This match carried on for more than 4 hours.’

比賽 *bǐsài* ‘match’ is an AT event noun. (21) expresses the duration of the event, which is part of the competition’s constitutive role.

The above analysis proves that neither *NT and NCT* nor *AT and ACT* have clear-cut distinction with respect to which qualia role is at work.

4.2.3 Establish a Scale-based Qualia Role Contribution System

Qualia Role Contribution to NT and NCT

Both formal role and constitutive role are of foremost importance to NT and NCT, while

agentive role and telic role are less important.

The Agentive role:

How some NT and NCT come into being is either controversial or unknown. For example, people may debate whether a rock comes into existence through a natural process or the creation of God. Some other NT and NCT may have a clearer causal chain of existence. For instance, a beaver nest is a natural artifact that is built by a beaver. In contrast, the agentive role of AT and ACT is easy to find. For instance, a table is made through a human.

The Telic role:

NT and NCT could have some effects, but they are not intentional.

Based on the above analysis, the scale-based qualia role contribution system to NT and NCT is:

Formal | Constitutive > Agentive > Telic

Qualia Role Contribution to AT and ACT

Telic role and agentive role are of great significance to AT and ACT, because artifacts are usually made (agentive role) with some purpose (telic role). But this is not to say that every artifact have a telic or agentive role. For instance, the AT noun 比賽 *bǐsài* ‘competition’ often have an aim ‘to win’ (Telic role), while some 車禍 *chēhuò* ‘car accidents’ happen due to certain fault rather than a purpose (Telic role). The AT noun 謀殺 *móushā* ‘murder’ is highly agentive, while 誤殺 *wùshā* ‘manslaughter’ is not agentive at all.

In contrast, formal role and constitutive role are less important to AT and ACT.

Based on the above analysis, the scale-based qualia role contribution system to AT and ACT is:

Telic | Agentive > Formal | Constitutive

Instead of the clear-cut distinction with the qualia roles to the tripartite types in (Pustejovsky 2001a, 2006, Pustejovsky & Jezek 2008), I propose a scale-based qualia role contribution system to event nouns based on three scales: high, moderate and low. The results are shown in Table 52.

Table 52. Qualia Role Contributions to the Type System of Event Nouns

Domain of Individuals \ Qualia Role		Formal	Constitutive	Telic	Agentive
		Natural	High	High	Low
Artifactual		Moderate	Moderate	High	High
Complex	Natural	High	High	Low	Moderate
	Artifactual	Moderate	Moderate	High	High

4.2.4 Summary

This section reveals that qualia roles do not have clear-cut contributions to the distinction of the domain of individuals. Instead, their contributions are based on a scale, which is not a matter of having that role or not, but high, moderate or low.

4.3 Constructions that can Identify Qualia Role Values

4.3.1 Literature Review

4.3.1.1 Use Constructions to Identify Qualia Role Values

Recently some attempts have been made towards qualia structure acquisition from corpus data (Yamada et al. 2007) or from web data (Cimiano & Wenderoth 2007). Both methods indicate that templates/patterns/constructions are very important in doing this task. Pustejovsky and Jezek (to appear) also propose constructions to find qualia role values.

4.3.1.1.1 Acquisition from Corpus Data

Yamada et al. (2007) propose two methods to acquire automatically a given noun's telic and agentive roles from corpus data. The first is a maximum entropy learning method. They treat all noun-verb pairs with an average human rating between 7 and 10 as positive instances, and all noun-verb pairs with an average rating of 0 as negative instances. Next they extracted all sentences from the parsed the British National Corpus data which incorporated either positive or negative noun-verb training pairs. They also extracted the local POS context of each target noun, based on the first two characters of the CLAWS-2 POS tag (reducing the tagset from 170 to 49 tags in the process). From this, they generated a feature vector of the following form for each noun-verb pair in the sentence token:

- The grammatical relation of the noun–verb dependency tuple
- The grammatical relation of any other dependency tuples the noun occurs in, and the POS tag of other words in the dependency tuple
- The grammatical relation of any other dependency tuples the verb occurs in, and the POS tag of other words in the dependency tuple

The second method uses hand-generated templates. They empirically identified the constructional templates for the telic and the agentive role, and counted the raw frequency of occurrence for each verb with a given noun in the two template sets. The hand-generated templates are depicted in Table 53 and Table 54.

Table 53. Templates for the Telic Role

Template	Example
N(be ϕ)(worth deserving meriting)(V[+ing] V[+nom])	(a) book worth reading
N BE worthy of V[+nom]	(the) book is worthy of reading
N(deserves merits) V[+nom]	(the) book merits reading
Adverb-V[+en] N	(a) well-read book
Adverb V[+en] N	(a) well read book
N BE Adverb-V[ed]	(the) book is well-read
V[+ing] Noun	(I enjoy) reading books
N to V	(a) book to read

Table 54. Template for the Agentive Role

Template	Example
N BE V[+en]	(the) book was written (by Kim)

Because they want to include only the high-ranking verbs in the qualia structure in actual system applications, they compared the correlation for the top-3 items. The experimental results for the agentive role indicate that the correlation for the top-3 items was 0.605 for the maximum entropy-based method, 0.500 for the template-based method, and 0.816 for the gold standard data. For the telic role, the correlation was 0.479 for the maximum entropy-based method, 0.337 for the template-based method, and 0.659 for the gold standard data. This result shows that the maximum entropy-based method tends to outperform the template-based method for smaller values of N, except in top-1 evaluation where the template method comes out on top for both the agentive and telic roles.

4.3.1.1.2 Acquisition from Web Data

Cimiano and Wenderoth (2007) present an approach for the automatic acquisition of qualia structure for nouns from the web. Using standard search engines on the World Wide Web, it builds on the idea of matching specific lexico-syntactic patterns, which convey a certain semantic relations.

This approach consists of five phases: (i) generate for each qualia role a set of clues, i.e. search engine queries indicating the relations of interest, (ii) download the snippets (abstracts) of the first 50 web search engine results matching the generated clues, (iii) tag the POS for downloaded snippets, (iv) match patterns in the form of regular expressions conveying the qualia role of interest, and (v) weigh and rank the returned qualia elements according to specific measures.

The following four tables (Table 55 to Table 58) show the clues and patterns for each qualia role.

Table 55. Clues and Patterns for the Formal Role

Clue	Pattern
Singular	
“a(x) x is a kind of”	NP_{QT} is a kind of NP_F
“a(x) x is”	NP_{QT} is a kind of NP_F
“a(x) x and other”	$NP_{QT} (,)?$ and other NP_F
“a(x) x or other”	$NP_{QT} (,)?$ or other NP_F
Plural	
“such as p(x)”	NP_F such as NP_{QT}
“p(x) and other”	$NP_{QT} (,)?$ and other NP_F
“p(x) or other”	$NP_{QT} (,)?$ or other NP_F
“especially p(x)”	$NP_F (,)?$ especially NP_{QT}
“including p(x)”	$NP_F (,)?$ including NP_{QT}

Table 56. Clues and Patterns for the Constitutive Role

Clue	Pattern
Singular	
“a(x) x is made up of”	NP_{QT} is made up of NP'_C
“a(x) x is made of”	NP_{QT} is made of NP'_C
“a(x) x comprises”	NP_{QT} comprises (of)? NP'_C

“a(x) x consists of”	NP _{QT} consists of NP’ _C
Plural	
“p(x) are made up of”	NP _{QT} is made up of NP’ _C
“p(x) are made of”	NP _{QT} are made of NP’ _C
“p(x) comprise”	NP _{QT} comprise (of)? NP’ _C
“p(x) consist of”	NP _{QT} consist of NP’ _C

Table 57. Clues and Patterns for the Telic Role

Clue	Pattern
Singular	
“purpose of a(x) x is”	purpose of (a an) x is (to)? PURP
“a(x) is used to”	(a an) x is used to PURP
Plural	
“purpose of p(x) is”	purpose of p(x) is (to)? PURP
“p(x) are used to”	p(x) are used to PURP

Table 58. Clues and Patterns for the Agentive Role

Clue	Pattern
Singular	
“to * a(x) new x”	to [RB]? [VB] a? new x
“to * a(x) complete x”	to [RB]? [VB] a? complete x
“a(x) new has been *”	a? new x has been [VBD] ²³
“a(x) complete x has been *”	a? complete has been [VBD] ²⁴
Plural	
“to * new p(x)”	to [RB]? [VB] new p(x)
“to * complete p(x)”	to [RB]? [VB] complete p(x)

4.3.1.1.3 Qualia Role Value Identification Using Specific Constructions

Pustejovsky and Jezek (to appear) propose the formal role, constitutive role and telic role’s specific constructions for finding a word’s qualia role values.

According to them, there are seven FORMAL-specific Constructions. They are: 1) NP such

²³ VBD (past tense of verbs) should be VBN (past participle of verbs).

²⁴ VBD (past tense of verbs) should be VBN (past participle of verbs).

as NP: events such as lectures, walks, tours and meetings; 2) such NP as NP: such areas as children's playground; 3) NP and other NP: rum and other spirits; 4) NP or other NP: insects or other animals; 5) NP, including NP: recyclable materials including glass; 6) NP, especially NP: cool temperate countries especially Europe and North America; 7) favorite NP is NP: Mario's favorite food is pasta. Moreover, formal roles can be expressed through different descriptor: 1) adjectival descriptors, such as a flat screen ($Shape_F$), a thick sweater ($Dimension_F$), and an expensive car ($Constitutive_F$); 2) nominal descriptors, such as the height of the wall ($Dimension_F$); 3) verbal descriptors, such as clean the table ($Surface_F$); 4) prepositional descriptors, such as the foot of the stairs ($Orientation_F$).

They also find seven CONSTITUTIVE-specific Constructions. They are: 1) N1's N2: the room's wall; 2) N2 of N1: the door of the car; 3) NP2 is a part of NP2: brain is a very sensitive part of the body; 4) NP1 made of NP2: monuments made of stone and marble; 5) NP1 of NP2: house of wood; 6) NP1 consists of NP2: the orchestra consists of ninety performers; 7) NP1 containing NP2: a forest containing dead trees.

They list five TELIC-specific Constructions. They are: 1) an NP to V: a book to read; 2) an NP worth V-ing: a question worth asking; 3) the NP merits / deserves V-ing: This book deserves reading; 4) enjoy/prefer V-ing NP: enjoy listening to music / prefer watching television; 5) an Adj NP to V: a difficult question to ask; 6) an NP (used) for V-ing: a spade (used) for digging.

4.3.1.2 Getting Qualia Role through A Web-Based Word-Guessing Game

Hsieh (2010) introduces a way to approach qualia structure for Mandarin Chinese through a web-based word-guessing game through MSN. The rules of this experiment are: (i) Do not use linguistic knowledge, such as "How many letters are there in the word?" "Is it a countable noun?" "How many syllables?" (ii) Pretend that you do not know the replier. Do not ask questions like "Do you think I will love it?" "Am I good at it?" (iii) Do not use pronouns and demonstrative pronouns, such as we, that, these, those etc. (iv) Do not use words containing probabilistic expressions, such as accidently, seldom, almost, may, etc. (v) Do not use correlative conjunctions such as "either or" and "both and" eg. "clothes or accessories," "both children and old men." The subsidiary rules are: (i) If the guesser violates any rule above, the replier will answer: "it's irrelevant." (ii) If the guesser tries to answer, please inform the replier first. (iii) If the guesser's questions include the answer or part of the answer, the replier will answer "yes."

I argue that though the method of using a web-based word-guessing game is feasible, it has some limitations. First, the designer of the game has to write a lot of questions for the

participants to answer. However, it is impossible to make a complete question list which captures all the properties of a word, thus it is hard to write all useful questions. Second, it needs much human labor to conduct this task.

In comparison, the method of using constructions is much more efficient. The constructions proposed by (Cimiano & Wenderoth 2007, Yamada et al. 2007, Pustejovsky & Jezek to appear) are very useful in finding English words' qualia roles. However, no study has been conducted on proposing constructions to identify qualia role values in Mandarin Chinese. To fill in the gap, the following section explores the constructions that can identify event nouns' qualia role values in Mandarin Chinese.

4.3.2 Constructions that can Identify Qualia Role Values in Mandarin Chinese

FORMAL-specific Constructions:

The formal role can be the hypernym of a lexical item. Three constructions can be used to find an event noun's hypernym as illustrated from (I) to (III).

The first construction to detect an event noun's formal role is shown in (I).

(I) NP 是一種.....

NP shì yī zhǒng.....

NP be a kind

'NP is a kind of

This construction uses the kind classifier 種 *zhǒng* 'kind' to identify the NP's hypernym. Sentence (22) shows an example of Construction (I).

(22) 感冒是一種常見的疾病。(CCL)

Gǎnmào shì yī zhǒng chángjiànde jíbìng.

cold be a kind common disease

'The cold is a kind of common diseases.'

In (22), the construction 是一種 *shì yī zhǒng* 'is a kind of' expresses 感冒 *gǎnmào* 'cold' 's hypernym 疾病 *jíbìng* 'disease', so it is also the formal role of 感冒 *gǎnmào* 'cold'.

The second construction that can detect an event noun's formal role is shown in (II).

(II) NP 和其他.....

NP hé qítā.....

NP and other

‘NP and other’

In this construction, 和其他 *hé qítā* ‘and other’ reveals the NP’s hypernym. Sentence (23) shows an example of this construction.

(23) “積極向上的情感類型”可以幫助抵抗感冒和其他疾病。(Web)

“Jíjǐxiàngshàngde qínggǎn lèixíng” kěyǐ bāngzhù dīkàng ***gǎnmào*** ***hé qítā***
 positive emotion type can help resist cold and other
 Jíbìng
 illness

“‘The positive emotion type’ can help one resist colds and other illnesses.”

In (23), the construction 和其他 *hé qítā* ‘and other’ also states 感冒 *gǎnmào* ‘cold’ ’s hypernym 疾病 *jíbìng* ‘disease’, so 疾病 *jíbìng* ‘disease’ is 感冒 *gǎnmào* ‘cold’ ’s formal role.

The third construction that can find an event noun’s formal role is shown in (c).

(III) NP 屬於.....

NP shǔyú.....

NP belong to

‘NP belongs to’

In this construction, 屬於 *shǔyú* ‘belong to’ is used to find the NP’s hypernym. Sentence (23) shows an example of this construction.

(24) 蝗災屬於爆發性、遷飛性和毀滅性的農業生物災害。(Web)

Huángzāi ***shǔyú*** bàofā xìng, qiānfēixìng hé huǐmièxìng de
 locust plague belong to explosive migratory and destructive DE
 nóngyè shēngwù zāihài.
 agricultural biological disaster

‘The locust plague belongs to explosive, migratory and destructive agricultural biological disasters.’

In (24), the construction 屬於..... *shǔyú*..... ‘belong to.....’ identifies the event noun 蝗災 *huángzāi* ‘locust plague’ ’s hypernym 災害 *zāihài* ‘disaster’, so 災害 *zāihài* ‘disaster’ is a formal role of 蝗災 *huángzāi* ‘locust plague’.

CONSTITUTIVE-specific Constructions:

Subevents are an important constitutive role of an event noun. The following are seven constructions that can identify an event noun’s subevents.

(I) NP 包括/包含.....

NP *bāokuò/bāohán*.....

NP include/contain

‘NP includes/contains.....’

In Construction (I), 包括/包含 *bāokuò/bāohán* ‘include/contain’ is a generic word. It can identify the subevents of the NP.

(25) 本屆東亞運動會，**開幕式包括**演出、運動員入場以及主火炬點燃等，一共耗時一個半小時。(Web)

Běn jiè Dōngyà yùndònghuì, **kāimùshì** **bāokuò** yǎnchū
 This CL East Asian Games opening ceremony include performance,
 yùndòngyuán rù chǎng yǐjí zhǔhuǒjù diǎnrán
 Athlete entering the stadium as well as the main torch lighting
 děng, yīgòng hàoshí yīgèbàn xiǎoshí.
 and so on in total consume time 1.5 hour

‘The opening ceremony of this East Asian Games included performances, athletes entering the stadium as well as lighting the main torch, which took one and a half hours.’

In (25), the construction 包括..... *bāokuò*..... ‘include’ shows the subevents of the event noun 開幕式 *kāimùshì* ‘opening ceremony’. They are 演出 *yǎnchū* ‘performance’, 運動員入場 *yùndòngyuán rùchǎng* ‘athletes entering the stadium’ and 主火炬點燃 *zhǔ huǒjù diǎnrán* ‘lighting the main torch’.

(II) NP 有.....

NP yǒu.....

NP has

‘NP has.....’

In Construction (II), 有 *yǒu* ‘has’ is a general verb, which gives a general statement of what the NP has. An example is shown in (26).

(26) 古典交響曲通常有四個樂章。(Web)

Gúdiǎn *jiāoxiǎngqǔ* tōngcháng **yǒu** sì gè yuèzhāng.
Classical symphony usually have four CL movements

‘Classical symphony usually has four movements.’

In (26), 交響曲 *jiāoxiǎngqǔ* ‘symphony’ is an event noun. Its four movements are its constitutive role.

(III) NP 分為.....

NP fēnwéi.....

NP divide

‘NP is divided into’

In Construction (III), 分為 *fēnwéi* ‘divide.....into’ identifies the subevents of the NP directly, as shown in (27).

(27) 京劇分為唱念做打。(Web)

Jīngjù **fēnwéi** chàng niàn zuò dǎ.
Beijing opera divide singing speaking performance martial arts

‘Beijing opera is divided into singing, speaking, performance and martial arts.’

In (27) 京劇 *jīngjù* ‘Beijing opera’ is an event noun. It is usually constituted by four subevents, which are 京劇 *jīngjù* ‘Beijing opera’ ’s constitutive role.

(IV) a.是 NP 的組成部分

.....shì NP de zǔchéng bùfèn

be NP DE component part

‘..... are component parts of NP’

b.是 NP 的幾個部分

.....shì NP de jǐ gè bùfèn

be NP DE several CL part

‘..... are several parts of NP’

Construction (IV) identifies an NP’s subevents that are in the subject position. In (IV)a, 組成部分 *zǔchéng bùfèn* ‘component parts’ identifies the components of the NP. Similarly, in (IV)b, 幾個部分 *jǐ gè bùfèn* ‘several parts’ is a vague statement, which also reveals the NP’s subevents. An example is shown in (28).

(28) 音樂演奏以詩為樂章，詩、樂結合便成為各種典禮的組成部分。(Web)

Yīnyuè yǎnzòu yǐ shī wéi yuèzhāng, shī, yuè jiéhé biàn
musical performance take poetry as movement poetry music combine simply
chéngwéi gèzhǒng diǎnlǐ de zǔchéng bùfèn.
become different kind ceremony DE component part

‘Musical performance takes poetry as movements. Poetry and music combine and become a component of different kinds of ceremonies.’

In (28), 詩 *shī* ‘poetry’ and 樂 *yuè* ‘music’ are the components of the event 典禮 *diǎnlǐ* ‘ceremony’, so they are 典禮 *diǎnlǐ* ‘ceremony’ ’s constitutive role.

(V) NP 由.....組成/構成

NP yóu.....zǔchéng/gòuchéng

NP by form/constitute

‘NP is composed of’

Construction (V) identifies the NP’s subevents through the prepositional phrase 由..... *yóu.....* ‘by’.

(29) 本屆運動會由開幕式、項目比賽和閉幕式三部分組成。

Běn jiè yùndònghuì yóu kāimù shì, xiàngmù bǐsài hé

this CL sports meet by opening ceremony item competition and
 bìmù shì sān bùfèn zǔchéng.
 closing ceremony three parts compose

‘This sports meet is composed of the opening ceremony, item competitions and the closing ceremony.’

In (29), 運動會 *yùndònghuì* ‘sports meet’ is an event noun. It has three subevents, which are the sports meet’s constitutive role.

(VI) NP 的組成部分包括.....

NP de zǔchéng bùfèn bāokuò.....
 NP DE component part include

‘NP’s component parts include’

Construction (VI) identifies the subevents that are in the object position, as shown in (30).

(30) 古典交響曲的組成部分包括四個樂章。

Gǔdiǎn jiāoxiǎngqǔ de zǔchéng bùfèn bāokuò sì gè yuèzhāng.
 classical symphony DE component part include four CL movement

‘Classical symphony’s components include four movements.’

In (30), the construction的組成部分包括..... *de zǔchéng bùfèn bāokuò*..... ‘.....’s components include.....’ identifies the subevents of 交響曲 *jiāoxiǎngqǔ* ‘symphony’, which are its constitutive role.

(VII) a. NP(的)程序是...等幾個部分/階段

NP (de) chéngxù shì...jǐ gè bùfèn/jiēduàn
 NP DE procedure be ... several CL parts / stage

‘NP (’s) procedure is ... several parts / stage’

b.是 NP 的幾個階段

.....shì NP de jǐ gè jiēduàn
 be NP DE several CL stage

‘..... are several stages of NP’

Construction (VII) is usually used to identify sequential subevents of an NP. In (III)a, the word 程序 *chéngxù* ‘procedure’ clearly reveals that the following is ordered events. (VII)b detects subevents in the subject position; the word 階段 *jiēduàn* ‘stage’ often indicates that the subevents are temporally ordered.

- (31) 明嘉靖時秦州伏羲廟的祭祀程序依次是迎神、初獻、亞獻、終獻、徹饌、送神、望七部分。(Web)

Míng jiājìng shí qínzhōu Fúxī miào de *jìsì* **chéngxù**
 Ming Dynasty Jiaping period Qinzhou Fuxi Temple DE sacrifice procedure
 yīcì **shì** yíng shén, chū xiàn, yà xiàn, zhōng xiàn,
 successive be welcoming God first offer second offer final offer
 chèzhuàn, sòng shén, wàng qī bùfèn.
 withdrawing food seeing God off, gazing seven parts

‘During the Jiaping period of Ming Dynasty, the sacrifice procedures of Fuxi Temple in Qingzhou have seven parts successively: welcoming God, first offer, second offer, final offer, withdrawing food, seeing God off, and gazing.’

In (31), 祭祀 *jìsì* ‘sacrifice’ is an event noun. It consists of seven subevents which are the 祭祀 *jìsì* ‘sacrifice’ ’s constitutive role. These subevents are temporally ordered.

TELIC-specific Constructions:

The telic role shows the aim or purpose of an event. The following introduces two constructions that can find an event noun’s telic role.

- (I) NP 的作用/目的/功能是……

NP de zuòyòng/mùdì/gōngnéng shì……

NP DE role / purpose / function be

‘NP’s role / purpose / function is ……’

Construction (I) uses the words 作用/目的/功能 *zuòyòng/mùdì/gōngnéng* ‘role / purpose / function’ to directly identify the NP’s telic role. An example is shown in (32).

- (32) 祭祀的目的主要是弭災、求福、報謝。(Web)

Jìsì **de mùdì** zhǔyào **shì** mǐzāi, qiú fú,
 Sacrifice DE purpose mainly be eliminate disasters seek happiness

bàoxiè.

express thanks

‘The purposes of a sacrifice are mainly to eliminate disasters, seek happiness and express thanks.’

In (32), the construction的目的是.....*de mùdì*..... ‘.....’s purpose is’ identifies the event noun 祭祀 *jìsì* ‘sacrifice’ ’s telic role, such as eliminating disasters, seeking happiness and expressing thanks.

(II) NP (是)用來.....

NP (shì) yòng lái.....

NP be used to

‘NP is used to’

Construction (II) uses (是)用來..... (*shì*) *yòng lái*..... ‘.....is used to’ to identify the NP’s telic role.

(33) 舞蹈是用來詮釋感情的藝術。 (Web)

Wǔdǎo shì yòng lái quǎnshì gǎnqíng de yìshù.

Dance be used for interpret feeling DE art

‘Dance is the art for interpreting feelings.’

In (33), 舞蹈 *wǔdǎo* ‘dance’ is an event noun. The construction是用來.....*shì yòng lái*..... ‘.....is used to.....’ shows its aim. That is, to interpret feelings. This is 舞蹈 *wǔdǎo* ‘dance’ ’s telic role.

AGENTIVE-specific Constructions:

The agentive role of an event noun expresses the origin of an event.

(I) NP 的原因是.....

NP de yuányīn shì.....

NP DE reason be

‘NP’s reason is’

The cause is an agentive role of an NP. Construction (I) is to identify an NP’s cause. An

example is shown in (34).

- (34) 美國南北戰爭的根本原因是兩種制度的衝突，落後的種植園經濟生產關係對資本主義生產關係的阻礙，所以美國南北戰爭是第二次資產階級革命。(Web)

Měiguó Nánběi Zhànzhēng de gēnběn yuányīn shì liǎng zhǒng zhìdù
 American Civil War DE fundamental reason be two kind system
de chōngtú, luòhòude zhòngzhíyuán jīngjì shēngchǎn guānxì duì
 DE conflict backward plantation economy production relation to
zīběnzhǔyì shēngchǎn guānxì de zǔ'ài, suǒyǐ Měiguó Nánběi Zhànzhēng
 capitalism production relation DE obstacle so American Civil War
shì dìèrcì zīchǎnjiējí gémìng.
 is the second bourgeois revolution

‘The fundamental reason of American Civil War is the conflict of two systems. The production relation of the backward plantation economy hinders the production relation of the capitalism, so American Civil War is the second bourgeois revolution.’

In (34), 美國南北戰爭 *Měiguó Nánběizhànzhēng* ‘American Civil War’ is an event noun. The construction的原因是.....*de yuányīn shì*..... ‘.....’s reason is.....’ finds its agentive role: the conflict of two systems.

(II) NP 由.....引起/引發

NP *yóu*.....*yǐnqǐ/yǐnfā*
 NP by cause trigger

‘NP is caused / triggered by.....’

The ‘bring about’ is also the agentive role of an NP. Construction (II) reflects the NP’s coming about.

- (35) 剛果(布)政府稱軍火庫爆炸由電線短路引發。(Web)

Gāngguǒ (Bù) zhèngfǔ chēng jūnhuǒkù *bào zhà* yóu diànxìàn
 Congo (Brazzaville) government claim arsenal explosion by electrical
duǎnlù yǐnfā.
 short circuit cause

‘The government of Congo (Brazzaville) claimed that the arsenal explosion is caused by electrical short circuit.’

In (35), 爆炸 *bàozhà* ‘explosion’ is an event noun. The construction 由……引發 *yóu……yǐnfā* ‘caused by……’ shows the origin of the explosion. Thus 爆炸 *bàozhà* ‘explosion’ ’s agentive role is *electrical short circuit*.

(III) NP 來自……

NP *láizi*……

NP come from

‘NP comes from …….’

The origin of an event can be identified by 來自…… *láizi*…… ‘come from’ in Chinese, which is the Construction (III). An example of this construction is shown in (36).

(36) 映秀泥石流來自震後斷裂帶的衝擊。(Web)

Yingxiù *níshíliú láizi zhèn hòu duànlièdài de chōngjī*.

Yingxiu mudslide come from post-earthquake fault zone DE impact

‘The Yingxiu mudslides came from the impact of post-earthquake fault zones.’

In (36), 泥石流 *níshíliú* ‘mudslide’ is an event noun. Its agentive role is identified through the construction ……來自…… *láizi*…… ‘come from ……’. That is, *the impact of post-earthquake fault zones*.

4.3.3 Summary

This section demonstrates the constructions that can identify the qualia role values of event nouns.

4.4 Conclusions

This chapter analyzed the distinction between natural and non-natural kind event nouns, established a type system for event nouns, proposed a scale-based qualia role contribution system, and identified constructions that can identify qualia role values.

First, this chapter explored the distinction between natural and non-natural kind event nouns through surveying the diagnostics between them. It made some modifications to the diagnostics *nominal co-predication* and *adjectival modification* in (Pustejovsky 2006). (i) Nominal co-predication of non-natural kinds requires that the co-predicated nouns must

share a property of the item being predicated, such as the formal role or the telic role. (ii) When an adjective modifies a complex-type natural noun, this construction could be ambiguous, as shown in (37). When an adjective modifies an artifactual-type non-natural noun, this construction is not necessarily ambiguous, as depicted in (38).

(37) 大雨

dà yǔ
heavy rain

‘heavy rain’

(38) 白色的牆

báisède qiáng
white wall

‘a white wall’

Second, previous research on the classification of these nouns was based on their semantic categories (Han 2004, Liu 2004, Han 2010b, Wang 2010, Zhong 2010b). However, such classification conceals the shared characteristics of different categories of event nouns. Based on the natural kind and non-natural kind distinction of event nouns, this chapter further established a classification system for event nouns. It found that event nouns of the same semantic category can belong to different types. (i) Event nouns that represent natural phenomena can be either natural types or natural complex types. For example, 地震 *dìzhèn* ‘earthquake’ only refers to an event and thus it is a natural type, while 雪 *xuě* ‘snow’ can be either an event or a physical object and thus it is a complex type. (ii) Event nouns that represent social activities can be either artifactual types or artifactual complex types. For example, 戰爭 *zhànzhēng* ‘war’ only has an event reading, so it is an artifactual type. 演講 *yǎnjiǎng* ‘speech’ can direct at either the speaking event or the information, so it is an artifactual complex type. The new classification system is summarized in Table 59.

Table 59. Event Nouns: Natural Kinds and Non-Natural Kinds

Event Nouns	Natural Kinds	Natural Types
		Natural Complex Types
	Non-Natural Kinds	Artifactual Types
		Artifactual Complex Types

Based on Table 59, the type system of GL is represented in Table 60.

Table 60. A New Type System of GL

Types	Natural Types	
	Artifactual Types	
	Complex Types	Natural Complex Types
		Artifactual Complex Types

This work has enriched the complex types by including both natural complex types and artifactual complex types. The new classification, which is based on types rather than semantic categories, can help to capture the characteristics of different types of event nouns.

Third, in GL, different types require different qualia role contributions: (a) Natural Types, which direct at the formal and constitutive qualia roles; (b) Artifactual Types, which refer to telic or agentive roles; (c) Complex Types, which make references to the relation between types. This chapter re-examined the qualia role contribution to different types and proposed a scale-based qualia role contribution system to event nouns based on three scales: high, moderate and low. The results are shown in Table 61.

Table 61. Qualia Role Contributions to the Type System of Event Nouns

Domain of Individuals \ Qualia Role		Formal	Constitutive	Telic	Agentive
		Natural	High	High	Low
Artifactual		Moderate	Moderate	High	High
Complex	Natural	High	High	Low	Moderate
	Artifactual	Moderate	Moderate	High	High

Fourth, this chapter identified the constructions that can identify the qualia role values of event nouns, as shown in Table 62.

Table 62. Constructions that can Identify the Qualia Role Values of Event Nouns

Qualia Role	Construction
FORMAL	(I) NP 是一種..... ‘NP is a kind of’ (II) NP 和其他..... ‘NP and other’ (III) NP 屬於..... ‘NP belongs to’
CONSTITUTIVE	(I) NP 包括/包含..... ‘NP includes/contains.....’ (II) NP 有..... ‘NP has.....’ (III) NP 分為..... ‘NP is divided into’ (IV) a.是 NP 的組成部分 ‘..... are component parts of NP’ b.是 NP 的幾個部分 ‘..... are several parts of NP’ (V) NP 由.....組成/構成 ‘NP is composed of’ (VI) NP 的組成部分包括..... ‘NP’s component parts include’ (VII) a. NP(的)程序是...等幾個部分/階段 ‘NP (’s) procedure is ... several parts / stage’ b.是 NP 的幾個階段 ‘..... are several stages of NP’
TELIC	(I) NP 的作用/目的/功能是..... ‘NP’s role / purpose / function is’ (II) NP (是)用來..... ‘NP is used to’
AGENTIVE	(I) NP 的原因是..... ‘NP’s reason is’ (II) NP 由.....引起/引發 ‘NP is caused / triggered by.....’ (III) NP 來自..... ‘NP comes from’

Chapter 5 The Semantic Type System of Event Nouns

5.1 Literature Review

The semantic type system in GL is composed of four levels of representation: (I) Argument Structure: the number and type of logical arguments; (II) Event Structure: event type and subeventual structure; (III) Qualia Structure: comprised of formal, constitutive, telic and agentive roles; (IV) Lexical Inheritance Structure: position of a lexical structure in the type lattice. In particular, Pustejovsky (1995) investigates the semantics of nominals from the three dimensions.

The Three Dimensions that Characterize the Semantics of Nouns:

- (i) ARGUMENT STRUCTURE: How many arguments the nominal takes; what they are typed as; whether they are simple, unified, or complex types.
- (ii) EVENT STRUCTURE: What events the nominal refers to, both explicitly and implicitly.
- (iii) QUALIA STRUCTURE: What the basic predicative force of the nominal is, and what relational information is associated with the nominal, both explicitly and implicitly.

The following sections will review the research on argument structure, event structure, and qualia structure in GL and other studies. Lexical inheritance structure uses a very shallow ontology in GL, and thus it is not discussed in this thesis.

5.1.1 Argument Structure

Pustejovsky (1991, 1995) distinguishes four types of arguments: true arguments, default arguments, shadow arguments, and true adjuncts. True arguments are syntactically realized words, e.g. *Julia* came. Default arguments are words that participate in the logical expression in the qualia, but do not need to be expressed syntactically, e.g. Bill made the table *out of rosewood*. Shadow arguments are words that are lexicalized into the lexical item. They can only be expressed by subtyping or discourse specification; otherwise, they will lead to pleonasm. For example, Evan kicked the door *with his left leg*. True adjuncts are

words that modify the logical expression, but are not fastened to any lexical item's semantic representation, e.g. Lucy goes shopping *in Harbor City*.

In GL, an argument also refers to what a function requires, as shown in the formal representations from (1) to (6). *Man* and *hand* are natural types; *beer* and *knife* are artifactual types; *book* and *record* are complex types.

Natural Types:

$$(1) \left[\begin{array}{l} \text{man} \\ \text{ARGSTR} = [\text{ARG1}=\text{x}: \text{human}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{CONSTITUTIVE}=\text{male}(\text{x}) \\ \text{FORMAL}=\text{x} \end{array} \right] \end{array} \right]$$

(P96)

$$(2) \left[\begin{array}{l} \text{hand} \\ \text{ARGSTR} = [\text{ARG1}=\text{x}: \text{limb}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \text{x} \\ \text{CONSTITUTIVE} = \text{part_of}(\text{x}, \text{y}: \text{body}) \end{array} \right] \end{array} \right]$$

(P99)

Artifactual Types:

$$(3) \left[\begin{array}{l} \text{beer} \\ \text{ARGSTR} = [\text{ARG1}=\text{x}: \text{liquid}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{drink}(\text{e}, \text{y}, \text{x}) \end{array} \right] \end{array} \right]$$

(P100)

$$(4) \left[\begin{array}{l} \text{knife} \\ \text{ARGSTR} = [\text{ARG1}=\text{x}: \text{tool}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \text{x} \\ \text{TELIC} = \text{cut}(\text{e}, \text{x}, \text{y}) \end{array} \right] \end{array} \right]$$

(P100)

Complex Types:

$$(5) \left[\begin{array}{l} \text{book} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = \text{x}: \text{information} \\ \text{ARG2} = \text{y}: \text{physobj} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{information} \cdot \text{physobj_lcp} \\ \text{FORMAL} = \text{hold}(\text{y}, \text{x}) \\ \text{TELIC} = \text{read}(\text{e}, \text{w}, \text{x} \cdot \text{y}) \\ \text{AGENT} = (\text{e}', \text{v}, \text{x} \cdot \text{y}) \end{array} \right] \end{array} \right]$$

(P101)

$$(6) \left[\begin{array}{l} \text{record} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{physobj} \\ \text{ARG2} = y: \text{info} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{infomation} \cdot \text{physobj_lcp} \\ \text{FORMAL} = R(x \cdot y) \\ \text{TELIC} = \text{play}(e, x \cdot y) \end{array} \right] \end{array} \right]$$

(P129)

There is much research on the valence of nouns in Mandarin Chinese. Yuan (1994) states that univalent nouns can be divided into three categories semantically: nouns expressing kinship, such as 爸爸 *bàba* ‘dad’, 妻子 *qīzi* ‘wife’; nouns expressing properties of things, such as 彈性 *tánxìng* ‘elasticity’, 脾氣 *píqi* ‘temper’; nouns that a part of an object, such as 胳膊 *gēbo* ‘arm’, 尾巴 *wěiba* ‘tail’.

Liu (2003) finds that the construction for identifying bivalent nouns is 'N1 +對 (對於) +N2 的 N'. These nouns fall into the following semantic categories: (i) emotion, attitude category, such as 感情 *gǎnqíng* ‘emotion’, 興趣 *xìngqù* ‘interest’, and 感覺 *gǎnjué* ‘sense’; (ii) view, opinion category, such as 見解 *jiànjiě* ‘view’, 結論 *jiélùn* ‘conclusion’, and 印象 *yìnxiàng* ‘impression’; (iii) function, effect category, such as 意義 *yìyì* ‘meaning’, 責任 *zérèn* ‘responsibility’, and 好處 *hǎochu* ‘benefit’; (iv) principle, policy category, such as 條例 *tiáolì* ‘regulation’, 策略 *cèluè* ‘policy’, and 方案 *fāng'àn* ‘proposal’.

In this chapter, I take the stance of GL in defining argument structure.

5.1.2 Event Structure

This section reviews the study in event structure and situation types both in English and Chinese in a temporal order.

5.1.2.1 English

This section reviews the research of Vendler (1957), Dowty (1979), Bach (1986), Parsons (1990), Tenny (1992), Pustejovsky (1995), Smith (1997), and Filip (1999).

Vendler (1957) uses examples to demonstrate time schemata of four classes of verbs. For activities: “A was running at time *t*” means that time instant *t* is on a time stretch throughout which A was running. For accomplishments: “A was drawing a circle at *t*” means that *t* is on the time stretch in which A drew that circle. For achievements: “A won a

race between t_1 and t_2 ” means that the time instant at which A won that race is between t_1 and t_2 . For states: “A loved somebody from t_1 to t_2 ” means that at any instant between t_1 and t_2 A loved that person (Vendler 1957: P8).

Dowty (1979) summarizes eleven syntactic and semantic criteria to distinguish states, activities, accomplishments and achievements, as depicted in Table 63.

Table 63. Syntactic and Semantic Criteria that Distinguish Event Types

Criterion	States	Activities	Accomplishments	Achievements
1. meets non-stative tests	no	yes	yes	?
2. has habitual interpretation in simple present tense:	no	yes	yes	yes
3. \emptyset for an hour, spend an hour \emptyset ing:	OK	OK	OK	bad
4. \emptyset in an hour, take an hour to \emptyset :	bad	bad	OK	OK
5. \emptyset for an hour entails \emptyset at all times in the hour:	yes	yes	no	d.n.a.
6. x is \emptyset ing entails x has \emptyset ed:	d.n.a.	yes	no	d.n.a.
7. complement of <i>stop</i> :	OK	OK	OK	bad
8. complement of <i>finish</i> :	bad	bad	OK	bad
9. ambiguity with <i>almost</i> :	no	no	yes	no
10. x \emptyset ed in an hour entails x was \emptyset ing during that hour:	d.n.a.	d.n.a.	yes	no
11. occurs with studiously, attentively, carefully, etc.	bad	OK	OK	bad

(OK = the sentence is grammatical, semantically normal; bad = the sentence is ungrammatical, semantically anomalous; d.n.a. = the test does not apply to verbs of this class.)

Dowty (1979) revises the Vendler-Kenny classification based on five partially cross-classifying semantic distinctions, as shown in Table 64 and in (i)-(v).

Table 64. Revised Vendler-Kenny Classification (Dowty 1979: P184)

	Non-Agentive	Agentive
States	la. be asleep, be in the garden (stage-level); love, know (object-level) lb. interval statives: sit, stand, lie	2a. possibly be polite, be a hero, etc. belong here, or in 4. 2b. interval statives: sit, stand, lie (with human subject)
Activities	3. make noise, roll, rain	4. walk, laugh, dance (cf. 2a)

Single change of state	5.notice, realize; ignite	6. kill, point out (something to someone)
Complex change of state	7.flow from x toy, dissolve	8. build (a house), walk from x toy, walk a mile

(I) Momentary (1a and “habituate” in all classes) vs. interval predicates (1b, 2b, 3-8). Syntactic test: ability to occur in the progressive. (Note: 6 and especially 5 appear less readily in the progressive than other interval predicates.)

(II) Predicates entailing definite or indefinite change (3-8) vs. those entailing no change (1 and 2). Syntactic test: ability to occur in do constructions (pseudo-clefts, do so reduction, etc.).

(III) Definite change of state predicates (5 8) vs. activity predicates or indefinite change of state predicates (3 and 4). Syntactic test: Does x was V-ing (pragmatically) entail x has V-ed?

(IV) Singulary change predicates (5-6) vs. complex change predicates (7-8). Syntactic test: Is x finished V-ing acceptable?

(V) Agentive (2, 4, 6, 8) vs. non-agentive (1, 3, 5, 7) predicates. Syntactic test: ability to occur in agentive contexts like imperatives, persuade x to V, do V deliberately, etc.

Dowty (1979) explores an explanatory hypothesis about Vendler’s four categories. “The idea is that the different aspectual properties of the various kinds of verbs can be explained by postulating a single homogeneous class of predicates - stative predicates - plus three or four sentential operators and connectives. English stative verbs are supposed to correspond directly to these stative predicates in logical structure, while verbs of the other categories have logical structures that consist of one or more stative predicates embedded in complex sentences formed with these "aspectual" connectives and operators. These aspectual operators and connectives are treated as logical constants - a standard model-theoretic interpretation is to be given for each - and the stative predicates are non- logical constants.” (Dowty 1979: P71)

Bach (1986) divides eventualities into states, processes and events.

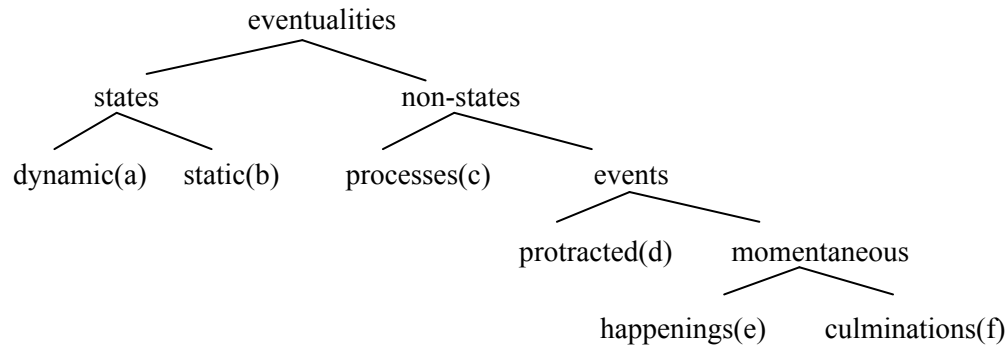


Figure 6. Eventualities in Bach (1986)

Typical examples are:

- (a) sit, stand, lie + Location
- (b) be drunk, be in New York, own x, love x, resemble x
- (c) walk, push a cart, be mean (Agentive)
- (d) build x, walk to Boston
- (e) recognize, notice, flash once
- (f) die, reach the top

Parsons (1990) argues that simple sentences in English contain subatomic quantification over events.

- (I) Entailment relations between sentences with adverbial modifiers;
- (II) Complements of perceptual verbs;
- (III) Implicit and explicit reference to events;
- (IV) Explicit quantification over events.

Tenny (1992) states that “Aspectual Interface Hypothesis (AIH): The mapping between thematic structure and syntactic argument structure is governed by aspectual properties. A universal aspectual structure associated with internal (direct), external and oblique arguments in syntactic structure constrain the kinds of event participants that can occupy these positions. Only the aspectual part of thematic structure is visible to the syntax.” (Tenny 1992: P2)

Pustejovsky (1995) distinguishes three aspectual types: states, processes and transitions²⁵, where the last class is itself sometimes broken down into accomplishment, and achievement (Pustejovsky 1995: P12, 68).

Smith (1997) distinguishes the temporal features of situation types as shown in Table 65.

Table 65. Temporal Features of Situation Types

Situations	Static	Durative	Telic
State	+	+	-
Activity	-	+	-
Accomplishment	-	+	+
Semelfactive	-	-	-
Achievement	-	-	+

Filip (1999) discusses cross-categorial parallelisms. He points out that mass and plural noun phrases are distributive and cumulative. Verbal predicates also have the characteristics of divisibility and cumulativity, since we consider the spatial parts of individuals and the temporal parts of eventualities. “Process and state predicates are cumulative, or atelic, and events quantized, or telic.” (P45) Figure 7 summarizes this distinction.

A variety of contextual factors can lead to shifts in meaning between event and process, such as optional adverbials (temporal, locative, directional), phasal verbs, mood (imperative), aspect (progressive), and tense (Filip 1999: P63).

²⁵ In GL, processes are also called activities, and transitions are also called events, referring to Page 12 and 68 in Pustejovsky (1995).

MASS AND PLURAL NPs

wine, apples

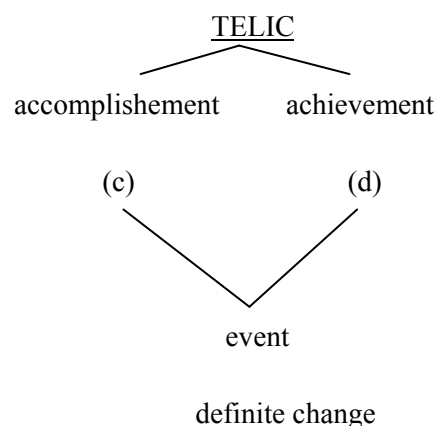
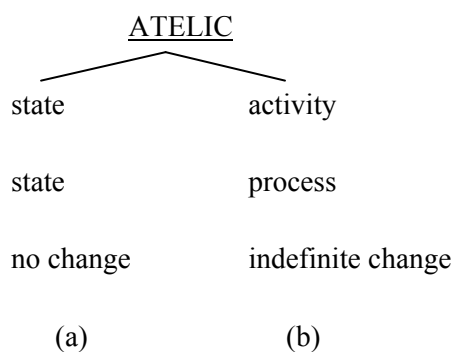
SINGULAR COUNT NPs

an/the/one apple

QUANTIFIED / MEASURE NPs

five / all (the) apples

a glass of wine



(a) Mary drank wine.

(c) Mary drank a glass of wine.

(b) Mary was in New York.

(d) Mary arrived.

Figure 7. Cross-Categorical Parallelisms in Filip (1999)

5.1.2.2 Chinese

This section reviews the research on event types in Chinese, especially the work of Tai (1984), Teng (1985), Smith (1997), and Huang et al. (2000).

Tai (1984) first introduces Vendler's work to the Chinese language. He argues that Chinese has three verb types under the notion of time: states, activities and results. The time schema for states and activities are the same with English; results do not have continuous tenses, but they have a definite time instant. He pointed out that “The accomplishment verb is expressed in Chinese in the form of a resultative verb compound. While an accomplishment verb in English has both action and result aspects, a resultative verb compound in Chinese has only the result aspect.” (Tai 1984: P292). For example:

(7) 我昨天畫了一幅畫，可是沒畫完。

wǒ zuótiān huà le yī fú huà, kěshì méi huà wán.

I yesterday paint ASP one CL picture but not have paint finish

‘I painted a picture yesterday but I didn't finish it.’

