

Chapter 1

Introduction

1.1. The Background

In recent years, lexical semantic studies have been paying more attention to the syntactic realizations of lexical meanings. Lexical units are viewed as a platform displaying the interface of syntax and semantics. Thus, the interest of research has shifted from an earlier concern of the syntagmatic and paradigmatic delimitation of lexical units as well as lexical relations, such as hyponym, synonym and antonym (Cruse 1986) to the close interaction between lexical semantics and syntactic behavior (Levin 1993; Levin and Rappaport 2005; Liu 2002) as well as the representational scheme of lexical meanings (e.g. Jackendoff 1990, 2002; Goldberg 1995, 2006). Among all the lexical categories, verbs have always been the center of concern, as they are considered to be the core of sentence structure and meaning projection. As verbs lexicalize a given event ‘episode’ out of all the possible events in the world, the key issue and challenge in verbal semantics has always been: *how to define and delimit the specific event information encoded in each verb?* This challenge involves more basic questions such as *how ‘meaning’ can be defined* and *what the criteria in defining lexical meanings are.*

As an attempt to further explore the essence of verb meanings and the interactions between verb meanings with syntactic behaviors, the thesis investigates Mandarin cognition verbs, which exhibit intricate and varied syntactic and semantic characteristics. By probing into the collo-grammatical behaviors of Mandarin cognition verbs, the study aims to provide clear definitions and conceptual representation for cognition verbs, so as to clarify the interrelations between different classes of cognition verbs. In other words, the study tackles the following questions:

- 1) *What are cognition verbs?*
- 2) *What is the event structure encoded in cognition verbs?*
- 3) *What are the interrelations among cognition verbs?*

Ultimately, the study provides a detailed analysis of the lexical distinctions encoded in Mandarin cognition verbs as evidenced in their syntax-to-semantics correlations and proposes a domain-specific conceptual schema as a semantic link for different types of cognition verbs.

1.2. The Issue: Cognition Verbs

Cognition verbs exhibit varied grammatical behaviors. For instance, they take different types of complements. Take English cognition verbs to illustrate this point. The complements they take include finite clauses, non-finite clauses, small clauses, gerunds and noun phrases, illustrated in (1) and the distributional differences are shown in (2).

(1) Complement Types of English Cognition Verbs

- a. Finite clauses:
I **remember/think/know/*plan** that he will come.
- b. Non-finite clauses:
I **remembered/*thought/*knew/planned** to close the door.
- c. Small clauses:
I **remember/think/know/*plan** him as a family man.
- d. Gerunds:
I **remember/*think/*know/*plan** coming to Seattle today.
- e. Noun phrases:
I **remember/*think/know/plan** the trip to Seattle.

(2) The Grammatical Dependency of Complements: English

Verbs \ Complements	<i>Remember...</i>	<i>Think...</i>	<i>Know...</i>	<i>Plan...</i>
Finite clauses	+	+	+	-
Non-finite clauses	+	-	-	+
Small clauses	+	+	+	-
Gerunds	+	-	-	-
Noun phrases	+	-	+	+

As for Mandarin cognition verbs, the complements they take include full clauses, verb phrases and noun phrases, as illustrated in (3) and the distribution of grammatical dependency is shown in (4):

(3) Complement Types of Mandarin Cognition Verbs

a. Clauses:

我 記得/ 認為/ 知道/ *計劃 他 會 來。
*Wo jide/ renwei/ zhidao/ *jihua ta hui lai*
 I remember/ think/ know/ plan he will come
 'I remember/think/know/*plan that he will come.'

b. Verb phrases:

我 記得/ *認為/ *知道/ 計劃 要 來 學校。
*Wo jide/ *renwei/ *zhidao/ jihua yao lai xuexiao*
 I remember/ think/ know/ plan need come school
 'I remember/*think/*know/plan to come to school.'

c. Noun phrases:

我 記得/ *認為/ 知道/ 計劃 那趟 旅途。
*Wo jide/ *renwei/ zhidao/ jihua na-tang lutu*
 I remember/ think/ know/ plan that-CL¹ trip
 'I remember/*think/know/plan the trip.'