In (7), 畫完 *huà wán* ‘finish painting’ is a resultative verb compound in which 畫 *huà* ‘paint’ is an action verb, and 完 *wán* ‘finish’ is the result. 畫完 *huà wán* ‘finish painting’ as a whole expresses accomplishment.

It should be noted that Tai (1984)’s classification is to verbs, not to event types based on sentences. He notices that English accomplishment verbs are similar to resultative verb compound in Mandarin Chinese. His pioneering analysis lays foundation for further studies on situation types in Mandarin Chinese.

Teng (1985) explores the relationship between situation types and temporal expressions in Mandarin Chinese. He assumes that Mandarin Chinese has the same internal temporal structure as English. Consequently, Chinese has the same four situation types as in Vendler's.

Tai (1984) claims that in English when a verb combines with an object, it encodes the result, but Chinese does not have such an operation. Teng (1985) argues that the situation type is not just the verb in a sentence and accomplishment is not just the coming about of a result.

Teng (1985) believes that the aspect has a direct relation with situation types and can contribute to the classification of situation types as shown in Table 66.

Table 66. The Relation between Aspects and Situation Types

Situation Types	Generic	Progressive (在 <i>zài</i> , 著 <i>zhe</i>)	Perfective (了 <i>le</i>)	Experiential (過 <i>guò</i>)
Activity	教書 <i>jiāoshū</i> ‘teaching’	在寫信 <i>zài xiě xìn</i> ‘is/was writing a letter’	*走了路 <i>*zǒu le lù</i> ‘*walked’	找過房子 <i>zhǎo guò fángzi</i> ‘looked for a house’
Accomplishment	*過去煮過飯 <i>*guòqù zhǔ guò fàn</i> ‘* cooked rice in the past’	*煮好著飯 <i>*zhǔ hǎo zhe fàn</i> ‘* is/was cooking the rice well’	作了一個夢 <i>zuò le yī gè mèng</i> ‘had a dream’	*走到過大學 <i>*zǒu dào guò dàxué</i> ‘* went to a college’
Achievement	*某種人不死 <i>*mǒu zhǒng rén bù sǐ</i> ‘* some kind of people does not die’	*氣球在破 <i>*qìqiú zài pò</i> ‘* The balloon is breaking.’	油漆幹了 <i>yóuqī gān le</i> ‘paint dried’	他病過 <i>tā bìng guò</i> ‘he was sick’
State	不喜歡吃肉 <i>bù xǐhuan chī ròu</i> ‘not like eating meat’	*在知道這件事 <i>*zài zhīdào zhè jiàn shì</i> ‘* is/was knowing about this’	*會了游泳 <i>*huì le yóuyǒng</i> ‘*was able to swim’	*客氣過 <i>*kèqi guò</i> ‘*was polite’

Smith (1997) points out three types of Resultative Verb Complements (RVCs): Directional RVCs (e.g. 上 *shàng* ‘ascend’, 出 *chū* ‘out’, 過 *guò* ‘across’, 進 *jìn* ‘in, into’, 起 *qǐ* ‘up’), Resultative Result State (e.g. 飽 *bǎo* ‘full’, 清楚 *qīngchū* ‘clarity’, 開 *kāi* ‘detachment’, 住 *zhù* ‘fixity’, 錯 *cuò* ‘error’) and Resultative Phase or Completive (e.g. 見 *jiàn* ‘sensory perception’, 到 *dào* ‘attainment’, 好 *hǎo* ‘satisfaction’, 成 *chéng* ‘succeed’, 完 *wán* ‘finish’). (Smith 1997: P282)

Phase RVCs can form achievements from activities as shown in Table 67.

Table 67. Examples of Activities and Achievements

Activity	Achievement
看 <i>kàn</i> ‘look’	看到 <i>kàn-dào</i> ‘see’
聽 <i>tīng</i> ‘listen’	聽到 <i>tīng-dào</i> ‘hear’
找 <i>zhǎo</i> ‘look for’	找到 <i>zhǎo-dào</i> ‘find’
逃 <i>táo</i> ‘flee’	逃到 <i>táo-dào</i> ‘escape’

Smith (1997) finds that the properties of dynamism, completion, duration, and detachability distinguish the situation types. She adds semelfactives to Vendler’s four-way classification. The syntax properties of the five situation types in Chinese are as follows.

Activities:

- a. Activities have dynamic syntax.
- b. They accept directional and flexible RVCs.
- c. They are compatible with forms of simple duration. The obligatory verb-copying rule applies to post-verbal durative adverbials.
- d. They allow durative adverbials and the main verb 花 *huā* ‘take’. (P287)

Accomplishments:

- a. Accomplishments have dynamic syntax.
- b. They are compatible with strictly completive RVCs.
- c. They appear with the main verb 花 *huā* ‘take’.
- d. They are ambiguous in sentences with 差一點兒 *chà yīdiǎnér* ‘almost’.
- e. They accept the 把 *bǎ* construction if the event has an Affected Object. (P290)

Semelfactives:

- a. Semelfactives have dynamic syntax.
- b. They do not allow imperfective viewpoints or other durative forms.
- c. They are incompatible with RVCs of strict completion. (P290)

Achievements:

- a. Achievements have dynamic syntax.
- b. They are incompatible with the imperfective viewpoints.
- c. They are compatible with RVCs of strict completion.
- d. They are incompatible with the main verb 花 *huā* ‘take’. (P292)

Statives:

- a. Statives have stative syntax: adjectival predicates with 很 *hěn* ‘very’, reduplication with the AABB pattern. They do not appear with the features of dynamic syntax.
- b. They accept the \emptyset imperfective, the 过 *guò* perfective, and the 著 *zhe* imperfective with stage-level predicates; with explicit bounds, they appear with perfective -了 *le*.
- c. They accept durative adverbials on a simple durative interpretation. (P294)

Huang et al. (2000) propose MARVS (the Module-Attribute Representation of Verbal Semantic), in which lexical knowledge is classified into two types of modules: event structure modules and role modules, as well as two sets of attributes: event-internal attributes and role-internal attributes as shown in Figure 8.

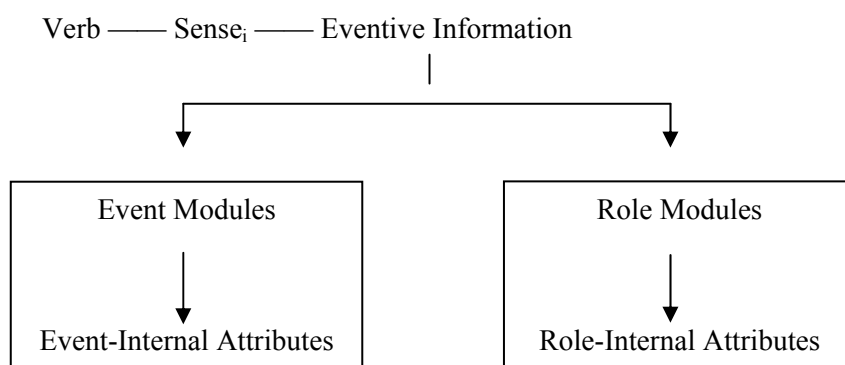


Figure 8. Module-Attribute Representation

Below is a detailed explanation of the four components of MARVS.

Event Modules: There are five atomic event structures: Boundary[.], Punctuality[/], Process[///], State[__] and Stage[^^^]. These five atomic event structures are the only building blocks necessary to capture the range of complex linguistic event structure. The combination of them produces thirteen different event types.

Event-internal Attributes: Attributes refer to the semantics of the event itself, such as [control], [effect], etc.

Role Modules: They contain the focused roles of an event and typically include all required arguments but can also include optional arguments and adjuncts. These roles are identified: Agent, Cause, Causer, Comparison, Experiencer, Goal, Instrument, Incremental Theme, Location, Locus, Manner, Range, Recipient, Source, Target, Theme, etc.

Role-internal Attributes: Attributes refer to the internal semantics of a particular focused role (of the event), such as [sentience], [volition], [affectedness], [design], etc.

5.1.2.3 Summary

Previous studies have contributed to the exploration of situation types both in English and Chinese. Though there are some minor differences with regard to the properties and classification of different situation types, scholars more or less share similar ideas. These studies focus on verbs in a sentence; little attention has been paid to nouns. In this chapter, I will take Pustejovsky (1995)'s GL method and examine the event structure of event nouns.

5.1.3 Qualia Structure

5.1.3.1 The Concept of Qualia Structure

Qualia structure is one of the most important levels in the generative lexicon theory. Pustejovsky (1991, 1995) shows how lexical items encode semantic information in the qualia structure. There are four roles in a qualia structure, and each is associated with some values: (i) the constitutive role is about the relation between an object and its constituents or parts. Its role values include material, weight, parts and component elements; (ii) the formal role can distinguish the object within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values; (iii) the telic role is about the purpose

and function of the object; (iv) the agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, and causal chain.

Furthermore, Pustejovsky (2001a, 2006), Pustejovsky and Jezek (2008) separate the domain of individuals into three distinct levels: (i) Natural Types direct at the Formal and Constitutive qualia roles; (ii) Artifactual Types refer to Telic or Agentive roles; (iii) Complex Types make references to the relation between types.

Hsieh (2010) points out three assumptions under the concept of qualia: (i) Lexical items encode semantic information in what the qualia structure conveys. (ii) Qualia structure drives our basic understanding of an object or a relation in the world, and they furthermore contribute to (or, in fact, determine) our ability to name an object with a certain predication. (iii) In terms of Mental Lexicon, the qualia can be viewed as ‘distinguished’ links between lexical concepts in the lexicon.

5.1.3.2 Interpreting Qualia Qualess

This section introduces the four qualia roles in (Pustejovsky 1991, 1995).

5.1.3.2.1 Interpreting the Formal Quale

The formal quale can distinguish an object from a larger set. Two possible structures are associated with the formal quale.

(i) Simple Typing: the value of the formal role is identical to the sortal typing of the argument;

(ii) Complex (Dotted) Typing: the value of the formal role defines the relation between the arguments of different types.

For simple type nouns, the formal role is the typing restriction on the argument structure. The schematic form is illustrated in (8).

$$(8) \quad \left[\begin{array}{l} \text{ARGSTR} = [\text{ARG1} = x: \tau] \\ \text{QUALIA} = [\text{FORMAL} = x] \end{array} \right]^a$$

(P96)

For example, man and woman are sorts of human, which are distinguished by gender.

Complex types, such as relational nouns (eg. door) and process-result alternating nominals (eg. destruction) are cases of logical polysemy. The schematic form is illustrated in (9).

$$(9) \quad \left[\begin{array}{l} \text{a} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \tau_1 \\ \text{ARG2} = x: \tau_2 \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \tau_1 \cdot \tau_2 \text{-lcp} \\ \text{FORMAL} = P(y, x) \end{array} \right] \end{array} \right]$$

(P96)

5.1.3.2.2 Interpreting the Constitutive Quale

The constitutive quale allows two abstractions:

$$\text{a. } \lambda x \exists y [\text{part_of}(y, x)]$$

$$\text{b. } \lambda x \exists y [\text{part_of}(x, y)]$$

The function (a) defines the parts or material of an object. For example, a flower has sepal as its part. (b) defines what an object is logically part of. For instance, a hand is a part of a limb.

5.1.3.2.3 Interpreting the Telic Quale

The telic quale defines the purpose or function of a concept. There are two modes of telic.

(i) Direct Telic: something that one acts on directly, as shown in (10).

$$(10) \quad \left[\begin{array}{l} \text{a} \\ \text{ARGSTR} = [\text{ARG1} = x: \tau] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{AGENTIVE} = R(e, y, x) \end{array} \right] \end{array} \right]$$

(P99)

A case in point is beer. The purpose of beer is the activity given in the telic role, as depicted in (11).

$$(11) \quad \left[\begin{array}{l} \text{beer} \\ \text{ARGSTR} = [\text{ARG1} = x: \text{liquid}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{drink}(e, y, x) \end{array} \right] \end{array} \right]$$

(P100)

(ii) Purpose Telic: something that is used to facilitate an activity, as shown in (12).

$$(12) \left[\begin{array}{l} \text{a} \\ \text{ARGSTR} = [\text{ARG1} = x: \tau] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = R(e, x, y) \end{array} \right] \end{array} \right]$$

(P100)

A case in point is knife. A knife is used in the performance of the cutting activity, as illustrated in (13).

$$(13) \left[\begin{array}{l} \text{knife} \\ \text{ARGSTR} = [\text{ARG1} = x: \text{tool}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{cut}(e, x, y) \end{array} \right] \end{array} \right]$$

(P100)

5.1.3.2.4 Interpreting the Agentive Quale

‘Coming into being’ of an object is encoded in the agentive quale of a lexical item. How something is created distinguishes natural types from artifactual types, and how something comes about distinguishes objects from events.

The schematic illustration for simple typed nominals and artifacts is in (14).

$$(14) \left[\begin{array}{l} \text{a} \\ \text{ARGSTR} = [\text{ARG1} = x: \tau] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{AGENTIVE} = R(e, y, x) \end{array} \right] \end{array} \right]$$

(P98)

For example, in ‘bake a cake’, ‘cake’ comes into being by a creative activity; in ‘bake a potato’, the potato just goes a change of state.

For a dot object nominal, the agentive may direct at the dotted argument directly. The illustration is shown in (15).

$$(15) \left[\begin{array}{l} \text{a} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \tau_1 \\ \text{ARG2} = x: \tau_2 \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \tau_1 \cdot \tau_2_lcp \\ \text{FORMAL} = P(y, x) \\ \text{AGENTIVE} = R(e, w, x \cdot y) \end{array} \right] \end{array} \right]$$

(P98)

5.1.3.3 Mapping from Qualia

The licensed projections from a particular quale, Q_i is illustrated below:

(i) a. $Q_i: R(e_1, x, y) \rightarrow x: \text{SUBJ}, y: \text{OBJ}$

b. $Q_i: P(e_2, y) \rightarrow y: \text{SUBJ}$

Individual qualia compete for projection because of the presence of more than one qualia role. The projectable qualia can be constrained by headedness. Two mappings are possible from the qualia in (i), as shown in (ii) and (iii).

(ii) a. $Q_i: R(e_1^*, x, y) \rightarrow x: \text{SUBJ}, y: \text{OBJ}$

b. $Q_i: P(e_2, y) \rightarrow \text{shadowed}$

(iii) a. $R(e_1, x, y) \rightarrow \text{shadowed}$

b. $Q_i: P(e_2^*, y) \rightarrow y: \text{SUBJ}$

This mapping principle can be demonstrated in the lexical representation for *kill*, as shown in (16).

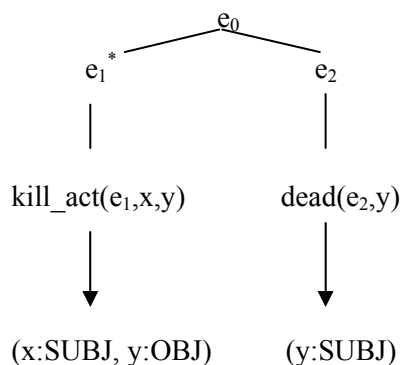
$$(16) \left[\begin{array}{l} \text{kill} \\ \text{EVENTSTR} = \left[\begin{array}{l} E_1 = e_1: \text{process} \\ E_2 = e_2: \text{state} \\ R_{\text{ESTR}} = <_{\infty} \\ H_{\text{EAD}} = e_1 \end{array} \right] \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = \boxed{1} \left[\begin{array}{l} \text{ind} \\ \text{FORMAL} = \text{physobj} \end{array} \right] \\ \text{ARG2} = \boxed{2} \left[\begin{array}{l} \text{animated}_{\text{ind}} \\ \text{FORMAL} = \text{physobj} \end{array} \right] \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{cause-lcp} \\ \text{FORMAL} = \text{dead}(e_2, \boxed{2}) \\ \text{AGENTIVE} = \text{kill_act}(e_1, \boxed{1}, \boxed{2}) \end{array} \right] \end{array} \right]$$

(P102)

The argument that is related to the second subevent, e_2 , cannot be expressed due to the headedness constraint. This is illustrated in (17).

(17)

(P102)



5.2 Argument Structure of Event Nouns

Pustejovsky (1991, 1995) distinguishes four types of arguments: true arguments, default arguments, shadow arguments, and true adjuncts.

Natural and non-natural kind event nouns differ in their ability of taking arguments. The former normally takes no argument, while the latter usually has arguments.

Natural Kind Event Nouns:

(18) 果然，**雷聲**一響，就下起雨來了。(Sinica)

Guǒrán, **léishēng** yī xiǎng, jiù xiàqǐ yǔ lái le.
 Sure enough thunder one sound at once fall rain come ASP

‘Sure enough, as soon as the **thunder** sounds, it began to rain.’

In (18), 雷聲 *léishēng* ‘thunder’ is a natural kind event noun. It takes no argument.

Non-natural Kind Event Nouns:

(i) take one argument, such as 文體活動類 *wéntǐ huódòng lèi* ‘entertainment and sports activities’: 游泳 *yóuyǒng* ‘swimming’, 跳高 *tiàogāo* ‘jumping’, 蹦床 *bèngchuáng* ‘trampolining’.

(19) 這是**他**度假結束前的最後一次**游泳**。(CCL)

Zhè shì **tā** dùjià jiéshù qián de zuìhòu yī cì **yóuyǒng**.
 this be he spend one's holidays end before DE final one CL swim

‘This was the last **swim** before *he* ended his vacation.’

In (19), the sports word 游泳 *yóuyǒng* ‘swim’ takes one argument 他 *tā* ‘he’.

(ii) take two arguments, such as 編輯 *biānjí* ‘editing’, 指揮 *zhǐhuī* ‘command’, 領導 *lǐngdǎo* ‘leading’, 導演 *dǎoyǎn* ‘directing’.

(20) 在幾十年的編輯生涯中，張先生勤勤懇懇埋頭于學術書籍的編輯，出版。(CCL)

Zài jǐshínián de biānjí shēngyá zhōng, Zhāng xiānshēng
in decades DE editing career in the course of Mr. Zhang
qínqínkěnkěn máitóuyú xuéshù shūjí de biānjí, chūbǎn.
diligently immerse oneself in academic books DE editing publishing

‘In the decades of editing career, *Mr. Zhang* diligently immersed in *editing* and publishing of *academic books*.’

(21) 交警增強了警力,加強了對行人和車輛的指揮。(CCL)

Jiāojǐng zēngqiáng le jǐnglì, jiāqiáng le duì
traffic police enhance ASP police force strengthen ASP to
xíng rén hé chēliàng de zhǐhuī.
pedestrian and vehicles DE command

‘The traffic police enhanced the police force, and strengthened the *command* of pedestrians and vehicles.’

In (21), the event noun 編輯 *biānjí* ‘editing’ takes two arguments: 張先生 *Zhāng xiānshēng* ‘Mr. Zhang’ and 學術書籍 *xuéshù shūjí* ‘academic books’. In (21), the event noun 指揮 *zhǐhuī* ‘command’ also takes two arguments: 交警 *jiāojǐng* ‘traffic police’ and 行人和車輛 *xíng rén hé chēliàng* ‘pedestrians and vehicles’.

True and Default Arguments

Process nominal and event nouns often have true arguments or default arguments. The following takes the process nominal 解釋 *jiěshì* ‘explanation’ as an example.

解釋 *jiěshì* ‘explain’ as a verb has a process reading, as it can be modified by a durative temporal expression. It is a two-place predicate. In (22) it takes two arguments: NP1 科學家 *kēxuéjiā* ‘scientist’ and NP2 雙生子同步現象 *shuāngshēngzǐ tóngbù xiànxàng* ‘the phenomenon of twins synchronization’.

(22) 科學家 解釋了 雙生子 同步 現象。

Kēxuéjiā jiěshì le shuāngshēngzǐ tóngbù xiànxàng.

Scientist explain ASP twins synchronization phenomenon

‘Scientists explained the phenomenon of twins synchronization.’

After nominalization, 解釋 *jiěshì* ‘explain’ can either have a process reading or a result reading, as shown in (23) and (24) respectively.

Test of the process reading:

(23) 科學家對雙生子同步現象的解釋進行了三個小時。

Kēxuéjiā duì shuāngshēngzǐ tóngbù xiànxàng de *jiěshì*
 Scientist to twins synchronization phenomenon DE explanation
 jinxíng le sān gè xiǎoshí.
 carry on ASP three CL hour

‘Scientists’ *explanation* to the phenomenon of twins synchronization carried on for **three hours**.’

In (23), 三個小時 *sān gè xiǎoshí* ‘three hours’ is a curative time expression, and therefore 解釋 *jiěshì* ‘explanation’ has a process reading.

Test of the result reading:

(24) 科學家對雙生子同步現象的解釋是正確的。

Kēxuéjiā duì shuāngshēngzǐ tóngbù xiànxàng de *jiěshì* shì
 Scientist to twins synchronization phenomenon DE explanation be
zhèngquède.
 correct

‘Scientists’ *explanation* to the phenomenon of twins synchronization is **correct**.’

In (24), “the 解釋 *jiěshì* ‘explanation’ is correct” refers to the information aspect of 解釋 *jiěshì* ‘explanation’, and thus it is a result reading.

When 解釋 *jiěshì* ‘explanation’ has a process reading, it can shadow either the argument NP1, NP2, or both. In (25)a, NP1 is the true argument, while NP2 becomes default. In (25)b, NP2 becomes the true argument, while NP1 is default. In (25)c 解釋 *jiěshì* ‘explain’ occurs in the subject position and neither argument is syntactically realized. Thus 解釋 *jiěshì* ‘explain’ has two default arguments.

(25) NP1 的 NV:

a. 科學家的解釋進行了三個小時。

Kēxuéjiā de *jiěshì* jìnxíng le sān gè xiǎoshí.
Scientist DE explanation carry on ASP three CL hour

‘Scientists’ *explanation* lasted three hours.’

NP2 的 NV:

b. 雙生子同步現象的解釋進行了三個小時。

Shuāngshēngzǐ tóngbù xiànxiàng de *jiěshì* jìnxíng
twins synchronization phenomenon DE explanation carry on
le sān gè xiǎoshí.
ASP three CL hour

‘The *explanation* to the phenomenon of twins synchronization carried on for three hours.’

NV in the subject position:

c. 解釋進行了三個小時。

Jiěshì jìnxíng le sān gè xiǎoshí.
explanation carry on ASP three CL hour

‘The *explanation* lasted three hours.’

When 解釋 *jiěshì* ‘explain’ has a result reading, it takes no argument, as indicated in (26)a and (26)b.

(26) a. 科學家的解釋是正確的。

Kēxuéjiā de *jiěshì* shì zhèngquède.
Scientist DE explanation be correct

‘Scientist’s *explanation* is correct.’

b. 雙生子同步現象的解釋是正確的。

Shuāngshēngzǐ tóngbù xiànxiàng de *jiěshì* shì zhèngquède.
twins synchronization phenomenon DE explanation be correct

‘The *explanation* of the phenomenon of twins synchronization is correct.’

5.3 Event Structure of Event Nouns

Pustejovsky (1991, 1995) distinguishes three aspectual types/situation types: state, activity and event, where the last class is itself broken down into accomplishment, and achievement events. This is shown in Table 68.

Table 68. Properties of Situation Types (Pustejovsky 1995)

Situation Types	Telic	Dynamic	Durative
State	-	-	+
Process	-	+	+
Transition (accomplishment)	+	+	+
Transition (achievement)	+	+	-

Event nouns express process event or instant event, so their situation types are process or achievement. For example, Process: 風 *fēng* ‘wind’, 雨 *yǔ* ‘rain’, 戲劇 *xìjù* ‘drama’, 國宴 *guóyàn* ‘state banquet’; achievement: 判決 *pànjué* ‘court decision’, 獎勵 *jiǎnglì* ‘award’, 死亡 *sǐwáng* ‘death’, 車禍 *chēhuò* ‘car accident’.

Event nouns can undergo aspectual shifts. *Section 5.5.4.2 Aspectual Shifts of 會議 huìyì ‘conference; meeting’* discusses this in detail.

Event nouns cannot be accomplishments. Because an accomplishment is composed of two parts: a process and a result. Event Nouns in Mandarin Chinese usually do not have such a function.

5.4 Qualia Structure of Event Nouns

Chapter 6 examines how to establish an eventive qualia structure in details, so this section will not discuss it.

5.5 A Case Study on 會議 *huìyì* ‘conference; meeting’

GL is a computational system composed of four levels of representation: (I) Argument Structure: the number and type of logical arguments; (II) Event Structure: event type and

subeventual structure; (III) Qualia Structure: comprised of formal, constitutive, telic and agentive roles; (IV) Lexical Inheritance Structure: position of a lexical structure in the type lattice. I adopt GL as the theoretical basis for the study on 會議 *huìyì* ‘conference; meeting’ because it provides a comprehensive account of the lexical semantic information of a lexical item.

This section takes 會議 *huìyì* ‘conference; meeting’ as a typical non-derived process event noun to explore how nouns can represent eventive information in Chinese. This research focuses on discovering evidences that 會議 *huìyì* ‘conference; meeting’ is an event, and establishing 會議 *huìyì*’s semantic type system by revealing its argument structure, event structure, and qualia structure. Lexical inheritance structure uses a very shallow ontology in GL; thus, it is not discussed in this study. This study aims to show that the framework of GL is versatile enough to represent eventive information encoded by nouns.

5.5.1 Related Research

Event nouns in Mandarin Chinese have generated considerable scholarly interest. Previous research on event nouns focuses on structures in which they usually occur (Ma 1995, Chu 2000, Han 2010a), their classifiers (Ma 1995, Wang & Zhu 2000, Wang & Huang 2011d), internal and external temporal attributes (Liu 2004), properties (Wang & Huang 2012e), qualia modification, event representing feature, and information inheritance characteristics (Wang & Huang 2011a), qualia structure (Wang & Huang 2012d), and their semantic categories (Wang & Zhu 2000, Han 2004, Liu 2004, Han 2007a, 2010b).

However, rarely have any in-depth study of the semantic characteristics of non-derived event nouns been conducted. In the following sections, I will discuss three problems: (I) Why can 會議 *huìyì* ‘conference; meeting’ be treated as an event noun? (II) What is 會議 *huìyì* ‘conference; meeting’’s semantic type system, e.g. argument structure, event structure and qualia structure? (III) How should 會議 *huìyì* ‘conference; meeting’’s semantic type system be represented?

5.5.2 Evidences of 會議 *huìyì* ‘conference; meeting’ as an Event Noun

There are various approaches to identify event nouns. A noun that can meet the following conditions is usually taken as an event noun:

(I) Selected by locative words (Ma 1995, Chu 2000, Wang 2000, Shao & Liu 2001, Liu 2003): e.g. 以前 *yǐqián* ‘before’, 以後 *yǐhòu* ‘after’;

(II) Selected by durative temporal expressions (Shao & Liu 2001, Wang 2010): e.g. 三個小時 *sān gè xiǎoshí* ‘three hours’, 十分鐘 *shí fēnzhōng* ‘ten minutes’;

(III) Selected by some classifiers: activity/verbal classifiers (Ma 1995, Wang & Zhu 2000, Wang 2000, Shao & Liu 2001, Liu 2003, Zhao 2006, Han 2007b): e.g. 次 *cì* ‘once (re. frequency of event)’, 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’ and event classifiers (Wang & Huang 2011d): e.g. 波 *bō* ‘of staggered event’.

會議 *Huìyì* has two senses in *The Contemporary Chinese Dictionary* (Bilingual Dictionary Subdivision 2002, Dictionary Department 2012), as shown in Table 69.

Table 69. Senses of 會議 *huìyì*

No.	Sense	Example
①	有組織有領導地商議事情的集會 <i>yǒu zǔzhī yǒu lǐngdǎo de shāngyì shìqíng de jíhuì</i> ‘meeting; conference; organized gathering for discussion and consultation’	廠務會議 <i>chǎngwù huìyì</i> ‘factory management meeting’
②	一種經常商討並處理重要事務的常設機構或組織 <i>yī zhǒng jīngcháng shāngtǎo bìng chǔlǐ zhòngyào shìwù de chángshè jīgòu huò zǔzhī</i> ‘congress; council; conference; standing body that meets regularly to discuss and make decisions on important matters’	中國人民政治協商會議 <i>Zhōngguó Rénmín Zhèngzhì Xiéshāng Huìyì</i> ‘Chinese People's Political Consultative Conference’

會議 *Huìyì* ‘conference; meeting’ in the first sense is regarded as an event noun; in the second, it is not (Wang & Huang 2013d). The following section will prove that because the first sense of 會議 *huìyì* ‘conference; meeting’ satisfies the above three distributional selectional conditions, it is an event noun.

5.5.2.1 Selection by Localizers

When a noun that is selected by the localizer 前 *qián* ‘before’ or 後 *hòu* ‘after’ expresses a temporal meaning, the noun is an event noun. (27) and (28) show that 會議 *huìyì* ‘conference; meeting’ can collocate with 前 *qián* ‘before’ and 後 *hòu* ‘after’, which indicate 會議 *huìyì* ‘conference; meeting’'s boundaries and distinguish it from other events. In (27), before the conference event, there is another event: the rising of the stock market. In (28), after the conference event, there will be another event: the study of an issue.

- (27) 經濟 會議前 股市將持續上漲。(Gigaword)

Jīngjì *huìyì* qián gǔshì jiāng chíxù shàngzhǎng.
economy conference before stock market will continue rise

‘The stock market will continue rising before the economic conference.’

- (28) 這次 會議後，就要著手研究這個問題。(Gigaword)

Zhè cì *huìyì* hòu, jiù yào zhuòshǒu yánjiū
This CL conference after, at once will set about study
zhè gè wèntí.
this CL issue

‘After this conference, (we) should set about studying this issue at once.’

5.5.2.2 Selection by Durative Temporal Expressions

會議 *huìyì* ‘conference; meeting’ can be modified by durative temporal expressions as shown in (29). 七個多小時 *qī gè duō xiǎoshí* ‘over seven hours’ means that 會議 *huìyì* ‘conference; meeting’ is an event with a process.

- (29) 今天的 會議 進行了 七個多小時。(Gigaword)

Jīntiān de *huìyì* jìnxíng le qī gè duō xiǎoshí.
Today DE conference carry on ASP seven CL more hour

‘Today’s conference carried on for over seven hours.’

This process can be interrupted. In (30), regular tea breaks occur throughout the duration of the conference.

- (30) 會議 每進行 兩個小時 就有一次茶歇。(Gigaword)

Huìyì měi jìnxíng liǎng gè xiǎoshí jiù yǒu
conference every carry on two CL hour right after have
yī cì cháxiē.
one CL tea break

‘There is a tea break every two hours during the conference.’

Moreover, this process can have a starting point and an ending point. In (31), 從六月七日開

始 *cóng liùyuè qīrì kāishǐ* ‘start from June 7th’ shows the starting date. In (32), 結束 *jiéshù* ‘end’ states the ending of the conference.

(31) 本次 會議從六月七日開始。(Gigaword)

Běn cì *huìyì* *cóng liùyuè qīrì kāishǐ*
this CL conference from June seventh start

‘This conference starts from June 7th.’

(32) 中法工業合作 會議圓滿結束。(Gigaword)

Zhōng fǎ gōngyè hézuò *huìyì* yuánmǎn *jiéshù*
China France industry cooperation conference satisfactory end

‘The Sino-French industrial cooperation conference comes to a successful ending.’

5.5.2.3 Selection by Event Classifiers

Huang et al. (1997) distinguish event classifiers from activity classifiers. The former is used to enumerate the number of events, e.g. 一筆生意 *yī bǐ shēngyì* ‘a deal of business’; the latter is used to enumerate the times of action, e.g. 去了一趟 *qù le yī tàng* ‘went once’. Moreover, the former usually appear before the enumerated event, eg. 一齣戲 *yī chū xì* ‘a play’; the latter usually appears after the enumerated action, e.g. 打了他一下 *dǎ le tā yīxià* ‘hit him once’. Huang and Ahrens (2003) further discover that an event classifier can coerce an event reading from a common noun.

Huang et al. (1997) find 35 event classifiers. 會議 *huìyì* ‘conference; meeting’ can combine with four of them: 輪 *lún* ‘a round’, 屆 *jiè* ‘similar to *number of times*, used for regular meetings, graduate classes, etc.’, 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’, 次 *cì* ‘once (re. frequency of event)’. In addition, 會議 *huìyì* ‘conference; meeting’ can also combine with 度 *dù* ‘frequency of an event’, which is an event classifier similar to 次 *cì* ‘once (re. frequency of event)’. 度 *dù* ‘frequency of an event’ can directly modify 會議 *huìyì* ‘conference; meeting’ to enumerate the times of the conference, which proves that 會議 *huìyì* ‘CONFERENCE; meeting’ is an event noun. In (33) 度 *dù* ‘frequency of an event’ counts the frequency of APEC.

(33) 一年一度的亞太經合會議

yī nián yī *dù* de YàTài JīngHé *Huìyì*

One year one CL DE APEC

‘the annual meeting of the Asia-Pacific Economic Cooperation conference’

Table 70 depicts the frequency and salience when 會議 *huìyì* ‘conference; meeting’ combines with event classifiers in Chinese Gigaword Corpus (Second Edition). It demonstrates that 次 *cì* ‘once (re. frequency of event)’ and 屆 *jiè* ‘similar to *number of times*, used for regular meetings, graduate classes, etc.’ are the two most salient event classifiers of 會議 *huìyì* ‘conference; meeting’, followed by 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’, 輪 *lún* ‘a round’ and 度 *dù* ‘frequency of an event’.

Table 70. Event Classifiers that Modify 會議 *huìyì* ‘conference; meeting’

Event Classifiers	Frequency	Salience	Examples
次 <i>cì</i> ‘once (re. frequency of event)’	94477	100.13	小組將在本週五再召開一 <u>次</u> 會議。 (Gigaword) Xiǎozǔ jiāng zài běnzhōu wǔ group will on this week Friday zài zhàokāi yī <u>cì</u> <i>huìyì</i> . again hold one CL conference ‘The group will hold a conference again on Friday this week.’
屆 <i>jiè</i> ‘similar to <i>number of times</i> , used for regular meetings, graduate classes, etc.’	12471	65.05	本屆會議討論主題為工業及科技合作。 (Gigaword) Běn <u>jiè</u> <i>huìyì</i> tāolùn zhǔtí this CL conference discussion theme wèi gōngyè jí is industry and kējì hézuò. science and technology cooperation ‘The discussion theme of this conference is between industry and science and technology cooperation.’
場 <i>chǎng</i> ‘a (scheduled) event (with beginning and ending)’	660	19.78	最後一場會議主要探討雜誌的發展。 Zuìhòu yī <u>chǎng</u> <i>huìyì</i> zhǔyào final one CL conference mainly tàntǎo zázhì de fāzhǎn. probe into journal DE development ‘The final conference mainly probed into the development of journals.’
輪 <i>lún</i> ‘a round’	185	17.27	賽莫達的海港公司過去10個月召開了幾輪 高層會議。(Gigaword) Sàimòdá de hǎigǎngōngsī

			Syed Mokhtar DE Seaport Terminal guòqù 10 gè yuè zhàokāi le past 10 CL month hold ASP jǐ lún gāocéng huìyì . several CL high-level conference ‘Seaport Terminal of Syed Mokhtar held several rounds of high-level conferences in the past 10 months.’
度 <i>dù</i> ‘frequency of an event’	50	1.48	雙方召開過數 度 當局者 會議 。(Gigaword) Shuāngfāng zhàokāi guò shù dù two sides hold ASP several CL dāngjúzhě huìyì . the authorities conference ‘The two sides held conferences for the authorities several times.’

5.5.3 Argument Structure of 會議 *huìyì* ‘conference; meeting’

Following Pustejovsky (1995), this section analyses 會議 *huìyì* ‘conference; meeting’'s argument types. The following section will first demonstrate that 會議 *huìyì* ‘conference; meeting’ takes two default arguments as core arguments, and takes temporal and spatial expressions as true adjuncts. Then it argues that *huìyì* satisfies argument typing of both light verbs and typical verbs.

5.5.3.1 Default Arguments of 會議 *huìyì* ‘conference; meeting’

會議 *Huìyì* ‘conference; meeting’ is an event that brings together a group of people with a common interest to discuss a topic. Thus, attendees and a topic are the arguments of 會議 *huìyì* ‘conference; meeting’. They have the following characteristics.

First, both of them are default arguments, which are not necessarily expressed syntactically. However, even though they do not appear syntactically, they are logically represented by the 會議 *huìyì* ‘conference; meeting’ event and can usually be found before or after the sentence that does not contain them.

Attendees:

(34) 北約組織召開特別**首腦會議**。(Gigaword)

Běiyuēzǔzhī zhàokāi tèbié **shǒunǎo huìyì**.

NATO hold special leader conference

‘NATO held a special leadership conference.’

- (35) 會議已原則通過在未來十年內建設「三峽工程」的決定。(Gigaword)

Huìyì yǐ yuánzé tōngguò zài wèilái shí nián
conference already principle pass in future ten year
nèi jiàn shè 「sānxiá gōngchéng」 de juéding.
within construct Three Gorges Project DE resolution

‘The conference has in principle passed the resolution of constructing Three Gorges Project in the next ten years.’

An interlocutor is a default argument of 會議 *huìyì* ‘conference; meeting’. In (34) it is syntactically expressed by 首腦 *shǒunǎo* ‘leader’, while in (35) the default argument is not expressed.

Topic:

- (36) 中加高等教育會議在加拿大舉行。(Gigaword)

Zhōng Jiā gāoděngjiàoyù *huìyì* zài Jiānádà jǔxíng.
China Canada high education conference in Canada hold

‘The Sino-Canada higher education conference is held in Canada.’

- (37) 今天的會議原定中午結束。(Gigaword)

Jīntiān de *huìyì* yuándìng zhōngwǔ jiéshù.
today DE conference originally scheduled noon finish

‘Today’s conference was originally scheduled to finish at noon.’

A topic is another default argument of 會議 *huìyì* ‘conference; meeting’. In (36) the topic 高等教育 *gāoděng jiàoyù* ‘higher education’ is syntactically expressed, while in (37) it is not expressed.

Second, attendees and the topic are encoded into the 會議 *huìyì* ‘conference; meeting’ event, and therefore are indispensable from it. One can hardly imagine any conference without people or a topic. Hence, they are the core arguments of 會議 *huìyì* ‘conference; meeting’.

Third, the attendees of 會議 *huìyì* ‘conference; meeting’ have these properties:

(I) 會議 *Huìyì* ‘conference; meeting’’s attendees must be more than one person. One person speaking without any audience is called a monologue, not a conference. 會議 *Huìyì* ‘conference; meeting’ has an embedded action of discussion or exchange of information, which needs no fewer than two participants.

(II) Attendees are always represented by an official position, identity, country/place, or organization, as illustrated from (38) to (41) respectively.

Official Position:

(38) 石油輸出國組織 部長 會議 在日內瓦舉行。(Gigaword)

Shíyóushūchūguóuzǔzhī bùzhǎng *huìyì* zài rìnèiwǎ jǔxíng.
OPEC minister conference in Geneva hold

‘The minister conference of OPEC will be held in Geneva.’

Identity:

(39) 院士 會議 每兩年召開一次。(Gigaword)

Yuànrshi *huìyì* měi liǎng nián zhàokāi yī cì.
academician conference every two year hold one CL

‘The academician conference is held every two years.’

Country or Place:

(40) 南韓 希望 今年 秋天 安排 南北韓 舉行 歷史性的 高峰 會議。(Gigaword)

Nánhán xīwàng jīnnián qiūtiān ānpái
South Korea hope this year fall arrange
nánběihán jǔxíng lìshǐxìng de gāofēng *huìyì*.
South and North Korea hold historic DE summit conference

‘South Korea hopes that this fall there could be an arrangement of a historic summit between South and North Korea.’

Organization:

(41) 下次 董事會 會議 將會 盡速 舉行。(Gigaword)

Xià cì dǒngshìhuì huìyì jiāng huì jìnsù jǔxíng 。
 next CL board conference will should ASAP hold

‘The next board conference will be held as soon as possible.’

In (38), 部長 *bùzhǎng* ‘minister’ is an official position. In (39), 院士 *yuànrshi* ‘academician’ is an identity. In (40), 南北韓 *Nánběihán* ‘South and North Korea’ is the names of countries. In (41) 董事會 *dǒngshìhuì* ‘board’ is an organization. All of them represent the attendees of different conferences.

5.5.3.2 True Adjuncts of 會議 *huìyì* ‘conference; meeting’

會議 *Huìyì* ‘conference; meeting’ takes temporal and spatial modifications, which are true adjuncts. Examples are shown in (I) and (II).

(I) Time: 年初 *niánchū* ‘the beginning of a year’, 年終 *niánzhōng* ‘the end of a year’, 去年 *qùnián* ‘last year’, 最近 *zuìjìn* ‘recently’, 今日 *jīnrì* ‘today’, 日前 *rìqián* ‘a few days ago’, 傍晚 *bàngwǎn* ‘in the evening’, 月底 *yuèdǐ* ‘the end of a month’, 夏季 *xiàjì* ‘the summer’

(II) Place: 場所 *chǎngsuǒ* ‘place; vanue’, 會場 *huìchǎng* ‘place for a meeting’, 地址 *dìzhǐ* ‘address’, 地點 *dìdiǎn* ‘locale’.

5.5.3.3 會議 *huìyì* ‘conference; meeting’ Satisfies Argument Typing of Different Verbs

First, many verbs in collocation with 會議 *huìyì* ‘conference; meeting’ are light verbs which do not contain much content, for example, 作 *zuò* ‘make’, 作出 *zuòchū* ‘make’, 做 *zuò* ‘make’, 做出 *zuòchū* ‘make’. In (42) the light verb 做出 *zuòchū* ‘make’ selects information → (human → t), and the subject 會議 *huìyì* ‘conference; meeting’ does not meet the “human” type directly.

(42) 今天的 會議 沒有 做出 任何決議。(Gigaword)

Jīntiān de huìyì méiyǒu zuòchū rènhé juéyì.
 today DE conference not have make any resolution

‘Today's conference did not accomplish any resolution.’

Second, typical verbs, such as 通過 *tōngguò* ‘pass’, 宣佈 *xuānbù* ‘announce’, 修改 *xiūgǎi*

‘revise’, 審查 *shěrchá* ‘examine’ can assign argument roles, as depicted in (43). Same with light verbs, the argument typing of these verbs is information → (human → t). However, 會議 *huìyì* ‘conference; meeting’ is not an agent, so it does not meet their selectional requirement.

(43) 會議通過/宣佈/修改/審查了決議。

Huìyì tōngguò/xuānbù/xiūgǎi/shěrchá le juéyì。
conference pass/announce/revise/examine ASP proposal

‘The conference passed/announced/revised/examined the proposal.’

However, both (42) and (43) are valid sentences: 會議 *huìyì* ‘conference; meeting’ satisfies the argument typing selected by light verbs and typical verbs. This is because through coercion by exploiting 會議 *huìyì* ‘conference; meeting’'s constitutive role in qualia structure--the default argument “attendees” -- the typing requirement of these verbs is met.

5.5.4 Event Structure of 會議 *huìyì* ‘conference; meeting’

Pustejovsky (1995) subclassifies situation types into three sorts: states, activities and events. The last class is further divided into accomplishments and achievements. This section first analyses the basic situation type of 會議 *huìyì* ‘conference; meeting’ and then reveals its aspectual shifts. Moreover, it discusses the case that 會議 *huìyì* ‘conference; meeting’ expresses more than one situation type in some situations.

5.5.4.1 The Basic Situation Type of 會議 *huìyì* ‘conference; meeting’

An activity describes an unbounded dynamic situation. 會議 *Huìyì* ‘conference; meeting’ is a heterogeneous activity, including subevents such as presentation and discussion. If a sentence describes the process of 會議 *huìyì* ‘conference; meeting’, it expresses an activity, as shown in (44).

(44) 亞洲 防控 禽流感 緊急 會議正在 曼谷 舉行。(Gigaword)

Yàzhōu fángkòng qínliúgǎn jǐnjí *huìyì* zhèngzài
Asia prevent and control bird flu emergent conference now
màngǔ jǔxíng 。
Bangkok hold

‘The Asia emergency conference on prevention and control of avian influenza is being held in Bangkok.’

If x is \emptyset ing entails x has \emptyset ed, then the predicate is an activity (Pustejovsky 1995). An event noun that is an activity also has such entailment. For example, in (44), *the conference is being held* entails *it has been held*. Thus 會議 *huìyì* ‘conference; meeting’ is an activity. An activity is a durative event, so an interval of such an event is still an activity. For instance, in (45), sentence (a) entails (b).

(45) a. 會議開了五個小時了。(Web)

Huìyì kāi le wǔ gè xiǎoshí le 。
conference hold ASP five CL hour ASP

‘The conference has been on for five hours.’

b. 會議開了三個小時了。(Web)

Huìyì kāi le sān gè xiǎoshí le 。
conference hold ASP three CL hour ASP

‘The conference has been on for three hours.’

5.5.4.2 Aspectual Shifts of 會議 *huìyì* ‘conference; meeting’

It is well-known that the aspectual properties of verbs may change due to various factors. Smith (1990) notices that a situation type is affected by the constellation of the verb, complements and adverbials. Smith (1994) notes that in Mandarin Chinese, certain resultative verbal complements, such as 完 *wán* ‘finish’, 好 *hǎo* ‘well’, 著 *zháo* ‘indicate having reached the goal or got the result’, 成 *chéng* ‘complete’, convey the completion of an accomplishment. Pustejovsky (1995) finds that adverbial modification (both durative and frame), the structure of the NP in an argument position (e.g., definite vs. bare plural), and a prepositional phrase can lead to an aspectual shift.

5.5.4.2.1 Accomplishments

This section demonstrates that the event noun 會議 *huìyì* ‘conference; meeting’ can be shifted from an activity to be an accomplishment. An accomplishment has a process and a result.

The basic situation type of 會議 *huìyì* ‘conference; meeting’ is an activity. The result

required by an accomplishment comes from a logical culmination and a temporal culmination of 會議 *huìyì* ‘conference; meeting’. The telic role of 會議 *huìyì* ‘conference; meeting’, to communicate information (eg. an academic conference) or reach an agreement (eg. a nuclear non-proliferation conference), presents the logical culmination. When 會議 *huìyì* ‘conference; meeting’ is delimited by demonstratives, localizers or quantifiers, the temporal culmination is provided; examples (46)-(51) illustrate such cases.

Demonstratives:

- (46) 那次 會議 的一個結果就是建立了國際貨幣基金組織。(Gigaword)

Nà cì huìyì de yī gè jiéguǒ jiù shì jiànli
that CL conference DE one CL result exactly be establish
le Guójì Huòbì Jījīn Zǔzhī.
ASP International Monetary Fund

‘One result of that meeting is the establishment of International Monetary Fund.’

- (47) 這次 會議 很成功。(Gigaword)

Zhè cì huìyì hěn chénggōng.
this CL conference very successful

‘This conference is very successful.’

Localizers:

- (48) 上次 會議 於 2003 年 7 月 在 厄瓜多爾 首都 基多 舉行。(Gigaword)

Shàng cì huìyì yú 2003 nián 7 yuè zài
last CL conference in 2003 year July in
Èguāduōěr shǒudū Jīduō jǔxíng.
Ecuador capital Quito hold

‘The last conference was held in Quito, the capital city of Ecuador, in July 2003.’