¹ Abbreviations used in this paper are listed below. CL.: classifiers; PROG: progressive aspect markers; PERF: perfective aspect markers; DE: nominal modifier markers; PART: sentence final particles; NAME: name; LIGHT: light verbs; AFFIX: affixes.

(4) The Grammatical Dependency of Complements: Mandarin

Verbs \ Complements	記得... <i>Jide...</i> 'remember'	認為... <i>Renwei...</i> 'think'	知道... <i>Zhidao...</i> 'know'	計劃... <i>Jihua...</i> 'plan'
Clauses	+	+	+	—
Verb phrases	+	—	—	+
Noun phrases	+	—	+	+

Now a number of questions arise: *what are the semantic and conceptual principles underlying such diverse syntactic behaviors? On the basis of the semantic and conceptual principles, what are the subclasses of cognition verbs that we can identify? And how are these subclasses interrelated?*

1.3. Theoretical Framework: Frame Semantics

To answer the questions above, the study adopts Frame Semantics as the theoretical framework, which was developed in the study of English verb *risk* and its semantic 'neighbors' in Fillmore and Atkins (1992). One of the theoretical assumptions in Frame Semantics is that '...a word's meaning can be understood only with reference to *a structured background of experience, beliefs, or practices*, constituting a kind of *conceptual prerequisite for understanding the meaning*'. In this respect, "...words or word senses are not related to each other directly, but only by way of their links to *common background frames* and indication of the manner in which their meanings *highlight particular elements of such frames*' (Fillmore and Atkins 1992: 76-77). Following the assumptions, the paper aims to establish the background frames of Mandarin cognition verbs and examine which frame elements are highlighted and how the verbs link to these background frames.

In fact, now there is a lexical database currently being developed based on Frame Semantics (Fillmore and Atkins 1992): **FrameNet** (<http://framenet.icsi.berkeley.edu/>).

It is the NSF project of the research group lead by Professor Charles Fillmore at UC Berkeley. The research targets of FrameNet are the English lexical items: nouns, verbs, prepositions and so on. Since FrameNet has provided a huge amount of detailed analyses for all kinds of lexical items, including cognition verbs, the current study refers to the analyses of English cognition verbs in FrameNet as the starting point and makes adjustments so as to show the characteristics of Mandarin cognition verbs.

1.4. Scope and Goal

The scope of research is limited to the verbs depicting *cognitive mental states/event*, which involve a cognizer's knowledge and belief. The evaluative mental states/events, involving the parameters true-false/good-bad, and the affective mental states/events, involving desire, pleasures and sorrows (Traugott & Dasher 1987: 563), are not concerned in this paper. The verbs in question include 想 *xiang* 'think', 思考 *sikao* 'think', 思索 *sisuo* 'ponder on', 考慮 *kaolu* 'consider', 考量 *kaoliang* 'consider', 認為 *renwei* 'think', 以為 *yiwei* 'think', 覺得 *juede* 'feel', 感覺 *ganjue* 'feel', 確定 *queding* '(make/be) sure', 確認 *queren* 'confirm', 斷定 *duanding* 'conclude', 發明 *faming* 'invent', 創造 *chuangzao* 'create', 構想出 *gouxiangchu* 'conceive', 推斷 *tuiduan* 'infer', 相信 *xiangxin* 'believe', 懷疑 *huaiyi* 'doubt', 想到 *xiangdao* 'think of, hit upon', 想出 *xiangchu* 'figure out', 研究 *yanjiu* 'research', 分析 *fenxi* 'analyze', 檢視 *jianshi* 'examine', 檢查 *jiancha* 'check', 注意 *zhuyi* 'pay attention to', 發現 *faxian* 'find', 發覺 *fajue* 'discover', 察覺 *chajue* 'be aware of', 注意到 *zhuyidao* 'note', 知道 *zhidao* 'know', 曉得 *xiaode* 'know', 清楚 *qingchu* 'be clear about', 明白 *mingbai* 'understand', 懂 *dong* 'understand', 記起 *jiqi* 'remember', 忘 *wang* 'forget', 忘記 *wangji* 'forget', 記得 *jide* 'remember', 想起 *xiangqi* 'remember', 回憶 *huiyi* 'recall', 回想起 *huixhaingqi* 'recall' and so on.