- (49) 下次 會議 將在 明年 初 舉行。(Gigaword)

Xià cì huìyì jiāng zài míngnián chū jǔxíng.
next CL conference will in next year early hold

‘The next conference will be held early next year.’

- (50) 這次會議在前次會議主題的基礎上，又增加了3個副主題。(Gigaword)

Zhè cì huìyì zài qián cì huìyì zhǔtí de
 this CL conference on previous CL conference theme DE
 jīchǔ shàng, yòu zēngjiā le 3 gè fùzhǔtí.
 basis on, again add ASP 3 CL sub-theme

‘This conference added three sub-themes based on the theme of the previous conference.’

Quantifiers:

- (51) 在一次會議上，我又見他。(Gigaword)

Zài yī cì huìyì shàng, wǒ yùjiàn tā。
 at one CL conference on, I meet him

‘At one conference, I met him.’

那 *nà* ‘that’ and 這 *zhè* ‘this’ in (46) and (47) are demonstratives. 上 *shàng* ‘last’, 下 *xià* ‘next’, 前 *qián* ‘previous’ in (48), (49), (50) are localizers. In (51), 一次 *yī cì* ‘one time’ is a quantifier: [numeral 一 *yī* ‘one’+ classifier 次 *cì* ‘once (re. frequency of event)’]. All of them can provide a temporal culmination, and thus delimit the conference event.

5.5.4.2.2 States

A state has no internal structure, and it can hold on for a certain time. 會議 *Huìyì* ‘conference; meeting’ itself is a bare noun. When it appears in the subject position and is followed by an adjectival predicate, it has a generic reading, and thus describes a state. For example, when 會議 *huìyì* ‘conference; meeting’ appears in the construction “N+ 很 *hěn* ‘very’ +adjective”, 會議 *huìyì* ‘conference; meeting’ is a state, as shown in (52).

- (52) 會議很有趣。(Web)

Huìyì hěn yǒuqù。
 conference very interesting

‘The conference is very interesting.’

5.5.4.2.3 Ambiguity

A sentence or expression with 會議 *huìyì* ‘conference; meeting’ is sometimes underspecified.

In this case, 會議 *huìyì* ‘conference; meeting’ expresses more than one situation type. For instance:

(53) 中國作協重慶會議很有趣。(Web)

Zhōngguó zuòxié Chóngqìng *huìyì* hěn yǒuqù.
China writer association Chongqing conference very interesting

‘The China Writer Association’s conference in Chongqing is very interesting.’

When there is no temporal expression in a sentence, the event time is unclear. If (53) is regarded as an event that is just finished, then 會議 *huìyì* ‘conference; meeting’ is an accomplishment. If 很有趣 *hěn yǒuqù* ‘very interesting’ is taken as a regular property of 中國作協重慶會議 *Zhōngguó zuòxié Chóngqìng huìyì* ‘China Writer Association’s conference in Chongqing’, then (53) is a generic statement, and therefore 會議 *huìyì* ‘conference; meeting’ is a state.

5.5.5 Qualia Structure of 會議 *huìyì* ‘conference; meeting’

Pustejovsky (1995) analyses how lexical items encode semantic information in the qualia structure. There are four roles in a qualia structure and each is associated with some values. (I) The constitutive role is about the relation between an object and its constituents or parts. Its role values include material, weight, parts and component elements. (II) The formal role can distinguish the object within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values. (III) The telic role is about the purpose and function of the object. (IV) The agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, and causal chain.

會議 *Huìyì* ‘conference; meeting’ is a heterogeneous event (formal role of GL), during which there are usually activities like presentation and discussion. I suggest including these subevents as part of the constitutive role of GL. Besides, the default arguments *attendees* and *topic* also comprise the constitutive role. Different conferences vary in their purpose (the telic role). For example, an academic conference is always for exchanging ideas; some political or economic conferences have an aim of reaching an agreement and taking further actions. 會議 *Huìyì* ‘conference; meeting’ comes into being through organization (the agentive role). With these analyses, 會議 *huìyì* ‘conference; meeting’’s qualia structure is illustrated in (61).

$$(61) \left[\begin{array}{l} \text{會議 } huìyì \text{ 'conference; meeting'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = x: \text{attendee} \\ \text{D-ARG2} = y: \text{topic} \\ \text{D-ARG3} = z: \text{organizer} \end{array} \right] \\ \text{EVENTSTR} = [E_1 = e_1: \text{process}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = r: \text{event} \\ \text{CONSTITUTIVE} = \{x, y, \text{presentation, discussion}\} \\ \text{TELIC} = \text{communicate information } \vee \text{ reach a decision} \\ \text{AGENTIVE} = \text{organize } (z, r) \end{array} \right] \end{array} \right]$$

The following section further surveys three issues: (I) the differences between 會議 *huìyì* ‘conference; meeting’ as a head and a modifier, (II) the qualia modification to 會議 *huìyì* ‘conference; meeting’ when it is a head noun, and (III) 會議 *huìyì* ‘conference; meeting’’s qualia modification to other nouns when it is a modifier in NN compounds.

5.5.5.1 Differences between 會議 *huìyì* ‘conference; meeting’ as a Head and a Modifier

會議 *Huìyì* ‘conference; meeting’ behaves differently depending on whether it is a head or a modifier. Firstly, the frequency and salience of nouns appear before and after 會議 *huìyì* ‘conference; meeting’ are quite different as depicted in Table 71. About 2/3 more nouns tend to appear before 會議 *huìyì* ‘conference; meeting’ than after it. Thus, nouns before 會議 *huìyì* ‘conference; meeting’ are more salient than those that come after it.

Table 71. Frequency and Salience of Nouns before and after 會議 *huìyì* ‘conference; meeting’

No.	Relation	Frequency	Salience	Examples
1	N_Modifier	358601	1.6	首腦會議 <u>shǒunǎo huìyì</u> ‘leader conference(s)’, 高峰會議 <u>gāofēng huìyì</u> ‘summit conference(s)’
2	Modifies	129350	0.6	會議期間 <u>huìyì qūjiān</u> ‘during the conference’, 會議紀要 <u>huìyì jìyào</u> ‘minutes of a conference’

Secondly, the same noun seldom appears both before and after 會議 *huìyì* ‘conference; meeting’. Out of all the nouns as modifiers or heads of 會議 *huìyì* ‘conference; meeting’, only two can appear in both pre-會議 *huìyì* ‘conference; meeting’ and post-會議 *huìyì* ‘conference; meeting’ position, as depicted in Table 72 and Table 73 respectively. The two nouns are 領袖 *lǐngxiù* ‘leader’ and 主席團 *zhǔxítuán* ‘presidium’.

Table 72. Pre-會議 *huìyì* ‘conference; meeting’ Nouns in Chinese Gigaword Corpus

NN	Frequency	Saliency
<u>領袖會議</u> <u>lǐngxiù huìyì</u> ‘leader conference(s)’	6182	47.51
<u>主席團會議</u> <u>zhǔxítuán huìyì</u> ‘presidium conference(s)’	729	46.54

Table 73. Post-會議 *huìyì* ‘conference; meeting’ Nouns in Chinese Gigaword Corpus

NN	Frequency	Saliency
<u>會議領袖</u> <u>huìyì lǐngxiù</u> ‘conference leader(s)’	468	20.25
<u>會議主席團</u> <u>huìyì zhǔxítuán</u> ‘conference presidium(s)’	206	36.31

Third, even when the same noun appears both before and after 會議 *huìyì* ‘conference; meeting’, the meanings and the number of participants are different. They are shown in the contrast between (62)a and (62)b.

(62) a. 領袖會議

lǐngxiù huìyì

leader conference

‘leaders’ conference(s)’

b. 會議領袖

huìyì lǐngxiù

conference leader

‘conference leader(s)’

(62)a is ambiguous, with two readings: the theme of the conference is leaders; a conference attended by leaders. (62)b has one reading: someone who has the role as a leader of a

conference. In addition, (62)a is a conference with more than one participant, while (62)b refers to only one individual or more than one person.

5.5.5.2 會議 *huìyì* ‘conference; meeting’ in Compounds

5.5.5.2.1 會議 *huìyì* ‘conference; meeting’ as a Head

When 會議 *huìyì* ‘conference; meeting’ is the head of a compound, its eventive information decides what kind of modification it gets. 會議 *Huìyì* ‘conference; meeting’ as a head usually gets formal and constitutive modification.

Formal Modification:

- (63) $\left[\begin{array}{l} \text{大型會議 } dàxíng \text{ huìyì 'large-scale conference'} \\ \text{QUALIA} = [\text{FORMAL} = \text{scale (dàxíng)}] \end{array} \right]$

In (63), 大型 *dàxíng* ‘large scale’ points to the scale of the 會議 *huìyì* ‘conference; meeting’ event, which is the formal role of 會議 *huìyì* ‘conference; meeting’. Similarly, 小型 *xiǎoxíng* ‘small scale’ and 盛大 *shèngdà* ‘grand’ also refer to the scale of a conference.

Constitutive Modification:

According to Pustejovsky (1995), the constitutive role expresses the relation between an object and its parts. 會議 *Huìyì* ‘conference; meeting’ is not a typical object, but it is a kind of event involving a series of subevents (e.g. presentation and discussion) with a particular topic and a group of people, which are inseparable parts of 會議 *huìyì* ‘conference; meeting’. The constitutive role includes the relation between an event and its participant roles (*Section 6.3.2 The Constitutive Role*). Consequently, in 經濟會議 *jīngjì huìyì* ‘economy conference’ and 院士會議 *yuànrshi huìyì* ‘academician conference’, the topic *economy* and the attendees *academicians* are regarded as 會議 *huìyì* ‘conference; meeting’'s constitutive role. Other examples of 會議 *huìyì* ‘conference; meeting’'s topic modifiers are: 商務 *shāngwù* ‘business’, 天文 *tiānwén* ‘astronomy’, 氣候 *qìhòu* ‘climate’, 能源 *néngyuán* ‘energy’, 人口 *rénkǒu* ‘population’, 教育 *jiàoyù* ‘education’, and 文學 *wénxué* ‘literature’. Other examples of 會議 *huìyì* ‘conference; meeting’'s attendees modifiers are: 指揮官 *zhǐhuīguān* ‘commander’, 軍官 *jūnguān* ‘military officer’, 法官 *fǎguān* ‘judge’, 裁判 *cáipàn* ‘judge’, 宇航員 *yǔhángyuán* ‘astronaut’, 大臣 *dàchén* ‘minister’, 股東 *gǔdōng* ‘shareholder’, and 部長 *bùzhǎng* ‘minister’.

5.5.5.2.2 會議 *huìyì* ‘conference; meeting’ as a Modifier

When 會議 *huìyì* ‘conference; meeting’ is a modifier, it is usually an argument in the telic or agentive relation of the compound.

Telic Modification:

- (64) $\left[\begin{array}{l} \text{會議紀念品 } huìyì\ jìniànpǐn \text{ ‘conference souvenir’} \\ \text{QUALIA} = [\text{TELIC} = \text{commemorate} (jìniànpǐn, huìyì)] \end{array} \right]$

In (64), 紀念品 *Jìniànpǐn* ‘souvenir’ is something that you keep as a reminder of a person, place or event. When it is modified by 會議 *huìyì* ‘conference; meeting’, its function is specified as an item for the memory of a conference. Similar examples are 主席臺 *zhǔxí tái* ‘podium’, 辦公室 *bàngōngshì* ‘office’, 講壇 *jiǎngtán* ‘platform’, 專線 *zhuānxiàn* ‘direct line’, 請柬 *qǐngjiǎn* ‘invitation’, 手冊 *shǒucè* ‘manual’, 許可證 *xǔkězhèng* ‘license’, and 材料 *cáiliào* ‘material’.

Agentive Modification:

- (65) $\left[\begin{array}{l} \text{會議決議 } huìyì\ juéyì \text{ ‘conference resolution’} \\ \text{QUALIA} = [\text{AGENTIVE} = \text{accomplish} (huìyì, juéyì)] \end{array} \right]$

決議 *Juéyì* ‘resolution’ is a formal decision reached after discussion at a conference. In 會議決議 *huìyì juéyì* ‘conference resolution’, 會議 *huìyì* ‘conference; meeting’ states the origin of the resolution. Here 會議 *huìyì* ‘conference; meeting’ undergoes coercion through constitutive role exploitation, referring to the attendees. Similar examples are 成果 *chéngguǒ* ‘achievement’, 新聞 *xīnwén* ‘news’, 收貨 *shōuhuò* ‘harvest’, 氣氛 *qìfēn* ‘atmosphere’, 成效 *chéngxiào* ‘effect’, 秘密 *mìmi* ‘secret’.

5.5.6 Summary

Through the above exploration, I have revealed the argument structure, event structure and qualia structure of 會議 *huìyì* ‘conference; meeting’ and accordingly established its semantic type system, which is illustrated in (66).

$$(66) \left[\begin{array}{l} \text{會議 } huìyì \text{ 'conference; meeting'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = x: \text{attendee} \\ \text{D-ARG2} = y: \text{topic} \\ \text{D-ARG3} = z: \text{organizer} \end{array} \right] \\ \text{EVENTSTR} = [E_1 = e_1: \text{process}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = r: \text{event} \\ \text{CONSTITUTIVE} = \{x, y, \text{presentation, discussion}\} \\ \text{TELIC} = \text{communicate information } \vee \text{ reach a decision} \\ \text{AGENTIVE} = \text{organize } (z, r) \end{array} \right] \end{array} \right]$$

5.6 Conclusions

First, this chapter reviewed the research on argument structure (Pustejovsky 1991, Yuan 1994, Pustejovsky 1995, Liu 2003), event structure of English (Vendler 1957, Dowty 1979, Bach 1986, Parsons 1990, Tenny 1992, Pustejovsky 1995, Smith 1997, Filip 1999), event structure of Chinese (Tai 1984, Teng 1985, Smith 1997, Huang et al. 2000), and qualia structure (Pustejovsky 1991, 1995, 2001a, 2006, Pustejovsky & Jezek 2008, Hsieh 2010).

Second, this chapter briefly explored argument structure and event structure of event nouns in Chinese. Regarding argument structure, natural kind event nouns normally take no argument, while non-natural kind event nouns usually have arguments. With respect to event structure, event nouns express process event or instant event, so their situation types are activities or achievements.

Third, previous studies on event nouns typically focused on deverbal nominals, such as 游泳 *yóuyǒng* 'swim'. Event nouns that are not derived from verbs are rarely studied. This chapter took 會議 *huìyì* 'conference; meeting' as a typical non-derived process event noun and gave a detailed semantic analysis to it based on GL.

The main findings are as follows. (i) 會議 *huìyì* 'conference; meeting' can be selected by localizers, durative temporal expressions, and event classifiers, so it is an event noun. (ii) 會議 *huìyì* 'conference; meeting' takes two default arguments: *topic* and *attendees* and two default adjuncts: *time* and *space*. 會議 *Huìyì* 'conference; meeting' satisfies the argument typing of light verbs and typical verbs through coercion by exploiting its constitutive role. (iii) The basic situation type of 會議 *huìyì* 'conference; meeting' is an activity. It can go through aspectual shifts, becoming an accomplishment or a state. In certain cases, it may have more than one situation type. (iv) 會議 *huìyì* 'conference; meeting' 's qualia structure and its qualia modification are discovered. It has more of a tendency to act as a head than as a modifier in NN compounds. As a head, it often gets formal and constitutive modification;

as a modifier, it is often an argument in telic or agentive relation. (iv) This chapter expanded the constitutive role of GL to include the explicit representation of an event's subevents as part of the qualia.

The results demonstrated that non-derived event nouns in Mandarin Chinese can represent eventive information. An event noun carries eventive information and can behave like a deverbal nominal and unlike an entity-referring noun.

Chapter 6 Establish an Eventive Qualia Structure through Adjective Modification

6.1 Literature Review

6.1.1 Research on Adjectives

Vendler (1970) classifies adjectives into eight categories:

A₁: Natural type adjectives

They correspond to natural qualities. The restrictive relative clause is the source of the prenominal adjective construction.

white table

is derived from

table is white.

This conforms to the transformation:

A N — N wh ... is A

A₂: Measuring adjectives

These adjectives presuppose a standard size, length, weight or other dimension that corresponds to each noun. This contrast is formed with respect to that standard.

small elephant

is not small as an animal, but small for an elephant.

The schema for this type of AN is:

A N — N wh ... is A for an N

A₃: Verb-related adjectives: the noun is the agent of the verb

She is a beautiful dancer.

-- She is a dancer who is beautiful.

-- She is a dancer who dances beautifully.

The adjective is tied to another verb that is recoverable from the noun "dancer".

The derivation schema is:

A NV — N wh ... V DA²⁶

a fast horse -- a horse which runs fast

Different from a beautiful dancer, no verb can be recovered for the noun horse. Yet the co-occurrence of fast and horse define a verb that connects the adverb fast with the noun horse, similar to how the verb dance connects fast with dancer. The representation is extended like this using a clumsy verb:

A N — N wh... [V] DA

A₄: Verb-related adjectives: the noun is the patient of the verb

good meal - good to eat; good for eating

good connects meal through a VP of the object.

The schema is:

A N — N wh ... is A to V

A₅: Container adjectives

The whole sentence shares the same subject of this adjective. Examples are like clever, stupid, reasonable, kind, nice, thoughtful, considerate, and good.

John is stupid to take that job.

It is stupid of John to take that job.

The person who is stupid and who takes that job is both John.

A₆: Adjectives whose attribution to a noun rely on the presence of a nominal

He is ready to go.

²⁶ NV stands for an "agent" nominalization formed out of a verb, such as dance, cook, judge. DA represents an adverb derived from an adjective, such as beautifully, slowly, fast.

He is eager to sign the contract.

They do not have the following counterparts:

* To go is ready of him.

* To sign the contract is eager of him.

A₇: Adjectives that are only attributed to nominals and not to nouns

His death is probable.

It is necessary that you go away.

His having won the race is unlikely.

This type of adjectives may have an added qualification (for N) for the nominal.

It is useful for him that you stay here.

That you won the game is profitable for them.

It is good for John that Mary goes away.

These adjectives comprise useful, profitable, pleasant, necessary, good, and their opposites.

A₈: A₈ is similar to A₇, except that they do not allow the added qualification (for N) for the nominal.

* His arrival is unlikely for us.

* His death is probable for you.

* That it is raining is true for us.

Adjectives in this group include true, false, probable, improbable, likely, certain, and their contraries.

I find that Vendler (1970)'s classification is not based on the same criteria. A₁ is based on whether the adjective is natural or non-natural. A₂ and A₅ are based on a semantic criterion. A₃ and A₄ are based on the implicit event related to the noun. A₆, A₇, and A₈ are based on their syntactic behavior. A good classification system should carry out one criterion thoroughly.

Levi (1978) syntactically divides adjectives into predicating and nonpredicating adjectives. Adjectives in the following noun phrases only occur nonpredicatively.

electric clock	musical clock
electric shock	musical criticism
electric engineering	musical interlude
electric conductor	musical comedy
electric outlet	musical talent

Nonpredicating adjectives may have meaning change depending on the head nouns that they modify. *Musical clock* means “a clock that produces music”, but *musical criticism* is not a criticism that produces music, but “criticism of music”.

Nonpredicating adjectives regularly appear in positions that nouns usually occur. That is, the complex nominals they form notably parallel to noun-noun collocations in both semantics and syntax. (i) shows examples that semantically parallel each other, while (ii) shows totally synonymous pairs.

(i)

corporate client	finance client
sanitary inspector	chief inspector
molecular genetics	microbial genetics
parental rights	human rights

(ii)

linguistic competence	language competence
industrial estate	industry estate
dramatic playing	drama playing
oceanic plateau	ocean plateau

Levi argues that this kind of nominal nonpredicating adjectives is derived from nouns. Therefore, they share syntactic and semantic properties with the nouns they derive from. She provides six evidences to show this claim.

(i) Nondegreeness

Nouns usually do not permit degree adverbials such as very, slightly, quite or extremely, neither do nonpredicating adjectives.

Nonpredicating Modifiers		Predicating Modifiers
Adjs	Ns	Adjs
* very urban area	* very city area	very large area
* very bodily harm	* very body harm	very extensive harm
* very electrical appliance	* very electricity appliance	very efficient appliance
* very automotive industry	* very automobile industry	very heavy industry

(ii) Conjunction

For one thing, nominal nonpredicating adjectives can have conjunction with semantically appropriate nouns and other nominal nonpredicating adjectives.

nonpredicating adjectives with N:

electrical and mining experts

a corporate and divorce jurist

solar and gas heating

electrical and water supplies

domestic and farm cattle

For another, nonpredicating and predicating adjectives cannot appear in coordinative structures. Nonpredicating adjectives only coordinate other nonpredicating adjectives.

a. a civil and mechanical scholar

a civil and *rude scholar

b. anthropological and ethnographic newspapers

anthropological and *respected newspapers

c. continental and oceanic research

continental and *expensive research

d. literary and musical criticism

literary and *bitter criticism

(iii) countability

Nouns and noun phrases are the only constituents that may be enumerated. Same with them, nonpredicating adjectives are also countable. In English morphology, free quantifier morphemes cannot modify surface adjectives. Instead, bound quantifying prefixes like mono-, bi-, and multi- can occur in nonpredicating adjectives, but cannot occur in predicating adjectives, as exemplified in Table 74.

Table 74. Prefix+Noun, Prefix+Nonpredicating Adj, Prefix+Predicating Adj

Prefix+Noun	Prefix+Nonpredicating Adj	Prefix+Predicating Adj
monoamine	monochromatic	*monohigh
bipack	binational	*bired
tricaprin	triconsonantal	*tristrong
quadraline	quadrasonic	*quadralow
multifactor	multiracial	*multidense
polysalt	polyphonic	*polynear

It should be noted that composite adjectives can appear in predicate position, so they should be removed from the nonpredicating class, as shown in Table 75.

Table 75. Simple Adjectives and Composite Adjectives

Simple Adjectives		Composite Adjectives	
chromatic analysis	*That analysis is chromatic.	monochromatic drawings	Those drawings are monochromatic.
national parks	*Those parks are national.	binational agreements	Those agreements are binational.
a consonantal alphabet	*That alphabet is consonantal.	triconsonantal roots	Those roots are triconsonantal.
a sonic transmitter	That transmitter is sonic.	quadrasonic recordings	Those recordings are quadrasonic.

(iv) Semantic features

Nouns have six crucial semantic divisions: ± definite, ± concrete, ± animate, ± human, + masculine/+ feminine, and ± common. All these features are applicable to nonpredicating adjectives.

+ definite: Chinese, Russian, French, German

-definite: national, rural, feline, stellar

+concrete: aquatic, suburban, bodily, lunar

-concrete: dramatic, constitutional, linguistic, musical

+animate: senatorial, feline, presidential, Chomskyan

+human: Markovian, presidential, papal, atheletic

-human: Bostonian, bovine, ethnographic, consonantal

+masculine: paternal, masculine

+feminine: maternal, feminine

+common: financial, weekly, rural, musical

-common: Persian, Chomskyan, Elizabethan, Parisian

It is the same with nouns that for nonpredicating adjectives, certain features render others redundant due to implication. For instance, [+human] implies [+animate], and [-common] implies [+definite].

(v) Case relations

Case relations like agent, instrument and location are normally peculiar to nouns and noun phrases. Yet nonpredicating adjectives show agentive, objective, locative, dative and instrumental case relations within their CNs.

Agentive:

presidential refusal, editorial assistance, senatorial investigations, national defense

Objective:

vconstitutional reform, cardiac rehabilitation, oceanic studies, solar explorations, dramatic criticism

locative:

marginal seat, marine mammal, cerebral cortex, urban dweller, tropical rainforest

dative/possessive:

feminine charm, feline agility, occupational stress, judicial appointment, planetary nebula

instrumental:

manual typewriter, microscopic examination, solar cell, aural perception, electric motor

(vi) Nominalization

Predicating adjectives can be nominalized, while nonpredicating adjectives normally do not allow nominalization. The following examples are homophonous adjective pairs that are ambiguous between predicating and nonpredicating use. The former use can get nominalization, while the latter cannot.

(1) a. mechanical calculator

The calculator is mechanical.

the mechanicalness of the calculator

b. mechanical genius

* The genius was mechanical.

* the mechanicalness of the genius

(2) a. a nervous student

The student is nervous.

The nervousness of the student

b. a nervous system

* The system is nervous.

* the nervousness of the system

(3) a. a marginal improvement

The improvement is marginal.

the marginality of the improvement.

b. a marginal illustration [on a page]

* The illustration is marginal.

* the marginality of the illustration

From (1) to (3), only the adjectives in (a) can be nominalized, so they are predicating adjectives. Those in (b) cannot get nominalization, so they are nonpredicating adjectives.

I agree that Levi (1978)'s research is useful in dividing predicating and nonpredicating adjectives.

Dixon (1982) looks at the concepts that adjectives can express and takes a field-descriptive approach to make a taxonomic classification of adjectives. He classifies adjectives based on the general semantic field of that term and gets seven semantic types:

- (i) DIMENSION - big, large, little, small; long, short; wide, narrow; thick, fat, thin
- (ii) PHYSICAL PROPERTY - hard, soft; heavy, light; rough, smooth; hot, cold; sweet, sour
- (iii) COLOR - black, white, red
- (iv) HUMAN PROPENSITY - jealous, happy, kind, clever, generous, gay, cruel, rude, proud, wicked
- (v) AGE - new, young, old
- (vi) VALUE - good, bad and a few more items (including proper, perfect, and perhaps pure, in addition to hyponyms of good and bad such as excellent, fine, delicious, atrocious, poor, etc.)
- (vii) SPEED - fast, quick, slow

I argue that Dixon (1982)'s semantic classification is not sufficient. For example, it ignores the adjectives that modify events.

Quirk et al. (1985) discover four features of adjectives:

- (i) They can freely occur in attributive position.
a clean table, the beautiful girl
- (ii) They can freely occur in predicative position.
The table is clean.
She thought the table clean.
- (iii) They can be premodified by the intensifier very.

They are very lucky.

- (iv) They have comparative and superlative forms.

happy happier happiest

Not all adjectives possess all the four features. Moreover, Quirk et al. (1985) make a syntactic and semantic classification for adjectives.

(I) Syntactic Subclassification of Adjectives

(i) Attributive Only

These are adjectives that are restricted to the attributive position, or occur predominantly in this position.

Intensifying Adjectives:

a true scholar *The scholar is true

a complete fool *The fool is complete.

Adverb-related Adjectives:

Some attributive-only adjectives can be related to adverbs but do not always fall within the intensifying or restrictive types.

a former teacher ‘formerly my teacher’

an occasional visitor ‘occasionally a visitor’

Denominal Adjectives: Many denominal adjectives are restricted to attributive position:

a criminal court ‘a court dealing with crime’

a polar bear ‘a bear living near the polar’

(ii) Predictive Only

These adjectives are restricted to predicative position. They have a tendency of referring to a temporary condition rather than to characterize. Many of them take complementation:

I am aware of that.

She was glad that everything was all right.

(II) Semantic Subclassification of Adjectives**(i) Stative/Dynamic**

Adjectives are characteristic of stative.

*He's being tall.

*Be tall.

There are also many dynamic adjectives, which denote qualities.

He is being careful.

Be careful.

(ii) Gradable/ Nongradable

All dynamic and most stative adjectives (e.g. tall, old) are gradable; some stative adjectives are not, mainly denominal adjectives like atomic scientist, and adjectives denoting provenance (e.g. American).

(iii) Inherent/Noninherent

An inherent adjective characterizes the referent of the noun directly. For example, a wooden bed is also a wooden object. On the other hand, a firm friend is not a firm person.

Table 76 shows examples of adjectives that demonstrate the various possibilities regarding the above three semantic distinctions.

Table 76. Semantic Subclassification of Adjectives (Quirk et al. 1985: P436)

Stative	Gradable	Inherent	Example
+	+	+	That's a big boat; She is a brave woman. [central adjectives]
-	+	+	She is being very brave. [dynamic use of central adjective]
+	+	-	He is a firm friend; He is a wooden actor. [peripheral adjectives: noninherent]
-	+	-	This actor is being wooden tonight. [dynamic use of stative adjective]
+	-	-	She is a medical student. [peripheral adjective: nongradable and noninherent]

I argue that Quirk et al. (1985)'s semantic classification is insufficient. For example, the adjective *frequent* is not dynamic, not gradable, not inherent. This classification does not

show what property it has.

Chierchia and McConnell-Ginet (1990) divide adjectives into three types: intersective, subjective and nonpredicative adjectives.

In an adjective-noun combination, if the set of things are an intersection of things denoted by the adjective and those denoted by the noun, then the adjective is intersective. *A blue cup* is such an example. One can infer that the thing denoted by this compound is both red and a cup.

There also exists an entailment relation. (4) entails both (5) and (6).

(4) This is a blue cup.

(5) This is blue.

(6) This is a cup.

Subjective adjectives have a meaning that is relative to what they modify.

(7) It is a large ant.

This is not to say that ants are large animals. Rather, it refers to one ant that is relatively large in the ant category, which is actually “small” compared to other living things.

Nonpredicative adjectives are intentional, denoting functions from properties to properties.

(8) Bush is a former president.

The following examples map the property of being a president to the property of being a former president. (8) does not entail (9) or (10) though it entails (11).

(9) *Bush is former.

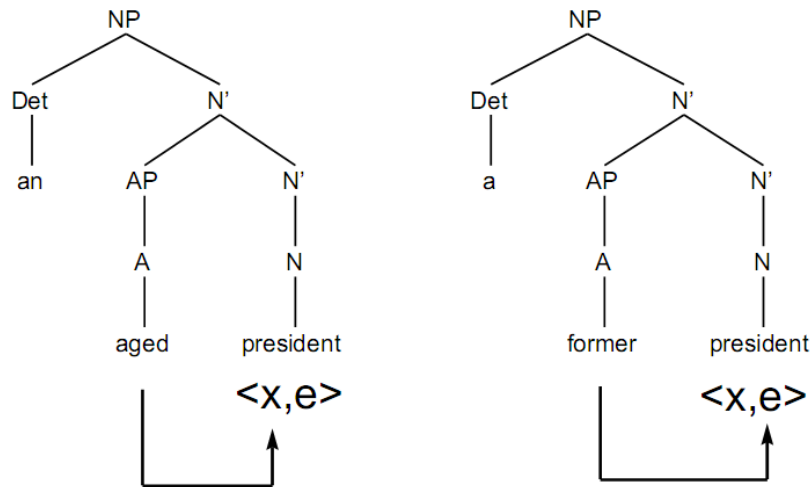
(10) Bush is a president.

(11) Bush was a president.

Larson (1995, 1998) proposes to analyze adjectives with Davidson semantics. He holds that the event variable *e* can include not only events, but also states. In (12), the intersective adjective “aged” modifies the person. In (13), the non-intersective adjective “former” modifies the event of being a president.

(12) Peter is an aged president.

(13) Peter is a former president.



(14) Olga is a beautiful dancer.

(14) is a famous example. In the intersective reading, beautiful applies to the person Olga; in the nonintersective reading, beautiful applies to the dancing event.

$\exists e[\text{dancing}(e) \ \& \ \text{Agent}(\text{olga}, e) \ \& \ \text{beautiful}(\text{olga})]$

$\exists e[\text{dancing}(e) \ \& \ \text{Agent}(\text{olga}, e) \ \& \ \text{beautiful}(e)]$

To sum up, current studies classify adjectives either syntactically or semantically. Few studies have explored their modification to event nouns.

6.1.2 Research on Expanding Qualia Roles

Huang et al. (2008) classify the relationship between deriving meaning cluster and the basic concept of a radical based on the definition in 說文解字 *Shuōwén Jiězì* ‘Origin of Chinese Characters’ (Xu 121). They use Pustejovsky’s Qualia Structure as a basis and use the definitions in 說文解字 *Shuōwén Jiězì* ‘Origin of Chinese Characters’ (Xu 121) to classify the deriving concepts of character radicals into seven categories, expanded from the original four qualia aspects of Formal, Constitutive, Agentive, and Telic:

(i) Formal: This category can be further divided into five small categories: sense, characteristic, proper names, and atypical. The “sense” categories can be further divided into five small categories: vision, hearing, smelling, and taste.

(ii) Constitutive: This category can be further divided into three small categories: part, member, and group.

- (iii) Telic: Concepts related to a function or usage.
- (iv) Participant: Words are classified into this category when the definition in 說文解字 *Shuōwén Jiězì* ‘Origin of Chinese Characters’ (Xu 121) mentions the participant involved.
- (v) Participating: According to different events, concepts are divided into six small categories action, state, purpose, function, tool, and others.
- (vi) Descriptive: This category can be further divided into two categories: active and state.
- (vii) Agentive: The relationship between the radical and its meaning cluster coming from production or giving birth is classified into agentive.

Wang and Huang (2010c) enlarge the scope of the constitutive role of qualia structure by including a location and its constituents, a period of time and its constituents, and an institution and its member.

Chapter 5 expands the constitutive role of GL to include the explicit representation of an event’s subevents as part of the qualia.

Based on these studies, this chapter further examines the properties of qualia structure and expands it through adjectival modification to event nouns. The aim of this chapter is to establish an eventive qualia structure.

6.2 Identify Adjectives that Modify Event Nouns

Events and objects have significantly different features. An object has a shape or form that people can see or touch, while an event encodes eventive information, including event structure and temporal information (Wang & Huang 2013d). Correspondingly, adjectives that modify events differ from those that modify objects. Zhao (2006) extracts nine kinds of adjectives that can modify event nouns:

【模態 *mótài* ‘mode’】：可能 *kěnéng* ‘may’, 必然 *bìrán* ‘inevitable’, 應該 *yīnggāi* ‘should’, 經常 *jīngcháng* ‘often’, 頻繁 *pínfán* ‘frequent’, 偶然 *ǒurán* ‘accidental’, 意外 *yìwài* ‘unexpected’, 突然 *tūrán* ‘sudden’

【難度 *nándù* ‘difficulty’】：難 *nán* ‘difficult’, 困難 *kùnnán* ‘difficult’, 棘手 *jíshǒu* ‘troublesome’, 麻煩 *máfan* ‘trouble’, 容易 *róngyì* ‘easy’, 艱難 *jiānnán* ‘difficult’, 艱苦

jiānkǔ ‘hard’, 艱巨 *jiānjù* ‘arduous’

【急度 *jídù* ‘urgency’】：急迫 *jípò* ‘urgent’, 危急 *wēiji* ‘critical’, 緊急 *jǐnjí* ‘urgent’, 緊迫 *jǐnpò* ‘urgent’, 緊要 *jǐnyào* ‘critical’, 要緊 *yàojǐn* ‘critical’, 迫切 *pòqiē* ‘urgent’, 急促 *jícù* ‘hurried; short’,

【速度 *sùdù* ‘speed’】：快 *kuài* ‘fast’, 慢 *màn* ‘slow’, 緩慢 *huǎnmàn* ‘slow’, 迅速 *xùnsù* ‘rapid’, 迅猛 *xùnměng* ‘swift and violent’, 迅疾 *xùnjí* ‘swift’, 迅捷 *xùnjié* ‘swift’, 快捷 *kuàijié* ‘shortcut’, 便捷 *biànjié* ‘convenient’, 舒緩 *shūhuǎn* ‘soothing’

【時長 *shícháng* ‘duration’】：漫長 *màncháng* ‘very long’, 短暫 *duǎnzàn* ‘short’, 短促 *duǎncù* ‘transient’, 長久 *chángjiǔ* ‘long’, 簡短 *jiǎnduǎn* ‘brief’, 長遠 *chángyuǎn* ‘long-term’, 長 *cháng* ‘long’, 短 *duǎn* ‘short’

【強度 *qiángdù* ‘intensity’】：強烈 *qiángliè* ‘strong’, 猛烈 *měngliè* ‘violent’, 劇烈 *jùliè* ‘severe’, 激烈 *jīliè* ‘intense’, 狂烈 *kuángliè* ‘furious’, 強勁 *qiángjìng* ‘powerful’, 尖銳 *jiānrùi* ‘sharp’, 濃烈 *nóngliè* ‘strong’, 熱烈 *rèliè* ‘warm’, 微弱 *wēiruò* ‘weak’, 輕微 *qīngwēi* ‘slight’, 細微 *xìwēi* ‘subtle’, 細弱 *xìruò* ‘thin and delicate’

【範圍 *fànwéi* ‘scope/scale’】：廣泛 *guǎngfàn* ‘wide’, 普遍 *pǔbiàn* ‘general’, 全面 *quánmiàn* ‘comprehensive’, 片面 *piànmiàn* ‘one-sided’

【深度 *shēndù* ‘profundity’】：深刻 *shēnkè* ‘profound’, 深入 *shēnrù* ‘thorough’, 深遠 *shēnyuǎn* ‘far-reaching’, 深切 *shēnqiē* ‘deep’, 徹底 *chèdǐ* ‘thorough’, 透徹 *tòuchè* ‘thorough’, 膚淺 *fūqiǎn* ‘shallow’, 淺顯 *qiǎnxiǎn* ‘plain’, 粗淺 *cūqiǎn* ‘superficial’

【細度 *xìdù* ‘specificity’】：詳細 *xiángxì* ‘detailed’, 詳盡 *xiángjìn* ‘detailed’, 詳密 *xiángmì* ‘elaborate’, 詳明 *xiángmíng* ‘full and clear’, 詳實 *xiángshí* ‘informative’, 翔實 *xiángshí* ‘full and accurate’, 細緻 *xìzhì* ‘meticulous’, 細密 *xìmì* ‘close’, 填密 *tiánmì* ‘packing’, 嚴密 *yánmì* ‘tight’, 精細 *jīngxì* ‘fine’, 精到 *jīngdào* ‘precise and penetrating’, 精密 *jīngmì* ‘accurate’, 簡要 *jiǎnyào* ‘concise and to the point’, 簡略 *jiǎnlüè* ‘brief’, 簡練 *jiǎnliàn* ‘terse’, 精煉 *jīngliàn* ‘refining’, 簡明 *jiǎnmíng* ‘concise’, 粗略 *cūlüè* ‘rough’, 扼要 *èyào* ‘brief’, 籠統 *lǒngtǒng* ‘general’, 簡單 *jiǎndān* ‘simple’, 概括 *gàikuò* ‘general’

The adjectives that Zhao (2006) extracts are very useful. However, for one thing, the categories are not enough. For another, he carries out no further investigation to these adjectives. In the following section, I will further supplement the adjective categories that

modify event nouns, and propose to establish an eventive qualia structure.

In the category 【模態 *mótài* ‘mode’】 , Zhao (2006) puts two categories of adjectives together: possibility and frequency. I argue that they are quite different from each other, so I put them into two categories: 【頻率 *pínlǜ* ‘frequency’】 and 【可能性 *kěnéng xìng* ‘possibility’】 .

In order to find out the adjectival categories that modify event nouns, I investigated the adjectives in Mei et al. (1983b), Su (2013), Sinica Corpus, and Chinese Gigaword Corpus (2nd edition) and added the following adjectival categories:

- (I) 【狀態 *zhuàngtài* ‘state’】
 - (i) 【正式性 *zhèngshì xìng* ‘formality’】
 - (ii) 【正常性 *zhèngcháng xìng* ‘normality’】
 - (iii) 【公開性 *gōngkāi xìng* ‘publicity’】
 - (iv) 【新舊性 *xīnjiù xìng* ‘newness’】
 - (v) 【真假性 *zhēnjiǎ xìng* ‘truthfulness’】
- (II) 【評價 *píngjià* ‘evaluation’】
 - (i) 【重要性 *zhòngyào xìng* ‘importance’】
 - (ii) 【趣味性 *qùwèi xìng* ‘interestingness’】
 - (iii) 【好壞性 *hǎohuài xìng* ‘goodness’】

By combing them with Zhao (2006)’s nine categories, I re-classify the all of them into the 7 categories , as shown in Table 77.

Table 77 shows the adjectival categories that can modify an event noun. That is, they form the attributes that describe nominal events.

Table 77. Categories of Adjectives that Modify Event Nouns

First Level Category	Second Level Category
【內部時間特性 <i>nèibù shíjiān tèxìng</i> ‘internal temporal property’】	【時長 <i>shícháng</i> ‘duration’】 (Zhao 2006)
	【速度 <i>sùdù</i> ‘speed’】 (Zhao 2006)
【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】 (Zhao 2006)
	【細度 <i>xìdù</i> ‘specificity’】 (Zhao 2006)
	【深度 <i>shēndù</i> ‘profundity’】 (Zhao 2006)
	【難度 <i>nándù</i> ‘difficulty’】 (Zhao 2006)
【頻率 <i>pínlǜ</i> ‘frequency’】 (Zhao 2006)	
【範圍 <i>fànwéi</i> ‘scope; scale’】 (Zhao 2006)	
【狀態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】 (Zhao 2006)
	【正式性 <i>zhèngshì xìng</i> ‘formality’】 (new)
	【正常性 <i>zhèngcháng xìng</i> ‘normality’】 (new)
	【公開性 <i>gōngkāi xìng</i> ‘publicity’】 (new)
	【新舊性 <i>xīnjiù xìng</i> ‘newness’】 (new)
	【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】 (new)
【評價 <i>píngjià</i> ‘evaluation’】	【重要度 <i>zhòngyào dù</i> ‘importance’】 (new)
	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】 (new)
	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】 (new)
【可能性 <i>kěnéng xìng</i> ‘possibility’】 (Zhao 2006)	

The following section will establish an eventive qualia structure through exploring these adjectival categories modification to event nouns, especially focusing on answering these questions:

- (I) Which qualia role do these adjectival categories take?
- (II) What role values does each qualia role have?
- (III) Out of the four types of event nouns (NT, AT, NCT, and ACT), which one have eventive role attributes?

6.3 Establish an Eventive Qualia Structure

Pustejovsky (1991, 1995) shows how lexical items encode semantic information in the qualia structure. There are four roles in a qualia structure, and each is associated with some values. (i) The formal role can distinguish the *object* within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values. (ii) The constitutive role is about the relation between an *object* and its constituents or parts. Its role values include material, weight, parts and component elements. (iii) The telic role is about the purpose and function of the *object*. (iv) The agentive role describes factors involved in the origin of an *object*, such as creator, artifact, natural kind, causal chain.

However, from the statement of qualia structure, I notice that each qualia role is about an *object*. Event nouns lexically encode eventive information (Wang & Huang 2013d), which are event-representing rather than object-representing. To extend the application of qualia structure to event nouns, this chapter proposes to establish an event-based qualia structure.

Having identified all adjectival categories that can modify event nouns, I will examine their qualia contribution in the adjective-noun construction and establish an eventive qualia structure.

6.3.1 The Formal Role

An event noun encodes information about the conceptual categories that it belongs to. Such information is part of the formal quale. Figure 9 is a shallow ontology for event nouns (Wang 2011, Su 2013, Wang 2013).

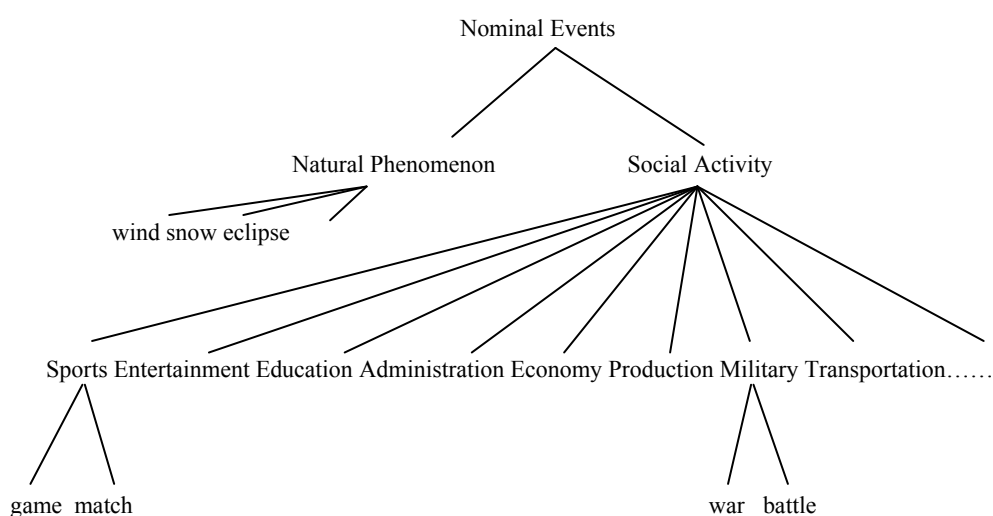


Figure 9. A Fragment Hierarchical Structure of Nominal Events

Figure 9 illustrates that event nouns can enter a hyponymy relation. Wind, snow, eclipse, game, match, war, and battle are hyponyms in Figure 9, while their hypernyms are actually their formal quale. Hence there is a “..... is a (kind of)” relation between an event noun and its formal quale.

For example, the direct formal role for *match* is sports, and for *war* is military. They are differentiated from each other through the hypernyms. Similarly, *game* is a kind of social activity, while *eclipse* is a kind of natural phenomenon. They are also discriminated from the hierarchical formal quale.

Two kinds of properties differentiate a nominal event from other events:

(I) the taxonomic/hierarchical classification of an event noun. I have demonstrated this point above;

(II) the attributes that describes an event from a larger domain. They are the adjectival categories that can modify event nouns. The following categories of adjectives act as a formal role of event nouns. These adjectival categories are the attributes of an eventive formal role.

(i) 【頻率 *pínlǜ* ‘frequency’】

(ii) 【範圍 *fànwéi* ‘scope; scale’】

(iii) 【狀態 *zhuàngtài* ‘state’】 :

【急度 *jídù* ‘urgency’】

【正式性 *zhèngshì xìng* ‘formality’】

【正常性 *zhèngcháng xìng* ‘normality’】

【公開性 *gōngkāi xìng* ‘publicity’】

【新舊性 *xīnjiù xìng* ‘newness’】

【真假性 *zhēnjiǎ xìng* ‘truthfulness’】

(iv) 【評價 *píngjià* ‘evaluation’】 :

【趣味性 *qùwèi xìng* ‘interestingness’】

The following section will discuss each of these quale attributes, their role values, and give

one example for event nouns of natural types (NT), artifactual types (AT), natural complex types (NCT) and artifactual complex types (ACT) discussed in Chapter 4.

6.3.1.1 頻率 *pínlǜ* ‘frequency’

The frequency of an event is the number of occurrences during a particular time. The following are the adjectival category 【頻率 *pínlǜ* ‘frequency’】’s role vales: 偶然 *ǒurán* ‘accidental’, 偶爾 *ǒuěr* ‘occasional’, 偶發 *ǒufā* ‘accidental’, 間或 *jiànhuò* ‘sometimes’, 有時 *yǒushí* ‘sometimes’, 經常 *jīngcháng* ‘often’, 時常 *shícháng* ‘often’, 常常 *chángcháng* ‘often’, 素常 *sùcháng* ‘usual’, 時時 *shíshí* ‘often’, 多次 *duōcì* ‘many times’, 屢次 *lǚcì* ‘repeated’, 累次 *lěicì* ‘repeated’, 頻繁 *pínfán* ‘frequent’, 反復 *fǎnfù* ‘repeated’.

NT, AT, NCT, and ACT can happen at a number of times during a particular period as shown in (15) to (18).