The goal of the study is to explore the ontological domain of cognition as well as the frames evoking Mandarin cognition verbs and to provide a systematic and well-motivated account for the distinction and interrelationships of Mandarin cognition verbs.

1.5. Outline of the Thesis

The thesis is organized as follows. Chapter one is a general introduction of the thesis. Chapter two reviews previous studies involving cognition verbs. Chapter three describes the database and the methodology. Chapter four presents the findings. Based on the findings, chapter five proposes a frame-based analysis of Mandarin cognition verbs. Finally, chapter six concludes the study and suggests future research topics.



Chapter 2

Literature Review

This chapter reviews previous studies on cognition verbs as a foundation of the research. A considerable number of studies have been dedicated to cognition verbs or mental verbs in general from a number of theoretical perspectives, and they will be introduced in the following sections. Since the verbs in question are not always referred to as ‘cognition verbs’ in the literature, section 2.1 briefly lists the terms used in the previous studies. Section 2.2 includes studies on cognition verbs from the diachronic perspective (He 1966; Thompson and Dasher 1987; Tang 1988; Sweetser 1990; Thompson and Mulac 1991; Yao 1997; Zhang 1999; Su 2002; Wang 2002; Chiang 2004; Wu 2005, 2006). Section 2.3 summarizes the role of cognition verbs in studies of linguistic universality and typology (Croft 1991, 1993; Wierzbicka 1996; Onishi 1997; Stanwood 1997; Goddard and Wierzbicka 2002). Section 2.4 introduces discussions of cognition verbs from the perspective of morphology in Tang T.-C. (2000: 14-17). Section 2.5 briefly reviews the treatment of cognition verbs in different theoretical paradigms of syntax and semantics, including Transformational Grammar and Government and Binding Theory (Postal 1970, 1971; Haegeman 1994; Cançado and Franchi 1999), Functional Grammar (Givón 1993a,b), Alternation-based Approach (Levin 1993), Usage-based Approach (Tao 2001, 2003), Role and Reference Grammar (Van Valin and Wilkins 1993), Frame Semantics and Construction Grammar (Liu 2002, Blanco-Carrion 2006; Garcia-Miguel and Comesana²; Berkeley FrameNet Project) and so on. Finally, section 2.6 summarizes the chapter.

² This article is obtained from the website <http://webs.uvigo.es/adesse/textos/LCC2003%20texto%20final.pdf>. The publication information is not clear. But this is an article worth of reviewing, and thus is included in this section.

2.1 Terms Used in the Previous Studies

‘Cognition verbs’ are often considered as a ‘sub-class’ of ‘mental verbs’ or ‘psych verbs’ by a number of researchers. For example, Croft states clearly that “The class of mental verbs (also known as ‘psych verbs’) includes verbs of perception, cognition and emotion” (1993: 55). FrameNet gives the following definition for ‘Mental_activity’ frame: “...The particular activity may be perceptual, emotional, or more generally cognitive.”

Many of the previous studies that will be discussed below in fact used a number of different but related terms: **‘mental verbs/predicates’** (Vendler 1972; Huang 1982; Traugott 1986; Traugott and Dasher 1987; Sweetser 1990; Croft 1991, 1993; Wierzbicka 1996; Onishi 1997; Stanwood 1997; Jaggar 2001: 567; Goddard and Wierzbicka 2002; Su 2002, 2004; Shinzato 2004), **‘psychological verbs/predicates’** (Leech 1983; McHoul & Rapley 2003), **‘epistemic parentheticals’** (Thompson and Mulac 1991), **‘epistemic verbs’** (Huang 2003: 4), **‘epistemic quantifiers’** (Su 2004: 22), **‘affective chunk’** (Chiang 2004), **‘intentional expressions’** (McHoul and Rapley 2003), **‘Contental attitude verbs’** (Garcia-Miguel & Comesana). The studies that used the term **‘cognition verbs/domain’** include Givón (1993a,b), Liu (2002), Li (2003), Garcia-Miguel & Comesana and Blanco-Carrion (2006). There are also some studies that did not explicitly term the verbs in question, most of which focusing on discussion of only one or two verbs, including He (1966), Postal (1970, 1971), Liu (1986), Tang (1988), Van Valin and Wilkins (1993), Yao (1997), Zhang (1999), Tang T.-C. (2000), Wang (2002), and Wu (2005, 2006).