- (15) NT: 頻繁的地震

pínfánde dìzhèn

frequent earthquake

‘frequent earthquakes’

- (16) AT: 頻繁的比賽

pínfánde bǐsài

frequent match

‘frequent matches’

- (17) NCT: 偶爾的雨

ǒu’ěrdè yǔ

occasional rain

‘occasional rain’

- (18) ACT: 偶爾的宴會

ǒu’ěrdè yànhuì

occasional banquet

‘occasional banquets’

頻繁 *pínfán* ‘frequent’ in (15) and (16) describes an event that has a high frequency of occurrences. In (15), the natural type event noun 地震 *dìzhèn* ‘earthquake’ is modified by 頻繁 *pínfán* ‘frequent’ to mean that earthquakes occur frequently. In (16), the artifactual type noun 比賽 *bǐsài* ‘match’ is modified by 頻繁 *pínfán* ‘frequent’ to mean that matches are frequently held. 偶爾 *ǒu'ěr* ‘occasional’ in (17) and (18) describes an event that sometimes happens, but not regular. (17) means that the rain does not often fall. (18) means that the banquets that are occasionally held.

6.3.1.2 範圍 *fànwéi* ‘scope/scale’

Scope/scale describes the size or extent of an event. The following are this adjectival category 【範圍 *fànwéi* ‘scope/scale’】’s role values: 廣泛 *guǎngfàn* ‘extensive’, 普遍 *pǔbiàn* ‘general’, 全面 *quánmiàn* ‘comprehensive’, 大規模的 *dàguīmóde* ‘large-scale of’, 大面積的 *dàmiànjīde* ‘a large area of’, 片面 *piànmiàn* ‘one-sided’.

Scope/scale fits NT, AT, NCT and ACT event nouns as shown from (19) to (22).

- (19) NT: 大規模的土石流
 dàguīmóde tǔshíliú
 large-scale mud-rock flow
 ‘large-scale mud-rock flow’

- (20) AT: 大規模的衝突
 dàguīmóde chōngtū
 large-scale conflict
 ‘large-scale conflict(s)’

- (21) NCT: 大範圍的春雨
 dàfànwéide chūnyǔ
 a wide range of spring rain
 ‘a wide range of spring rain’

- (22) ACT: 大規模的調查
 dàguīmóde diàochá

large-scale investigation

‘large-scale investigation(s)’

In (19), 土石流 *tǔshíliú* ‘mud-rock flow’ is a natural type event noun. It can be modified by the scale 大規模的 *dàguīmóde* ‘large-scale’ to mean that the mud-rock flow occurs on a large scale. In (20), 衝突 *chōngtū* ‘conflict’ is an artifactual type event noun. It is modified by the scale 大規模的 *dàguīmóde* ‘large-scale’ and means that the conflict occurs on a large scale. In (21), 春雨 *chūnyǔ* ‘spring rain’ is a natural complex type event noun. 大範圍的 *dàfànwéide* ‘a wide range of’ describes the range that the rainfall happens. In (22), 調查 *diàochá* ‘investigation’ is an artifactual complex type event noun, which gets modification by 大規模的 *dàguīmóde* ‘large-scale’ to mean that the investigation is carried on in a large scale.

6.3.1.3 狀態 *zhuàngtài* ‘state’

This section examines 【狀態 *zhuàngtài* ‘state’】’s sub-classes that play a formal role of event nouns. They are 【急度 *jídù* ‘urgency’】, 【正式性 *zhèngshì xìng* ‘formality’】, 【正常性 *zhèngcháng xìng* ‘normality’】, 【公開性 *gōngkāi xìng* ‘publicity’】, 【新舊性 *xīnjiù xìng* ‘newness’】, and 【真假性 *zhēnjiǎ xìng* ‘truthfulness’】.

6.3.1.3.1 急度 *jídù* ‘urgency’

Urgency is the state of being urgent. The following are some of the adjectival category 【急度 *jídù* ‘urgency’】’s role values: 急迫 *jípò* ‘urgent’, 危急 *wēiji* ‘critical’, 緊急 *jǐnjí* ‘urgent’, 緊迫 *jǐnpò* ‘urgent’, 迫切 *pòqiē* ‘urgent’.

Natural types and natural complex types usually do not have an urgent attribute, while artifactual types and artifactual complex types have such attributes, as shown in (23) and (24).

(23) AT: 緊急的轉變

jǐnjíde zhuǎnbiàn
emergent change

‘emergent change(s)’

(24) ACT: 一次緊急的警告

yī cì jǐnjíde jǐnggào
one CL emergent warning

‘an emergent warning’

In (23), 緊急的 *jǐnjíde* ‘emergent’ modifies the artifactual type event noun 轉變 *zhuǎnbiàn* ‘change’ to mean that the change is an emergent event. In (24), 警告 *jǐnggào* ‘warning’ is an artifactual complex type event noun as shown in

(25) 阿羅約總統不顧美國多次警告,堅持從伊撤軍。(CCL)

Āluóyuē zǒngtǒng bùgù Měiguó duō cì jǐnggào, jiānchí cóng
Arroyo president regardless of USA many CL warning insist on from
Yī chèjūn.

Iraq withdraw the troops

‘Regardless of US’s repeated warnings, President Arroyo insists on withdrawing the troops from Iraq.’

(26) 科學家們的警告是地球最多能養活的人口只有八十億。(CCL)

Kēxuéjiāmén de jǐnggào shì dìqiú zuìduō néng yǎnghuo de
scientists DE warning be the Earth maximally can feed DE
rénkǒu zhǐyǒu bāshí yì.
population only 80 a hundred million

‘Scientists’ warning is that the Earth can maximally support a population of only eight billion.’

In (25), 警告 *jǐnggào* ‘warning’ is selected by the event classifier 次 *cì* ‘once (re. frequency of event)’, so it is an event; in (26), 警告 *jǐnggào* ‘warning’ refers to the information. Thus 警告 *jǐnggào* ‘warning’ is a dot object event • information.

In (24), 緊急 *jǐnjí* ‘emergent’ modifies the event aspect of 警告 *jǐnggào* ‘warning’ to mean that the warning is emergent.

6.3.1.3.2 正式性 *zhèngshì xìng* ‘formality’

Formality refers to the way that a particular event is carried out following some rules or conventions. A formal event often follows formal procedures or actions, while an informal event is the opposite. 正式的 *zhèngshì de* ‘formal’ and 非正式的 *fēi zhèngshì de*

‘informal’ are the adjectival category’s role values.

Natural types and natural complex types do not have such a role, while artifactual types and artifactual complex types have. For example, in ancient China, the enthroned ceremony is of vital significance. 明史 *Mingshi* ‘History of Ming Dynasty’ edited by Tingyu Zhang (Zhang 1739) documented the formal procedures of such a ceremony.

(27) 登極儀 *dēngjíyí* ‘ceremony of ascending the throne’

……皇帝袞冕升御座，大樂鼓吹振作。樂止，將軍捲簾，尚寶卿置寶於案。拱衛司鳴鞭，引班導百官入丹墀拜位。初行樂作，至位樂止。……

……Huángdì gǔn miǎn shēng yùzuò,
 Emperor ceremonial dress worn by the emperor crown ascend emperor seat
 dà yuè gǔ chuī zhènzuo. Yuè zhǐ, jiāngjūn juǎn lián,
 big music drub blow cheer up music end general roll curtain
 shàngbǎoqīng zhì bǎo yú àn.
 an officer in charge of the treasure put treasure PREP table
 Gōngwèisī míngbiān, yǐnbān dǎo
 officers for protection set off fireworks officers for leading lead
 bǎiguān rù dānchí bǎiwèi.
 hundreds of officers enter red steps leading up to an imperial palace worship
 Chū xíng yuè zuò, zhì wèi yuè zhǐ. ……
 start walk music play arrive at seat music end

‘The Emperor, wearing ceremonial dress and crown, walks to the emperor seat; music sounds. The music ends; a general rolls the curtain; an officer put the treasure on the table. The officers for protection set off fireworks; they lead hundreds of officers to the red steps to worship. When they start to move, music sounds; when they arrive at their position, music stops.’

Examples are shown in (28) and (29).

(28) AT: 正式的比赛

zhèngshìde bǐsài

formal match

‘formal match(es)’

- (29) ACT: 正式的宴會
 zhèngshìde yànhuì
 formal banquet
 ‘formal banquet(s)’

In (28), the artifactual type event noun 比賽 *bǐsài* ‘match’ is modified by 正式的 *zhèngshìde* ‘formal’, which means that the match is held following some formal procedures. In (29), 正式的 *zhèngshìde* ‘formal’ modifies the artifactual complex type event noun 宴會 *yànhuì* ‘banquet’ to mean that the banquet event is held formally.

6.3.1.3.3 正常性 *zhèngcháng xìng* ‘normality’

Normality is a situation in which an event occurs naturally. On the contrary, abnormality is a state deviating from normal rules. The following are some of the adjectival category 【正常性 *zhèngcháng xìng* ‘normality’】’s role values: 正常 *zhèngcháng* ‘normal’, 正規 *zhèngguī* ‘regular’, 常規 *chángguī* ‘conventional’, 反常 *fǎncháng* ‘abnormal’, 失常 *shīcháng* ‘disorder’, 乖謬 *guāimiù* ‘perverse’, 乖戾 *guāilì* ‘surlly’, 怪 *guài* ‘strange’, 奇怪 *qíguài* ‘strange’.

NT, AT, NCT, and ACT event nouns can be modified by adjectives that express normality, as shown from (30) to (33).

- (30) NT: 正常的睡眠
 zhèngchángde shuìmián
 normal sleep
 ‘normal sleep’
- (31) AT: 正常的比賽
 zhèngchángde bǐsài
 normal match
 ‘normal match(s)’
- (32) NCT: 正常的雪

zhèngchángde xuě

normal snow

‘normal snow’

(33) ACT: 正常的宴會

zhèngchángde yànhuì

normal banquet

‘normal banquet(s)’

正常 *zhèngcháng* ‘normal’ describes something that happens not deviating from a norm, rule, or principle. In (30), 睡眠 *shuìmián* ‘sleep’ is a natural type event noun. (30) refers to a sleep that occurs at normal time and it may be a sound sleep. In (31), 比賽 *bǐsài* ‘match’ is an artifactual type event noun. (31) is a competition that lasts normally. In (32), 雪 *xuě* ‘snow’ is a natural complex type event noun. (32) may mean the snow falls at a normal time or at a normal amount. In (33), 正常 *zhèngcháng* ‘normal’ modifies the banquet event to mean that the banquet is held and happens in a normal way.

6.3.1.3.4 公開性 *gōngkāi xìng* ‘publicity’

Publicity is the state of being open to public view. On the contrary, secrecy is a secret event that remains hidden from the public and is only known to a special group of people. The following are some of the adjectival category 【公開性 *gōngkāi xìng* ‘publicity’】’s role values: 公開 *gōngkāi* ‘public’, 秘密 *mìmi* ‘secret’, 機密 *jīmi* ‘confidential’, 絕密 *juémì* ‘top-secret’, 隱秘 *yǐnmì* ‘covert’, 神秘 *shénmì* ‘mysterious’, 詭秘 *guǐmì* ‘surreptitious’, 悄悄 *qiāoqiāo* ‘quietly’, 偷偷 *tōutōu* ‘stealthy’, 鬼祟 *guǐsuì* ‘sneaky’.

Natural types and natural complex types do not have a public or secret attribute, while artifactual types and artifactual complex types have such attributes as shown in (34) and (35).

(34) AT: 公開談判

gōngkāi tánpàn

open negotiation

‘open negotiation(s)’

(35) ACT: 秘密宴會

mìmi yànhuì
secret banquet

‘secret banquet(s)’

In (34), 公開 *gōngkāi* ‘open’ describes an event that is done in such a way that any person can see or know it. It modifies the artifactual type event noun 判斷 *tánpàn* ‘negotiation’ to mean that a negotiation is openly held. In (35), 秘密 *mìmi* ‘secret’ modifies the artifactual complex type event noun 宴會 *yànhuì* ‘banquet’ to mean that a banquet is secretly held.

6.3.1.3.5 新舊性 *xīnjiù xìng* ‘newness’

Newness can either mean the initiation of something or a new style of something. The former meaning refers to the agentive role, while the latter refers to the formal role. Here I refer to the latter. When oldness, the opposite of newness, means an old style, it is also a formal role.

The following are some of the adjectival category 【新舊性 *xīnjiù xìng* ‘newness’】’ role values: 新 *xīn* ‘new’, 新式的 *xīnshìde* ‘new-style’, 新穎 *xīnyǐng* ‘novel’, 新型 *xīnxíng* ‘new pattern’, 舊 *jiù* ‘old’, 陳舊 *chénjiù* ‘obsolete’, 老式的 *lǎoshìde* ‘old-fashioned’.

Natural types and natural complex types normally do not have a style of old or new. Examples of AT and ACT are shown in (36) and (37).

(36) AT: 新式比賽

xīnshì bǐsài
new-style match

‘new-style match(s)’

(37) ACT: 老式宴會

lǎoshì yànhuì
old-fashioned banquet

‘old-fashioned banquet(s)’

In (36), 比賽 *bǐsài* ‘match’ is an artifactual type event noun. 新式 *xīnshì* ‘new-style’ is a style that something occurs in a new way. 新式比賽 *xīnshì bǐsài* ‘new-style match’ is a match that is held in a new style. In (37), 宴會 *yànhuì* ‘banquet’ is an artifactual complex

type event noun, as shown in (38) and (39).

(38) 去年的生日慶祝有音樂會、有豐盛的宴會，以及各界的賀禮。

Qùnián de shēngri qìngzhù yǒu yīnyuèhuì, yǒu fēngshèngde yànhuì,
last year DE birthday celebration have concert have sumptuous banquet
yǐjí gèjiè de hèlǐ.
as well as all circles DE gift (as a token of congratulation)

‘Last year's birthday celebration had a concert, a sumptuous banquet, as well as the gifts from all circles.’

(39) 在今晚這個隆重的宴會上，總統先生發表了熱情洋溢的講話。

Zài jīnwǎn zhè ge lóngzhòngde yànhuì shàng, zǒngtǒng xiānshēng
on tonight this CL grand banquet on president sir
fābiǎo le rèqíngyángyide jiǎnghuà.
deliver ASP warm speech

‘At tonight's grand banquet, the President delivered a warm speech.’

In (38), 豐盛 *fēngshèng* ‘sumptuous’ modifies the food aspect of 宴會 *yànhuì* ‘banquet’, while in (39), 隆重 *lóngzhòng* ‘grand’ modifies 宴會 *yànhuì* ‘banquet’ ’s event aspect, so 宴會 *yànhuì* ‘banquet’ is a dot object: food • event. In (37), 老式 *lǎoshì* ‘old-fashioned’ is a style of something. It modifies the event aspect of 宴會 *yànhuì* ‘banquet’, to mean that the banquet is held in an old style.

6.3.1.3.6 真假性 *zhēnjiǎ xìng* ‘truthfulness’

An event being true means that it is in accordance with the actual situation, rather than being invented or assumed. In contrast, an event being false means that it is not in accordance with the fact or reality. The following are the adjectival category 【真假性 *zhēnjiǎ xìng* ‘truthfulness’】’ role values: 真實 *zhēnshí* ‘true’, 真 *zhēn* ‘true’, 實在 *shízai* ‘actual’, 真正 *zhēnzhèng* ‘real’, 虛假 *xūjiǎ* ‘mendacious’, 虛 *xū* ‘void’, 假 *jiǎ* ‘false’, 虛偽 *xūwěi* ‘hypocritical’, 虛妄 *xūwàng* ‘delusive’, 無稽 *wújī* ‘ridiculous’, 荒誕 *huāngdàn* ‘absurd’, 誇誕 *kuādàn* ‘exaggerative’.

Natural types and natural complex type event nouns normally do not have a true or false attributes, while artifactual type and artifactual complex type event nouns have such attributes as shown in (40) and (41).

(40) AT: 真實的攻擊

zhēnshíde gōngjī

real attack

‘real attack(s)’

(41) ACT: 虛假的報導

xūjiǎde bàodào

false reporting

‘false reporting(s)’

In (40), 攻擊 *gōngjī* ‘attack’ is an artifactual type event noun. It is modified by 真實 *zhēnshí* ‘real’ to mean that an attack is actually conducted. In (41), 報導 *bàodào* ‘reporting’ is an artifactual complex type event noun, as shown in (42) and (43).

(42) 中央電視台作了一個多小時的報導。

Zhōngyāngdiànshìtái zuò le yī gè duō xiǎoshí de bàodào.

CCTV make ASP one CL more hour DE reporting

‘CCTV made a more than one hour reporting.’

(43) 他們已看到這篇報導。

Tāmen yǐ kàndào zhè piān bàodào.

they already see-achieve this CL report

‘They have already seen this report.’

In (42), 報導 is modified by the temporal expression 一個多小時的 *yī gè duō xiǎoshí de* ‘more than one hour’, so it is a process. In (43), 報導 *bàodào* ‘report’ is modified by the individual classifier 篇 *piān* ‘CL’, so it is a result. (42) and (43) show that 報導 *bàodào* ‘reporting; report’ is a dot object: process • result. 報導 *bàodào* ‘reporting; report’ is an event noun when it has a process reading. In (41), the attribute 虛假 *xūjiǎ* ‘false’ modifies 報導 *bàodào* ‘reporting; report’.

6.3.1.4 評價 *píngjià* ‘evaluation’

Evaluation is the act of determining the value of an event through careful appraisal. Here I

examine one kind of evaluation: whether an event is interesting.

6.3.1.4.1 趣味性 *qùwèi xìng* ‘interestingness’

An interesting event is one that attracts people’s attention because it is exciting or unusual. By contrast, a boring event is one that lacks interest and may cause mental weariness. The following are some of adjectival category 【趣味性 *qùwèi xìng* ‘interestingness’】’s role values: 有趣 *yǒuqù* ‘interesting’, 帶勁 *dàijìn* ‘energetic’, 枯燥 *kūzào* ‘dull’, 枯澀 *kūsè* ‘dull and heavy’, 乏味 *fáwèi* ‘tedious’, 無味 *wúwèi* ‘tasteless’, 平淡 *píngdàn* ‘insipid’.

Natural types and natural complex types normally do not have an interesting or boring attribute, while artifactual types and artifactual complex types have, as show in (44) and (45).

(44) AT: 一次有趣的書畫展

yī cì yǒuqùde shūhuàzhǎn

a CL interesting painting and calligraphy exhibition

‘an interesting painting and calligraphy exhibition’

(45) ACT: 一次無聊的調查

yī cì wúliáode diàochá

a CL boring investigation

‘a boring investigation’

In (44), 書畫展 *shūhuàzhǎn* ‘painting and calligraphy exhibition’ is an artifactual type event noun. 有趣的 *yǒuqùde* ‘interesting’ modifies it to mean that this calligraphy and painting exhibition is very interesting. In (45), 調查 *diàochá* ‘investigation’ is an artifactual complex type event noun as shown in (46) and (47).

(46) 4名檢察官前往蘇哈托住處進行了一個半小時的調查。(Gigaword)

4 Míng jiǎncháguān qiánwǎng Sūhātū zhùchù jìnxíng le yīgèbàn

4 CL prosecutor proceed to Suharto residence carry out ASP 1.5

xiǎoshí de diàochá.

hour DE investigation

‘Four prosecutors proceeded to Suharto’s residence and carried out an investigation for one and half hours.’

- (47) 英文「中國日報」今天刊出一篇調查說，中國大陸個體戶子女在校成績低落，校外生活虛華。

Yīngwén ‘zhōngguó ribào’ jīntiān kānchū yī piān diàochá shuō, zhōngguó
 English China Daily today publish one CL report say China
 dàlù gètǐhù zǐnǚ
 mainland households engaged in individual enterprises sons and daughters
 zàixiào chéngjī dīluò, xiàowài shēnghuó xūhuá.
 at school grade poor outside school life flaunty

‘In the English version of "China Daily," a survey published today said that in mainland China children of households engaged in individual enterprises have poor grades at school, and live a flaunty life outside school.’

In (46), 調查 *diàochá* ‘investigation’ is modified by the temporal expression 一個半小時的 *yīgèbàn xiǎoshí de* ‘one and half hours’, so it is a process. In (47), 調查 *diàochá* ‘investigation’ is selected by the individual classifier 篇 *piān* ‘CL’, so it is a result. (46) and (47) show that 調查 *diàochá* ‘investigation’ is a dot object: process • result.

In (45), 調查 *diàochá* ‘investigation’ is selected by the event classifier 次 *cì* ‘once (re. frequency of event)’, so it is an event noun. 無聊 *wúliáo* ‘boring’ modifies it to mean that the investigation process is dull and uninteresting.

6.3.2 The Constitutive Role

The constitutive role in GL has three properties: material, weight, and parts and component elements. I argue that an event is in some way similar to an object, so there is a correspondence between an object’s constitutive role and an event’s constitutive role, as depicted in Table 78.

Table 78. The Constitutive Role in GL and Eventive Constitutive Role

Constitutive Role in GL	Eventive Constitutive Role
Material	↔ Duration, Speed, Event Happening Time
Weight	↔ Intensity, Specificity, Profundity, Difficulty
Parts and Component Elements	↔ Participants

First, a physical object is made up of some materials. For example, a table is usually made up of wood. Similarly, an event is composed of some elements, such as duration, speed, and event happening time.

Duration and speed refer to the time that an event lasts, which is the internal temporal property of an event. I will further discuss them in Section 6.3.2.1 內部時間特性 *nèibù shíjiān tèxìng* ‘internal temporal property’.

Every event happens at a certain time. NT and NCT do not specify the event time before it happens, though modern sciences enable people to estimate the happening time of some events. Some AT and ACT such as 安史之亂 *ānshǐzhīluàn* ‘Rebellion of An Lushan and Shi Siming’ encodes the event time. Event happening time is usually not expressed by adjectives.

Second, a physical object usually has weight, being light or heavy. For example, a leaf is light and an elephant is heavy. Similarly, an event has intensity, specificity, profundity or difficulty, which makes it simple or complex. These are the degrees of an event. I will further discuss them in Section 6.3.2.2 程度 *chéngdù* ‘degree’.

Third, a physical object has parts and component elements. For example, a house has walls, doors and windows, which are functional parts. Similarly, many non-natural events involve participants, which play a role in events.

Any non-natural event happens with the involvement of participants. For example, a 圖片展 *túpiànzhǎn* ‘photo exhibition’ usually requires at least pictures, audience and organizers. They are participants of a photo exhibition. For an event noun, the information in the argument structure can be put in the constitutive role of the qualia structure as shown in (48).

$$(48) \left[\begin{array}{l} \text{圖片展 } \textit{túpiànzhǎn} \text{ ‘photo exhibition’} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{picture} \\ \text{D-ARG1} = y: \text{audience} \\ \text{D-ARG2} = z: \text{organizer} \end{array} \right] \\ \text{QUALIA} = [\text{CONSTITUTIVE} = \{x, y, z\}] \end{array} \right]$$

Pictures, audience and organizers are the participants of a 圖片展 *túpiànzhǎn* ‘photo exhibition’. In the qualia structure, they are stored in the constitutive role (Wang & Huang 2012d).

To sum up, an eventive constitutive role comprises three attributes:

(I) Internal Temporal Property:

【時長 *shícháng* ‘duration’】

【速度 *sùdù* ‘speed’】

【Event Happening Time】

(II) Degrees:

【強度 *qiángdù* ‘intensity’】

【細度 *xìdù* ‘specificity’】

【深度 *shēndù* ‘profundity’】

【難度 *nándù* ‘difficulty’】

(III) Participants

Because event happening time and participants are usually not adjectives, I will not discuss them in the following section.

The following adjectival categories can act as an eventive constitutive role. They are the attributes of an eventive constitutive role:

(I) 【內部時間特性 *nèibù shíjiān tèxìng* ‘internal temporal property’】:

【時長 *shícháng* ‘duration’】

【速度 *sùdù* ‘speed’】

(II) 【程度 *chéngdù* ‘degree’】:

【強度 *qiángdù* ‘intensity’】

【細度 *xìdù* ‘specificity’】

【深度 *shēndù* ‘profundity’】

【難度 *nándù* ‘difficulty’】

6.3.2.1 內部時間特性 *nèibù shíjiān tèxìng* ‘internal temporal property’

6.3.2.1.1 時長 *shícháng* ‘duration’

The duration of an event is the period of time during which an event lasts. The following are some of duration’s role values: 長 *cháng* ‘long’, 漫長 *màncháng* ‘very long’, 長久 *chángjiǔ* ‘long’, 冗長 *rǒngcháng* ‘lengthy’, 短 *duǎn* ‘short’, 短暫 *duǎnzàn* ‘momentary’, 短促 *duǎncù* ‘transient’, 簡短 *jiǎnduǎn* ‘brief’.

Any event can persist for some time, either short or long as shown in (49) to (52).

(49) NT: 很短的地震

hěn duǎnde dìzhèn

very short earthquake

‘very short earthquake(s)’

(50) AT: 很長的比賽

hěn chǎngde bǐsài

very long match

‘very long match(s)’

(51) NCT: 短暫的雨

duǎnzǎnde yǔ

short rain

‘short rain’

(52) ACT: 很長的宴會

hěn chǎngde yànhuì

very long banquet

‘very long banquet(s)’

In (49), the adjective 短 *hěnduǎnde* ‘short’ modifies the natural type event noun 地震 *dìzhèn* ‘earthquake’. It means that the earthquake lasts shortly. In (50), the adjective 長 *chǎng* ‘long’ modifies the artifactual type event noun 比賽 *bǐsài* ‘match’ to mean that the match lasts for a long time. In (51), the adjective 短暫 *duǎnzǎn* ‘short’ modifies the natural complex type event noun 雨 *yǔ* ‘rain’ to mean that the rain lasts shortly. In (52), the adjective 長 *chǎng* ‘long’ modifies the artifactual complex type event noun 宴會 *yànhuì* ‘banquet’ to mean that the banquet lasts long.

6.3.2.1.2 速度 *sùdù* ‘speed’

The speed of event is the rate at which it happens. The following are some of the adjectival category 【速度 *sùdù* ‘speed’】’s role values: 快 *kuài* ‘fast’, 快速 *kuàisù* ‘fast’, 迅速 *xùnsù*

‘rapid’, 神速 *shénsù* ‘marvelously quick’, 迅猛 *xùnměng* ‘swift and violent’, 飛速 *fēisù* ‘at full speed’, 飛快 *fēikuài* ‘fast’, 急速 *jísù* ‘very fast’, 慢 *màn* ‘slow’, 緩慢 *huǎnmàn* ‘slow’, 遲緩 *chíhuǎn* ‘sluggish’, 遲延 *chíyán* ‘delayed’.

All four types of event nouns have the speed attribute as shown from (53) to (56).

(53) NT: 迅速的颶風

xùnsùde jùfēng
rapid hurricane
‘a rapid hurricane’

(54) AT: 快速戰爭

kuàisù zhànzhēng
fast war
‘fast war(s)’

(55) NCT: 迅速的閃電

xùnsùde shǎndiàn
rapid lightning
‘rapid lightning’

(56) ACT: 快速的討論

kuàisùde tāolùn
quick discussion
‘quick discussion(s)’

In (53)-(56), 迅速 *xùnsù* ‘rapid’ and 快速的 *kuàisùde* ‘quick’ means an event happens or moves at great speed. In (53), the natural type event noun 颶風 *jùfēng* ‘hurricane’ is modified by 迅速 *xùnsù* ‘rapid’, which means that a hurricane moves rapidly. In (54), the adjective 快速 *kuàisù* ‘quick’ modifies 戰爭 *zhànzhēng* ‘war’, which means that a war is taken fast action and lasts shortly. In (55), 閃電 *shǎndiàn* ‘lightning’ is a natural complex type event noun, which can refer to the lighting event and the lightning as a physical object. It is modified by 快速 *kuàisù* ‘quick’, which means the lightening event goes through fast. In

(56), the adjective 快速 *kuàisù* ‘quick’ modifies 討論 *tǎolùn* ‘discussion’ to mean that a discussion lasts shortly.

6.3.2.2 程度 *chéngdù* ‘degree’

This section discusses four types of 【程度 *chéngdù* ‘degree’】: 【強度 *qiángdù* ‘intensity’】, 【細度 *xìdù* ‘specificity’】, 【深度 *shēndù* ‘profundity’】, 【難度 *nándù* ‘difficulty’】.

6.3.2.2.1 強度 *qiángdù* ‘intensity’

Intensity of an event is the degree of being intense. The following are some of the adjectival category 【強度 *qiángdù* ‘intensity’】’s role values: 猛烈 *měngliè* ‘violent’, 劇烈 *jùliè* ‘severe’, 強烈 *qiángliè* ‘strong’, 酷烈 *kùliè* ‘severe and cruel’, 激烈 *jīliè* ‘intense’, 微弱 *wēiruò* ‘weak’, 輕微 *qīngwēi* ‘slight’, 細微 *xìwēi* ‘subtle’, 細弱 *xìruò* ‘thin and delicate’.

All the four types of event nouns have the intensity attribute as shown from (57) to (60).

(57) NT: 強勁的風

qiángjìngde fēng
strong wind

‘strong wind’

(58) AT: 猛烈的戰爭

měngliède zhànzhēng
fierce war

‘fierce war(s)’

(59) NCT: 猛烈的雪

měngliède xuě
fierce snow

‘fierce snow’

(60) ACT: 激烈的辯論

jīliède biànlùn

heated debate

‘heated debate(s)’

In (57), the adjective 強勁 *qiángjìng* ‘strong’ modifies the natural type event noun 風 *fēng* ‘wind’, which means that the wind blows strongly. In (58), the artifactual type event noun 戰爭 *zhànzhēng* ‘war’ is modified by 猛烈 *měngliè* ‘fierce’, which means that a war is fought fiercely by two parties. In (59), the adjective 猛烈 *měngliè* ‘fierce’ modifies the natural complex type event noun 雪 *xuě* ‘snow’, which means that snow falls fiercely. In (60), the adjective 激烈 *jīliè* ‘heated’ modifies the artifactual complex type event noun 辯論 *biànlùn* ‘debate’ to mean the debate is heated.

6.3.2.2.2 細度 *xìdù* ‘specificity’

Specificity is the condition of being specific rather than general. On the contrary, briefness is being concise and succinct. The following are some of the adjectival category 【細度 *xìdù* ‘specificity’】’s role values: 詳細 *xiángxì* ‘detailed’, 詳盡 *xiángjìn* ‘exhaustive’, 周詳 *zhōuxiáng* ‘comprehensive’, 透徹 *tòuchè* ‘thorough’, 透闢 *tòupì* ‘penetrating’, 簡單 *jiǎndān* ‘simple’, 簡略 *jiǎnlüè* ‘brief’, 簡約 *jiǎnyuē* ‘simple’, 簡短 *jiǎnduǎn* ‘brief’, 簡易 *jiǎnyì* ‘simple’, 簡便 *jiǎnbiàn* ‘simple and convenient’, 粗略 *cūlüè* ‘rough’, 簡要 *jiǎnyào* ‘brief’, 扼要 *èyào* ‘to the point’, 概括 *gàikuò* ‘general’, 簡明 *jiǎnmíng* ‘concise’, 簡練 *jiǎnliàn* ‘terse’.

Artifactual types and artifactual complex types usually have the attribute of specificity as shown in (61) and (62).

(61) AT: 一次簡要的彙報

yī cì jiǎnyàode huìbào
a CL brief reporting’
‘a brief reporting’

(62) ACT: 一次詳細的報導

yī cì xiángxìde bàodào
a CL detailed reporting
‘a detailed reporting’

In (61), the adjective 簡要 *jiǎnyào* ‘brief’ modifies the artifactual type event noun 彙報 *huìbào* ‘reporting’ to mean the reporting is conducted briefly. In (62), 報導 *bàodào* ‘reporting; report’ is a dot object: process • result. The adjective 詳細 *xiángxì* ‘detailed’ modifies the process aspect of 報導 *bàodào* ‘reporting; report’, which means that the reporting is conducted in a detailed way.

6.3.2.2.3 深度 *shēndù* ‘profundity’

The profundity of an event is characterized by depth and quality. By contrast, a simple event is one that is uncompounded. The following are some of the adjectival category 【深度 *shēndù* ‘profundity’】’s role values: 深刻 *shēnkè* ‘profound’, 深入 *shēnrù* ‘thorough’, 深切 *shēnqiē* ‘heartfelt’, 尖銳 *jiānrùi* ‘sharp’, 刻骨 *kègǔ* ‘bone-deep’, 透徹 *tòuchè* ‘penetrating’, 透闢 *tòupì* ‘penetrating’, 深透 *shēntòu* ‘deep penetrating’, 中肯 *zhòngkěn* ‘pertinent’, 入骨 *rùgǔ* ‘to the marrow’, 深刻 *shēnkè* ‘profound’, 膚淺 *fūqiǎn* ‘shallow’, 浮淺 *fúqiǎn* ‘superficial’, 浮泛 *fúfàn* ‘superficial’, 輕微 *qīngwēi* ‘slight’, 細微 *xìwēi* ‘subtle’, 深奧 *shēnào* ‘profound’, 高深 *gāoshēn* ‘advanced’, 艱深 *jiānshēn* ‘difficult’, 精深 *jīngshēn* ‘profound’, 精微 *jīngwēi* ‘subtle’, 古奧 *gǔào* ‘archaic and abstruse’, 淺近 *qiǎnjìn* ‘plain’, 淺顯 *qiǎnxiǎn* ‘simple’, 淺易 *qiǎnyì* ‘simple and easy’, 粗淺 *cūqiǎn* ‘coarse and shallow’, 通俗 *tōngsú* ‘popular’, 淺俗 *qiǎnsú* ‘shallow and vulgar’.

Natural types and natural complex types do not have a profundity attribute, while artifactual types and artifactual complex types have as shown in (63) and (64).

(63) AT: 一次深刻的思考

yī cì shēnkède sīkǎo
a CL profound thinking
‘a profound thinking’

(64) ACT: 一次深刻的論述

yī cì shēnkède lùnsù
a CL profound exposition
‘a profound exposition’

In (63), 思考 *sīkǎo* ‘thinking’ is an artifactual type event noun. The adjective 深刻 *shēnkè* ‘profound’ modifies it to mean that the thinking has intellectual penetration. In (64), 論述

lùnshù ‘exposition’ is a dot object: process • result. The event noun 論述 *lùnshù* ‘exposition’ is modified by the adjective 深刻 *shēnkè* ‘profound’, which means that exposition is exposed profoundly.

6.3.2.2.4 難度 *nándù* ‘difficulty’

A difficult event requires great physical or mental effort to accomplish. In contrast, an easy event is one that requires little effort. The following are some of the adjectival category 【難度 *nándù* ‘difficulty’】’s role values: 難 *nán* ‘difficult’, 困難 *kùnnán* ‘difficult’, 艱難 *jiānnán* ‘difficult’, 棘手 *jíshǒu* ‘troublesome’, 麻煩 *máfan* ‘trouble’, 容易 *róngyì* ‘easy’.

Natural types and natural complex types normally do not have a value about difficult or easy. Artifactual type and artifactual complex type events can be either difficult or easy, as shown in (65) and (66).

(65) AT: 一次艱難的談判

yī cì jiānnán de tánpàn
one CL difficult negotiation

‘a difficult negotiation’

(66) ACT: 一次艱難的抉擇

yī cì jiānnán de juézé
one CL difficult choice

‘a difficult choice’

In (65), the adjective 艱難 *jiānnán* ‘difficult’ modifies the artifactual type event noun 談判 *tánpàn* ‘negotiation’, which means that the negotiation is difficult. In (66), 抉擇 *juézé* ‘choice’ is a dot object: event • information. It is modified by 艱難 *jiānnán* ‘difficult’, which means that the choice is difficult to make.

6.3.3 The Telic Role

The telic role is the purpose or function of an event. This section will discuss the adjectival category 【重要性 *zhòngyào xìng* ‘importance’】.

An important event is one whose effect is greatly valued. The following are some of the adjectival category 【重要性 *zhòngyào xìng* ‘importance’】’s role values: 重要 *zhòngyào*

‘important’, 緊要 *jǐnyào* ‘critical’, 要緊 *yàojǐn* ‘critical’, 顯要 *xiǎnyào* ‘powerful and influential’, 重大 *zhòngdà* ‘significant’, 關鍵 *guānjiàn* ‘key’.

Natural types and natural complex types could be referred to as important or not according to their effect on human beings. However, this is not quite typical. Conversely, it is common that artifactual types and artifactual complex types have the attribute of being important or not, as shown in (67) and (68).

(67) AT: 一次關鍵的戰役

yī cì guānjiàn de zhànyì

a CL key battle

‘a key battle’

(68) ACT: 一場重要的演講

yī chǎng zhòngyào de yǎnjiǎng

a CL important speech

‘an important speech’

In (67), the adjective 關鍵 *guānjiàn* ‘key’ modifies the artifactual type event noun 戰役 *zhànyì* ‘battle’ to mean that the battle is crucial. In (68), 演講 *yǎnjiǎng* ‘speech’ is a dot object: event • info. Because the classifier is 場 *chǎng* ‘a (scheduled) event (with beginning and ending)’, so here 演講 *yǎnjiǎng* ‘speech’ is an event. The adjective 重要 *zhòngyào* ‘important’ modifies the event 演講 *yǎnjiǎng* ‘speech’ to mean that the speech has significant effect.

6.3.4 The Agentive Role

The agentive role is about factors that lead to the emergence or coming into being of an event. This section discusses the cases when the category 【可能性 *kěnéng xìng* ‘possibility’】 acts as an agentive role.

Modals have potentially two possible interpretations: 1) Modal (agentive), and 2) Modal (formal).

(69) That car almost killed John.

It has two readings:

(a) John got hit and he almost died. (modal on agentive)

The event happened, and John almost died. The modal is on how the event happened.

(b) The car did not touch John and John was not hit. (modal on formal)

The event does not happen. This is modal on whether the event happened.

Here we only concern about modals on agentive role of event nouns. The following are some of modals' role values: 應該 *yīnggāi* 'should', 應當 *yīngdāng* 'should', 必須 *bìxū* 'must', 必然 *bìrán* 'inevitable', 肯定 *kěndìng* 'sure', 可能 *kěnéng* 'possible'.

Any of the four types of event nouns can be modified by modals as shown from (70) to (73).

(70) NT: 可能的乾旱

kěnéngde gānhàn
possible drought

'possible drought': a drought that is possible to happen

(71) AT: 可能的攻擊

kěnéngde gōngjī
possible attack

'possible attack(s)'

(72) NCT: 可能的雨

kěnéngde yǔ
possible rain

'possible rain': rain that is possible to fall

(73) ACT: 一次可能的解釋

yī cì kěnéngde jiěshì
a CL possible explanation

'a possible explanation': an explanation that is possible to make

From (70) to (73), the modal 可能的 *kěnéngde* 'possible' modifies different types of event nouns. In (70), 乾旱 *gānhàn* 'drought' is a natural type event noun. It is modified by 可能的

kěnéngde ‘possible’ to mean that a drought is possible to happen. In (71), 攻擊 *gōngjī* ‘attack’ is an artifactual type event noun. 可能的 *kěnéngde* ‘possible’ modifies it to mean that an attack is possible to happen. In (72), 雨 *yǔ* ‘rain’ is a dot object: event • physobj. It is modified by 可能的 *kěnéngde* ‘possible’ to mean the rain is possible to fall. In (73), 解釋 *jiěshì* ‘explanation’ is a dot object: process • result. Since it collocates with 次 *cì* ‘once (re. frequency of event)’, 解釋 *jiěshì* ‘explanation’ expresses a process here. 可能的 *kěnéngde* ‘possible’ modifies it to mean that an explanation is possible to be made.

6.3.5 Multiple Qualia Role Possibilities

The meaning of an adjective is dependent on the head it modifies. Considering this, Pustejovsky (1995) proposes selective binding, which takes place where a lexical item or phrase operates specifically on the substructure of a phrase, without changing the overall type in the composition. He represents selective binding in the following way:

“If α is of type $\langle a, a \rangle$, β is of type b , and the qualia structure of β , QS_{β} , has quale, q of type a , then $\alpha\beta$ is of type b , where $[[\alpha\beta]] = \beta \cap \alpha(q_{\beta})$.” (Pustejovsky 1995: P129)

Pustejovsky (2000) further reveals that adjectives bind into the qualia structure of nouns to select a narrow facet of the noun’s meaning. For example:

(74) a large (Formal) carved (Agentive) wooden (Constitutive) useful (Telic) arrow
 ([Formal; Constitutive; Agentive; Telic]).

Example (74) illustrates the richness of the qualia structure and each adjective selects individual qualia.

Wang and Huang (2010a) examine how adjectives modify different facets of a head noun through the study on [adjective+圖書館 *túshūguǎn* ‘library’].

Table 79 shows the top ten modifiers of 圖書館 *túshūguǎn* ‘library’ from Sinica Corpus ranked by salience. The qualia roles that these adjectives assume were annotated.

Table 79. Adjective Modifiers of 圖書館 *túshūguǎn* ‘library’ in Sinica Corpus

No.	Adjective Modifier	Frequency	Salience	Qualia role
1	登樣 <i>dēngyàng</i> ‘decent’	1	12.53	formal+constitutive+telic+agentive
2	靜寂 <i>jìngjì</i> ‘silent’	1	10.45	formal
3	大 <i>dà</i> ‘large’	3	8.88	formal

4	豪華 <i>háohuá</i> ‘luxury’	1	8.27	formal+constitutive+telic
5	聞名 <i>wénmíng</i> ‘famous’	1	7.44	formal+constitutive+telic+agentive
6	典型 <i>diǎnxíng</i> ‘typical’	1	7.14	formal+constitutive+telic
7	古老 <i>gǔlǎo</i> ‘old’	1	7.11	agentive
8	熟悉 <i>shúxī</i> ‘familiar’	1	6.2	(refer to the agent)
9	完整 <i>wánzhěng</i> ‘integral’	1	6.1	formal+constitutive+telic
10	好 <i>hǎo</i> ‘good’	1	3.75	formal+constitutive+telic+agentive

Through examining 圖書館 *túshūguǎn* ‘library’ ’s qualia roles that different adjectives modify, I can find the following facts:

Table 79 illustrates that some adjectives are able to modify multi-facet of a noun, such as 登樣 *dēngyàng* ‘decent’, 豪華 *háohuá* ‘luxury’, 聞名 *wénmíng* ‘famous’, 典型 *diǎnxíng* ‘typical’, 完整 *wánzhěng* ‘integral’. Here I take the evaluative adjective 好 *hǎo* ‘good’ as an example:

(75) 我們真的需要一個好的圖書館和醫藥室。(Sinica)

Wǒmen zhēnde xūyào yī gè hǎode túshūguǎn hé yīyàoshì.
we really need a CL good library and medical room.

‘We really need a good library and medical room.’

一個好的圖書館(a good library) could be a library which is large and multifunctional with lots of collections and is well-built. These properties are the possible values of 圖書館 *túshūguǎn* ‘library’ ’s qualia roles, as shown in (76).

(76)
$$\left[\begin{array}{l} \text{圖書館 } túshūguǎn \text{ 'library'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x : \text{building} \\ \text{D-ARG1} = y : \text{human} \\ \text{D-ARG2} = z : \text{knowledge} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{CONSTITUTIVE} = r : \text{collections} \\ \text{TELIC} = \text{provide} (r, z) \\ \text{AGENTIVE} = \text{build} (y, x) \end{array} \right] \end{array} \right]$$

好 *hǎo* ‘good’ itself does not specify any facet of the head. It generally describes something with desirable and positive qualities.

Though Wang and Huang (2010) has only examined adjectival modification to the entity

noun 圖書館 *túshūguǎn* ‘library’, I argue that their statement holds for event nouns. In the following section, I will investigate the evaluation category 【好壞性 *hǎohuài xìng* ‘goodness’】.

6.3.5.1 好壞性 *hǎohuài xìng* ‘goodness’

A good event refers to one with a favorable character. On the contrary, a bad event is one with undesirable or negative qualities. The following are some of the adjectival category 【好壞性 *hǎohuài xìng* ‘goodness’】’s role values: 好 *hǎo* ‘good’, 坏 *huài* ‘bad’, 差劲 *chājìn* ‘poor’, 稀松 *xīsōng* ‘sloppy’, 糟糕 *zāogāo* ‘terrible’. All four types of event nouns can get a good or bad evaluation from people’s appraisal.

Sometimes the good or bad evaluation is vague on which facet is good or bad, as shown in (77).

(77) AT: 一次很好的討論

yī cì hěn hǎo de tāolùn
one CL very good DE discussion

‘a good discussion’

In (77), 討論 *tāolùn* ‘discussion’ can refer to the event, the contents, or the effect of the discussion. Correspondingly, 好 *hǎo* ‘good’ plays a formal, constitutive, or telic role.

Of course, the good or bad adjectival evaluation is not vague all the time. In some cases, they act as one qualia role. First, sometimes the good or bad adjectival evaluation tends to refer to the effect of an event, so the adjective is a telic role, as shown in (78).

(78) NCT: 好雨知時節，當春乃發生。(CCL)

Hǎo yǔ zhī shíjié, dāng chūn nǎi fāshēng.
Good rain know season just at the time of spring as soon as grow

‘Good rain knows the right season, (because) it falls just at the time when (plants) are growing in spring.’

In (78) 好雨 refers to the rain that has good effect on the plants’ growth. Thus 好 plays a telic role.

Second, sometimes the good or bad adjectival evaluation tends to refer to the process of an

event, so the adjective is a constitutive role, as shown in (79).

(79) NT: 親愛的, 我永遠祝福你, 好人就有好夢。 (Web)

Qīn'àide, wǒ yǒngyuǎn zhùfú nǐ, hǎo rén
 Honey I forever bless you good people
 jiù yǒu hǎo mèng.
 indicating a natural result under certain conditions have good dream

'Honey, I always bless you: good people have good dreams.'

Third, sometimes the good or bad adjectival evaluation tends to distinguish one event from a larger domain, so the adjective plays a formal role, as shown in (80) and (81).

(80) AT: 精彩的球賽

jīngcǎide qiúsài
 wonderful ball game

'wonderful ball game(s)'

(81) ACT: 一次出色的報導

yī cì chūsède bàodǎo
 a CL outstanding reporting

'an outstanding reporting'

In (80), the 球賽 *qiúsài* 'ball game' is evaluated as 精彩 *jīngcǎi* 'wonderful'; in (81), the 報導 *bàodǎo* 'reporting' is evaluated as 出色 *chūsè* 'outstanding'. In both cases, the adjectives distinguish the game and reporting from other events, and thus they are formal roles.

6.4 Interaction between Adjectives and Event Nouns

Section 6.3 *Establish an Eventive Qualia Structure* has examined different adjectival categories' qualia roles. However, this does not mean that each adjective can only act as the one role discussed in this section. What Section 6.3 demonstrated is one possibility of the qualia role that an adjective may assume.

The qualia role of an adjective may change. First, there is an interaction between adjectives and event nouns. The qualia role of an adjective depends on which event noun it modifies or the meaning of the adjective-noun construction.

One adjective modifies different event nouns:

- (82) 11月中旬到12月初的工交座談會，是一次重大的鬥爭。(CCL)

11 yuè zhōngxún dào 12 yuè chū de
November middle till December beginning DE
gōngjiāo zuòtánhuì, shì yī cì zhòngdàde dòuzhēng.
industry and communication forum be one CL major struggle

‘The industry and communication forum from mid-November to early December is a major struggle.’

- (83) 歷史上東京曾遭到兩次重大的破壞。(CCL)

Lìshǐshàng Dōngjīng céng zāodào liǎng cì zhòngdàde
historically Tokyo at some time in the past suffer from two CL severe
pòhuài.
damage

‘Historically Tokyo had been subjected to two severe damages.’

In (82), 重大的鬥爭 *zhòngdà de dòuzhēng* ‘major struggle’ means the struggle has a significant effect, so 重大 *zhòngdà* ‘major’ is a telic role. In (83), 重大的破壞 *zhòngdàde pòhuài* ‘severe damage’ means the damage is to a severe degree, so 重大 *zhòngdà* ‘severe’ is a constitutive role.

Multiple meaning of the adjective-noun construction:

- (84) 一次深刻的教訓

yī cì shēnkède jiàoxùn
a CL profound lesson

‘a profound lesson’

In (84), 教訓 *jiàoxùn* ‘lesson’ is an artifactual type event noun. It is modified by the adjective 深刻 *shēnkè* ‘profound’. On the one hand, when (84) means the lesson has a profound effect on someone, then the adjective 深刻 *shēnkè* ‘profound’ is a telic role. On the other hand, when (84) means the lesson is profound in itself, then 深刻的 *shēnkè* ‘profound’ refers to a degree of the event itself, and so it a constitutive role.

6.5 Conclusions

Firstly, this chapter identified and re-classified different categories of adjectives that are capable of modifying event nouns, as shown in Table 81. It shows the adjectival categories that can modify an event noun. They form the attributes that describe nominal events.

Table 81. Categories of Adjectives that Modify Event Nouns

First Level Category	Second Level Category
【內部時間特性 <i>nèibù shíjiān tèxìng</i> ‘internal temporal property’】	【時長 <i>shícháng</i> ‘duration’】 (Zhao 2006)
	【速度 <i>sùdù</i> ‘speed’】 (Zhao 2006)
【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】 (Zhao 2006)
	【細度 <i>xìdù</i> ‘specificity’】 (Zhao 2006)
	【深度 <i>shēndù</i> ‘profundity’】 (Zhao 2006)
	【難度 <i>nándù</i> ‘difficulty’】 (Zhao 2006)
【頻率 <i>pínlǜ</i> ‘frequency’】 (Zhao 2006)	
【範圍 <i>fānwéi</i> ‘scope; scale’】 (Zhao 2006)	
【狀態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】 (Zhao 2006)
	【正式性 <i>zhèngshì xìng</i> ‘formality’】 (new)
	【正常性 <i>zhèngcháng xìng</i> ‘normality’】 (new)
	【公開性 <i>gōngkāi xìng</i> ‘publicity’】 (new)
	【新舊性 <i>xīnjiù xìng</i> ‘newness’】 (new)
	【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】 (new)
【評價 <i>píngjià</i> ‘evaluation’】	【重要度 <i>zhòngyào dù</i> ‘importance’】 (new)
	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】 (new)
	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】 (new)
【可能性 <i>kěnéng xìng</i> ‘possibility’】 (Zhao 2006)	

Secondly, this chapter established an eventive qualia structure through examining each qualia role’s attributes (the adjectival categories of each qualia role) and each attribute’s role values.

(I) Eventive Formal Role

Two kinds of properties differentiate a nominal event from other events:

- (i) the taxonomic/hierarchical classification of an event noun;
- (ii) the attributes that distinguish an event from a larger domain, such as:

(a) 【頻率 *pínlǜ* ‘frequency’】

(b) 【範圍 *fànwéi* ‘scope; scale’】

(c) 【狀態 *zhuàngtài* ‘state’】 :

【急度 *jídù* ‘urgency’】

【正式性 *zhèngshì xìng* ‘formality’】

【正常性 *zhèngcháng xìng* ‘normality’】

【公開性 *gōngkāi xìng* ‘publicity’】

【新舊性 *xīnjiù xìng* ‘newness’】

【真假性 *zhēnjiǎ xìng* ‘truthfulness’】

(d) 【評價 *píngjià* ‘evaluation’】 :

【趣味性 *qùwèi xìng* ‘interestingness’】

(II) Eventive Constitutive Role

An eventive constitutive role comprises three attributes:

(i) Internal Temporal Property:

【時長 *shícháng* ‘duration’】

【速度 *sùdù* ‘speed’】

【Event Happening Time】

(ii) Degrees:

【強度 *qiángdù* ‘intensity’】

【細度 *xìdù* ‘specificity’】

【深度 *shēndù* ‘profundity’】

【難度 *nándù* ‘difficulty’】

(iii) Participants

(III) Eventive Telic Role

An eventive telic role directs at the purpose or function of an event, such as the importance of an event.

(IV) Eventive Agentive Role

An eventive agentive role refers to factors that lead to the emergence or coming into being of an event. For example, modals can sometimes act as an agentive role.

Table 82 shows the qualia roles of different adjectival categories. These adjectival categories are the attributes of different qualia roles.

Table 82. Qualia Roles of Different Adjectival Categories

Qualia Role	Adjectival Category	
Formal	【頻率 <i>pínlǜ</i> ‘frequency’】	
	【範圍 <i>fānwéi</i> ‘scope’】	
	【狀態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】
		【正式性 <i>zhèngshì xìng</i> ‘formality’】
		【正常性 <i>zhèngcháng xìng</i> ‘normality’】
		【公開性 <i>gōngkāi xìng</i> ‘publicity’】
		【新舊性 <i>xīnjiù xìng</i> ‘newness’】
【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】		
【評價 <i>píngjià</i> ‘evaluation’】	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】	
Constitutive	【內部時間特性 <i>nèibù shíjiān tèxìng</i> ‘internal temporal property’】	【時長 <i>shícháng</i> ‘duration’】
		【速度 <i>sùdù</i> ‘speed’】
	【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】
		【細度 <i>xìdù</i> ‘specificity’】
		【深度 <i>shēndù</i> ‘profundity’】
【難度 <i>nándù</i> ‘difficulty’】		
Telic	【評價 <i>píngjià</i> ‘evaluation’】	【重要性 <i>zhòngyào xìng</i> ‘importance’】
Modals on Agentive	【可能性 <i>kěnéng xìng</i> ‘possibility’】	
Multiple Qualia Role Possibilities	【評價 <i>píngjià</i> ‘evaluation’】	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】

Each adjectival attribute in Table 82 has their role values. For example, 【趣味性 *qùwèi xìng* ‘interestingness’】 has these role values: 有趣 *yǒuqù* ‘interesting’, 帶勁 *dàijìn* ‘energetic’, 枯燥 *kūzào* ‘dull’, 枯澀 *kūsè* ‘dull and heavy’, 乏味 *fáwèi* ‘tedious’, 無味 *wúwèi* ‘tasteless’, 平淡 *píngdàn* ‘insipid’.

Thirdly, this chapter examined which types of event nouns (NT, AT, NCT, ACT) that each adjectival category can modify, as illustrated in Table 83.

Table 83. Types of Event Nouns that Each Adjectival Category can Modify

Qualia Role	Adjectival Category	Types of Event Nouns				Example	
		NT	AT	NCT	ACT		
Formal	【頻率 <i>pínlǜ</i> ‘frequency’】	+	+	+	+	偶爾的聚會 <i>ǒu'ěr de jùhuì</i> ‘occasional gatherings’	
	【範圍 <i>fànwéi</i> ‘scope’】	+	+	+	+	廣泛的傳播 <i>guǎngfàn de chuánbō</i> ‘widely transmission(s)’	
	【狀態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】	-	+	-	+	急迫的調整 <i>jí pò de tiáozhěng</i> ‘urgent adjustment(s)’
		【正式性 <i>zhèngshì xìng</i> ‘formality’】	-	+	-	+	正式的比賽 <i>zhèngshì de bǐsài</i> ‘formal competition(s)’
		【正常性 <i>zhèngcháng xìng</i> ‘normality’】	+	+	+	+	反常的決定 <i>fǎncháng de juédìng</i> ‘abnormal decision(s)’
		【公開性 <i>gōngkāi xìng</i> ‘publicity’】	-	+	-	+	秘密的經歷 <i>mì mì de jīnglì</i> ‘secret experience(s)’
		【新舊性 <i>xīnjiù xìng</i> ‘newness’】	-	+	-	+	嶄新的變化 <i>zhǎnxīn de biànhuà</i> ‘new change(s)’
		【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】	-	+	-	+	真實的戰爭 <i>zhēnshí de zhànzhēng</i> ‘real war(s)’
【評價 <i>píngjià</i> ‘evaluation’】	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】	-	+	-	+	有趣的實驗 <i>yǒuqù de shíyàn</i> ‘interesting experiment(s)’	

		s’】					
Constitutive	【內部時間特性 <i>nèibù shíjiān tèxìng</i> ‘internal temporal property’】	【時長 <i>shícháng</i> ‘duration’】	+	+	+	+	漫長的等待 <i>màncháng de děngdài</i> ‘long wait(s)’
		【速度 <i>sùdù</i> ‘speed’】	+	+	+	+	迅猛的暴雨 <i>xùnměng de bàoyǔ</i> ‘rapid torrential rain’
	【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】	+	+	+	+	猛烈的轟炸 <i>měngliè de hōngzhà</i> ‘heavy bombardment’
		【細度 <i>xìdù</i> ‘specificity’】	-	+	-	+	詳細的登記 <i>xiángxì de dēngjì</i> ‘detailed registration(s)’
		【深度 <i>shēndù</i> ‘profundity’】	-	+	-	+	深入的研究 <i>shēnrù de yánjiū</i> ‘in-depth study(ies)’
	【難度 <i>nándù</i> ‘difficulty’】	-	+	-	+	艱難的磋商 <i>jiānnán de cuōshāng</i> ‘tough negotiation(s)’	
Telic	【評價 <i>píngjià</i> ‘evaluation’】	【重要性 <i>zhòngyào xìng</i> ‘importance’】	-	+	-	+	重要的辯論 <i>zhòngyào de biànlùn</i> ‘important debate(s)’
Modals on agentive	【可能性 <i>kěnéng xìng</i> ‘possibility’】		+	+	+	+	可能的選擇 <i>kěnéng de xuǎnzé</i> ‘possible option(s)’
Multiple Qualia Role Possibilities	【評價 <i>píngjià</i> ‘evaluation’】	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】	+	+	+	+	瑞雪 <i>ruìxuě</i> ‘auspicious snow’

Fourthly, this chapter found the qualia role of an adjective may change. This results from the interaction between adjectives and event nouns or the polysemy of some adjectives.

Chapter 7 Compositionality of Event Nouns according to NN Compounds

7.1 Literature Review on Noun-Noun Compounds

7.1.1 The Generative Method

Levi (1978) finds that complex nominals are derived by two processes: predicate deletion (e.g. ‘The virus causes infection.’ -- virus infection) and predicate nominalization (e.g. ‘The parents refused the appointment.’ -- parental refusal).

The semantic relationships of complex nominals can be expressed by a small set of specifiable predicates that are recoverably deletable in complex nominal formation. This set comprises nine predicates: five verbs (CAUSE, HAVE, MAKE, USE and BE) and four prepositions (IN, FOR, FROM and ABOUT) as shown in Table 84.

Table 84. Complex Nominals Derived by Predicate Deletion (Levi 1978: P76-77)

Recoverably Deletable Predicate (RDP)	N1 < direct object of relative clause	N1 < subject of relative clause
CAUSE	tear gas	drug deaths
	disease germ	birth pains
	malarial mosquitoes	nicotine fit
	traumatic event	viral infection
	mortal blow	thermal stress
HAVE	picture book	government land
	apple cake	lemon peel
	gunboat	student power
	musical comedy	reptilian scales
	industrial area	feminine intuition
MAKE	honeybee	daisy chains
	silkworm	snowball
	musical clock	consonantal patterns
	sebaceous glands	molecular chains
	songbird	stellar configurations

USE	voice vote
	steam iron
	manual labor
	solar generator
	vehicular transportation
BE	soldier ant
	target structure
	professorial friends
	consonantal segment
	mammalian vertebrates
IN	field mouse
	morning prayers
	marine life
	marital sex
	autumnal rains
FOR	horse doctor
	arms budget
	avian sanctuary
	aldermanic salaries
	nasal mist
FROM	olive oil
	test-tube baby
	apple seed
	rural visitors
	solar energy
ABOUT	tax law
	price war
	abortion vote
	criminal policy
	linguistic lecture

Table 85 gives the more traditional terms of these Recoverably Deletable Predicate.

Table 85. Traditional Terms for Recoverably Deletable Predicate (Levi 1978: P77)

Recoverably Deletable Predicate (RDP)	Traditional Term
CAUSE	causative
HAVE	possessive/dative
MAKE	productive; constitutive, compositional
USE	instrumental
BE	essive/appositional
IN	locative [spatial or temporal]
FOR	purposive/benefactive
FROM	source/ablative
ABOUT	topic

Levi (1978) proposes four nominalization types: (a) Act Nominalizations: dream analysis, staff attempts, birth control, (b) Product Nominalizations: oil imports, editorial comment, royal orders, (c) Agent Nominalizations: city planner, sound synthesizer, film cutter, and (d) Patient Nominalizations: student inventions, designer creations, city trainees.

Miller (1996) summarizes the semantic relations in English compounds, putting forward nine relations, as shown in Table 86. His relations are the same with the RDP in Levi (1978).

Table 86. English Compound Relations (Miller 1996: P118)

Relation	Compound
CAUSE	sleeping pill
HAVE	picture book
MAKE	rainwater
USE	steam iron
BE	machine tool
IN	country club
FOR	fish pond
FROM	sea breeze
ABOUT	book review

Miller (1996) maintains that no proposal has created an exhaustive and mutually exclusive set of relations, and thus the results are inconclusive. English compounds are still an obstacle for learners of English as a second language.

I argue that there are some problems with the deletable predicate recovery method. First, some predicates are too vague that they mix up different relations. For example, Levi (1978) claims that both ‘lemon peel’ and ‘student power’ have a ‘HAVE’ predicate. However, although it is not incorrect to say that ‘The lemon has a peel.’ and ‘The student has the power.’, the two compounds have different relations. A peel is inherent to a lemon and thus a constituent of a lemon, while power is not a necessary part of a student.

Second, some compounds that are listed under some predicates are not suitable. For example, ‘olive oil’ and ‘apple seed’ are both under the preposition ‘FROM’. I agree that ‘olive oil’ has a ‘FROM’ relation; that is, *the oil is from olives*. However, it is incorrect to say that *the seed is from an apple*. It is more likely that the relation is FOR; that is, *the seed is for growing apples*.

Third, Levi (1978) neglects the fact that some compounds that have different relations. For example, she notices that ‘rural visitors’ has a ‘FROM’ relation, but it is also possible that it has an ‘IN’ relation. She notes that ‘musical clock’ has a ‘MAKE’ relation, but it can also have a ‘FROM’ relation.

7.1.2 The Semantic Relation Method

Downing (1977) makes an inventory of the most common underlying relationships:

- 1) Whole-part: duck foot
- 2) Half-half: giraffe-cow
- 3) Part-whole: pendulum clock
- 4) Composition: stone furniture
- 5) Comparison: pumpkin bus
- 6) Time: summer dust
- 7) Place: Eastern Oregon meal
- 8) Source: vulture shit
- 9) Product: honey glands
- 10) User: flea wheelbarrow
- 11) Purpose: hedge hatchet
- 12) Occupation: coffee man

I argue that this inventory cannot include all common relations. Moreover, some relations are not suitable. For example, ‘coffee man’ does not necessarily have an occupational relation. It could mean a man who likes drinking coffee or a man who makes coffee.

Quirk et al. (1985) classify English noun compounds into eight categories: 1) Type 'subject and verb', 2) Type 'verb and object', 3) Type 'verb and adverbial', 4) 'Verbless' compounds, 5) Type 'subject and object', 6) Type 'subject and complement', 7) combining-form compounds, and 8) 'bahuvrihi' compounds. Furthermore, they distinguish numerous subclasses within each category based on the grammatical and semantic analysis of the constituents involved in the noun compounds, as shown below (P1570-1576).

1) Type 'subject and verb':

- i) subject+deverbal noun: sunrise, daybreak, earthquake
- ii) verb+subject: crybaby, flashlight, popcorn
- iii) verbal noun in -ing+subject: cleaning woman, flying machine, investigating committee

2) Type 'verb and object':

- i) object+deverbal noun: book review, tax cut, meat delivery
- ii) object+ verbal noun in -ing: brainwashing, book-reviewing, sightseeing
- iii) object+agential noun in -er: cigar smoker, computer-designer, songwriter
- iv) verb+object: call-girl, drawbridge, push-button
- v) verbal noun in -ing+object: cooking apple, drinking-water, eating apple

3) Type 'verb and adverbial':

- i) verbal noun in -ing + adverbial: several adverbial relations are involved.

PLACE:

diving board ['dive from a board']

hiding place ['hide in a place']

typing paper ['type on paper']

INSTRUMENTAL:

baking powder ['bake with powder']

carving knife ['carve with a knife']

sewing machine ['sew with a machine']

ii) adverbial + verbal noun in -ing:

PLACE:

churchgoing ['going to church']

horse riding ['ride on a horse']

sun-bathing ['bathe in the sun']

TIME:

sleepwalking ['walk in one's sleep']

INSTRUMENTAL:

fly-fishing ['fish with a fly']

handwriting ['write by hand']

OTHER:

shadow-boxing ['box against a shadow']

iii) adverbial+ agential noun in -er:

PLACE:

backswimmer ['swim on the back']

city-dweller ['dwell in the city']

factory-worker ['work in a factory']

TIME: daydreamer ['dream during the day']

iv) adverbial + deverbal noun:

PLACE: boat-ride ['ride in a boat']

table talk ['talk at the table']

moon walk ['walk on the moon']

TIME:

daydream ['dream during the day']

night flight ['fly during the night']

INSTRUMENTAL: gunfight ['fight with a gun']

OTHER:

smallpox vaccination [‘vaccinate against smallpox’]

tax-exemption [‘exempt from tax’]

telephone call [‘message by the telephone’]

v) verb + adverbial:

PLACE:

dance hall [‘dance in a hall’]

springboard [‘spring from a board’]

workbench [‘work at a bench’]

INSTRUMENTAL:

grindstone [‘grind with a stone’]

plaything [‘play with a thing’]

4) ‘Verbless’ compounds: Type ‘subject and object

noun1 + noun2 (N1 powers/operates N2): air rifle, cable car, coal fire

noun1+noun2 (N2 produces/yields N1): oil well, power plant, gold mine

noun1 + noun2: (N1 produces/yields N2): cane sugar, gaslight, sawdust

noun1 + noun 2 (N1 has N2): arrowhead, piano keys, table leg

noun1 + noun2 (N2 controls/works in connection with N1): chairperson,
deckhand, postman

5) Type ‘subject and complement’:

noun1+noun2 (N2 is N1): oak tree, killer shark, blinker light

adjective + noun (noun is adjective): blackboard, blueprint, longboat

noun1 + noun2 (N2 is like N1): butter-bean, dragonfly, goldfish

noun1+noun2 (N2 consists of N1): chocolate bar, sand dune, soap flake

noun1 + noun2 (N2 is for N1): birdcage, doghouse, fire engine

6) combining-form compounds:

noun1 (in its ‘combining form’) + noun2 (= noun2 [in respect of] N1):
‘agri-culture, ·bio’physics

7) ‘bahuvrihi’ compounds:

Neither N1 nor N2 refers to the named entity; the whole refers to a separate entity, e.g. birdbrain, egghead, highbrow.

Winston et al. (1987) explore six types of part-whole relations: Component-Integral object, Member-Collection, Portion-Mass, Stuff-Object, Feature-Activity, Place-Area. Three relation elements indicate the differences among the six types of meronymic relations: functional, homeomerous and separable. Functional parts are restricted in their spatial or temporal location. For example, for the handle of a cup to function as handle, it can only be placed in limited positions. Homeomerous parts are the same with the whole (e.g. slice-pie), while nonhomeomerous parts are different from the whole (e.g. tree-forest). Separable parts be separated from the whole (e.g. tree-forest), while inseparable parts cannot (e.g. steel-bike). The results are shown in Table 87.

Table 87. Six Types of Meronymic Relations with Relation Elements (Winston et al. 1987: P421)

Relation	Example	Relation Elements		
		Functional	Homeomerous	Separable
Component-Integral Object	handle-cup	+	-	+
Member-Collection	tree-forest	-	-	+
Portion-Mass	slice-pie	-	+	+
Stuff-Object	steel-bike	-	-	-
Feature-Activity	paying-shopping	+	-	-
Place-Area	oasis-desert	-	+	-

Wang (2005) finds that Miller’s nine categories of semantic relations are not exhaustive, so he adds some additional semantic relations:

- 1) Apposition: killer-whale (The whale [is] a killer.)
- 2) Coordination: deaf-mute (deaf and mute)
- 3) Comparison: snow-white (as white as snow)
- 4) Time: nightwork (The work [is] at night)
- 5) Means: hand-pump (The pump [is operated] by hand)

Even so, he points out that the semantic relations of NN are extremely complex, so despite his efforts to supplement Miller’s classification, it is hardly possible to encompass all semantic relations.

Barker (1998), Barker et al. (1998), and Barker and Szpakowicz (1998) build a system for noun modifier relationship (NMR) analysis that assigns semantic relationships in complex noun phrases. The following classifications are the list of the NMRs used by their analyzer. The list is based on similar lists found in literature on the semantics of noun compounds. For

each NMR, they give a paraphrase and example modifier-noun compounds. In the analyzer, they replace adjectives with their WordNet pertainyms to improve awkward paraphrases. For example, ‘charitable benefits from charitable donation’ is replaced by ‘charity benefits from charitable donation’.

- 1) Agent: compound is performed by modifier, e.g. student protest, band concert, military assault
- 2) Beneficiary: modifier benefits from compound, e.g. student price, charitable donation
- 3) Cause: modifier causes compound, e.g. exam anxiety, overdue fine
- 4) Container: modifier contains compound, e.g. printer tray, flood water, film music, story idea
- 5) Content: modifier is contained in compound, e.g. paper tray, eviction notice, oil pan
- 6) Destination: modifier is destination of compound, e.g. game bus, exit route, entrance stairs
- 7) Equative: modifier is also head, e.g. composer arranger, player coach
- 8) Instrument: modifier is used in compound, e.g. electron microscope, diesel engine, laser printer
- 9) Located: modifier is located at compound, e.g. building site, home town, solar system
- 10) Location: modifier is the location of compound, e.g. lab printer, internal combustion, desert storm
- 11) Material: compound is made of modifier, e.g. carbon deposit, gingerbread man, water vapour
- 12) Object: modifier is acted on by compound, e.g. engine repair, horse doctor
- 13) Possessor: modifier has compound, e.g. national debt, student loan, company car
- 14) Product: modifier is a product of compound, e.g. automobile factory, light bulb, colour printer
- 15) Property: compound is modifier, e.g. blue car, big house, fast computer
- 16) Purpose: compound is meant for modifier, e.g. concert hall, soup pot, grinding abrasive
- 17) Result: modifier is a result of compound, e.g. storm cloud, cold virus, death penalty
- 18) Source: modifier is the source of compound, e.g. foreign capital, chest pain, north wind

- 19) Time: modifier is the time of compound, e.g. winter semester, late supper, morning class
 20) Topic: compound is concerned with modifier, e.g. computer expert, safety standard, horror novel

Packard (2004) finds that when complex noun lexical items take the form of $[N_1 N_2]_N$, the relation between the N_1 and N_2 can be a hierarchical ‘modifier–modified’ relation, or it can be a non-hierarchical, ‘parallel’ relation. (P85)

When the relationship is hierarchical, the type of relationship between the modifying and modified elements is nearly without limit, constrained only by pragmatic, ‘real world’ considerations (Li & Thompson 1989).

The examples below are some modification relations between N_1 and N_2 .

Packard (2004): P86-88

N_1 is the place where N_2 operates or is located:

眼鏡	<i>yǎnjìng</i>	eye-lens	‘glasses’
海灘	<i>hǎitān</i>	sea-beach	‘beach’
陸軍	<i>lùjūn</i>	land-troops	‘army’
手錶	<i>shǒubiǎo</i>	hand-watch	‘wristwatch’

N_2 indicates a medical condition of N_1 :

肺炎	<i>fēiyán</i>	lung-inflammation	‘pneumonia’
皮疹	<i>pízhěn</i>	skin-rash	‘rash’
心病	<i>xīnbìng</i>	heart-disease	‘mental disorder’
胃癌	<i>wèiái</i>	stomach-cancer	‘stomach cancer’

N_1 depicts the form of N_2 :

砂糖	<i>shātáng</i>	sand-sugar	‘granulated sugar’
片劑	<i>piànjì</i>	tablet-medicine	‘medicine pill’
塊煤	<i>kuàiméi</i>	chunk-coal	‘lump coal’
磚茶	<i>zhuānchá</i>	brick-tea	‘brick tea’

N_2 depicts the form of N_1

雪花	<i>xuěhuā</i>	snow-flower	‘snowflake’
冰塊	<i>bīngkuài</i>	ice-piece	‘ice cube’

藥粉	<i>yàofěn</i>	medicine-powder	‘medicine powder’
茶磚	<i>cházhuān</i>	tea-brick	‘brick tea’
N ₂ is used for N ₁			
菜刀	<i>càidāo</i>	vegetable-knife	‘cleaver’
機場	<i>jīchǎng</i>	machine-field	‘airport’
煙斗	<i>yāndòu</i>	tobacco-cup	‘pipe’
球拍	<i>qiúpāi</i>	ball-paddle	‘racket’
N ₁ is the habitat of N ₂			
水鳥	<i>shuǐniǎo</i>	water-bird	‘aquatic bird’
壁虎	<i>bìhǔ</i>	wall-tiger	‘gecko’
海牛	<i>hǎiniú</i>	sea-cow	‘manatee’
松鼠	<i>sōngshǔ</i>	pine-rat	‘squirrel’
N ₂ is caused by N ₁ :			
水災	<i>shuǐzāi</i>	water-disaster	‘flood’
淚痕	<i>lèihén</i>	tear-stain	‘tear stains’
車禍	<i>chēhuò</i>	vehicle-misfortune	‘vehicle accident’
血印	<i>xuèyìn</i>	blood-stamp	‘blood stain’
N ₂ is a container for N ₁ :			
茶杯	<i>chábéi</i>	tea-cup	‘teacup’
飯碗	<i>fànwǎn</i>	rice-bowl	‘rice bowl’
酒瓶	<i>jiǔpíng</i>	wine-bottle	‘wine bottle’
書包	<i>shūbāo</i>	book-bag	‘bookbag’
N ₂ is produced by N ₁ :			
雞蛋	<i>jīdàn</i>	chicken-egg	‘(chicken) egg’
牛奶	<i>niúniǎi</i>	cow-milk	‘(cow’s) milk’
蠶絲	<i>cánsī</i>	silkworm-silk	‘silk’
魚卵	<i>yúluǎn</i>	fish-egg	‘roe’
N ₂ is made from or composed of N ₁ :			
皮鞋	<i>píxié</i>	leather-shoe	‘leather shoes’
鐵路	<i>tiělù</i>	iron-road	‘railroad’
豬肉	<i>zhūròu</i>	pig-meat	‘pork’

木材	<i>mùcái</i>	wood-material	‘lumber’
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N₁ is a type or subclass of N₂:

蘭花	<i>lánhuā</i>	orchid-flower	‘orchid’
蘋果	<i>píngguǒ</i>	apple-fruit	‘apple’
心臟	<i>xīnzāng</i>	heart-organ	‘heart’
松樹	<i>sōngshù</i>	pine-tree	‘pine tree’

N₁ is a metaphorical description of N₂:

銀行	<i>yínháng</i>	silver-business	‘bank’
駝鳥	<i>tuóniǎo</i>	camel-bird	‘ostrich’
火車	<i>huǒchē</i>	fire-vehicle	‘train’
柴油	<i>cháiyou</i>	firewood-oil	‘diesel fuel’

N₂ is a source of N₁:

電池	<i>diànchí</i>	electricity-pool	‘battery’
油井	<i>yóujǐng</i>	oil-well	‘oil well’
果園	<i>guǒyuán</i>	fruit-garden	‘orchard’
煤礦	<i>méikuàng</i>	coal-mine	‘coal mine’

N₁ is a source of N₂:

海鹽	<i>hǎiyán</i>	sea-salt	‘sea salt’
地磁	<i>dìcí</i>	earth-magnetism	‘geomagnetism’
河泥	<i>héní</i>	river-mud	‘river silt’
花粉	<i>huāfěn</i>	flower-powder	‘pollen’

N₂ is something that N₁ has or contains:

車條	<i>chētiáo</i>	vehicle-strip	‘wheel spoke’
房頂	<i>fángdǐng</i>	house-top	‘roof’
手掌	<i>shǒuzhǎng</i>	hand-palm	‘palm’
票根	<i>piàogēn</i>	ticket-root	‘ticket stub’

N₁ is something that N₂ has or contains:

名片	<i>míngpiàn</i>	name-strip	‘name card’
斑馬	<i>bānmǎ</i>	stripe-horse	‘zebra’
廁所	<i>cèsuǒ</i>	toilet-place	‘lavatory’
相片	<i>xiàngpiàn</i>	appearance-strip	‘photograph’

Packard (2004) notes that when the $[N_1N_2]_N$ are in a non-hierarchical relation, the relationship between N_1 and N_2 can either be one of synonymy, in which both elements are more or less semantically equivalent to each other and to the gestalt noun they combine to form, or it can be one in which the N_1 and N_2 are semantically disparate items. In the latter case, the meaning of the gestalt noun is usually a superordinate class that includes both N_1 and N_2 . (P88)

The following are examples that show a synonymous relationship between N_1 and N_2 . Both N_1 and N_2 possess meanings that are similar to the gestalt noun they compose.

Packard (2004): P89

盜賊	<i>dào zéi</i>	thief-thief	‘thief’
房屋	<i>fáng wū</i>	house-house	‘house’
歌曲	<i>gē qǔ</i>	song-song	‘song’
皮膚	<i>pí fū</i>	skin-skin	‘skin’
牆壁	<i>qiáng bì</i>	wall-wall	‘wall’
森林	<i>sēn lín</i>	forest-forest	‘forest’
聲音	<i>shēng yīn</i>	sound-sound	‘sound’
眼睛	<i>yǎn jīng</i>	eye-eye	‘eye’
衣裳	<i>yī shang</i>	clothing-clothing	‘clothing’
脂肪	<i>zhī fáng</i>	fat-fat	‘fat’

The following are examples in which the formed gestalt noun refers to a superordinate class to which N_1 and N_2 both belong. Since these gestalt words represent superordinate categories, they are usually more general and abstract than the $[N_1N_2]_N$ examples above. (P89)

Packard 2004: P89

刀槍	<i>dāo qiāng</i>	knife-gun	‘weapons’
燈火	<i>dēng huǒ</i>	light-fire	‘lights’
風水	<i>fēng shuǐ</i>	wind-water	‘geomancy’
街道	<i>jiē dào</i>	street-road	‘neighborhood’
禽獸	<i>qín shòu</i>	bird-quadruped	‘animals’

山水	<i>shānshuǐ</i>	mountain-water	‘scenery’
書刊	<i>shūkān</i>	book-periodical	‘reading materials’
水土	<i>shuǐtǔ</i>	water-earth	‘natural environment’
圖畫	<i>túhuà</i>	chart-picture	‘picture’
土木	<i>tǔmù</i>	earth-wood	‘building, construction’

I argue that there are some problems with Packard (2004)’s research. First, some semantic relations are controversial. For example, 海灘 *hǎitān* sea-beach ‘beach’ is treated as ‘N₁ is the place where N₂ operates or is located’. Actually, N₂ is not located at N₁, but beside N₁.

Compounds like 果園 *guǒyuán* fruit-garden ‘orchard’ and 煤礦 *méikuàng* coal-mine ‘coal mine’ are treated as *N₂ is a source of N₁*. Actually, in 果園 *guǒyuán* fruit-garden ‘orchard’, 園 *yuán* ‘garden’ is not the source of 果 *guǒ* ‘fruit’, but its location. Similarly, in 煤礦 *méikuàng* coal-mine ‘coal mine’, 礦 *kuàng* ‘mine’ is the location of 煤 *méi* ‘coal’ rather than its source.

Compounds like 河泥 *héní* river-mud ‘river silt’ and 花粉 *huāfěn* flower-powder ‘pollen’ are taken as *N₁ is a source of N₂*. In fact, N₁ is the location of N₂, not a source.

Secondly, there is some redundancy in listing those relations. The following relations can be merged, as shown in Table 88.

Table 88. Merging Semantic Relations of (Packard 2004)

Semantic relations in Packard (2004)	Merge
N ₁ depicts the form of N ₂	Form-entity relation
N ₂ depicts the form of N ₁	
N ₁ is the habitat of N ₂	Location-entity relation
N ₂ is a container for N ₁	
N ₂ is a source of N ₁	
N ₁ is a source of N ₂	
N ₂ is something that N ₁ has or contains	Part-whole relation
N ₁ is something that N ₂ has or contains	

Liu and Liu (2004) classify NN into five categories:

- 1) Conjunctive NN: a composed concept made up of N₁ and N₂ and the

compound can be interpreted as either N1 or N2. For example, a pet bird is a bird that is also a pet.

- 2) Relational NN: The concepts of components constitute a complementary relationship around a theme. For example, an apartment dog is a small dog that lives in city apartments.
- 3) Property-Mapping NN: mapping the features of the modifier N to the head N and produce a new synthetic concept. For example, in ‘elephant fish’, elephant has a salient feature big, which is mapped onto fish and yielding the concept ‘big fish’.
- 4) Hybrid NN: the synthetic concept is a mixture of the two constituents. For instance, a zebra horse is an animal that is a cross between a zebra and a horse.
- 5) Blended NN: the synthetic concept is temporary newly generated which has nothing to do with the two constituents. For example, ‘a cover girl’ originally means an attractive young lady whose photograph appears on a magazine cover. Then it refers to a kind of cosmetics.

Liu and Liu (2004)’s method is about how the parts of a compound contribute to its overall meaning. However, the five categories are not enough to capture all possibilities. For example, 水果刀 *shuǐguǒdāo* ‘fruit knife’ is a modifier-head type compound, which does not fit any of their five categories.

To sum up, the method of finding semantic relations between the two nouns in NN compounds helps us better understand the diversity of the two nouns. However, this method has some common problems. First, as some scholars have realized, it is far from sufficient to identify all possible relations. Second, some of the proposed relations are not accurate.

7.1.3 The Generative Lexicon Method

Regarding the inherent problems of using the semantic relation method, some studies use GL to analyze the relation between N1 and N2 of NN compounds. Johnston and Busa (1996) argue for a compositional treatment of compound constructions, which limits the need for listing of compounds in the lexicon. In their approach, the qualia structure enables compositional interpretation of the modifying noun and head noun. They analyzed the telic, agentive, constitutive, and telic event modification to nouns. Telic Qualia Modification: in the compound ‘bread knife’, the N2 knife is used to cut bread, so N1 has telic modification

to N2. Agentive Qualia Modification: in the compound ‘lemon juice’, the N2 juice is made from the N1 lemon, so N1 has agentive modification to N2. Constitutive Qualia Modification: in the compound ‘glass door’, the door is made of glass, so the N1 has constitutive modification to N2. Telic Event Modifiers: in the compound ‘hunting rifle’, the N2 rifle has the function of being used for hunting, so the N1 is a telic event modifier of N2.

Lee et al. (2010) do a cross-language survey on the qualia structure of noun-noun compounds found in Chinese, German, Spanish, Japanese and Italian. They use GL to display that qualia structure enables compositional interpretation within the compound. Telic Qualia Modification: in the compound 菜刀 *cài-dāo* vegetable-knife ‘kitchen knife’, the N2 刀 *dāo* ‘knife’ is used to cut vegetables, so the N1 菜 *cài* ‘vegetable’ has telic modification to N2. Agentive Qualia Modification: in the compound 雞蛋 *jī-dàn* hen-egg ‘(hen's) egg’, the N2 蛋 *dàn* ‘egg’ is laid by the N1 雞 *jī* ‘hen’, so the N1 has an agentive modification to the N2. Constitutive Qualia Modification: in the compound 皮鞋 *pí-xié* leather-shoe ‘leather shoes’, the N2 鞋 *xié* ‘shoe’ is made of the N1 皮 *pí* ‘leather’, so the N1 has a constitutive modification to the N2. Formal Qualia: in the compound 蘭花 *lán-huā* orchid-flower ‘orchid’, the N2 花 *huā* ‘flower’ is a hypernym of the N1 蘭 *lán* ‘orchid’, so the N2 is a formal role of the N1.

Qi (2012) investigates the internal structure of modifier-head type NN compounds in Chinese. The combinatorial possibility of NN compounds which contain a single predicate depends on the qualia structure of morphemes. He discovers three types of semantic relation models between the single morphemes (N): 1) [appearance], 2) [patient-agent] and 3) [cause-effect]. The combinatorial possibility of NN compounds that contain two predicates also depends on the qualia structure of the morphemes. In such cases, there is only one type of semantic relation model, that is, [object-tool] semantic relation. These types of semantic relation models actually represent the generative model of NN compounds.

7.1.4 Summary

In this section, I have reviewed the research on NN compounds from three perspectives: the generative method, the semantic relation method and the GL method. There are a huge number of studies on this topic, so what is included here is not exhaustive, but some representative works.

There are some problems with previous research. The research using the generative method and the semantic relation method is empirical and cannot exhaustively include all relations.

It shows the necessity of proposing a more general mechanism that can predicate different NN relations. The research using the GL method gives a compositional treatment to capture the N1 and N2 relations, but it only concerns the situation when N1 has qualia modification to N2. However, there are some inadequacies in existing research. First, the mechanism at work when N1 has qualia modification to N2 has not yet been studied. Second, the cases when N2 functions over a qualia role of N1 have not been studied. Third, no study has been carried out when this compound refers to an event. Fourth, there is no generalization for such kind of NN compounds.

7.2 Literature Review on Compositionality of GL

Primitives-based approach to word meaning has met up with much difficulty in explaining all well-formed expressions in languages. Instead, GL provides richer compositional representation through generative devices (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). Under a tripartite system of domain of individuals (e.g. natural types, artifactual types and complex types), GL establishes three mechanisms at work when a predicate selects an argument.

(i) Pure Selection (Type Matching): the type a function requires is directly satisfied by the argument;

(ii) Accommodation: the type a function requires is inherited by the argument;

(iii) Type Coercion: the type a function requires is imposed on the argument type. This is accomplished by either:

(a) Exploitation: taking a part of the argument's type to satisfy the function;

(b) Introduction: wrapping the argument with the type required by the function.

These operations have been applied to test the selection of a verb to an argument. In the following sections, I examine their usage in NN compounds that at least one noun is an event noun.

7.3 Compositionality of NN Compounds: a case Study on [N1+Artifactual-Type Event Nouns]

The internal structure of NN compounds has been widely investigated as reviewed in *Section 7.1*. In recent years, some research uses GL to analyze the relation between N1 and N2 (Johnston & Busa 1996, Lee et al. 2010, Qi 2012). Though some noticed the qualia

modification phenomenon between N1 and N2, previous studies neglected the compositional mechanisms at work.

Following Pustejovsky (2001b, 2006), and Pustejovsky and Jezek (2008), Chapter 4 establishes a type system for event nouns, including natural types, artifactual types, natural complex types and artifactual complex types (Wang & Huang 2012f). This section focuses on *artifactual-type event nouns* to explore the compositional mechanisms in NN compounds. It extends these mechanisms' usage in two ways: (a) the eventive nominal head's selection of a nominal modifier, and (b) their use in the eventive domain, through the case study on N1+比賽 *bǐsài* 'competition'.

The following sections use [N1+比賽 *bǐsài* 'competition'] as a case study to analyse the compositional mechanisms of the NN compound: [N1 + Artifactual-Type Event Noun].

7.3.1 Interpreting 比賽 *bǐsài* 'competition'

A 比賽 *bǐsài* 'competition' is an activity in which one try to win against the opponents. Its semantic type system is depicted in (1).

$$(1) \left[\begin{array}{l} \text{比賽 } bǐsài \text{ 'competition'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = y: \text{individual} \\ \text{D-ARG2} = y: \text{individual} \\ \text{D-ARG3} = z: \text{organizer} \\ \text{D-ARG4} = r: \text{rule} \end{array} \right] \\ \text{EVENTSTR} = [E_1 = e_1: \text{process}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = a: \text{activity} \\ \text{CONSTITUTIVE} = \{x, y, z, r\} \\ \text{TELIC} = [e_1 \text{ satisfies } r \rightarrow (x \vee y) \text{ win}] \\ \text{AGENTIVE} = \text{organize } (z, a) \end{array} \right] \end{array} \right]$$

A competition usually sets rules so that the participant who has the best performance will be the winner. Therefore, the purpose of 比賽 *bǐsài* 'competition', which is the telic role, is to win with some rules satisfied during the competing process e_1 .

In an N1+比賽 *bǐsài* 'competition' compound, N1 is the item that people are competing against each other. N1 can be an event or entity. A competition could be either on the process of an event that participants involve in or the resultative product produced during an event. *Section 2.5.2.1* classifies nouns into nominals (process nominals, result nominals and instant nominals), pure event nouns, and entity nouns (Wang & Huang 2012c, 2013e). Following this classification, the following will examine which kinds of nouns fit the N1 and

explain the rules of being a winner in difference competitions.

If the competition is about the process, then the competition is based on the behavior of participants during the event. Three kinds of N1 fit this case: 1) pure event nouns: 體操 *tǐcāo* ‘gymnastics’, 馬術 *mǎshù* ‘horsemanship’, 雜技 *zájì* ‘acrobatics’, 圈操 *quāncāo* ‘hoop gymnastics’; 2) event nominals: 舉重 *jǔzhòng* ‘weightlifting’, 賽艇 *sàitǐng* ‘boat racing’, 攀巖 *pānyán* ‘rock climbing’, 調酒 *tiàojiǔ* ‘wine-mixing’; 3) entities: 龍舟 *lóngzhōu* ‘dragon boat’, 帆船 *fānchuán* ‘yacht’²⁷.

In the following, I list the rule of winning a competition for one example from the three kinds of N1. To win a 體操比賽 *tǐcāo bǐsài* ‘gymnastics competition’, one should gain the maximal score according to the rules during the competition. To win a 舉重比賽 *jǔzhòng bǐsài* ‘weightlifting competition’, one should lift the maximal weight among all the participants. To be a winner in a 龍舟比賽 *lóngzhōu bǐsài* ‘Dragon boat competition’, one should spend the minimum time for paddling within a fixed distance between all the participants.

If the competition is about the final product, then the rule to decide the winners will be based on the quality of the product. Two kinds of N1 fit such as a case: 1) event nominals: 攝影 *shèyǐng* ‘photography’, 調酒 *tiàojiǔ* ‘wine mixing’; 2) entities: 書畫 *shūhuà* ‘painting and calligraphy’, 航模 *hángmó* ‘model airplane’.

The following lists the rule of winning a competition for one example from the two kinds of N1. To win a 攝影比賽 *shèyǐng bǐsài* ‘photography competition’, one should provide a picture with the best quality. In a 書畫比賽 *shūhuà bǐsài* ‘painting competition’, the best drawing is based on the quality.

Summarizing, this section has illustrated the semantic type system of 比賽 *bǐsài* ‘competition’. A competition can be either on the process or result. If the competition is about the process, N1 can be a pure event noun, an event nominal or an entity. If the competition is about the result, N1 can be an event nominal or an entity (coerced to be an event). The rules for winning some competitions are listed. To achieve the goal of a competition (the telic role), usually to win, one should satisfy some rules.

²⁷龍舟 *lóngzhōu* ‘dragon boat’ and 帆船 *fānchuán* ‘yacht’ can be treated as either an entity or activity in themselves. Here we treat them as an entity which is coerced to be an event through qualia exploitation. This is discussed in Section 7.3.3 in more details.

7.3.2 Pure Selection and Accommodation

When N1 is an event nominal, the head 比賽 *bǐsài* ‘competition’ selects N1 through pure selection/Accommodation. Because the verbal morpheme in the nominal N1 already specifies what event it is. Examples are shown in Table 89 and Table 90.

Table 89. VO Type Event Nominals in Chinese Gigaword Corpus

Words	Pinyin	English	Frequency	Saliency
攝影	<i>shèyǐng</i>	photography	1074	51.01
舉重	<i>jǔzhòng</i>	weightlifting	957	48.31
賽艇	<i>sàitǐng</i>	boat racing	314	47.85
攀巖	<i>pānyán</i>	rock climbing	80	31.35
調酒	<i>tiàojiǔ</i>	wine mixing	13	20.26

In Table 89, within the N1 攝影 *shèyǐng* ‘photography’, the verbal morpheme 攝 *shè* ‘take a photograph of’ is embedded in the photographing action.

Table 90. Adj-V Type Event Nominals in Chinese Gigaword Corpus

Words	Pinyin	English	Frequency	Saliency
雙打	<i>shuāngdǎ</i>	doubles	1775	62.01
單打	<i>dāndǎ</i>	singles	1799	59.5

Similarly, in Table 90, the verbal morpheme 打 *dǎ* ‘play’ in both 雙打 *shuāngdǎ* double-play ‘doubles’ and 單打 *dāndǎ* single-play ‘singles’ already specify the playing event.

(2) shows the derivation when 比賽 *bǐsài* ‘competition’ selects the event nominal 攝影 *shèyǐng* ‘photography’.

- (2)
- a. 比賽 *bǐsài* ‘competition’ is of type event \rightarrow t;
 - b. 攝影 *shèyǐng* ‘photography’ is of type artifactual event;
 - c. Accommodation Subtyping (AS) applies, artifactual event \sqsubseteq event:
 \Rightarrow 攝影 *shèyǐng* ‘photography’ is of type event;
 - d. Function Application (Type Matching) applies:
 \Rightarrow *bǐsài* (*shèyǐng*)

When 比賽 *bǐsài* ‘competition’ other event nominals, there is a similar derivation of pure selection/accommodation.

7.3.3 Type Coercion through Qualia Exploitation of N1

7.3.3.1 N1 as an Entity

If N1 is an entity, there will be two possibilities: 1) the competition is dependent on the process of a potential event that is related to the entity; 2) the competition is dependent on the final product N1, where a potential event that is an agentive role of the entity is also involved. In both cases, we would like to say that there is type coercion from the entity to their potential events.

7.3.3.1.1 Type Coercion with Ordered Events (Type Coercion with Event Combination)

Pustejovsky (2000) finds that the qualia provide three relations: <, o and >. According to temporal properties, the partial orderings of qualia roles are: Agentive < Formal, Constitutive o Formal, and Formal < Telic. In N1+比賽 *bǐsài* ‘competition’, N1 can involve in more than one event. Type coercion of N1 includes the combination of ordered events from different qualia roles. When N1 is an entity, it sometimes requires the pre-existence of a creation event, which comes from the agentive role of N1. The entity is produced through the creation event. 比賽 *bǐsài* ‘competition’ is to compare the quality of different products. The product quality can be decided according to either the formal or telic role.

In an art competition, what is being compared is the design, shape, color, etc., which are the formal role of the objects. These forms exist after the creation of the objects (the agentive role). Table 91 shows some examples.

Table 91. Examples of Type coercion with Ordered Events in Chinese Gigaword Corpus:

Agentive < Formal

Words	Pinyin	English	Frequency	Saliency	Qualia Roles
冰雕	<i>bīngdiāo</i>	ice sculpture	73	35.35	agentive (做 <i>zuò</i> ‘make’) +formal
沙雕	<i>shādiāo</i>	sand sculpture	33	27.96	agentive (做 <i>zuò</i> ‘make’) +formal
花燈	<i>huādēng</i>	lantern	59	26.56	agentive (做 <i>zuò</i> ‘make’) +formal
書畫	<i>shūhuà</i>	painting and calligraphy	79	19.99	agentive (創作 <i>chuàngzuò</i> ‘create’) +formal

In Table 91, 冰雕比賽 *bīngdiāo bǐsài* ‘ice sculpture competition’ involves an event of making ice sculpture (the agentive role), and then the quality of 冰雕 *bīngdiāo* ‘ice sculpture’ (the formal role) is compared to determine the winner.

In a competition in an applied field, what is compared is the function of the objects, which is the telic role. The function exists after the making of the objects. Examples are as shown in Table 92.

Table 92. Examples of Type Coercion with Ordered Events in Chinese Gigaword Corpus:
Agentive < Telic

Words	Pinyin	English	Frequency	Saliency	Qualia Roles
航模	<i>hángmó</i>	model airplane	33	28.38	agentive (做 <i>zuò</i> ‘make’) +telic
模型	<i>móxíng</i>	model	111	22.48	agentive (做 <i>zuò</i> ‘make’) +telic

For example, in Table 92, 航模比賽 *hángmó bǐsài* ‘model airplane competition’ first requires the creation of a model airplane (the agentive role), and then the function of different models (the telic role) is compared.

7.3.3.1.2 Type Coercion with one Individual Event

In 水餃比賽 *shuǐjiǎo bǐsài* ‘dumpling competition’, 水餃 *shuǐjiǎo* ‘dumpling’ can be coerced to three events, eating, making, or tasting through the telic role, agentive role, and formal role respectively, as illustrated below.

$$(3) \left[\begin{array}{l} \text{水餃 } shuǐjiǎo \text{ ‘dumpling’} \\ \text{EVENTSTR} = \left[\begin{array}{l} E_1 = e_1: \text{process} \\ E_2 = e_2: \text{process} \\ D-E_3 = e_3: \text{state} \end{array} \right] \\ \text{ARGSTR} = \left[\begin{array}{l} ARG1 = x: \text{food} \\ D-ARG1 = y: \text{individual} \\ D-ARG2 = z: \text{individual} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} AGENTIVE = \text{make } (e_1, y, x) \\ TELIC = \text{eat } (e_2, z, x) \\ FORMAL = \text{taste } (e_3, x) \end{array} \right] \end{array} \right]$$

水餃比賽 *shuǐjiǎo bǐsài* ‘dumpling competition’ has three readings through type coercion of dumplings’ different qualia roles: 1) through the telic role: x wins if x eats most dumplings; 2) through the agentive role: x wins if x makes most dumplings; 3) through the formal role: x wins if x’s dumplings tastes best. These readings indicate that the context for 水餃比賽

shuǐjiǎo bǐsài ‘dumpling competition’ is that if you meet some rules, then you win. This can be depicted below:

Telic role for 水餃比賽 *shuǐjiǎo bǐsài* ‘dumpling competition’: $R \rightarrow [\phi]$ win

R: rules

For 水餃比賽 *shuǐjiǎo bǐsài* ‘dumpling competition’, $[\phi]$ is competing by eating or making or tasting. That is, 水餃 *shuǐjiǎo* ‘dumpling’ can be coerced to any of the three events. Reading 1) and 2) have only one event involved respectively, while reading 3) comprises of an agentive event and the following formal role related event.

7.3.3.2 N1 as a Pure Event Noun

Similar to N1 as an entity in *Section 7.3.3.1 N1 as an Entity*, when N1 is a pure event noun, coercion is still at work. That is because just like an entity, an artifactual event comes into being (the agentive role) for some purpose (the telic role). Different from the diversity of N1-as-an-entity coercion (including ordered events or an individual event), in N1+比賽 *bǐsài* ‘competition’, N1-as-a-pure event noun coercion normally only has one coerced event through the agentive role.

For example, in 體操比賽 *tǐcāo bǐsài* ‘gymnastics competition’, the coerced event ‘perform gymnastics’ is through exploiting the agentive role of 體操 *tǐcāo* ‘gymnastics’. During a gymnastics competition, the existence of the gymnastics is the same as the process of the performance. Other examples of such N1 include 馬術 *mǎshù* ‘horsemanship’, 雜技 *zájì* ‘acrobatics’, and 圈操 *quāncāo* ‘hoop gymnastics’.

7.3.4 Summary

Summarizing, pure selection/accommodation and type coercion have been used in verbal selection of nouns in the entity domain (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). *Section 7.3.2 Pure Selection* and *Section 7.3.3 Type Coercion through Qualia Exploitation of N1* have extended their usage in two ways: 1) nominal head selection of a nominal modifier, and 2) their use in the eventive domain, through the case study on N1+比賽 *bǐsài* ‘competition’. The results are shown in Table 93.

Table 93. Interpreting 比賽 *bǐsài* ‘competition’

N1+ 比賽 <i>bǐsài</i> ‘competition’	比賽 <i>bǐsài</i> ‘competition’: Process or Result	Compositional Mechanism: Pure Selection/Accommodation or Type Coercion
Pure Event Noun+ 比賽 <i>bǐsài</i> ‘competition’	Process	Type Coercion
Event Nominal+ 比賽 <i>bǐsài</i> ‘competition’	Process or Result	Pure Selection/Accommodation
Entity+ 比賽 <i>bǐsài</i> ‘competition’	Process or Result	Type Coercion/Accommodation

Table 93 shows that a competition can be either about the process or the result. For a process competition, N1 can be a pure event noun, an event nominal or an entity. For a result competition, N1 can be an event nominal or an entity. When N1 is an event nominal, pure selection/accommodation is usually at work, while when N1 is a pure event noun or an entity, type coercion happens (Wang et al. 2012).

7.4 Compositionality of NN Compounds: a Case Study on [Artifactual-Type Event Nouns+N2]

Section 7.3 has examined the N-N construction when N2 is an artifactual-type event noun. This section will explore the cases when N1 is an artifactual-type event noun.

Different from the diverse of compositional mechanisms when the head N2 is an artifactual-type event noun, when the modifier N1 is an artifactual-type event noun, the head N2 usually selects it through pure selection/accommodation. I illustrate this point through the case study on [婚禮 *hūnlǐ* ‘wedding’ +N2]. The qualia structure of 婚禮 *hūnlǐ* ‘wedding’ is shown in (4).

$$(4) \left[\begin{array}{l} \text{婚禮 } hūnlǐ \text{ ‘wedding’} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = x: \text{ bridegroom} \\ \text{D-ARG2} = y: \text{ bride} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = z: \text{ ceremony} \\ \text{TELIC} = \text{ marry } (x, y) \\ \text{AGENTIVE} = \text{ hold } (x \wedge y, z) \end{array} \right] \end{array} \right]$$

When N1 is an artifactual-type event noun, N2 is either an entity noun or an event noun.

When the event noun N1 婚禮 *hūnlǐ* ‘wedding’ is a modifier, it is usually selected by the head through pure selection/accommodation.

When the head N2 is an entity noun, the modifier N1 婚禮 *hūnlǐ* ‘wedding’ has qualia modification to N2. For example, in 婚禮相片 *hūnlǐ xiàngpiàn* ‘wedding photo’, 相片 *xiàngpiàn* ‘photo’ is originated from the wedding. Hence the modifier 婚禮 *hūnlǐ* ‘wedding’ has agentive modification to the head 相片 *xiàngpiàn* ‘photo’. In 婚禮請柬 *hūnlǐ qǐngjiǎn* ‘wedding invitation’, the 請柬 *qǐngjiǎn* ‘invitation’ is used to attend the wedding, so 婚禮 *hūnlǐ* ‘wedding’ has telic modification to the head 請柬 *qǐngjiǎn* ‘invitation’. Similar examples are 婚禮大廳 *hūnlǐ dàtīng* ‘wedding hall’, 婚禮蛋糕 *hūnlǐ dàngāo* ‘wedding cake’, and 婚禮服裝 *hūnlǐ fúzhuāng* ‘wedding apparel’.

When the head N2 is an event noun, the modifier N1 婚禮 *hūnlǐ* ‘wedding’ also has qualia modification to N2. For example, in 婚禮音樂 *hūnlǐ yīnyuè* ‘wedding music’, 音樂 *yīnyuè* ‘music’ is used for the wedding, so the modifier 婚禮 *hūnlǐ* ‘wedding’ has telic modification to this construction. Similar examples are 婚禮進行曲 *hūnlǐ jìnxíngqǔ* ‘wedding march’, 婚禮慶典 *hūnlǐ qìngdiǎn* ‘wedding celebration’, 婚禮派對 *hūnlǐ pàiduì* ‘wedding party’, 婚禮策劃 *hūnlǐ cèhuà* ‘wedding planning’, 婚禮設計 *hūnlǐ shèjì* ‘wedding design’, and 婚禮晚宴 *hūnlǐ wǎnyàn* ‘wedding dinner’.

7.5 Sub-Composition

In the study of NN compounds based on GL, the cases when N1 has qualia modification to N2 have been studied when this compound refers to an entity (Johnston & Busa 1996, Lee et al. 2010, Qi 2012). However, there are some inadequacies in existing research. First, the mechanism at work when N1 has qualia modification to N2 has not yet been studied. Second, the cases when N2 functions over a qualia role of N1 have not been studied. Third, no study has been carried out when this compound refers to an event. Fourth, there is no generalization for such kind of NN compounds. To fill in the gap, this study proposes the compositional mechanism *sub-composition*.

I define the qualia role of a word as a function. Pustejovsky (1995) analyses how lexical items encode semantic information in the qualia structure. This structure has four roles, each with some values. 1) The constitutive role is about the relation between an object and its constituents or parts. Its role values include material, weight, parts and component elements. 2) The formal role can distinguish an object within a larger domain. Orientation, magnitude,

shape, dimensionality, color, and position are its role values. 3) The telic role is about the purpose and function of the object. 4) The agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, and causal chain.

I treat the four qualia roles as the four functions of a word:

f_1 : FORMAL, abbreviated as Q_F

f_2 : CONSTITUTIVE, abbreviated as Q_C

f_3 : TELIC, abbreviated as Q_T

f_4 : AGENTIVE, abbreviated as Q_A

In a sub-compositional NN compound, either N1 or N2 has some qualia in QS (N1) or QS (N2), which is the argument to N2 or N1 respectively. The following section examines both Functor-Argument Type and Argument-Function Type through exploring eventive NN compounds when N2 is an artifactual type event noun. That is, the construction [N1+Artifactual-Type Event Noun].

7.5.1 The Functor-Argument Type

In the construction $[\alpha\beta]$, if α subselects over β , then there is some quale in QS (β) that is the argument to α through function application and resulting composition. That is, $[\alpha\beta] = \alpha[QS(\beta)]$. NN compounds of this type can be illustrated in (5).

(5)

$$\begin{array}{ccc}
 \begin{array}{c} \text{N1} \\ \left(\begin{array}{c} \cdot \\ \cdot \\ \cdot \end{array} \right) \\ \text{QS}_i \\ \text{Functor} \end{array} & \begin{array}{c} \text{N2} \\ \left(\begin{array}{c} \\ x \\ \end{array} \right) \\ \text{Argument} \end{array} & \Rightarrow [[\text{N1N2}]]: \begin{array}{c} \left(\begin{array}{c} \cdot \\ \cdot \\ \cdot \end{array} \right) \\ \text{N1 [QS (N2)]} \end{array}
 \end{array}$$

In the functor-argument type, N1 has qualia modification to N2. The four qualia roles function on N2: $Q_F(N2)$, $Q_C(N2)$, $Q_T(N2)$, and $Q_A(N2)$, which are the arguments to N1. They are shown from (I) to (IV) in detail.

(I) $[\text{N1N2}] = \text{N1}[Q_F(N2)]$

泰式拳擊 *tàishì quánjí* ‘Thai-style boxing’

泰式拳擊 *tàishì quánjí* ‘Thai-style boxing’ = Tai-Style [Q_F(Boxing)]

$\lambda x\exists y$ [boxing (x) \wedge Tai-style(y) \wedge a style of (y, x)]

The semantics of this compound is presented in (6). A style is a formal role, so the modifier N1 泰式 *tàishì* ‘Thai-style’ is a formal role of the head noun N2 拳擊 *quánjí* ‘boxing’ in the compound 泰式拳擊 *tàishì quánjí* ‘Thai-style boxing’. That is to say, N1 has formal modification to N2.

$$(6) \left[\begin{array}{l} \text{泰式拳擊 } \textit{t\`aish\`i qu\`anji} \text{ ‘Thai-style boxing’} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{ sport} \\ \text{D-ARG1} = z: \text{ human} \\ \text{D-ARG2} = r: \text{ human} \\ \text{D-ARG2} = s: \text{ human} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \left[\begin{array}{l} \text{formal_quale1} = \text{styp}e (y: \text{ Thai-style}) \\ \text{formal_quale2} = x \end{array} \right] \\ \text{TELIC} = \text{compete_with}(z, r) \\ \text{AGENTIVE} = \text{invent}(s, x) \end{array} \right] \end{array} \right]$$

(II) [N1N2] = N1[Q_C (N2)]

闖關遊戲 *chuǎngguān yóuxì* ‘crashing-through-barrier game’

闖關遊戲 *chuǎngguān yóuxì* ‘crashing-through-barrier game’ = Crashing-through-Barriers [Q_C(Competition)]

$\lambda x\exists y$ [game (x) \wedge crashing-through-barriers (y) \wedge subevent-of (y, x)]

A 遊戲 *yóuxì* ‘game’ is an amusement that is composed of some subevents, as shown in (7). The modifier 闖關 *chuǎngguān* ‘crashing through a barrier’ relates to the subevents of the head noun 遊戲 *yóuxì* ‘game’, so it involves constitutive quale modification. The meaning of this compound is given in (8).

$$(7) \left[\begin{array}{l} \text{遊戲 } \textit{y\`oux\`i} \text{ ‘game’} \\ \text{EVENTSTR} = [E_1 = e_1: \text{process} \{ \text{subevent1, subevent2, } \dots \}] \\ \text{QUALIA} = [\text{CONSTITUTIVE} = e_1] \end{array} \right]$$

$$(8) \left[\begin{array}{l} \text{闖關遊戲 } chuǎngguān yóuxì \text{ 'crashing-through-barrier game'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{amusement} \\ \text{D-ARG1} = z: \text{human} \\ \text{D-ARG2} = r: \text{human} \end{array} \right] \\ \text{EVENTSTR} = \left[\begin{array}{l} \text{E1} = e_1: \text{process} \{e_1, : \text{crashing-through-barrier}, e_2, : \text{subevent2}, \dots \dots \} \\ \text{E2} = e_2: \text{state} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{CONSTITUTIVE} = \{e_1, e_2, z, r\} \\ \text{TELIC} = \text{entertain} (x, z) \\ \text{AGENTIVE} = \text{invent} (r, x) \\ \text{FORMAL} = \diamond \text{pass} (e_2, z, x) \end{array} \right] \end{array} \right]$$

(III) [N1N2] = N1[Q_T (N2)]

慶功儀式 *qìnggōng yíshì* 'celebrating-victory ceremony'

慶功儀式 *qìnggōng yíshì* 'celebrating-victory ceremony' = celebrating-victory [Q_T (ceremony)]

$\lambda x \exists y$ [ceremony (x) \wedge celebrating-a-victory (y) \wedge function_as (x, y)]

The modifier N1 慶功 *qìnggōng* 'celebrating a victory' relates to the purpose of the head noun N2 儀式 *yíshì* 'ceremony', meaning that a ceremony is held to celebrate the victory. 慶功 *qìnggōng* 'celebrating a victory' is encoded by the predicate *function_as* in the telic role, so it is one argument of this relation. The representation of this compound is given in (9).

$$(9) \left[\begin{array}{l} \text{慶功儀式 } qìnggōng yíshì \text{ 'celebrating-victory ceremony'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{ceremony} \\ \text{ARG2} = y: \text{celebration} \end{array} \right] \\ \text{QUALIA} = [\text{TELIC} = \text{function_as} (x, y)] \end{array} \right]$$

(IV) [N1N2] = N1[Q_A (N2)]

職業病 *zhíyè bìng* 'occupation disease'

職業病 *zhíyè bìng* 'occupation disease' = occupation [Q_A (disease)]

$\lambda x \exists y$ [disease (x) \wedge occupation (y) \wedge cause (y, x)]

The modifier N1 職業 *zhíyè* 'occupation' relates to the origin of the head noun N2 病 *bìng* 'disease', meaning that the disease is caused by this occupation. 職業 *zhíyè* 'occupation' is encoded by the predicate *cause* in the agentive role, so the function of 職業 *zhíyè* 'occupation' is to specify one argument of the cause relation. This compound is presented in (10).

$$(10) \left[\begin{array}{l} \text{職業病 } zhíyè \text{ bìng 'occupation disease'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = x: \text{event} \\ \text{ARG2} = y: \text{artifact} \end{array} \right] \\ \text{QUALIA} = [\text{AGENTIVE} = \text{cause_act}(y, x)] \end{array} \right]$$

(I) - (IV) have illustrated the mechanism *sub-composition* in four cases when N1 has qualia modification to N2 in NN compounds.

7.5.2 The Argument-Functor Type

In the construction $[\alpha\beta]$, if β subselects over α , then there is some quale in QS (α) that is the argument to β through function application and resulting composition. That is, $[\alpha\beta] = \beta$ [QS (α)]. A NN compound of this type is demonstrated in (11).

(11)

$$\begin{array}{ccc} \text{N1} & \text{N2} & \\ \left(\begin{array}{c} \cdot \\ x \\ \cdot \end{array} \right) & \left(\begin{array}{c} \cdot \\ \cdot \\ \cdot \end{array} \right) & \Rightarrow [[\text{N1N2}]]: \left(\begin{array}{c} \cdot \\ \cdot \\ \cdot \end{array} \right) \\ \text{QS}_i & & \text{N2}[\text{QS}(\text{N1})] \\ \text{Argument} & \text{Functor} & \end{array}$$

In the argument-functor type, the qualia roles function on N1: Q_F (N1), Q_C (N1), Q_T (N1), and Q_A (N1), which are the arguments to N2. They are shown from (I) to (IV) in detail.

(I) $[\text{N1N2}] = \text{N2} [Q_F (\text{N1})]$

校慶活動 *xiàoqìng huódòng* ‘school celebration activity’

校慶活動 *xiàoqìng huódòng* ‘school celebration activity’ = activity $[Q_F (\text{school-celebration})]$

$\lambda x \exists y [\text{activity}(x) \wedge \text{school-celebration}(y) \wedge \text{a kind of}(y, x)]$

The N1 校慶 *xiàoqìng* ‘school celebration’ is a kind of activity, so it has a formal role ‘activity’, which is the N2 活動 *huódòng* ‘activity’, as shown in (12).

$$(12) \left[\begin{array}{l} \text{校慶 } xiàoqìng \text{ 'school celebration'} \\ \text{QUALIA} = [\text{FORMAL} = \text{activity}] \end{array} \right]$$

(II) [N1N2] = N2 [Q_C (N1)]

運動會開幕式 *yùndònghuì kāimùshì* ‘sports-meet opening-ceremony’

運動會開幕式 *yùndònghuì kāimùshì* ‘sports-meet opening-ceremony’ = opening-ceremony [Q_C (sports-meet)].

$\lambda x \exists y [\text{opening ceremony } (x) \wedge \text{sports meet } (y) \wedge \text{part of } (x, y)]$

運動會 *yùndònghuì* ‘sports meet’ is an event that includes many subevents, such as the opening ceremony, competitions and the closing ceremony, as shown in (13). Therefore in this compound, the head noun N2 開幕式 *kāimùshì* ‘opening ceremony’ is a constituent part of the modifier N1 運動會 *yùndònghuì* ‘sports meet’.

(13)
$$\left[\begin{array}{l} \text{運動會 } yùndònghuì \text{ ‘sports meet’} \\ \text{EVENTSTR} = [E_1 = e_1: \text{process } \{\text{subevent1, subevent2, } \dots \dots \}] \\ \text{QUALIA} = [\text{CONSTITUTIVE} = \{e_1, \text{participants}\}] \end{array} \right]$$

(III) [N1N2] = N2 [Q_T (N1)]

火車運輸 *huǒchē yùنشū* ‘train transportation’

火車運輸 *huǒchē yùنشū* ‘train transportation’ = transportation [Q_T (train)].

$\lambda x \exists y [\text{transportation } (x) \wedge \text{train } (y) \wedge \text{purpose-of } (x, y)]$

火車 *huǒchē* ‘train’ is a vehicle that is usually used for transportation, carrying people and goods from one place to another, as shown in (14). Thus, in the compound 火車運輸 *huǒchē yùنشū* ‘train transportation’, the head N2 運輸 *yùنشū* ‘transportation’ is the telic role of the modifier N1 火車 *huǒchē* ‘train’.

(14)
$$\left[\begin{array}{l} \text{火車 } huǒchē \text{ ‘train’} \\ \text{ARGSTR} = [D\text{-ARG1} = z: \text{entity}] \\ \text{QUALIA} = [\text{FORMAL} = r: \text{vehicle}] \\ \quad \quad \quad [\text{TELIC} = \text{transport } (r, z)] \end{array} \right]$$

(IV) [N1N2] = N2 [Q_A (N1)]

電影拍攝 *diànyǐng pāishè* ‘movie shooting’

電影拍攝 *diànyǐng pāishè* ‘movie shooting’ = shooting [Q_A (movie)]

$\lambda x \exists y [\text{shooting } (x) \wedge \text{movie } (y) \wedge \text{produce } (x, y)]$

電影 *diànyǐng* ‘movie’ is produced by the shooting action, as shown in (15). Hence in the compound 電影拍攝 *diànyǐng pāishè* ‘movie shooting’, the head N2 拍攝 *pāishè* ‘shooting’ is the agentive role of the modifier N1 電影 *diànyǐng* ‘movie’.

$$(15) \left[\begin{array}{l} \text{電影 } diànyǐng \text{ ‘movie’} \\ \text{ARGSTR} = [\text{D-ARG1} = \text{z: human}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \text{r: event} \bullet \text{physobj} \\ \text{AGENTIVE} = \text{shoot (z, r)} \end{array} \right] \end{array} \right]$$

In sum, sections 7.5.1 and 7.5.2 has proposed the compositional mechanism *sub-composition*. The construction N1N2 has two ways of sub-composition: functor-argument and argument-functor.

7.5.3 Sub-Composition, Co-Composition and Selective Binding

This section compares sub-composition with co-Composition and selective binding.

7.5.3.1 Sub-Composition vs Co-Composition

Pustejovsky (1995, 2012) introduces co-composition. Co-Composition of a VP is composed of three operations: (i) the governing verb binds the complement into the argument structure of the verb through conventional function application; (ii) the complement co-specifies the verb; (iii) the composition of qualia structures results in a derived sense of the verb. The derived sense results from qualia unification. The operation of Function Application With Qualia Unification is stated below:

“For two expressions, α , of type $\langle a, b \rangle$, and β , of type a , with qualia structures QS_{α} and QS_{β} , respectively, then, if there is a Quale value shared by α and β , $[QS_{\alpha} \dots [Qi = \gamma]]$ and $[QS_{\beta} \dots [Qi = \gamma]]$, then we can define the qualia unification of QS_{α} and QS_{β} , $QS_{\alpha} \sqcap QS_{\beta}$, as the unique greatest lower bound of these two qualia structures. Further, $\alpha(\beta)$ is of type b with $QS_{\alpha(\beta)} = QS_{\alpha} \sqcap QS_{\beta}$.” (Pustejovsky 1995: P124)

The following part examines the examples in Section 7.5.1 and 7.5.2 using co-composition, and let’s see what kind of results we can arrive at.

Examples in Section 7.5.1

泰式拳擊 *tàishì quánjī* ‘Thai-style boxing’

$$(16) \quad Q_F(\text{Thai-style}) \neq Q_F(\text{boxing})$$

In (16), the formal role of *Thai-style* is style, while the formal role of *boxing* is activity, so their formal roles are not the same. Therefore it is not co-composition.

闖關遊戲 *chuǎngguān yóuxì* ‘crashing-through-barrier game’

(17) $Q_C(\text{crashing-through-barrier}) \subset Q_C(\text{game})$

In (17), the constitutive role of *crashing-through-barrier* is part of the *game*, so it is not co-composition.

慶功儀式 *qìnggōng yíshì* ‘celebrating-victory ceremony’

(18) $Q_T(\text{celebrating-victory}) \subset Q_T(\text{ceremony})$

In (18), the telic role of *celebrating-victory* is part of the *ceremony*, so it is not co-composition.

職業病 *zhíyè bìng* ‘occupation disease’

(19) $Q_A(\text{occupation}) \neq Q_A(\text{disease})$

In (19), the agentive role of *occupation* is social development, while the agentive role of *disease* is some cause, such as tiredness, so their agentive roles are not the same. Therefore it is not co-composition.

Examples in Section 7.5.2

校慶活動 *xiàoqìng huódòng* ‘school-celebration activity’

(20) $Q_F(\text{school-celebration}) \neq Q_F(\text{activity})$

In (20), the formal role of *school-celebration* can be *celebration*, while the formal role of *activity* is an event, so they are not the same.

運動會開幕式 *yùndòng huì kāimùshì* ‘sports-meet opening-ceremony’

(21) $Q_C(\text{sports-meet}) \supset Q_C(\text{opening-ceremony})$

In (21), *opening-ceremony* is part of *sports-meet*, so their constitutive roles are not the same.

火車運輸 *huǒchē yùنشū* ‘train transportation’

(22) $Q_T(\text{train}) \neq Q_T(\text{transportation})$

In (22), the telic role of *train* is to transport, while the telic role of *transportation* is to the

change the location of goods or people, so they are not the same.

電影拍攝 *diànyǐng pāishè* ‘movie shooting’,

(23) $Q_A(\text{movie}) = Q_A(\text{shooting})$

In (23), the agentive role of *movie* is *to shoot*, while the agentive role of *shooting* is *shoot_act*, so they are the same. Therefore this fits co-composition.

In sum, the above analysis shows that it is possible that under some circumstances, some sub-compositional cases are the same as co-composition, such as 電影拍攝 *diànyǐng pāishè* ‘movie shooting’. Thus sometimes co-composition could be a special case of sub-composition.

7.5.3.2 Sub-Composition vs. Selective Binding

In GL, the operation of Selective Binding is stated follows:

“If α is of type $\langle a, a \rangle$, β is of type b , and the qualia structure of β , QS_β , has quale q of type a , then $\alpha\beta$ is of type b , where $[[\alpha\beta]] = \beta \cap \alpha(q_\beta)$.” (Pustejovsky 1995: P129)

An example of selective binding is shown in (24).

(24) She is a beautiful dancer.

Beautiful is able to modify the individual or the dancing event, as shown in (25).

(25)
$$\left[\begin{array}{l} \text{dancer} \\ \text{ARGSTR} = [\text{ARG1} = x: \text{human}] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{dance}(e, x) \end{array} \right] \end{array} \right]$$

Beautiful modifies the dancing event is made available through selective binding.

beautiful dancer = dancer \cap beautiful ($\text{Telic}_{\text{dancer}}$)

This means a dancer who dances beautifully. The following part explores the examples in Section 7.5.1 and 7.5.2 using selective-binding, and let’s see whether we can get the correct meaning.

Examples in Section 7.5.1

泰式拳擊 *tàishì quánjī* ‘Thai-style boxing’

(26) Thai-style boxing = boxing \cap Thai-style (Formal_{boxing})

In (26), *Thai-style* modifies the formal role of *boxing*. That is, it modifies a style. However, in this compound, *Thai-style* is a style in itself and modifies the head noun *boxing*.

闖關遊戲 *chuǎngguān yóuxì* ‘crashing-through-barrier game’

(27) crashing-through-barrier game = game \cap crashing-through-barrier (Constitutive_{game})

In (27), *crashing-through-barrier* modifies the constitutive role of *game*; that is, it modifies the subevents and the participants. However, in this compound, *crashing-through-barrier* is in itself a subevent, not modifying it.

慶功儀式 *qìnggōng yíshì* ‘celebrating-victory ceremony’

(28) celebrating-victory ceremony = ceremony \cap celebrating-victory (Telic_{ceremony})

In (28), *celebrating-victory* modifies the telic role of *ceremony*. That is, it modifies the function. However, in this compound, *celebrating-victory* is one telic role of a *ceremony* in itself, not modifying a telic role.

職業病 *zhíyè bìng* ‘occupation disease’

(29) occupation disease = disease \cap occupation (Agentive_{disease})

In (29), *occupation* modifies the agentive role of *disease*; that is, it modifies the cause. However, in this compound, *occupation* is the cause of the *disease*, it is modifying the head *disease*, rather than the cause.

Examples in Section 7.5.2

(30) school-celebration activity = activity \cap school-celebration (Formal_{activity})

In (30), *school-celebration* modifies the formal role of *activity*. That is, it modifies an event. However, *school-celebration* has a formal role which is activity \subset event.

(31) sports-meet opening-ceremony = opening-ceremony \cap sports-meet
(Constitutive_{opening-ceremony})

In (31), *sports-meet* modifies the constitutive role of *opening-ceremony*. That is, it modifies the subevents of the *ceremony*, such as dancing, delivering a speech. However, *sports-meet* modifies the head noun *opening-ceremony* directly, rather than the subevents.

火車運輸 *huǒchē yùnnshū* ‘train transportation’

(32) train transportation = transportation \cap train (Telic_{transportation})

In (32), *train* modifies the telic role of *transportation*. That is, it modifies changing the location of goods or people. However, in this compound, *train* directly modifies *transportation* rather than its telic role.

電影拍攝 *diànyǐng pāishè* ‘movie shooting’

(33) movie shooting = shooting \cap movie (Agentive_{shooting})

In (33), *movie* modifies the agentive role of *shooting*. That is, it modifies the shooting act. Although it gets the correct meaning: it is a shooting which is a movie shooting, it has redundancy and shows nothing about the internal structure of this compound.

In sum, the above analysis shows that sub-composition is different from selective binding.

7.5.4 Further discussion on Sub-Composition

7.5.4.1 Application to Other Constructions

Sub-composition has been tested on NN compounds when the head noun expresses an artifactual type event in Section 7.5.1 and 7.5.2. It is applicable to other constructions as well.

(i) Eventive NN compounds can not only be artifactual types, but also natural types, natural complex types and artifactual complex types. Sub-composition is applicable to them.

(34) 美聯社稱，白宮表示，預算爭斗在今年晚些時候上演之前，奧巴馬總統將在本週再次發表一系列經濟演講。(web)

Měiliánshe chēng, Báigōng biǎoshì, yùsuàn zhēngdòu zài jīnnián

The Associated Press claim the White House express budget battle at this year

wǎnxiē shíhòu shàngyǎn zhīqián, Àobāmǎ zǒngtǒng jiāng zài běnzhōu zài cì

later time stage before Obama president will in this week again CL

fābiǎo yīxiliè jīngjì yǎnjiǎng.

deliver a series of economy speech

‘The Associated Press claimed that the White House said that before the budget

battle staged later in this year, President Obama will again deliver a series of economy speeches in this week.’

In (34), 演講 *yǎnjiǎng* ‘speech’ is an artifactual complex type, so the NN compound 經濟演講 *jīngjì yǎnjiǎng* ‘economy speech’ is an artifactual complex type. The modifier 經濟 *jīngjì* ‘economy’ is combined with the head 演講 *yǎnjiǎng* ‘speech’ through the functor-argument relation:

[economy speech] = economy [Q_C(speech)]

(ii) Sub-composition is applicable to some non-eventive NN compounds.

排骨湯 *páigǔ tāng* ‘ribs soup’ is a functor-argument type:

[ribs soup] = ribs[Q_A(soup)]

桌子腿 *zhuōzi tuǐ* ‘table leg’ is an argument-functor type:

[table leg] = leg [Q_C(table)]

(iii) Sub-composition is applicable to some [adjective-noun] constructions.

人工雨 *réngōng yǔ* ‘artificial rain’ is a functor-argument type:

[artificial rain] = artificial [Q_A(rain)]

In sum, sub-composition is applicable not only to some eventive NN compounds, but also to some non-eventive NN compounds and adjective-noun constructions. The theorem for sub-composition can be generalized as follows.

In order for α and β to combine as $[\alpha\beta]$, you need to extract some sub-elements from α or β depending on which element the qualia roles function on: QS(β) or QS(α). If $[\alpha\beta]$ has a functor-argument relation, then $[\alpha\beta] = \alpha[\text{QS}(\beta)]$. If $[\alpha\beta]$ has an argument-functor relation, then $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

7.5.4.2 Multiple Interpretations

It is common that some NN compounds are ambiguous. For example, 火車運輸 *huǒchē yùnnshū* ‘train transportation’ may have these readings: 1) trains are used for transportation, and 2) transport trains.

Regarding reading 1), it may have two interpretations: (i) trains are used for transportation; and (ii) trains are a means of transportation. *Section 7.5.2* has dealt with the interpretation (i),

treating it as a Argument-Functor relation. The semantic representation is transportation [Q_T(train)].

Regarding reading 2), the N1 火車 *huǒchē* ‘train’ is are argument of N2 運輸 *yùnsū* ‘transportation’. Thus this is an argument binding case.

7.5.4.3 The Type of the Overall Expression

Consider the relation to subselection in a construction $[\alpha\beta]_\gamma$. In the normal case, β is the projecting term or head of the expression. If α subselects over β , then there is some Q in QS(β) that is the argument to α through function application and resulting composition. But the overall expression is still typed as that type carried by β , type(β), and hence the type of γ will be also (mutatis mutandi) the type(β): i.e., type(γ)=type(β).²⁸

7.5.4.4 Function Application

In a construction $[\alpha\beta]$, sub-composition states the optionality of either α applying functionally to β or β applying functionally to α . This can be treated as underspecified function application. If both α and B are acting functionally (as in a co-composition case), then there is a special instance of unification. The nature of how these applications are directly leads directly to which expression maintains overall superiority in the resulting composition.²⁹

7.5.5 Summary

This section has proposed the compositional mechanism *sub-composition*, which has two types:

The Functor-Argument Type:

In the construction $[\alpha\beta]$, if α subselects over β , then there is some quale in QS (β) that is the argument to α through function application and resulting composition. Therefore $[\alpha\beta] = \alpha[\text{QS}(\beta)]$.

The Argument-Functor Type:

In the construction $[\alpha\beta]$, if β subselects over α , then there is some quale in QS (α) that is the argument to β through function application and resulting composition. Therefore $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

²⁸ Cited from Prof. James Pustejovsky’s report on this thesis.

²⁹ Cited from Prof. James Pustejovsky’s report on this thesis.

The theorem for sub-composition is generalized as follows.

In order for α and β to combine as $[\alpha\beta]$, you need to extract some sub-elements from α or β depending on which element the qualia roles function on: $QS(\beta)$ or $QS(\alpha)$. If $[\alpha\beta]$ has a functor-argument relation, then $[\alpha\beta] = \alpha[QS(\beta)]$. If $[\alpha\beta]$ has an argument-functor relation, then $[\alpha\beta] = \beta[QS(\alpha)]$.

Sub-composition is applicable not only to some eventive NN compounds, but also to some non-eventive NN compounds and adjective-noun constructions. It is possible that one expression with the same meaning might have multiple interpretations. Sub-composition does not change the overall type of the overall expression.

7.6 Domain Relevance of Type Coercion

Wang and Huang (2011c) has established the relation between type coercion and domain information. They reveal that type coercion can be dependent on a specific domain, because 1) intuitively each domain often establishes a different type of event convention and NN compounds are always domain specific terms; 2) domain information can help to predict the coercion type. Following this analysis, I argue that the coerced event is also domain relevant for ‘NN’ type eventive NN. I further observed that some domains have well-known conventional events, while some others do not. The former leads to a most probable and default reading, while the latter results in ambiguity. This point can be explained by the examples 足球比賽 *zúqiú bǐsài* ‘football competition’ and 湯圓比賽 *tāngyuán bǐsài* ‘rice ball competition’.

Through qualia exploitation, both 足球 *zúqiú* ‘football’³⁰ and 湯圓 *tāngyuán* ‘rice ball’ have the events demonstrated by the telic and agentive role. 足球 *zúqiú* ‘football’ has the playing event and the producing event, while 湯圓 *tāngyuán* ‘rice ball’ has the eating event and making event as illustrated in (5) and (6).

$$(5) \left[\begin{array}{l} \text{足球 } zúqiú \text{ 'football'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = y: \text{ manufacturer} \\ \text{D-ARG2} = z: \text{ human} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x: \text{ ball} \\ \text{TELIC} = \text{play}(z, x) \\ \text{AGENTIVE} = \text{produce}(y, x) \end{array} \right] \end{array} \right]$$

³⁰ In Mandarin Chinese, 足球 *zúqiú* ‘football’ can be treated either as an activity or an entity. When it is treated as an activity, 足球比賽 *zúqiú bǐsài* ‘football competition’ combines through pure selection and there is no type coercion. When it is treated as an entity, there is type coercion through qualia exploitation. In this section, we treat it in the second way.

$$(6) \left[\begin{array}{l} \text{湯圓 tāngyuán 'rice ball'} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{D-ARG1} = y: \text{individual} \\ \text{D-ARG2} = z: \text{individual} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = x: \text{food} \\ \text{TELIC} = \text{eat} (y, x) \\ \text{AGENTIVE} = \text{make} (z, x) \end{array} \right] \end{array} \right]$$

Corpus data support the above analysis. Table 94 demonstrates Verb+足球 *zúqiú* ‘football’ in Chinese Gigaword Corpus. 踢 *tī* ‘kick’, 玩 *wán* ‘play’, 打 *dǎ* ‘fight’, 踢過 *tīguò* ‘kick-experiential ASPECT’, and 踢入 *tīrù* ‘kick into’ are the telic role of 足球 *zúqiú* ‘football’, while 製 *zhì* ‘make’, 縫製 *féngzhì* ‘sew’, and 生產 *shēngchǎn* ‘produce’ are the agentive role.

Table 94. Verbs that take 足球 *zúqiú* ‘football’ as an Object in Chinese Gigaword Corpus

Words	Pinyin	English	Frequency	Saliency	Qualia Role
踢	<i>tī</i>	kick	199	74.33	telic
玩	<i>wán</i>	play	37	36.25	telic
打	<i>dǎ</i>	fight	15	17.04	telic
踢過	<i>tīguò</i>	kick-experiential ASPECT	2	15.04	telic
踢入	<i>tīrù</i>	kick into	1	8.18	telic
製	<i>zhì</i>	make	4	11.46	agentive
縫製	<i>féngzhì</i>	sew	2	10.83	agentive
生產	<i>shēngchǎn</i>	produce	7	7.51	agentive

Table 95 shows Verb+湯圓 *tāngyuán* ‘rice ball’ in Gigaword. 吃 *chī* ‘eat’, 品嚐 *pǐncháng* ‘taste’, 食用 *shíyòng* ‘eat and use’ and so on are the telic role of 湯圓 *tāngyuán* ‘rice ball’, while 製作 *zhìzuò* ‘make’, 包 *bāo* ‘wrap’, and 搓 *cuō* ‘knead’ and so on are the agentive role.

Table 95. Verbs that Take 湯圓 *tāngyuán* ‘rice ball’ as an Object in Chinese Gigaword Corpus

Words	Pinyin	English	Frequency	Saliency	Qualia Role
吃	<i>chī</i>	eat	152	56.04	telic
品嚐	<i>pǐncháng</i>	taste	10	24.5	telic
食用	<i>shíyòng</i>	eat and use	9	20.73	telic
吃到	<i>chīdào</i>	Eat-RVC	3	14.22	telic
煮食	<i>zhǔshí</i>	cook and eat	2	14.17	telic
享用	<i>xiǎngyòng</i>	enjoy	3	12.96	telic
吃吃	<i>chīchī</i>	eat eat	1	8.27	telic
嚐	<i>cháng</i>	taste	1	6.18	telic
共用	<i>gòngxiǎng</i>	share	1	5.06	telic
享受	<i>xiǎngshòu</i>	enjoy	1	3.48	telic
製作	<i>zhìzuò</i>	make	18	24.15	agentive
包	<i>bāo</i>	wrap	9	21.89	agentive
搓成	<i>cuōchéng</i>	knead-RVC	2	17.73	agentive
搓搖出	<i>cuōyáochū</i>	knead and shake out	1	13.06	agentive
搓	<i>cuō</i>	knead	1	13.06	agentive
捏	<i>niē</i>	pinch	2	12.32	agentive
搓出	<i>cuōchū</i>	knead-RVC	1	11.45	agentive
搓好	<i>cuōhǎo</i>	knead well	1	11.45	agentive
做	<i>zuò</i>	make	7	9.61	agentive
搓揉	<i>cuōróu</i>	knead and rub	1	9.07	agentive
自製	<i>zìzhì</i>	self-made	1	4.77	agentive
製成	<i>zhìchéng</i>	make-RVC	1	4.77	agentive

However, as modifiers of 比賽 *bǐsài* ‘competition’, their activated coercions are different. 足球比賽 *zúqiú bǐsài* ‘football competition’ has a strong convention of occurring in the sports domain, so the most possible reading comes from the telic role. That is, a competition of playing football rather than producing a football. By contrast, 湯圓比賽 *tāngyuán bǐsài* ‘rice ball competition’ does not show a preference for either the telic or agentive event, which renders both eating and making rice balls as possible readings.

This finding is confirmed by corpus data of Gigaword Corpus. I set window size as 5 tokens

between N1 and N2. The result is indicated in Table 96.

Table 96. Coerced Event Difference in Chinese Gigaword Corpus

NN	Telic Event		Agentive Event		Total Frequency
	Frequency	Percentage	Frequency	Percentage	
足球比賽 <i>zúqiú bǐsài</i> ‘football competition’	4432	100.00%	0	0.00%	4432
湯圓比賽 <i>tāngyuán bǐsài</i> ‘rice ball competition’	2	28.57%	5	71.43%	7

In Table 96, 足球比賽 *zúqiú bǐsài* ‘football competition’ has 4432 occurrences, with all of them indicating telic events only and none as agentive events. 湯圓比賽 *tāngyuán bǐsài* ‘rice ball competition’ has seven hits in total, with two as telic events and five as agentive events, so this compound does not show a strong tendency towards any one of the two kinds of events.

7.7 Conclusions

First, this chapter reviewed the research on noun-noun compounds from three perspectives: the generative method (Levi 1978, Miller 1996), the semantic relation method (Downing 1977, Quirk et al. 1985, Winston et al. 1987, Barker 1998, Barker et al. 1998, Barker & Szpakowicz 1998, Liu & Liu 2004), and the GL method (Johnston & Busa 1996, Lee et al. 2010, Qi 2012).

There are some problems with these methods. (I) The Generative Method: (i) some predicates are too vague that they mix up different relations; (ii) some compounds that are listed under some predicates are not suitable; (iii) this method neglects the fact that some compounds have different relations. (II) The Semantic Relation Method: (i) it is far from sufficient to identify all possible relations; (ii) some of the proposed relations are not accurate. (III) the GL Method: (i) previous research did not examine compositional mechanisms at work; (ii) former research only concerned about the situation when N1 has qualia modification to N2. It did not explain cases when N2 is a qualia role of N1; (iii) it did not give a generalization for such kind of relation; (iv) no study has been carried out when this compound refers to an event. Comparing the three methods, GL method is more effective in explaining different NN compounds.

Second, this chapter analyzed the compositional mechanisms at work in NN compounds through the case study on [N1+比賽 *bǐsài* ‘competition’] and [婚禮 *hūnlǐ* ‘wedding’ +N2]. In GL, the compositional mechanisms have been used when a predicate selects an argument (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). Through the two case studies, this chapter extended their usage in two ways: (i) nominal head selection of a nominal modifier, and (ii) their usage in the nominal event domain.

Third, this chapter proposed a new compositional mechanism *sub-composition*. It has two types:

The Functor-Argument Type:

In the construction $[\alpha\beta]$, if α subselects over β , then there is some quale in QS (β) that is the argument to α through function application and resulting composition. Therefore $[\alpha\beta] = \alpha[\text{QS}(\beta)]$.

The Argument-Function Type:

In the construction $[\alpha\beta]$, if β subselects over α , then there is some quale in QS (α) that is the argument to β through function application and resulting composition. Therefore $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

The theorem for sub-composition is generalized as follows.

In order for α and β to combine as $[\alpha\beta]$, you need to extract some sub-elements from α or β depending on which element the qualia roles function on: QS(β) or QS(α). If $[\alpha\beta]$ has a functor-argument relation, then $[\alpha\beta] = \alpha[\text{QS}(\beta)]$. If $[\alpha\beta]$ has an argument-function relation, then $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

Fourth, following Wang and Huang (2011c), this chapter further demonstrated that some domains have strong conventional events, while some others do not. The former gives a default reading, while the latter brings about ambiguity.

This chapter has not only enriches the study on compositionality and GL, but also reveals the domain information contribution in type coercion. In future work, I will compare the differences of using the GL method with the generative method and the semantic relation method. We will be clear about whether there are cases one method cannot explain but another method can.

Chapter 8 Conclusions and Future Research

This chapter summarizes the findings of this thesis, reveals the significances and suggests directions for future research and the implications for applications.

8.1 Summary of the Findings

This section recalls all the questions raised in Chapter 1 and summarizes all the findings in different chapters.

(I) How to identify event nouns? How to establish an event-based noun classification system?

Chapter 2 answered resolved these problems.

This chapter first reviewed the approaches of identifying event nouns in the literature (Fu 1994, Ma 1995, Chu 2000, Wang & Zhu 2000, Liu 2003, Han 2004, Liu 2004, Han 2006, Zhao 2006, Han 2007a, 2007b, 2010a, 2010b), and found there are some problems. First, some scholars noticed that a few classifiers, light verbs and aspectualizers are applicable in finding event nouns, but no systematic research or detailed analysis is carried out. Second, no semantic selectional constraints of each method are explored. Thirdly, previous research overlooked the selectional difference between natural and non-natural events, as well as process and instant event nouns.

This chapter then did a systematic analysis of event classifiers, aspectualizers and light verbs' selection to nouns. The results show that they select event nouns through pure selection/accommodation and they can coerce entity nouns to have an event reading. Event classifiers and light verbs select both process event nouns and instant event nouns. Different event classifiers, aspectualizers and light verbs have varied selection to natural and non-natural type event nouns.

By combining with other criteria of finding event nouns, this chapter established a constraint-based linguistic model for identifying event nouns, which is composed of these criteria:

(I) Event Classifiers

- (II) Event Structure
- (i) Aspectualizers
 - (ii) Frequency Adjectives
 - (iii) Localizers
 - (iv) Temporal Expressions
 - a. Durative Time Expressions
 - b. Time Points
- (III) Light verbs

These criteria can facilitate the detection of non-natural kind nominal events in texts.

Nouns in Chinese are usually classified according to classifiers (Chao 1968, Lü 1979, Zhu 1982, Huang et al. 1998, Wang & Zhu 2000). Differently, this chapter classified them according to whether a noun has an event reading, as shown in Table 97.

Table 97. Different Types of Nouns

Nouns		Non-natural kind nouns	Natural kind nouns
Nominal	Process Nominal	報導 <i>bàodǎo</i> ‘reporting’	感冒 <i>gǎnmào</i> ‘cold’
	Result Nominal	報導 <i>bàodǎo</i> ‘report’	-
	Instant Nominal	決定 <i>juédìng</i> ‘decision’	死亡 <i>sǐwáng</i> ‘death’
Pure Event Noun		婚禮 <i>hūnlǐ</i> ‘wedding’	風 <i>fēng</i> ‘wind’
Entity Noun	Concrete Entity Noun	狗 <i>gǒu</i> ‘dog’	太陽 <i>tàiyáng</i> ‘Sun’
	Abstract Entity Noun	主意 <i>zhǔyì</i> ‘idea’	磁場 <i>cíchǎng</i> ‘magnetic field’

Grimshaw (1990) claimed that simple event nominals denote events in some sense. They occur or take place, and they occur over time. However, they act like result nominals because they share the determiner system of result nominals, occur only with optional modifiers and not with arguments, disallow *frequent* and *constant* unless they are in the plural, and disallow event control (Grimshaw 1990: P58-59).

She claimed that only complex event nominals have an event structure and a syntactic argument structure like verbs. The argument structure of complex nominals licenses (and requires) arguments. Complex event nominals are distinguished from simple event nominals and result nominals in the range of determiners and adjuncts they occur with as well as in event control and predication (Grimshaw 1990: P59).

Following Grimshaw (1990)'s research, Fu (1994) compared process nominals, result nominals, and concrete entity nouns in Chinese, and found that they have the same behavior as those in English. However, for one thing, instant nominals, simple event nouns and abstract entity nouns in Chinese have not yet been studied. For another, the natural and non-natural kind nouns are not distinguished.

To fill in the gap, this chapter examined non-natural kind and natural kind nouns in Table 97, through applying the eventive constraint-based linguistic model. An event-based noun classification system is established, as shown in Table 98.

Table 98 indicates that process nominals and pure event nouns have the same behavior; instant nominal behave similarly to process nominals and pure event nouns, except that they cannot be selected by aspectualizers and durative time expressions; result nominals, concrete entity nouns and abstract entity nouns have the same behavior. This analysis shows that that process nominals and pure event nouns in Chinese allow all the eventive features, which is different from Grimshaw (1990)'s analysis in English.

Table 98. An Event-based Noun Classification System

		Event Classifier	Event Structure					Light Verbs	Non-natural Kind	Natural Kind
			Aspectualizer	Frequency Adjective	Localizer	Durative Time Expression	Time Point			
Nominal	Process Nominal	+	+	+	+	+	+	+	報導 <i>bàodǎo</i> 'reporting'	感冒 <i>gǎnmào</i> 'cold'
	Result Nominal	-	-	-	-	-	-	-	報導 <i>bàodǎo</i> 'report'	-
	Instant Nominal	+	-	+	+	-	+	+	判決 <i>pànjué</i> 'verdict'	死亡 <i>sǐwáng</i> 'death'
Pure Event Noun		+	+	+	+	+	+	+	婚禮 <i>hūnlǐ</i> 'wedding'	雪 <i>xuě</i> 'snow'
Entity Noun	Concrete Entity Noun	-	-	-	-	-	-	-	桌子 <i>zhuōzi</i> 'table'	月亮 <i>yuèliàng</i> 'Moon'
	Abstract Entity Noun	-	-	-	-	-	-	-	政策 <i>zhèngcè</i> 'policy'	重力 <i>zhònglì</i> 'gravity'

(“+” means that nouns in this category have a high tendency of having this feature. It does not mean every noun in this category has such a feature. By contrast, “-” means nouns in this category have a low tendency of having this feature. It does not mean that no noun in this category has such a feature.)

(II) What are the properties of event nouns?

Chapter 3 answered this question.

This chapter has explored the following properties of compound event nouns: (I) morpho-

syntactic properties, grammatical categories of the morphemes, (II) semantic properties, (III) event representation properties, and (IV) information inheritance properties.

First, this chapter analysed the morpho-syntactic properties of event nouns from two angles: (i) bound-free morpheme combination, and (ii) grammatical categories of the morphemes according to functional types of the compounds.

(i) Bound-Free Morpheme Combination

The morpheme of different types of event nouns differs in their ability of being free or bound. (a) Modifier-head type and coordinative type: either the left or the right morpheme can be free. (b) Predicate-object type: it is rare to have a bound left morpheme and a free right morpheme. (c) Subject-Predicate (Topic-Comment): the left morpheme tends to be free and the right morpheme can be either free or bound.

(ii) Grammatical Categories of the Morphemes

(a) modifier-head type has four kinds of structure: N+N, Adj+N, V+N, Numeral+N; (b) coordinative type has two kinds of structure: N+N, V+V; (c) predicate-object type has one kind of structure: V+N; (d) Subject-Predicate type has two kinds of structure: N+V and N+A. The result indicates that different types of compound event nouns vary in their syntactic structure.

Second, this chapter explored the semantic properties of event nouns. (i) Process event nouns have a time frame, including starting point, duration, and ending point. (ii) Event nouns show the distinction between individual-level and stage-level. An individual-level event noun shows the generic property of an event, while a stage-level event noun has a temporary property.

Third, this chapter studies the event representation properties of event nouns.

The event representation ability of each morpheme in compound event nouns is different. (i) The right morpheme expresses the main event information: Modifier-Head type, Subject-Predicate type. (ii) The left morpheme elaborates eventual information: Modifier-Head, Subject-Predicate type. (iii) The right morpheme is theme: Predicate-Object type. (iv) Both the left and the right morpheme represent events: Coordinative type.

Compound event nouns either represent one or two events. For predicate-object type and subject-predicate (topic-comment) type event nouns, only the predicate shows event information, so they only represent one event. The event(s) represented by a coordinative type have several conditions. (i) one event as a whole, such as 試驗 *shì-yàn* test-test 'test'.

試驗 *shì-yàn* test-test ‘test’ has two morphemes which have similar meanings, and as a whole it represent one event. (ii) two ordered events, such as 收藏 *shōu-cáng* collect-keep ‘collecting’. The event collecting happens first, and it is followed by the keeping event. (iii) two simultaneous events, such as 風雨 *fēng-yǔ* wind-rain ‘wind and rain’. In 風雨 *fēng-yǔ* wind-rain ‘wind and rain’, wind blowing and snowing happen together. These results are shown in Table 99.

Table 99. Event Representation Properties of Compound Event Nouns

Compound Event Nouns	Property	Example
Modifier-Head	(i) the head represents a generic event and the modifier restricts the event scope	雪災 <i>xuězāi</i> ‘snow disaster’
	(ii) represents one event with two event types	攀岩賽 <i>pānyánsài</i> ‘rock climbing competition’
Coordinative	(i) one event as a whole	試驗 <i>shì-yàn</i> test-test ‘test’
	(ii) two ordered events	收藏 <i>shōu-cáng</i> collect-keep ‘collecting’
	(iii) two simultaneous events	風雨 <i>fēng-yǔ</i> wind-rain ‘wind and rain’
Predicate-Object	Only the predicate shows event information, so they only represent one event.	
Subject-Predicate (Topic-Comment)		

Fourth, this chapter studies the information inheritance properties of event nouns.

The main information in predicate-object type and subject-predicate (topic-comment) type is from the predicate. Generally, the major information of the modifier-head type is from the head. However, in some cases the information load of this type is from the modifier, as shown in (1) and (2). In (1), 聆聽 *língtīng* ‘listen to sth. respectfully’ refers to the modifier 音樂 *yīnyuè* ‘music’. In (2), 炸 *zhà* ‘explode’ refers to the modifier 地雷 *dìléi* ‘landmine’.

(1) 聆聽音樂會

língtīng

yīnyuè-huì

listen to sth. respectfully music-meeting

‘listen to a concert respectfully’.

(2) 地雷戰炸破敵膽

dìléi- zhàn zhà pò dí dǎn
landmine warfare explode broken enemy gallbladder

‘The landmine warfare frightens the enemy and defeats their morale.’

(III) How to establish the type system of event nouns? What are the contributions of qualia roles to each type?

Chapter 4 solved these problems.

This chapter analyzed the distinction between natural and non-natural kind event nouns, established a type system for event nouns, proposed a scale-based qualia role contribution system, and identified constructions that can identify qualia role values.

First, this chapter explored the distinction between natural and non-natural kind event nouns through surveying the diagnostics between them. It made some modifications to the diagnostics *nominal co-predication* and *adjectival modification* in (Pustejovsky 2006). (i) Nominal co-predication of non-natural kinds requires that the co-predicated nouns must share a property of the item being predicated, such as the formal role or the telic role. (ii) When an adjective modifies a complex-type natural noun, this construction could be ambiguous, as shown in (3). 大 *dà* ‘heavy’ can modify the raining event and the raindrops. When an adjective modifies an artifactual-type non-natural noun, this construction is not necessarily ambiguous, as depicted in (4). This construction means the wall has a white color.

(3) 大雨

dà yǔ
heavy rain

‘heavy rain’

(4) 白色的牆

báisède *qiáng*
white wall

‘a white wall’

Second, previous research on the classification of these nouns was based on their semantic categories (Han 2004, Liu 2004, Han 2010b, Wang 2010, Zhong 2010b). However, such

classification conceals the shared characteristics of different categories of event nouns. Based on the natural kind and non-natural kind distinction of event nouns, this chapter further established a classification system for event nouns. It found that event nouns of the same semantic category can belong to different types. (i) Event nouns that represent natural phenomenon can be either natural types or natural complex types. For example, 地震 *dìzhèn* ‘earthquake’ only refers to an event and thus it is a natural type, while 雪 *xuě* ‘snow’ can be either an event or a physical object and thus it is a complex type. (ii) Event nouns that represent social activities can be either artifactual types or artifactual complex types. For example, 戰爭 *zhànzhēng* ‘war’ only has an event reading, so it is an artifactual type. 演講 *yǎnjiǎng* ‘speech’ can direct at either the speaking event or the information, so it is an artifactual complex type. The new classification system is summarized in Table 100.

Table 100. Event Nouns: Natural Kinds and Non-Natural Kinds

Event Nouns	Natural Kinds	Natural Types
		Natural Complex Types
	Non-Natural Kinds	Artifactual Types
		Artifactual Complex Types

Based on Table 100, the type system of GL is represented in Table 101.

Table 101. A New Type System of GL

Types	Natural Types	
	Artifactual Types	
	Complex Types	Natural Complex Types
		Artifactual Complex Types

This work has enriched the complex types by including both natural complex types and artifactual complex types. The new classification, which is based on types rather than semantic categories, can help to capture the characteristics of different types of event nouns.

Third, in GL, different types require different qualia role contributions: (a) Natural Types, which direct at the formal and constitutive qualia roles; (b) Artifactual Types, which refer to telic or agentive roles; (c) Complex Types, which make references to the relation between types. This chapter re-examined the qualia role contribution to different types and proposed a scale-based qualia role contribution system to event nouns based on three scales: high,

moderate and low. The results are shown in Table 102.

Table 102. Qualia Role Contributions to the Type System of Event Nouns

Domain of Individuals \ Qualia Role		Formal	Constitutive	Telic	Agentive
Natural		High	High	Low	Moderate
Artifactual		Moderate	Moderate	High	High
Complex	Natural	High	High	Low	Moderate
	Artifactual	Moderate	Moderate	High	High

Fourth, this chapter identified the constructions that can identify the qualia role values of event nouns:

FORMAL-specific Constructions:

(I) NP 是一種.....

NP shì yī zhǒng.....

NP be a kind

‘NP is a kind of’

(II) NP 和其他.....

NP hé qítā.....

NP and other

‘NP and other’

(III) NP 屬於.....

NP shǔyú.....

NP belong to

‘NP belongs to’

CONSTITUTIVE-specific Constructions:

(I) NP 包括/包含.....

NP bāokuò/bāohán.....

NP include/contain

‘NP includes/contains.....’

(II) NP 有.....

NP yǒu.....

NP has

‘NP has.....’

(III) NP 分為.....

NP fēnwéi.....

NP divide

‘NP is divided into’

(IV) a.是 NP 的組成部分

.....shì NP de zǔchéng bùfèn

be NP DE component part

‘..... are component parts of NP’

b.是 NP 的幾個部分

.....shì NP de jǐ gè bùfèn

be NP DE several CL part

‘..... are several parts of NP’

(V) NP 由.....組成/構成

NP yóu.....zǔchéng/gòuchéng

NP by form/constitute

‘NP is composed of’

(VI) NP 的組成部分包括.....

NP de zǔchéng bùfèn bāokuò.....

NP DE component part include

‘NP’s component parts include’

(VII) a. NP(的)程序是.....等幾個部分/階段

NP (de) chéngxù shì..... jǐ gè bùfèn/jiēduàn

NP DE procedure be several CL parts / stage

‘NP (’s) procedure is several parts / stage’

b.是 NP 的幾個階段

.....shì NP de jǐ gè jiēduàn

be NP DE several CL stage

‘..... are several stages of NP’

TELIC-specific Constructions:

(I) NP 的作用/目的/功能是.....

NP de zuòyòng/mùdì/gōngnéng shì.....

NP DE role / purpose / function be

‘NP’s role / purpose / function is’

(II) NP (是)用來.....

NP (shì) yòng lái.....

NP be used to

‘NP is used to’

AGENTIVE-specific Constructions:

(I) NP 的原因是.....

NP de yuányīn shì.....

NP DE reason be

‘NP’s reason is’

(II) NP 由.....引起/引發

NP yóu.....yīnqǐ/yīnfā

NP by cause trigger

‘NP is caused / triggered by.....’

(III) NP 來自.....

NP láizi.....

NP come from

‘NP comes from’

(IV) What is the semantic type system of event nouns?

Chapter 5 answered this question.

First, this chapter reviewed the research on argument structure (Pustejovsky 1991, Yuan 1994, Pustejovsky 1995, Liu 2003), event structure of English (Vendler 1957, Dowty 1979, Bach 1986, Parsons 1990, Tenny 1992, Pustejovsky 1995, Smith 1997, Filip 1999), event structure of Chinese (Tai 1984, Teng 1985, Smith 1997, Huang et al. 2000), and qualia structure (Pustejovsky 1991, 1995, 2001a, 2006, Pustejovsky & Jezek 2008, Hsieh 2010).

Second, this chapter briefly explored argument structure and event structure of event nouns in Chinese. Regarding argument structure, natural kind event nouns normally take no argument, while non-natural kind event nouns usually have arguments. With respect to event structure, event nouns express process event or instant event, so their situation types are activities or achievements.

Third, previous studies on event nouns typically focused on deverbal nominals, such as 游泳 *yóuyǒng* ‘swim’. Event nouns that are not derived from verbs are rarely studied. This chapter took 會議 *huìyì* ‘conference; meeting’ as a typical non-derived process event noun and gave a detailed semantic analysis to it based on GL.

The main findings are as follows. (i) 會議 *huìyì* ‘conference; meeting’ can be selected by localizers, durative temporal expressions, and event classifiers, so it is an event noun. (ii) 會議 *huìyì* ‘conference; meeting’ takes two default arguments: *topic* and *attendees* and two default adjuncts: *time* and *space*. 會議 *Huìyì* ‘conference; meeting’ satisfies the argument typing of light verbs and typical verbs through coercion by exploiting its constitutive role. (iii) The basic situation type of 會議 *huìyì* ‘conference; meeting’ is an activity. It can go through aspectual shifts, becoming an accomplishment or a state. In certain cases, it may have more than one situation type. (iv) 會議 *huìyì* ‘conference; meeting’ ’s qualia structure and its qualia modification are discovered. It has more of a tendency to act as a head than as a modifier in NN compounds. As a head, it often gets formal and constitutive modification; as a modifier, it is often an argument in the telic or agentive relation. (iv) This chapter

expanded the constitutive role of GL to include the explicit representation of an event's subevents as part of the qualia.

The results demonstrated that non-derived event nouns in Mandarin Chinese can represent eventive information. An event noun carries eventive information and can behave like a deverbal nominal and unlike an entity-referring noun.

(V) How to establish an eventive qualia structure for event nouns?

Chapter 6 solved this problem.

Firstly, this chapter identified and re-classified different categories of adjectives that are capable of modifying event nouns, as shown in Table 103.

Table 103 shows the adjectival categories that can modify an event noun. They form the attributes that describe nominal events.

Table 103. Categories of Adjectives that Modify Event Nouns

First Level Category	Second Level Category
【內部時間特性 <i>nèibù shíjiān tèxìng</i> 'internal temporal property'】	【時長 <i>shícháng</i> 'duration'】 (Zhao 2006)
	【速度 <i>sùdù</i> 'speed'】 (Zhao 2006)
【程度 <i>chéngdù</i> 'degree'】	【強度 <i>qiángdù</i> 'intensity'】 (Zhao 2006)
	【細度 <i>xìdù</i> 'specificity'】 (Zhao 2006)
	【深度 <i>shēndù</i> 'profundity'】 (Zhao 2006)
	【難度 <i>nándù</i> 'difficulty'】 (Zhao 2006)
【頻率 <i>pínlǜ</i> 'frequency'】 (Zhao 2006)	
【範圍 <i>fànwéi</i> 'scope; scale'】 (Zhao 2006)	
【狀態 <i>zhuàngtài</i> 'state'】	【急度 <i>jídù</i> 'urgency'】 (Zhao 2006)
	【正式性 <i>zhèngshì xìng</i> 'formality'】 (new)
	【正常性 <i>zhèngcháng xìng</i> 'normality'】 (new)
	【公開性 <i>gōngkāi xìng</i> 'publicity'】 (new)
	【新舊性 <i>xīnjiù xìng</i> 'newness'】 (new)
	【真假性 <i>zhēnjiǎ xìng</i> 'truthfulness'】 (new)
【評價 <i>píngjià</i> 'evaluation'】	【重要度 <i>zhòngyào dù</i> 'importance'】 (new)
	【趣味性 <i>qùwèi xìng</i> 'interestingness'】 (new)
	【好壞性 <i>hǎohuài xìng</i> 'goodness'】 (new)
【可能性 <i>kěnéng xìng</i> 'possibility'】 (Zhao 2006)	

Secondly, this chapter established an eventive qualia structure through examining each qualia role's attributes (the adjectival categories of each qualia role) and each attribute's role values.

(i) Eventive Formal Role

Two kinds of properties differentiate a nominal event from other events:

- (a) the taxonomic/hierarchical classification of an event noun;
- (b) the attributes that describes an event from a larger domain, such as:

① 【頻率 *pínlǜ* 'frequency'】

② 【範圍 *fànwéi* 'scope; scale'】

③ 【狀態 *zhuàngtài* 'state'】 :

【急度 *jídù* 'urgency'】

【正式性 *zhèngshì xìng* 'formality'】

【正常性 *zhèngcháng xìng* 'normality'】

【公開性 *gōngkāi xìng* 'publicity'】

【新舊性 *xīnjiù xìng* 'newness'】

【真假性 *zhēnjiǎ xìng* 'truthfulness'】

④ 【評價 *píngjià* 'evaluation'】 :

【趣味性 *qùwèi xìng* 'interestingness'】

(ii) Eventive Constitutive Role

An eventive constitutive role comprises three attributes:

- (a) Internal Temporal Property:

【時長 *shícháng* 'duration'】

【速度 *sùdù* 'speed'】

【Event Happening Time】

(b) Degrees:

【強度 *qiángdù* ‘intensity’】

【細度 *xìdù* ‘specificity’】

【深度 *shēndù* ‘profundity’】

【難度 *nándù* ‘difficulty’】

(c) Participants

(iii) Eventive Telic Role

An eventive telic role directs at the purpose or function of an event, such as the importance of an event.

(iv) Eventive Agentive Role

An eventive agentive role refers to factors that lead to the emergence or coming into being of an event. For example, modals can sometimes act as an agentive role.

Table 104 shows the qualia roles of different adjectival categories. These adjectival categories are the attributes of different qualia roles.

Table 104. Qualia Roles of Different Adjectival Categories

Qualia Role	Adjectival Category	
Formal	【頻率 <i>pínlǜ</i> ‘frequency’】	
	【範圍 <i>fànwéi</i> ‘scope’】	
	【狀態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】
		【正式性 <i>zhèngshì xìng</i> ‘formality’】
		【正常性 <i>zhèngcháng xìng</i> ‘normality’】
		【公開性 <i>gōngkāi xìng</i> ‘publicity’】
		【新舊性 <i>xīnjiù xìng</i> ‘newness’】
	【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】	
【評價 <i>píngjià</i> ‘evaluation’】	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】	
Constitutive	【內部時間特性 <i>nèibù</i> 】	【時長 <i>shícháng</i> ‘duration’】

	<i>shíjiān tèxìng</i> ‘internal temporal property’】	【速度 <i>sùdù</i> ‘speed’】
	【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】
		【細度 <i>xìdù</i> ‘specificity’】
		【深度 <i>shēndù</i> ‘profundity’】
		【難度 <i>nándù</i> ‘difficulty’】
Telic	【評 價 <i>píngjià</i> ‘evaluation’】	【重 要 性 <i>zhòngyào xìng</i> ‘importance’】
Modals on Agentive	【可能性 <i>kěnéng xìng</i> ‘possibility’】	
Multiple Qualia Role Possibilities	【評 價 <i>píngjià</i> ‘evaluation’】	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】

Each adjectival attribute in Table 104 has their role values. For example, 【趣味性 *qùwèi xìng* ‘interestingness’】 has these role values: 有趣 *yǒuqù* ‘interesting’, 帶勁 *dàijìn* ‘energetic’, 枯燥 *kūzào* ‘dull’, 枯澀 *kūsè* ‘dull and heavy’, 乏味 *fáwèi* ‘tedious’, 無味 *wúwèi* ‘tasteless’, 平淡 *píngdàn* ‘insipid’.

Thirdly, this chapter examined which types of event nouns (NT, AT, NCT, ACT) that each adjectival category can modify, as illustrated in Table 105.

Table 105. Types of Event Nouns that Each Adjectival Category can Modify

Qualia Role	Adjectival Category	Types of Event Nouns				Example	
		N T	A T	N C T	A C T		
Formal	【頻率 <i>pínlǜ</i> ‘frequency’】	+	+	+	+	偶爾的聚會 <i>ǒu'ěr de jùhuì</i> ‘occasional gatherings’	
	【範圍 <i>fànwéi</i> ‘scope’】	+	+	+	+	廣泛的傳播 <i>guǎngfàn de chuánbò</i> ‘widely transmission(s)’	
	【狀 態 <i>zhuàngtài</i> ‘state’】	【急度 <i>jídù</i> ‘urgency’】	-	+	-	+	急迫的調整 <i>jípò de tiáozhěng</i> ‘urgent adjustment(s)’
		【正式性 <i>zhèngshì xìng</i> ‘formality’】	-	+	-	+	正式的比賽 <i>zhèngshì de bǐsài</i> ‘formal competition(s)’
		【正常性 <i>zhèngcháng</i> 】	+	+	+	+	反常的決定 <i>fǎncháng de juédìng</i>

		<i>xìng</i> ‘normality’】					‘abnormal decision(s)’
		【公開性 <i>gōngkāi xìng</i> ‘publicity’】	-	+	-	+	秘密的經歷 <i>mìmi de jīnglì</i> ‘secret experience(s)’
		【新舊性 <i>xīnjiù xìng</i> ‘newness’】	-	+	-	+	嶄新的變化 <i>zhǎnxīn de biànhuà</i> ‘new change(s)’
		【真假性 <i>zhēnjiǎ xìng</i> ‘truthfulness’】	-	+	-	+	真實的戰爭 <i>zhēnshí de zhànzhēng</i> ‘real war(s)’
	【評價 <i>píngjià</i> ‘evaluation’】	【趣味性 <i>qùwèi xìng</i> ‘interestingness’】	-	+	-	+	有趣的實驗 <i>yǒuqù de shíyàn</i> ‘interesting experiment(s)’
Constitutive	【內部時間特性 <i>nèibù shíjiān tèxìng</i> ‘internal temporal property’】	【時長 <i>shícháng</i> ‘duration’】	+	+	+	+	漫長的等待 <i>màncháng de děngdài</i> ‘long wait(s)’
		【速度 <i>sùdù</i> ‘speed’】	+	+	+	+	迅猛的暴雨 <i>xùnměng de bàoyǔ</i> ‘rapid torrential rain’
	【程度 <i>chéngdù</i> ‘degree’】	【強度 <i>qiángdù</i> ‘intensity’】	+	+	+	+	猛烈的轟炸 <i>měngliè de hōngzhà</i> ‘heavy bombardment’
		【細度 <i>xìdù</i> ‘specificity’】	-	+	-	+	詳細的登記 <i>xiángxì de dēngjì</i> ‘detailed registration(s)’
		【深度 <i>shēndù</i> ‘profundity’】	-	+	-	+	深入的研究 <i>shēnrù de yánjiū</i> ‘in-depth study(ies)’
【難度 <i>nándù</i> ‘difficulty’】	-	+	-	+	艱難的磋商 <i>jiānnán de cuōshāng</i> ‘tough negotiation(s)’		
Telic	【評價 <i>píngjià</i> ‘evaluation’】	【重要性 <i>zhòngyào xìng</i> ‘importance’】	-	+	-	+	重要的辯論 <i>zhòngyào de biànlùn</i> ‘important debate(s)’
Modals on agentive	【可能性 <i>kěnéng xìng</i> ‘possibility’】	<i>kěnéng xìng</i>	+	+	+	+	可能的選擇 <i>kěnéng de xuǎnzé</i> ‘possible option(s)’
Multiple Qualia Role Possibilities	【評價 <i>píngjià</i> ‘evaluation’】	【好壞性 <i>hǎohuài xìng</i> ‘goodness’】	+	+	+	+	瑞雪 <i>ruìxuě</i> ‘auspicious snow’

Fourthly, this chapter found the qualia role of an adjective may change. This results from the interaction between adjectives and event nouns or the polysemy of some adjectives.

(VI) What compositional mechanisms are at work in NN compounds when an event noun is the head or modifier in this compound?

Chapter 7 solved this question.

First, this chapter reviewed the research on noun-noun compounds from three perspectives: the generative method (Levi 1978, Miller 1996), the semantic relation method (Downing 1977, Quirk et al. 1985, Winston et al. 1987, Barker 1998, Barker et al. 1998, Barker & Szpakowicz 1998, Liu & Liu 2004), and the GL method (Johnston & Busa 1996, Lee et al. 2010, Qi 2012).

There are some problems with these methods. (I) The Generative Method: (i) some predicates are too vague that they mix up different relations; (ii) some compounds that are listed under some predicates are not suitable; (iii) this method neglects the fact that some compounds that have different relations. (II) The Semantic Relation Method: (i) it is far from sufficient to identify all possible relations; (ii) some of the proposed relations are not accurate. (III) The GL Method: (i) previous research did not examine compositional mechanisms at work; (ii) former research only concerned about the situation when N1 has qualia modification to N2. It did not explain cases when N2 is a qualia role of N1; (iii) it did not give a generalization for such kind of relation; (iv) no study has been carried out when this compound refers to an event. Comparing the three methods, GL method is more effective in explaining different NN compounds.

Second, this chapter analyzed the compositional mechanisms at work in NN compounds through the case study on [N1+比賽 *bǐsài* ‘competition’] and [婚禮 *hūnlǐ* ‘wedding’ +N2]. In GL, the compositional mechanisms have been used when a predicate selects an argument (Pustejovsky 1993, Pustejovsky & Bouillon 1995, Pustejovsky 2001b, 2006, Pustejovsky et al. 2008, Pustejovsky & Jezek 2008, Pustejovsky et al. 2009, Pustejovsky 2011). Through the two case studies, this chapter extended their usage in two ways: (i) nominal head selection of a nominal modifier, and (ii) their usage in the nominal event domain.

Third, this chapter proposed the compositional mechanism *sub-composition*. It has two types:

The Functor-Argument Type:

In the construction [$\alpha\beta$], if α subselects over β , then there is some quale in QS (β) that is the

argument to α through function application and resulting composition. Therefore $[\alpha\beta] = \alpha[\text{QS}(\beta)]$.

The Argument-Functor Type:

In the construction $[\alpha\beta]$, if β subselects over α , then there is some quale in QS (α) that is the argument to β through function application and resulting composition. Therefore $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

The theorem for sub-composition is generalized as follows.

In order for α and β to combine as $[\alpha\beta]$, you need to extract some sub-elements from α or β depending on which element the qualia roles function on: QS(β) or QS(α). If $[\alpha\beta]$ has a functor-argument relation, then $[\alpha\beta] = \alpha[\text{QS}(\beta)]$. If $[\alpha\beta]$ has an argument-functor relation, then $[\alpha\beta] = \beta[\text{QS}(\alpha)]$.

Sub-composition is applicable not only to some eventive NN compounds, but also to some non-eventive NN compounds and adjective-noun constructions. It is possible that one expression with the same meaning might have multiple interpretations. Sub-composition does not change the overall type of the overall expression.

Fourth, following Wang and Huang (2011c), this chapter further demonstrated that some domains have strong conventional events, while some others do not. The former gives a default reading, while the latter brings about ambiguity.

This chapter has not only enriches the study on compositionality and GL, but also reveals the domain information contribution in type coercion.

8.2 Theoretical Significances

This thesis not only conducted a detailed analysis on event nouns based on GL, but also enriched GL. The significances of the thesis can be summarized below through the contributions.

Contribution to the identification of event nouns

Typical nouns such as 飛機 *fēijī* ‘airplane’ have spatial features rather than eventive features. On the contrary, event nouns have eventive features rather than spatial features. Distinguishing them from other nouns is not an easy task. This thesis uses event classifiers, event structure and light verbs to identify them.

In addition, previous research on event nouns in Chinese literature only noticed the process nominals and pure event nouns. This thesis discovered one more category: instant nominals, which enriched the categories of event nouns. All of them were examined in detail.

Contribution to the establishment of an event-based noun classification system

Previous research claimed that pure event nouns act like result nominals and do not have eventive features. The thesis shows that they have the same eventive features as process nominals. Based on the constrain-based linguistic model, this thesis established an event-based noun classification system.

Contribution to the revelation of the properties of event nouns

Compound event nouns have distinct morpho-syntactic, semantic, event representation and information inheritance properties, which distinguish them from other nouns. This study reveals these properties in order to show the uniqueness of event nouns.

Contribution to the type system of GL

The type system in GL is composed of natural types, artifactual types and complex types. Through the study on event nouns, this thesis further divides complex types into natural complex types and artifactual complex types. It not only enriches the type system of GL but also provides a new classification for event nouns, which is different from the previous classification based on semantic categories.

Contribution to qualia role contributions to the Type System of GL

In GL, different types require different qualia role contributions: (a) Natural Types, which direct at the formal and constitutive qualia roles; (b) Artifactual Types, which refer to telic or agentive roles; (c) Complex Types, which make references to the relation between types. This thesis re-examined the qualia role contribution to different types and proposed a scale-based qualia role contribution system to event nouns based on three scales: high, moderate and low.

Contribution to the constructions that can identify qualia role values

This thesis identified the constructions that can identify the formal, constitutive, telic and agentive role values of event nouns.

Contribution to the investigation of the semantic type system of event nouns

Rarely any research has investigated on the semantic type system (viz. argument structure,

event structure and qualia structure) of event nouns. Some research claimed that pure event nouns do not have argument structure and event structure (Grimshaw 1990). Nevertheless, through examining the semantic type system, this thesis showed that pure event nouns can license argument structure and event structure, which is the same as complex event nominals.

Contribution to the construction of an eventive qualia structure

The statement of qualia structure in GL uses “objects” as the target. Events have different features from objects. This thesis first identified the adjectival categories that can modify event nouns. These categories are the attributes of eventive qualia roles. Then the role values each attribute are also revealed.

Contribution to type coercion

Type coercion in GL is widely used in cases when a predicate selects an argument. This thesis extends its usage in the nominal event domain. That is, some constructions or words can coerce entity nouns to have an event reading, such as event classifiers, aspectualizers and NN compounds. This thesis provided a deep insight into this interesting phenomenon.

Contribution to compositionality of NN compounds

NN compounds representing entities have got much attention. This thesis particularly examines cases when either N1 or N2 is an event noun and summarizes the mechanisms at work.

Contribution to the study of compositional mechanisms

NN compounds are widely surveyed, but former research using GL only concerned about the situation when N1 has qualia modification to N2. This thesis proposes the compositional mechanism *sub-composition* which has both the functor-argument type and the argument-functor type.

8.3 Future Research and Applications

First, this thesis has examined the features of event nouns in Mandarin Chinese and established an event-based noun classification system based on the constraint-based linguistic model. The current method should be universal and applicable to other languages. In future work, I would investigate other languages to verify this argument.

Second, this thesis has surveyed a pure event noun 會議 *huìyì* ‘meeting; conference’ to represent the semantic type system of event nouns. It is an artifactual complex type event

noun. Other types of event nouns (i.e. natural types, artifactual types, natural complex types) can be analyzed in the future, so that we can make comparison between different types.

Third, this thesis has examined the compositionality of NN compounds with the head or modifier as an event noun. I have used *sub-composition* to capture the relation between two nouns in a compound. Sub-composition is applicable to some NN compounds, but not to all. In future work, I will compare the differences of using the GL method with the generative method and the semantic relation method. We will be clear about whether there are cases one method cannot explain but another method can.

Fourth, current research has many implications for applications. (I) Application for Natural Language Processing: the identification of event nouns contributes to extract nominal events and determine the temporal location and ordering of events, which in turn contributes to many natural language applications, such as question answering and information retrieval. (II) Application for Language Learning: the investigation of linguistic features of event nouns helps language learners to better understand the properties of event nouns and how to use them. (III) Application for Lexicography: the word sense is the core of lexicography and it is an important standard for dictionary evaluation. By establishing the levels of representation of event nouns based on GL, we can avoid the problem with the sense enumeration method and meaning postulate method.

Appendices

Appendix 1: Verbs with 地震 *dìzhèn* ‘earthquake’ as a Subject in Sinica Corpus (frequency ≥ 2)

- (1) 阪神大 地震發生 在日本時間 清晨 五點 四十六分。

Bǎnshén dà *dìzhèn* fāshēng zài rìběn shíjiān qīngchén wǔ diǎn sìshíliù fēn.

‘The great earthquake of Hanshin occurred at Japan time 5: 46 am.’

- (2) 海底 地震常造成 海底地形的劇變。

Hǎidǐ *dìzhèn* cháng zàochéng hǎidǐ dìxíng de jùbiàn.

‘Undersea earthquakes often cause drastic changes in the seabed topography.’

- (3)再 小心翼翼地 將 模型屋 固定在 地震模擬 振動台 上。

.....zài xiǎoxīnyìyì de jiāng móxíngwū gùdìng zài *dìzhèn* mónnǐ zhèndòngtái shàng.

‘..... then carefully fix the model house on the shaking table used for earthquake simulation.’

- (4) 地震繼續 著， 小城 最高 的一幢 大樓 外壁 龜裂。

Dìzhèn jìxùzhe, xiǎochéng zuìgāo de yī zhuàng dàlóu wàibì jūnliè.

‘The earthquake continues; in the small town, the outer wall of the highest building cracks.’

- (5) 北嶺 地震所引致 之 基本 自由場 加速度 及 結構物 加速度 均 相當 大。

Běilǐng *dìzhèn* suǒ yīnzhi zhī jīběn zìyóu chǎng jiāsùdù jí jiégòuwù jiāsùdù jūn xiāngdāng dà.

‘The accelerations of both the basic free-field and structures caused by the Northridge earthquake are quite large.’

- (6) 氣象局 表示， 中部 災區 遭 地震破壞， 地表 土石 相當 脆弱。

Qìxiàng jú biǎoshì, zhōngbù zāiqū zāo *dìzhèn* pòhuài, dìbiǎo tǔshí xiāngdāng cuìruò.

‘The Bureau of Meteorology said the central disaster area was damaged by the earthquake, and the earth and rock on the earth’s surface are quite fragile.’

- (7) 但斷層經常是地震釋放能量的地方。

Dàn duàncéng jīngcháng shì **dìzhèn shìfàng** néngliàng de dìfāng.

‘But the fault is often the place where earthquakes release energy.’

- (8) 地震停止，母親回家，再也找不到那尾魚。

Dìzhèn tíngzhǐ, mǔqīn huí jiā, zài yě zhǎo bù dào nà wěi yú.

‘The earthquake stopped; Mother returned home, but she could not find the fish.’

- (9) 此次地震導致南側橋梁 B2 橋墩最外緣之兩支橋柱頂部混凝土爆裂。

Cǐ cì **dìzhèn dǎozhì** nán cè qiáoliáng B2 qiáodūn zuì wài yuán zhī liǎng zhī qiáo zhù dǐngbù hùnníngtǔ bàoliè.

‘The earthquake led to the burst of the top concrete of two main bridge columns, which are located at the outermost edge of the south bridge column B2.’

- (10) 受地震影響，今年第四季經濟成長率將向下修正 . 六% 至 . 七%，全年經濟成長率仍可望達五 . 四%。

Shòu **dìzhèn yǐngxiǎng**, jīnnián dì sì jì jīngjì chéngzhǎnglǜ jiāng xiàng xià xiūzhèng .liù% zhì .qī% , quán nián jīngjì chéngzhǎnglǜ réng kě wàng dá wǔ.sì%.

‘Affected by the earthquake, the economic growth rate in the fourth quarter will be revised downward 0.6%-0.7%; annual economic growth rate is still expected to reach 5.4%.’

- (11) 我不去拔牙的第三個藉口是地震，萬一拔牙時地震來了怎麼辦？

Wǒ bù qù bá yá de dì sān gè jièkǒu shì dìzhèn, wànyī bá yá shí **dìzhèn lái** le zěnmé bàn?

‘The third excuse of my not going to have tooth extraction is an earthquake. What to do in case of an earthquake when I am having a tooth extraction?’

Appendix 2: Subjects of 發生 *fāshēng* ‘occur’ in Sinica Corpus (frequency ≥ 5)

- (1) 許多研究報告指出，多數暴力 事件 發生在家中。

Xǔduō yánjiū bàogào zhǐchū, duōshù bàoli shìjiàn fāshēng zài jiāzhōng.

‘Many research reports indicate that most violence events occur at home.’

- (2) 洛杉磯北嶺 地震 發生於1994年1月17日當地時間清晨四時三十分。

Luòshānjī Běilíng dìzhèn fāshēng yú 1994 nián 1 yuè 17 rì dāngdì shíjiān qīngchén sì shí sānshí fēn.

‘Northridge earthquake in Los Angeles occurred at local time 4:30, early in the morning, on January 17, 1994.’

- (3) 湧水 事故 發生時共有 一百八十九名工人正在井下作業。

Yǒng shuǐ shìgù fāshēng shí gòngyǒu yībǎi bāshíjiǔ míng gōngrén zhèngzài jǐngxià zuòyè.

‘There are 189 workers working under the well when the Surge Water Accident occurred.’

- (4) 年輕人喝酒、打架的 事情 頻頻發生。

Niánqīngrén hējiǔ, dǎjià de shìqíng pín pín fāshēng.

‘The matters that young people drinking and fighting occur again and again.’

- (5) 於一般大眾缺乏用藥的正確常識，才使得「吃藥吃出問題」的 悲劇 一再發生。

Yú yībān dàzhòng quēfá yòngyào de zhèngquè chángshì, cái shǐde ‘chī yào chī chū wèntí’ de bēijù yīzài fāshēng.

‘Because the public lack correct common sense of using medicine, the tragedies of ‘problem caused by eating medicine’ repeatedly occur.’

- (6) 第一階段先篩選出有輟學傾向的國中生，由專任老師認領輔導，預防輟學 情形 發生。

Dì yī jiēduàn xiān shāixuǎn chū yǒu chuòxué qīngxiàng de guózhōngshēng, yóu zhuānrèn lǎoshī rèn lǐng fǔdǎo, yùfáng chuòxué qíngxíng fāshēng.

‘The first stage is to fill out high school students who have the dropping out tendency, and then the mentors will claim and give guidance to prevent such a situation from happening.’

- (7) 愛麗絲吃了一口蘑菇後，奇怪的事又發生了。她的脖子突然變長，伸展到樹枝間。

Àilīsī chī le yīkǒu mógu hòu, qíguài de shì yòu fāshēng le. Tā de bózi túrán biàn cháng, shēnzhǎn dào shùzhī jiān.

‘After Alice ate one mouth of the mushroom, a strange thing happened. Her neck suddenly became long and extended to the branches.’

- (8) 馬路上人車稀少，倒沒有嚴重的車禍發生。

Mǎlù shàng rén chē xīshǎo, dào méiyǒu yánzhòng de chēhuò fāshēng.

‘There were rare people or car on the road and no serious accident happened.’

- (9) 化學實驗原本就是一項危險度極高的工作，意外災害的發生是在所難免；實驗次數增多，相對地也提升了意外發生的機率。

Huàxué shíyàn yuánběn jiùshì yī xiàng wéixiǎn dù jí gāo de gōngzuò, yìwài zāihài de fāshēng shì zài suǒ nánmiǎn; shíyàn cìshù zēngduō, xiāngduì de yě tíshēng le yìwài fāshēng de jīlǜ.

‘A chemical experiment is actually a kind of work with high risks and it is difficult to avoid accidents from occurring. The more the experiments are carried out, the relatively higher possibility of accidents is.’

- (10) 人體具有物體的性質，所以必定有導電和極化兩種現象同時發生。

Réntǐ jùyǒu wùtǐ dì xìngzhì, suǒyǐ bìding yǒu dǎodiàn hé jíhuà liǎng zhǒng xiànxàng tóngshí fāshēng.

‘A human body carries the property of materials, so the phenomenon of electric conduction and polarization certainly occur simultaneously.’

- (11) 在使用系統輸入的時候，使用者將發現，詞彙缺乏的情況會一直發生。

Zài shǐyòng xìtǒng shūrù de shíhou, shǐyòng zhě jiāng fāxiàn, cíhuì quēfá de qíngkuàng

huì yīzhí **fāshēng**.

‘When using the system to type, users will notice that the lack of vocabulary always occurs.’

- (12) 本 **案** **發生** 日期 為 去年 七月。

Běn'àn **fāshēng** rìqí wèi qùnián qī yuè.

‘This case occurred in July last year.’

- (13) 同樣的 **狀況** 也 **發生** 在 周傑倫 的 演唱會上。

Tóngyàng de zhuàngkuàng yě **fāshēng** zài Zhōu Jiélún de yǎnchànghuì shàng.

‘The same situation occurred on Chou Chieh-Lun’s concert.’

- (14) 龍安國小的 邱桂蘭 老師 擔心，這些 小孩 會不會 因為 不 習慣 國中的 教育 方式，又值 青少年 反叛期，會有 厭惡 上學 等其他 **問題** **發生**。

Lóng’ān guóxiǎo de Qiū Guilán lǎoshī dānxīn, zhèxiē xiǎohái huì bù huì yīnwèi bù xíguàn guózhōng de jiàoyù fāngshì, yòu zhí qīngshàonián fǎnpànqī, huì yǒu yànwù shàngxué děng qítā wèntí **fāshēng**.

‘Qiu Guilan, a teacher from Long’an elementary school, worries that other problem may occur such as disgusting going to school. Because these children may not get used to the educational style of junior high school, and the same time, they are in the rebel period.’

- (15) 現在的 措施 應該 是在於 如何 讓 消費 **行為** 持續 **發生** 下去。

Xiànzài de cuòshī yīnggāi shì zàiyú rúhé ràng xiāofèi xíngwéi chíxù **fāshēng** xiàqù.

‘Now the measure should lie on how to let the consumption action continuously occurs.’

Appendix 3: Verbs with 地震 *dìzhèn* ‘earthquake’ as an Object in Sinica Corpus (frequency ≥ 2)

- (1) 台灣 位於 菲律賓 板塊 與 歐亞 板塊 交接 之處，兩 板塊 不斷 擠壓，使得 台灣 經常 **發生** **地震**。

Táiwān wèiyú Fēilìbīn bǎnkuài yǔ ŌuYà bǎnkuài jiāojiē zhī chù, liǎng bǎnkuài bùduàn jǐyā, shǐde Táiwān jīngcháng **fāshēng** **dìzhèn**.

‘Taiwan is located at the conjunction part of the Philippine plate and the Eurasian plate. The two plates continue extracting with each other, which makes earthquakes frequently occur in Taiwan.’

- (2) 如果 Ague 的理論可行，那麼一個地震的發生或許可以觸發接二連三的地震。

Rúguǒ Ague de lǐlùn kěxíng, nàme yīgè dìzhèn de fāshēng huòxǔ kěyǐ chùfā jiē'èrliánsān de dìzhèn.

‘If the Ague theory is feasible, then the occurring of one earthquake will perhaps trigger other earthquakes one after another.’

- (3) 他在散文〈地震進行曲〉裡，非但對地震逆來順受，甚至採取了一定的美感距離觀看地震。

Tā zài sǎnwén 〈dìzhèn jìnxíngqǔ〉 li, fēidàn duì dìzhèn nǐláishùnshòu, shènzhì cǎiqǔ le yīdìng de měigǎn jùlǐ guānkàn dìzhèn.

‘In his prose ‘Earthquake March’, he not only resigned himself to the earthquake, but even took a certain aesthetic distance viewing earthquake.’

- (4) 目前在科學上對究竟是斷層引發地震或地震造成斷層還沒有定論。

Mùqián zài kēxué shàng duì jiùjìng shì duàncéng yǐnfā dìzhèn huò dìzhèn zàochéng duàncéng hái méiyǒu dìnglùn.

‘Currently in science there is no conclusion on whether the fault triggers an earthquake or an earthquake triggers faults.’

- (5) 〈蹲著等地震〉裡的角川，雖然在花蓮觀測地震七年了，他仍然是一個他者，由於報憂不報喜，是花蓮居民心目中的一個陰謀者。

〈Dūnzhe děng dìzhèn〉 li de jiǎochuān, suīrán zài huālián guāncè dìzhèn qī niánle, tā réngrán shì yīgè tā zhě, yóuyú bào yōu bù bào xǐ, shì huālián jūmín xīnmù zhōng de yīgè yīnmóu zhě.

‘Although Jiaochuan, in ‘Wait for an Earthquake by Squatting’, spent seven years observing earthquakes in Hualian, he was still a third person. He was regarded as a conspirator among Hualian residents because he only reported the bad news and covered the good news.’

- (6) 台灣中部 經過 九二一 地震 後，地理結構已經出了問題，去年沒有大災害發生，只是一時僥倖。

Táiwān zhōngbù jīngguò jiǔ'èryī dìzhèn hòu, dìlǐ jiégòu yǐjīng chū le wèntí, qùnián méiyǒu dà zāihài fāshēng, zhǐshì yīshí jiǎoxìng.

‘After the Earthquake on Sep 21, the geographical structure of the Central area of Taiwan has some problems. It is lucky that last year no big disaster occurred.’

- (7) 一次的斷層滑移可以加熱岩石，並引發流體的釋放，於是 造成 下一次的 地震 發生。

Yīcì de duàncéng huá yí kěyǐ jiārè yánshí, bìng yǐnfā liútǐ de shìfàng, yúshì zàochéng xià yī cì de dìzhèn fāshēng.

‘A fault slippage will heat rocks and release fluid, and therefore leads to the occurring of the next earthquake.’

Appendix 4: Verbs with 雪 *xuě* ‘snow’ as a Subject in Sinica Corpus (frequency ≥ 2)

- (1) 狂 雪紛飛 埋草屋。

Kuáng xuě fēnfēi mái cǎowū.

‘Mad snow swirled and buried the thatched cottage.’

- (2) 雪落下，雪落在城市的公園裏。

Xuě luòxià, xuě luò zài chéngshì de gōngyuán lǐ.

‘Snow falls, and it falls in the city park.’

- (3) 雪終於 停 了。

Xuě zhōngyú ting le.

‘The snow eventually stopped.’

- (4) 雪靜靜地 下 著、下 著。

Xuě jìngjìng de xià zhe, xià zhe.

‘The snow is quietly falling to the ground.’

- (5) 紐約大雪終將停止的，冰雪融化之後，春天就要來臨了。

Niǔyuē dà xuě zhōng jiāng tíngzhǐ de, bīngxuě róng huà zhīhòu, chūntiān jiù yào lái lín le.

‘The heavy snow in New York will eventually stop. Spring is coming after the snow melts.’

- (6) 連自己的頭巾都給了地藏菩薩的老公公，頭上被雪覆蓋得白白的。

Lián zìjǐ de tóujīn dōu gěi le dìcáng púsà de lǎogōnggōng, tóu shàng bèi xuě fùgài de báibái de.

‘The grandpa, who gave even his scarf to Ksitigarhba Buddhisattva, has his head covered by snow, white.’

- (7) 我住的那個半地下室的小窗常常被雪埋得不見天日。

Wǒ zhù de nà gè bàn dìxiàshì de xiǎo chuāng chángcháng bèi xuě mái de bùjiàn tiānrì.

‘The small window of the semi-basement where I live is always covered by snow without any light coming in.’

- (8) 在冬雪來臨前，紅黃葉落盡時，雪嶽山成為樹幹和岩石組成的黑色世界。

Zài dōng xuě lái lín qián, hóng huáng yè luò jìn shí, Xuěyuèshān chéngwéi shùgàn hé yánshí zǔchéng de hēisè shìjiè.

‘Before the winter snow arrives and when the red and yellow leaves competently fall, Seoraksan becomes a black world composed of trunks and rocks.’

- (9) 當時康藏公路（西康至西藏）正在修築，但那條線冬季雪封山，夏季要塌方，不能保持暢通。

Dāngshí KāngZàng gōnglù (Xikāng zhì Xīzàng) zhèngzài xiūzhù, dàn nà tiáo xiàn dōngjì xuě fēng shān, xiàjì yào tāfāng, bùnéng bǎochí chàngtōng.

‘At that time, the Kang-Zang highway (from Xikang to Tibet) was under construction. But on that line, snow closes the mountains in winter and landslide occurs in summer, so it cannot keep clear.’

- (10) 你等的 **雪** 又 **來** 了。

Nǐ děng de **xuě** yòu **lái** le.

‘The snow you are waiting comes again.’

Appendix 5: Verbs with 雪 xuě ‘snow’ as an Object in Sinica Corpus (frequency ≥ 2)

- (1) 冬天白雪皚皚可 **賞雪** 玩雪。

Dōngtiān bái xuě ái'ái kě **shǎng xuě** wán xuě.

‘In winter the snow gleams white; (you can) enjoy and play with the snow.’

- (2) 信封裡還有一張照片，背景是 **下著雪** 的波士頓。

Xìnfēng lǐ hái yǒu yī zhāng zhàopiàn, bèijǐng shì **xià zhe xuě** de Bōshìdùn.

‘Inside the envelope there is a photo, the background of which is Boston with snow falling down.’

- (3) 我們忙著穿暖了衣服，邀鄰居的小孩一起 **玩雪** 去。

Wǒmen máng zhe chuān nuǎn le yīfú, yāo línjū de xiǎohái yīqǐ wán **xuě** qù.

‘We are busy wearing warm clothes and invite neighborhood children to play snow together.’

- (4) 一般人碰到下雪只覺得冷和不便。可是我來這裡以後，雖然已經 **看** 過了幾次 **雪**，卻仍然非常喜歡它。

Yībānrén pèng dào xià xuě zhǐ juéde lěng hé bùbiàn. Kěshì wǒ lái zhèlǐ yǐhòu, suīrán yǐjīng **kàn** guò le jǐ cì **xuě**, què réngrán fēicháng xǐhuan tā.

‘Common people feel cold and inconvenient when they encounter snow falling. However, after I came here, I still like it very much although I have seen snow several times.’

- (5) 倘若不是 **躲避風雪**，只怕再過十年，也未必會到他家來。

Tǎngruò bùshì **duǒbì** fēngxuě, zhǐ pà zài guò shí nián, yě wèibì huì dào tā jiā lái.

‘If not for sheltering wind and snow, even after ten years, (I) may not come to his home.’

- (6) 寒風夾雪撲進門來。

Hánfēng **jiā xuě** pū jìn mén lái.

‘The cold wind, which is mixed with snow, blows into the door.’

- (7) 你也再用不著頂風冒雪提著東西往家走了。

Nǐ yě zài yòng bù zháo dǐngfēng **mào xuě** tízhe dōngxi wǎng jiā zǒu le.

‘You do not have to trek against the wind and snow walking home carrying things.’

- (8) 11月中旬後就是嚴寒的冬季，時有降雪，直到3月。

11 Yuè zhōngxún hòu jiùshì yánhán de dōngjì, shí yǒu **jiàngxuě**, zhí dào 3 yuè.

‘It is severe winter after the middle of November; snow sometimes falls till March.’

- (9) 我不換衣服了，假裝是個哈薩克男子，到你這而來避風雪，你千萬別說穿。

Wǒ bù huàn yīfú le, jiǎzhuāng shì gè Hāsàkè nánzǐ, dào nǐ zhè ér lái bì fēng xuě, nǐ qiān wàn bié shuōchuān.

‘I will not change clothes, pretending to be a Kazakhstan man who comes here to shelter from wind and snow. Be sure not to disclose the truth.’

- (10) 上個月，這裡已落過兩場雪。

Shàng gè yuè, zhèlǐ yǐ **luò** guò liǎng chǎng xuě.

‘Last month, snow fell twice.’

- (11) 山邊白雲湧起，像千堆雪，又像成群的綿羊，更像朵朵的浪花。

Shānbiān báiyún yǒng qǐ, **xiàng** qiān duī xuě, yòu xiàng chéng qún de miányáng, gèng xiàng duo duo de lànghuā.

‘The white clouds emerged from the mountain edge, which look like a thousand heaps of snow, also like flocks of sheep, and more like blossoming sprays.’

- (12) 在歐洲經歷過幾個奇寒卻無雪的冬季之後，才修正了這個想法。

Zài Ōuzhōu jīnglì guò jǐ gè qí hán què **wú xuě** de dōngjì zhīhòu, cái xiūzhèng le zhègè xiǎngfǎ.

Appendices

‘This idea was corrected after several extremely cold but no snow winter in Europe.’

Appendices

REFERENCES

- Asher, Nicholas & James Pustejovsky. 2006. A Type Composition Logic for Generative Lexicon. *Journal of Cognitive Science* 7 (1). pp.1-38.
- Bach, Emmon. 1986. The Algebra of Events. *Linguistics and Philosophy* 9. pp.5-16.
- Barker, Ken. 1998. *A Trainable Bracketeer for Noun Modifiers*. Advances in Artificial Intelligence: 12th Biennial Conference of the Canadian Society for Computational Studies of Intelligence, ed. by Robert E. Mercer & Eric Neufeld. Verlag Berlin Heidelberg: Springer. pp.196-210.
- Barker, Ken, Sylvain Delisle & Stan Szpakowicz. 1998. *Test-driving TANKA: Evaluating a Semi-Automatic System of Text Analysis for Knowledge Acquisition*. Advances in Artificial Intelligence: 12th Biennial Conference of the Canadian Society for Computational Studies of Intelligence, ed. by Robert E. Mercer & Eric Neufeld. Verlag Berlin Heidelberg: Springer. pp.60-71.
- Barker, Ken & Stan Szpakowicz. 1998. *Semi-Automatic Recognition of Noun Modifier Relationships*. Proceedings of the 17th International Conference on Computational Linguistics. Quebec, Canada. pp.96-102.
- Bilingual Dictionary Subdivision, Linguistics and Dictionary Division, Foreign Language Teaching and Research Press. 2002. *The Contemporary Chinese Dictionary [Chinese-English Edition]*. Beijing: Foreign Language Teaching and Research Press.
- Bloomfield, Leonard. 1933. *Language*. New York: Holt, Reinhart and Winston.
- Borer, Hagit. 2003. *Exo-Skeletal vs. Endo-Skeletal Explanations-Syntactic Projections and the Lexicon*. The Nature of Explanation in Linguistic Theory, ed. by John C. Moore & Maria Polinsky. Stanford: Center for the Study of Language and Information. pp.31-67.
- Brinton, Laurel J. 1988. *The Development of English Aspectual Systems: Aspectualizers and Post-verbal Particles*. Cambridge: Cambridge University Press.
- Busa, Federica. 1996. *Compositionality and the Semantics of Nominals*. Waltham, MA: Brandeis University.
- Cai, Wenlan. 1986. Verbs that Take Non-Nominal Objects (带非名词性宾语的动词). *Studies of the Chinese Language (中国语文)* (4).
- Carlson, Greg N. 1977. A Unified Analysis of the English Bare Plural. *Linguistics and Philosophy* 1. pp.413-457.
- Chang, Shu-Min & Ting-Chi Tang. 2009. A Comparative Analysis of Chinese, English, and Japanese Compounds: Classification, Structure and Derivation (漢、英、日複合詞的對比分析——分類、結構與衍生). *Journal of Taiwanese Languages and Literature (台灣語文研究)* (3). pp.179-213.
- Chao, Yuen-Ren. 1968. *A Grammar of Spoken Chinese*. Berkeley: University of California Press.
- Chen, Keh-Jiann, Chu-Ren Huang, Li-Ping Chang & Hui-Li Hsu. 1996. *Sinica corpus: Design Methodology for Balanced Corpora*. Proceedings of The 11th Pacific Asia Conference on Language, Information and Computation (PACLIC-11), ed. by Byung-Soo Park & Jong-Bok Kim. Kyung Hee University, Seoul. pp.167-176.
- Chen, Ningping. 1987. The Expansion of the Modern Chinese Noun Class (现代汉语名词类的扩大). *Studies of the Chinese Language (中国语文)* (5).
- Chen, Ping. 1988. On the Tripartite Structure of the Temporal System of Contemporary Chinese (论现代汉语时间系统的三元结构). *Studies of the Chinese Language (中国语文)* (6). pp.401-422.

References

- Chen, Wangdao. 1978. *A Brief Introduction to Grammar (文法简论)*. Shanghai: Shanghai Education Publishing House (上海教育出版社).
- Chierchia, Gennaro. 1984. *Topics in the Syntax and Semantics of Infinitives and Gerunds*. MA: University of Massachusetts Amherst.
- Chierchia, Gennaro. 1995. *Individual-Level Predicates as Inherent Generics*. The Generic Book, ed. by Greg N. Carlson & Francis Jeffrey Pelletier. Chicago: University of Chicago Press. pp.176-223.
- Chierchia, Gennaro & Sally McConnell-Ginet. 1990. *Meaning and Grammar: An Introduction to Semantics*. Cambridge: MIT Press.
- Chomsky, Noam. 1970. *Remarks on Nominalization*. Readings in English Transformational Grammar, ed. by R. Jacobs & P. Rosenbaum. Baisdell, Waltham, MA. pp.184-221.
- Chu, Zexiang. 2000. *An Investigation on Temporal Adaptation of Nouns (名词的时间适应性情况考察)*. Modern Chinese Grammar Studies that Face the Challenges of New Century: the International Conference on Modern Chinese Grammar 1998 (面临新世纪挑战的现代汉语语法研究: '98 现代汉语语法学国际学术会议论文集), ed. by Jianming Lu. Jinan: Shandong Education Press.
- Cimiano, Philipp & Johanna Wenderoth. 2007. *Automatic Acquisition of Ranked Qualia Structures from the Web*. Proceedings of the 45th Annual Meeting of the Association of Computational Linguistics. Prague, Czech Republic. pp.888-895.
- Diao, Yanbin. 2004a. *On Delexical Verb (虚义动词论)*. Tianjin: Nankai University.
- Diao, Yanbin. 2004b. *Research on Delexical Verb in Modern Chinese (现代汉语虚义动词研究)*. Dalian: Liaoning Normal University Press.
- Dictionary Department, Institute of Linguistics, Chinese Academy of Social Sciences. 1978, 1983, 1996, 2002, 2005, 2012. *The Contemporary Chinese Dictionary (现代汉语词典)*. Beijing: The Commercial Press.
- Dictionary Department, Institute of Linguistics, Chinese Academy of Social Sciences. 2005. *The Contemporary Chinese Dictionary (现代汉语词典)*. Beijing: The Commercial Press.
- Dictionary Department, Institute of Linguistics, Chinese Academy of Social Sciences. 2012. *The Contemporary Chinese Dictionary (现代汉语词典)*. Beijing: The Commercial Press.
- Dixon, R. M.W. 1982. *Where have All the Adjectives Gone?* Berlin: Walter de Gruyter.
- Dong, Xiufang. 2005. *Chinese Lexicon and Morphology (汉语的词库与词法)*. Beijing: Peking University Press (北京大学出版社).
- Downing, Pamela. 1977. On the Creation and Use of English Compound Nouns. *Language* 53. pp.810-842.
- Dowty, David R. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montagues PTQ*. Dordrecht: Reidel Publishing Company.
- Du, Quner. 2010. *A Tentative Study on Dummy Verbs of Contemporary Chinese Language (现代汉语形式动词研究)*. Shanghai: Shanghai Normal University.
- Fan, Xiao, Gaoyin Du & Guanglei Chen. 1987. *Overview of Chinese Verb (汉语动词概述)*. Shanghai: Shanghai Education Publishing House (上海教育出版社).
- Fang, Guangtao. 1997a. *Another Talk on System and Method (再谈体系与方法)*. Guangtao Fang's Linguistic Papers (方光焘语言学论文集). Beijing: The Commercial Press (商务印书馆).
- Fang, Guangtao. 1997b. *Several Principled Issues on Chinese Grammar Research (研究汉语语法的几个原则性问题)*. Guangtao Fang's Linguistic Papers (方光焘语言学论文集). Beijing: The Commercial Press (商务印书馆).
- Fang, Guangtao. 1997c. *System and Method (体系与方法)*. Guangtao Fang's Linguistic Papers (方光焘语言学论文集). Beijing: The Commercial Press (商务印书馆).

- Filip, Hana. 1999. *Aspect, eventuality types, and nominal reference*. New York & London: Garland Publishing.
- Freed, Alice F. 1979. *The Semantics of English Aspectual Complementation*. Dordrecht, Holland: D. Reidel Publishing Company.
- Fu, Jingqi. 1994. *On Deriving Chinese Derived Nominals: Evidence for V-to-N Raising*. Amherst: University of Massachusetts Amherst.
- Gong, Qianyan. 1961. On 'jiāyǐ' (论“加以”). *Studies of the Chinese Language (中国语文)* (2).
- Grimshaw, Jane Barbara. 1990. *Argument structure*. Cambridge: MIT Press.
- Guo, Rui. 2002. *Research on Word Classes in Modern Chinese (现代汉语词类研究)*. Beijing: The Commercial Press (商务印书馆).
- Han, Lei. 2004. An Analysis of Event Nouns in Modern Chinese (现代汉语事件名词分析). *Journal of East China Normal University (Philosophy and Social Sciences)* [华东师范大学学报(哲学社会科学版)] 36 (5). pp.106-113.
- Han, Lei. 2006. Semantic Basis and Relevant Sentence Pattern of the Event Nouns (事件名词的语义基础及相关句式). *Studies in Language and Linguistics (语言研究)* 26 (3).
- Han, Lei. 2007a. *On the Timeliness of Event Nouns (事件名词的时间性表现)*. New Development of the Study of Chinese Grammar 3: The 3rd International Conference on Contemporary Chinese Grammar (ICCCG-3) (汉语语法研究的新拓展: 21世纪第三届现代汉语语法国际研讨会文集), ed. by Jingmin Shao & Xianliang Zhang. Changchun: Northeast Normal University Press (东北师范大学出版社). pp.432-443.
- Han, Lei. 2007b. The Selection of Event Nouns and Classifiers—A Case Study of“Yu” (事件名词与量词的选择关系——以含有语素“雨”的名词为例). *Journal of East China Normal University (Philosophy and Social Sciences)*[华东师范大学学报(哲学社会科学版)] 39 (3). pp.64-68.
- Han, Lei. 2010a. Analysing the Word Class Status of Event Nouns (试析事件名词的词类地位). *Journal of Ningxia University (Humanities & Social Sciences Edition)* [宁夏大学学报(人文社会科学版)] (1). pp.6-10.
- Han, Lei. 2010b. The Definition of Event Nouns (事件名词的界定). *Paper presented at The 16th Symposium on Modern Chinese Grammar*, City University of Hong Kong, Hong Kong.
- Hong, Jia-Fei & Chu-Ren Huang. 2006. Using Chinese Gigaword Corpus and Chinese Word Sketch in linguistic research *Paper presented at The 20th Pacific Asia Conference on Language, Information and Computation (PACLIC 20)*, Huazhong Normal University, Wuhan.
- Hsieh, Shu-Kai. 2010. Toward Weaving a Lexicon with Qualia Structures. *Paper presented at Chinese Lexical Semantics Workshop 11 (CLSW 2010)*, Soochow University, Suzhou.
- Hu, Yushu. 1995. *Modern Chinese (现代汉语)*. Shanghai: Shanghai Education Publishing House (上海教育出版社).
- Hu, Yushu & Xiao Fan. 1995. *Research on Verbs (动词研究)*. Kaifeng: Henan University Press.
- Huang, Borong & Xudong Liao. 1991. *Modern Chinese (现代汉语)*. Beijing: Higher Education Press.
- Huang, Borong & Xudong Liao. 2002. *Modern Chinese (现代汉语)*. Beijing: Higher Education Press.
- Huang, Chu-Ren. 2006. Large-scale Data and Seeking Truth: How to do a Linguistic Analysis and Research Using a Billion Characters Corpus (大數與求真: 如何以十億字語料庫進行語言分析與研究). *Paper presented at The 4th Annual Meeting of Society of Chinese Teachers*, Kaohsiung, Taiwan.

- Huang, Chu-Ren. 2009. Tagged Chinese Gigaword Version 2.0. Philadelphia: Lexical Data Consortium, University of Pennsylvania.
- Huang, Chu-Ren & Kathleen Ahrens. 2003. Individuals, Kinds and Events: Classifier Coercion of Nouns. *Language Sciences* 25 (4). pp.353-373.
- Huang, Chu-Ren, Kathleen Ahrens, Li-Li Chang, Keh-Jiann Chen, Mei-Chun Liu & Mei-Chi Tsai. 2000. The Module-Attribute Representation of Verbal Semantics: From Semantic to Argument Structure. *Computational Linguistics and Chinese Language Processing*. pp.19-46.
- Huang, Chu-Ren, Keh-Jiann Chen & Zhao-Ming Gao. 1998. *Noun Class Extraction from a Corpus-based Collocation Dictionary: An Integration of Computational and Qualitative Approaches* (由名量搭配词典中自动抽取名词语意分类架构: 计质与计量方法之结合). Quantitative and Computational Studies on the Chinese language (漢語計量與計算研究), ed. by Benjamin Ka-Yin T'sou, Tom Bong Yeung Lai, Samuel Wai-Kwong Chan & William Shi-Yuan Wang. Hong Kong: Language Information Sciences Research Center, City University of Hong Kong.
- Huang, Chu-Ren, Keh-Jiann Chen & Qing-Xiong Lai. 1997. Mandarin Chinese Classifier and Noun-Classifier Collocation Dictionary. Taipei: Mandarin Daily Press.
- Huang, Chu-Ren, Shu-Kai Hsieh, Jia-Fei Hong, Yun-Zhu Chen, I-Li Su, Yong-Xiang Chen & Sheng-Wei Huang. 2010. Chinese Wordnet: Design, Implementation, and Application of an Infrastructure for Cross-Lingual Knowledge Processing (中文词汇网络:跨语言知识处理基础架构的设计理念与实践). *Journal of Chinese Information Processing* (中文信息学报) 24 (2). pp.14-23.
- Huang, Chu-Ren, Adam Kilgarriff, Yiching Wu, Chih-Ming Chiu, Simon Smith, Pavel Rychly, Ming-Hong Bai & Keh-Jiann Chen. 2005. *Chinese Sketch Engine and the Extraction of Grammatical Collocations*. Proceedings of the Fourth SIGHAN Workshop on Chinese Language Processing. Jeju Island, Korea. pp.48-55.
- Huang, Chu-Ren & Jingxia Lin. 2013. *The Ordering of Mandarin Chinese Light Verbs*. Chinese Lexical Semantics: The 13th Chinese Lexical Semantics Workshop (CLSW-13), ed. by Yanxiang He & Donghong Ji. Springer Berlin Heidelberg: Berlin Heidelberg. pp.728-735.
- Huang, Chu-Ren, Jingxia Lin & Huarui Zhang. 2011. World Chineses Based on Comparable Corpus: The Case of Grammatical Variations of *jìnxíng*. Paper presented at The Sixth Cross-Strait Modern Chinese Symposium, Macao: Macao Polytechnic Institute.
- Huang, Chu-Ren, Ya-Jun Yang & Sheng-Yi Chen. 2008. *An Ontology of Chinese Radicals: Concept Derivation and Knowledge Representation based on the Semantic Symbols of Four Hoofed-Mammals*. Proceedings of The 22nd Pacific Asia Conference on Language, Information and Computation (PACLIC2008). De La Salle University, Manila, Philippines. pp.189-196.
- Johnston, Michael & Federica Busa. 1996. *Qualia Structure and the Compositional Interpretation of Compounds*. Proceedings of the ACL SIGLEX workshop on breadth and depth of semantic lexicons. Santa Cruz, California. pp.77-88.
- Ke, Bide. 1992. On Chinese Morpheme Classification (试论汉语语素的分类). *Chinese Teaching in the World* (世界汉语教学) (1). pp.1-12.
- Kilgarriff, Adam, Pavel Rychly, Pavel Smrz & David Tugwell. 2004. *The Sketch Engine*. Proceedings of the 11th EURALEX International Congress, ed. by Geoffrey Williams & Sandra Vessier. Lorient, France. pp.105-116.
- Kilgarriff, Adam & David Tugwell. 2002. *Sketching Words* Lexicography and Natural Language: A Festschrift in Honour of B.T.S. Atkins (EURALEX 2002), ed. by Marie-Hélène Corréard. Copenhagen, Denmark. pp.125-137.
- Larson, Richard. 1995. Olga is a Beautiful Dancer. Paper presented at Winter Meetings of the Linguistic Society of America, New Orleans.
- Larson, Richard. 1998. *Events and Modification in Nominals*. Proceedings of the 8th Semantics and Linguistic Theory Conference (SALT-VIII), ed. by Devon Strolovitch & Aaron Lawson. Cornell University, Ithaca. pp.145-168.

- Lee, Chih-yao, Chia-hao Chang, Wei-chieh Hsu & Shu-kai Hsieh. 2010. *Qualia Modification in Noun-Noun Compounds: A Cross-Language Survey*. Proceedings of the 22nd Conference on Computational Linguistics and Speech Processing (ROCLING-22). National Chi Nan University, Taiwan. pp.379-390.
- Levi, Judith N. 1978. *The syntax and semantics of complex nominals*. New York: Academic Press.
- Li, Charles N. & Sandra Annear Thompson. 1989. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.
- Li, Linding. 1990. *Modern Chinese Verbs (现代汉语动词)*. Beijing: China Social Sciences Press.
- Li, Yu-Ming. 1996. The Grammatical Category Status of Non-predicate Adjectives (非谓形容词的词类地位). *Studies of the Chinese Language (中国语文)* (1). pp.1-9.
- Liu, Shun. 2003. *A Multi-Perspective Study on Modern Chinese Nouns (现代汉语名词的多视角研究)*. Shanghai: Academia Press (学林出版社).
- Liu, Shun. 2004. A Study of Temporality of Common Nouns (普通名词的时间性研究). *Language Teaching and Linguistic Studies (语言教学与研究)* (4). pp.25-35.
- Liu, Shuxin. 1990. Lexical Attributes of Compounds' Structure: Also On The Relation Among Grammar, Lexicology and Word Formation (复合词结构的词汇属性——兼论语法学、词汇学同构词法的关系). *Studies of the Chinese Language (中国语文)* (4).
- Liu, Zhengguang & Runqing Liu. 2004. The Cognitive Mechanisms of N+N Conceptual Combination (N+N 概念合成名词的认知发生机制). *Journal of Foreign Languages (外国语)* (1). pp.26-32.
- Lü, Shuxiang. 1953. *Grammar Learning (语法学习)*. Beijing: China Youth Publishing Group (中国青年出版社).
- Lü, Shuxiang. 1962a. On "the Identity of Language Units", etc. (关于“语言单位的同一性”等等). *Studies of the Chinese Language (中国语文)* (11).
- Lü, Shuxiang. 1962b. Supplements of "On 'the Identity of Language Units', etc." (《关于“语言单位的同一性”等等》订补). *Studies of the Chinese Language (中国语文)* (12).
- Lü, Shuxiang. 1979. *Issues on Chinese Grammar Analysis (汉语语法分析问题)*. Beijing: The Commercial Press.
- Lü, Shuxiang. 1980. *800 Words in Modern Chinese (现代汉语八百词)*. Beijing: The Commercial Press.
- Lü, Shuxiang. 1990. *An Introduction to Chinese Grammar (中国文法要略)*. Beijing: The Commercial Press.
- Ma, Jianzhong. 1898. *Mr. Ma's Grammar (马氏文通)*. Beijing: The Commercial Press (商务印书馆)--printed in 1998.
- Ma, Qingzhu. 1995. *Verbs with Denotational Meaning and Nouns with Predicative Meaning (指称义动词和陈述义名词)*. Research and Exploration of the Grammar: VII (语法研究和探索: 七). Beijing: The Commercial Press. pp.139-152.
- Ma, Wei-Yun & Chu-Ren Huang. 2006. *Uniform and Effective Tagging of a Heterogeneous Giga-word Corpus*. Proceedings of The 5th International Conference on Language Resources and Evaluation (LREC-5). Genoa, Italy.
- Mei, Jiaju, Yiming Zhu & Yunqi Gao. 1983a. *Tongyici Cilin*. Shanghai: Shanghai Lexicographical Publishing House.
- Mei, Jiaju, Yiming Zhu, Yunqi Gao & Hongxiang Yin. 1983b. *A Forest of Synonymous Words (同义词词林)*. Shanghai: Shanghai Lexicographical Publishing House.
- Miller, George Armitage. 1996. *The Science of Words*. New York: Scientific American Library.
- Nagy, Tünde. 2009. The Semantics of Aspectualizers in English (unpublished work).
- Nida, Eugene Albert. 1949. *Morphology: The Descriptive Analysis of Words*.

- Packard, Jerome L. 2004. *The Morphology of Chinese: A Linguistic and Cognitive Approach*. Cambridge: Cambridge University Press.
- Parsons, Terence. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics*. MA: The MIT Press.
- Peng, Daosheng. 1987. On the Nature of the Objects of the Verbs *jìnxíng* and *gěiyǐ* (试论“进行”、“给以”一类动词的宾语的性质). *Jinan Journal(Philosophy & Social Science Edition)* [暨南学报(哲学社会科学版)] (3).
- Pustejovsky, James. 1991. The Generative Lexicon. *Computational Linguistics* 17 (4). pp.409-441.
- Pustejovsky, James. 1993. *Type Coercion and Lexical Selection*. Semantics and the Lexicon, ed. by James Pustejovsky. Dordrecht, The Netherlands: Kluwer Academic Publishers. pp.73-94.
- Pustejovsky, James. 1995. *The Generative Lexicon*. Cambridge, MA: MIT Press.
- Pustejovsky, James. 2000. *Events and the semantics of opposition*. Events as grammatical objects: the converging perspectives of lexical semantics and syntax, ed. by Carol Tenny & James Pustejovsky. Stanford: CSLI Publications. pp.445-482.
- Pustejovsky, James. 2001a. *Construction and the Logic of Concepts*. The Language of Word Meaning, ed. by Pierrette Bouillon & Federica Busa: Cambridge University Press. pp.91-123.
- Pustejovsky, James. 2001b. *Type Construction and the Logic of Concepts*. The Language of Word Meaning, ed. by Pierrette Bouillon & Federica Busa. New York: Cambridge University Press. pp.91-123.
- Pustejovsky, James. 2005. A survey of dot objects. Brandeis University. Technical report.
- Pustejovsky, James. 2006. Type Theory and Lexical Decomposition. *Journal of Cognitive Science* 7 (1). pp.39-76.
- Pustejovsky, James. 2011. Coercion in a General Theory of Argument Selection. *Linguistics* 49 (6). pp.1401-1431
- Pustejovsky, James. 2012. *Co-compositionality in Grammar*. The Oxford Handbook of Compositionality, ed. by Markus Werning, Wolfram Hinzen & Edouard Machery. New York: Oxford University Press. pp.371-382.
- Pustejovsky, James, Anna Rumshisky, Jessica L. Moszkowicz & Olga Batiukova. 2008. GLML: A Generative Lexicon Markup Language: Annotation Guidelines. Waltham: Brandeis University.
- Pustejovsky, James & Pierrette Bouillon. 1995. Aspectual Coercion and Logical Polysemy. *Journal of Semantics* 12. pp.133-162.
- Pustejovsky, James & Elisabetta Jezek. 2008. Semantic Coercion in Language: Beyond Distributional Analysis. *Distributional Models of the Lexicon in Linguistics and Cognitive Science, special issue of Italian Journal of Linguistics/Rivista di Linguistica*.
- Pustejovsky, James & Elisabetta Jezek. to appear. *A Guide to Generative Lexicon Theory*. Oxford: Oxford University Press.
- Pustejovsky, James, Anna Rumshisky, Jessica L. Moszkowicz & Olga Batiukova. 2009. GLML: Annotating Argument Selection and Coercion. *Paper presented at IWCS-8: Eighth International Conference on Computational Semantics*.
- Qi, Chong. 2012. *The Semantic Relations of Internal Construction in NN Modifier-Head Compounds (NN 偏正复合词内部成分的语义关系)*. The 13th Chinese Lexical Semantics Workshop (CLSW-13), ed. by Yanxiang He & Donghong Ji. Wuhan University, China. pp.211-215.
- Quine, Willard Van Orman. 1960. *Word and Object*. Cambridge: The MIT Press.
- Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech & Jan Svartvik. 1985. *A Comprehensive Grammar of the English Language*. New York: Longman.
- Rychlý, Pavel. 2008. *A Lexicographer-Friendly Association Score*. Proceedings of The 2nd Workshop on Recent Advances in Slavonic Natural Languages Processing, ed. by Peter Sojka & Aleš Horák. Brno: Masaryk University.

- Shao, Jingmin. 1993. The Semantic Analysis of Classifiers and the Mutual Selection between Classifiers and Nouns (量词的语义分析及其与名词的双向选择). *Studies of the Chinese Language (中国语文)* (3).
- Shao, Jingmin. 2007. *A General Introduction to Modern Chinese (现代汉语通论)*. Shanghai: Shanghai Education Publishing House.
- Shao, Jingmin & Yan Liu. 2001. Discussion on Dynamic Property of Nouns and the Identification Method (论名词的动态性及其鉴别方法). *Chinese Language Learning (汉语学习)* (6). pp.1-6.
- Shi, Guan'gan. 1992. *On the Morpheme in Chinese (现代汉语语素说略)*. Research and Exploration on Grammar 6 (语法研究和探索: 六). Beijing: Language and Culture Press (语文出版社). pp.92-103.
- Smith, Carlota S. 1990. Event types in Mandarin. *Linguistics* 28 (2). pp.309-336.
- Smith, Carlota S. 1994. Aspectual Viewpoint and Situation Type in Mandarin Chinese. *Journal of East Asian Linguistics* 3 (2). pp.107-146.
- Smith, Carlota S. 1997. *The Parameter of Aspect*. Boston: Kluwer Academic Publishers.
- Song, Yu. 2005. Study of the Verbal Function of Formal Transitives (关于形式动词的及物性考察). *Journal of Xuzhou Institute of Technology (徐州工程学院学报)* 20 (6).
- Song, Yuke. 1982. The Grammatical Function of *jìnxíng* (“进行”的语法作用). *Language Teaching and Linguistic Studies (语言教学与研究)* (1). pp.59-64, 46.
- Su, Xinchun. 2013. *A Thesaurus of Modern Chinese / Modern Chinese Concept Dictionary*. Beijing: The Commercial Press.
- Tai, James H-Y. 1984. *Verbs and Times in Chinese: Vendler's Four Categories*. Papers from the Parasession on Lexical Semantics, ed. by David Testen, Veena Mishra & Joseph Drogo. Chicago: Chicago Linguistic Society pp.289-296.
- Teng, Shou-Hsin. 1985. The Temporal Structure of Chinese Verbs (汉语动词的时间结构). *Language Teaching and Linguistic Studies (语言教学与研究)* (4). pp.7-17, 48.
- Tenny, Carol. 1992. *The Aspectual Interface Hypothesis*. Lexical Matters, ed. by Ivan A. Sag & Anna Szabolcsi. Stanford: Center for the Study of Language and Information (CSLI). pp.1-27.
- Vendler, Zeno. 1957. Verbs and Times. *The Philosophical Review* 66 (2). pp.143-160.
- Vendler, Zeno. 1970. *Linguistics in Philosophy*. Ithaca: Cornell University Press.
- Wang, Hui & Xuefeng Zhu. 2000. *Subclassification and Quantitative Research on Modern Chinese Nouns (现代汉语名词的子类划分及定量研究)*. Modern Chinese Grammar Studies that Face the Challenges of New Century: the International Conference on Modern Chinese Grammar 1998 (面临新世纪挑战的现代汉语语法研究: '98 现代汉语语法学国际学术会议论文集). Jinan: Shandong Education Press.
- Wang, Jue. 2000. *A Study on Modern Chinese Nouns (现代汉语名词研究)*. Shanghai: East China Normal University Press.
- Wang, Li. 1951. *Chinese Grammar Theory (中国语法理论)*. Beijing: The Commercial Press (商务印书馆).
- Wang, Li. 1980. *Chinese Language History Manuscript (汉语史稿)*. Beijing: Chung Hwa Book Corporation (中华书局).
- Wang, Li. 1985. *China's Modern Grammar (中国现代语法)*. Beijing: The Commercial Press.
- Wang, Nianyi. 1959. On '*jìnxíng*' (说“进行”). *Studies of the Chinese Language (中国语文)* (12).
- Wang, Shan. 2011. A New Practice on Lexicon System Construction: A Case Study on the “Economy and Trade” Category. *Paper presented at The 19th Annual Conference of the International Association of Chinese Linguistics (IACL-19)*, Nankai University, Tianjin, China.
- Wang, Shan. 2013. *Social Activities*. A Thesaurus of Modern Chinese / Modern Chinese

- Concept Dictionary, ed. by Xinchun Su. Beijing: The Commercial Press. pp.214-262.
- Wang, Shan & Chu-Ren Huang. 2010a. *Adjectival Modification to Nouns in Mandarin Chinese: Case Studies on “cháng+noun” and “adjective+túshūguān*. Proceedings of The 24th Pacific Asia Conference on Language, Information and Computation (PACLIC-24), ed. by Ryo Otaguro, Kiyoshi Ishikawa, Hiroshi Umemoto, Kei Yoshimoto & Yasunari Harada. Tohoku University, Sendai, Japan. pp.701-705.
- Wang, Shan & Chu-Ren Huang. 2010b. *Compositional Operations of Mandarin Chinese Perception Verb “kàn”*: A Generative Lexicon Approach. Proceedings of The 24th Pacific Asia Conference on Language, Information and Computation (PACLIC-24), ed. by Ryo Otaguro, Kiyoshi Ishikawa, Hiroshi Umemoto, Kei Yoshimoto & Yasunari Harada. Tohoku University, Sendai, Japan. pp.707-714.
- Wang, Shan & Chu-Ren Huang. 2010c. A Generative Lexicon Approach to Possessive Relation of Mandarin Chinese. *Paper presented at The Symposium Commemorating the 90th Anniversary of the Birth of Prof. Dexi Zhu and the 50th Anniversary of Prof. Jianming Lu’s Teaching*, Peking University, Beijing, China.
- Wang, Shan & Chu-Ren Huang. 2010d. Semantic and Temporal Features of Event Nouns. *Paper presented at Annual Research Forum, Linguistic Society of Hong Kong (LSHK-ARF)*, Chinese University of Hong Kong, Hong Kong.
- Wang, Shan & Chu-Ren Huang. 2010e. *Sense Representation in MARVS--A Case Study on the Polysemy of chī*. Proceedings of The 11th Chinese Lexical Semantics Workshop, ed. by Qiaoming Zhu, Donghong Ji & Guodong Zhou. Singapore: Chinese and Oriental Languages Information Processing Society (COLIPS) Publications. pp.22-29.
- Wang, Shan & Chu-Ren Huang. 2011a. *Compound Event Nouns of the ‘Modifier-head’ Type in Mandarin Chinese*. Proceedings of The 25th Pacific Asia Conference on Language, Information and Computation (PACLIC-25), ed. by Helena Hong Gao & Minghui Dong. Nanyang Technological University, Singapore. pp.511-518.
- Wang, Shan & Chu-Ren Huang. 2011b. Derived Event Nouns in Mandarin Chinese. *Paper presented at The 7th LSHK Postgraduate Research Forum on Linguistics (PRFL-7)*, City University of Hong Kong.
- Wang, Shan & Chu-Ren Huang. 2011c. Domain Relevance of Event Coercion in Compound Nouns. *Paper presented at The 6th International Conference on Contemporary Chinese Grammar (ICCCG-6)*, I-Shou University, Kaohsiung, Taiwan.
- Wang, Shan & Chu-Ren Huang. 2011d. Event Classifiers and Their Selected Nouns. *Paper presented at The 19th Annual Conference of the International Association of Chinese Linguistics (IACL-19)*, Nankai University, Tianjin, China.
- Wang, Shan & Chu-Ren Huang. 2011e. Sense Representation in MARVS: A Case Study on the Polysemy of *chī*. *International Journal of Computer Processing Of Languages (IJCPOL)* 23 (3). pp.285-306.
- Wang, Shan & Chu-Ren Huang. 2012a. A Constraint-based Linguistic Model for Event Nouns. *Paper presented at Forum on “Y. R. Chao and Linguistics”, Workshop of The 20th Annual Conference of the International Association of Chinese Linguistics (IACL-20)*, The Hong Kong Institute of Education, Hong Kong.
- Wang, Shan & Chu-Ren Huang. 2012b. Light Verbs and Their Selected Nouns. *Paper presented at XIX Biennial Conference of the European Association of Chinese Studies (EACS-19)*, Paris, France.
- Wang, Shan & Chu-Ren Huang. 2012c. *A Preliminary Study of An Event-based Noun Classification System*. The 13th Chinese Lexical Semantics Workshop (CLSW-13), ed. by Yanxiang He & Donghong Ji. Wuhan University, China. pp.4-9.
- Wang, Shan & Chu-Ren Huang. 2012d. Qualia Structure of Event Nouns in Mandarin Chinese. *Paper presented at The Second International Symposium on Chinese Language and Discourse*, Nanyang Technological University, Singapore.
- Wang, Shan & Chu-Ren Huang. 2012e. Temporal Properties of Event Nouns in Mandarin Chinese. *Paper presented at The 57th Annual International Linguistic Association Conference (ILA-57)*, Borough of Manhattan Community College, City University

- of New York, New York, USA.
- Wang, Shan & Chu-Ren Huang. 2012f. *Type Construction of Event Nouns in Mandarin Chinese*. Proceedings of The First Workshop on Generative Lexicon for Asian Languages (GLAL-1), Workshop of The 26th Pacific Asia Conference on Language, Information and Computation (PACLIC-26). Bali: Faculty of Computer Science, Universitas Indonesia. pp.582-591.
- Wang, Shan & Chu-Ren Huang. 2013a. *Apply Chinese Word Sketch Engine to Facilitate Lexicography*. Lexicography and Dictionaries in the Information Age: Selected papers from the 8th ASIALEX International Conference, ed. by Deny A. Kwary, Nur Wulan & Lilla Musyahda. Bali, Indonesia. pp.285-292.
- Wang, Shan & Chu-Ren Huang. 2013b. Aspectualizers and Their Selected Nouns. *Paper presented at The 21st Annual Conference of the International Association of Chinese Linguistics (IACL-21)*, National Taiwan Normal University, Taiwan.
- Wang, Shan & Chu-Ren Huang. 2013c. *Inchoation of Emotions*. Proceedings of The 14th Chinese Lexical Semantics Workshop (CLSW-14). Zhengzhou University, China. pp.195-202.
- Wang, Shan & Chu-Ren Huang. 2013d. *The Semantic Type System of Event Nouns: A Case Study on huìyì 'conference'*. Increased Empiricism: New Advances in Chinese Linguistics, ed. by Schmidt Zhuo Jing. Philadelphia / Amsterdam: John Benjamins Publishing Company.
- Wang, Shan & Chu-Ren Huang. 2013e. *Towards an Event-Based Classification System for Non-Natural Kind Nouns*. Chinese Lexical Semantics, ed. by Donghong Ji & Guozheng Xiao. Berlin Heidelberg: Springer. pp.381-395.
- Wang, Shan, Chu-Ren Huang & Hongzhi Xu. 2012. *Compositionality of NN Compounds: A Case Study on [N₁+Artifactual-Type Event Nouns]*. Proceedings of The 26th Pacific Asia Conference on Language, Information and Computation (PACLIC-26). Bali: Faculty of Computer Science, Universitas Indonesia. pp.70-79.
- Wang, Wenbin. 2005. The Internal Syntactic and Semantic Structures of English Compounds (英语复合词的内在句法、语义及认知构建). *Foreign Language Research (外语学刊)* (2). pp.39-43.
- Wang, Yanqing. 2010. *A Study on the Combination of the Time-quantity Phrase and the Event Noun (时量成分与事件名词的组配研究)*. Wuhan: Central China Normal University.
- Wenlian & Hufu. 1954a. On Word Classification (I) [谈词的分类 (上)]. *Studies of the Chinese Language (中国语文)* (2).
- Wenlian & Hufu. 1954b. On Word Classification (II) [谈词的分类 (下)]. *Studies of the Chinese Language (中国语文)* (3).
- Wierzbicka, Anna. 1988. *The Semantics of Grammar*. Amsterdam: John Benjamins Publishing Company.
- Williams, Edwin. 1981. On the notions 'Lexically Related' and 'Head of a Word'. *Linguistic inquiry* 12 (2). pp.245-274.
- Winston, Morton E., Roger Chaffin & Douglas Herrmann. 1987. A Taxonomy of Part-Whole Relations. *COGNITIVE SCIENCE* 11. pp.417-444.
- Xing, Fuyi. 2003. *Challenging Questions of Word Classes (词类辨难)*. Beijing: The Commercial Press.
- Xu, Shen. 121. *Origin of Chinese Characters (说文解字)*. Beijing: Chung Hwa Book Corporation (中华书局)--printed in 2009.
- Yamada, Ichiro, Timothy Baldwin, Hideki Sumiyoshi, Masahiro Shibata & Nobuyuki Yagi. 2007. Automatic Acquisition of Qualia Structure from Corpus Data. *IEICE transactions on information and systems* 90 (10). pp.1534-1541.
- Yang, Hong. 2009. *The Research of Dummy Verbs in Modern Chinese (现代汉语形式动词研究)*. Shanghai: Shanghai Normal University.
- Yin, Binyong. 1984. A Quantitative Study on Chinese Morphemes (汉语语素的定量研究).

References

- Studies of the Chinese Language (中国语文)* (5).
- Yin, Binyong. 1986. A Quantitative Study of the Grammatical Categories of Chinese Words (汉语词类的定量研究). *中国语文* (6). pp.428-436.
- Yin, Shichao. 1980. On Verbal Predicate Sentence of the 'jìnxíng' Type (谈“进行”类动词谓语句). *Journal of Harbin Teachers College (哈尔滨师专学报)* (1). pp.82-83, 91.
- Yu, Lili. 2008. *Research on Dummy Verbs in Modern Chinese (现代汉语形式动词研究)*. Suzhou: Soochow University.
- Yu, Shiwen, Xuefeng Zhu & Huiming Duan. 2005. Dummy Verbs in Contemporary Chinese (现代汉语中的形式动词). *Computational Linguistics and Chinese Language Processing* 10 (4). pp.509-518.
- Yu, Shiwen, Xuefeng Zhu, Hui Wang, Huarui Zhang, Yunyun Zhang & Dexi Zhu. 2003. *The Grammatical Knowledge-base of Contemporary Chinese—A complete Specification (现代汉语语法信息词典详解)*. Beijing: Tsinghua University Press.
- Yuan, Jie & Yunyi Xia. 1984. On Light Verbs (虚义动词纵横谈). *Studies in Language and Linguistics (语言研究)* (2). pp.31-40.
- Yuan, Yulin. 1994. A Cognitive Study on Univalent Nouns (一价名词的认知研究). *Studies of the Chinese Language (中国语文)* (4). pp.241-253.
- Zhang, Tingyu. 1739. *Ceremony of Ascending the Throne (登極儀)*. History of Ming Dynasty (明史), ed. by Tingyu Zhang.
- Zhao, Chunli. 2006. *A Static and Dynamic Study on Adjective-Noun Constructions (形名组合的静态与动态研究)*. Guangzhou: Jinan University.
- Zhong, Ming. 2010a. *Study on Event Noun in Chinese and English (汉英事件名词比较)*. Nanchang: Nanchang University.
- Zhong, Ming. 2010b. *A Study on Event Nouns in Chinese and English (汉英事件名词比较)*. Nanchang: Nanchang University.
- Zhou, Gang. 1985. Supplementary Discussion on 'jiāyǐ' (“加以”补议). *Chinese Language Learning (汉语学习)* (3).
- Zhou, Gang. 1987a. Subdivision of Dummy Verbs (形式动词的次分类). *Chinese Language Learning (汉语学习)* (1).
- Zhou, Xiaobing. 1987b. Sentence Pattern Comparison of 'jìnxíng' and 'jiāyǐ' (“进行”“加以”句型比较). *Chinese Language Learning (汉语学习)* (6).
- Zhu, Dexi. 1982. *Grammar Handouts (语法讲义)*. Beijing: The Commercial Press.
- Zhu, Dexi. 1985a. Dummy Verbs and NV in Modern Chinese (现代书面汉语里的虚化动词和名动词). *Journal of Peking University (Humanities and Social Sciences) (北京大学学报(哲学社会科学版))* (5).
- Zhu, Dexi. 1985b. *Grammar Question-and-Answer (语法答问)*. Beijing: The Commercial Press (商务印书馆).