2.2 Studies of Cognition Verbs from the Diachronic Perspective

There are quite a few of studies investigating the diachronic development of cognition verb(s). Some focus on the development of one single cognition verb.

For example, He (1966), Tang (1988), Yao (1997), Zhang (1999), Wang (2002) and Wu (2005, 2006) all focus on the syntactic and semantic development of one Chinese cognition verb 以為 *yiwei* ‘think’.

Some concern the grammaticalization of certain cognition verbs with other constituents in the same sentence. For instance, Givón (1993b:37), Thompson and Mulac (1991), McHoul and Rapley (2003:509) discuss the grammaticalization of ‘epistemic phrases’, one kind of chunks composed by a certain personal pronoun³ with a cognition verb, such as the English *I think* and *I guess*. Chiang (2004) also studies the Chinese counterpart 我覺得 *wo juede* ‘I think’. Syntactically, this kind of chunks can occur before, in the middle of and at the end of a main clause; semantically, they function as an ‘epistemic quantifier on the information in the complement clause’ (Givón 1993b:37) and might become a discourse marker functioning to ‘tone down the speaker’s disagreement or opposition from others’ (Chiang 2004:1).

In addition, there are studies concerning how the relationship of cognition verbs with others contributes the development of cognition verbs. To begin with, Sweetser (1990) explicitly shows the metaphorical extension from verbs of perception to verbs of cognition (1990: 38, Diagram 1). Specifically, ‘the objective, intellectual side of our mental life seems to be regularly linked with the sense of vision’ (Sweetser 1990:37) because ‘it is our primary source of objective data about the world’ (ibid, 39). In addition, Su (2002) shows the grammaticalization path of 說 *suo* ‘say’ and accounts for the frequent co-occurrences of these two kinds of verbs, such as 我想說 *xiang suo* ‘I think say’ in spoken Chinese, on the basis of the general agreement on the semantic affinity between verbs of saying and verbs of thinking (e.g. Vendler 1972;

³ The pronouns that can form this kind of ‘epistemic phrases’ are restricted to first or second singular person pronouns.

Leech 1983; Traugott and Dasher 1987; Li 2003; Shinzato 2004). Furthermore, Liu (1986) observed a shared extended use of three verbs in spoken Chinese: the utterance verb 說 *shuo* 'say', the cognition verb 想 *xiang* 'think' and the perception verb 看 *kan* 'see' all develop a function of expressing someone's opinion or suggestion when the clausal subject is the first or second person pronoun.

2.3 Studies of Cognition Verbs in Linguistic Universality/Typology

Cognition verbs also play a role in the researches of linguistic universality and typology. For researchers working on linguistic universality, 'cognition verbs' are included in the 'mental predicates', which are regarded as one of the semantic primes (Wierzbicka 1996; Onishi 1997; Stanwood 1997; Goddard and Wierzbicka 2002). This indicates that cognitive or mental states/activities are one of the most basic elements in the human societies, which has been attested in a variety of languages, including Chinese (Chappel 2002).

For researchers who are interested in typological studies, Croft (1991, 1993), for example, found that the class of mental verbs, which include verbs of perception, cognition and emotion, are of interests because there exists variation in terms of case marking and subject/object assignment both across languages and within one language, which is not common to verbs of other classes. To face this issue, Croft proposes a 'causal structure model' of verb meaning and bridges lexical semantics with case marking.

2.4 Studies of Cognition Verbs in Morphology

Tang T.-C. (2000: 14-17) discussed several cognition verbs in great detail from the aspect of morphological aspect. Tang compared a number of compound verbs which are similar in their morphological structures. These verbs include 記住 *jizhu*

‘memorize’ and 記得 *jide* ‘remember’, which are the same in their internal structure, namely, predicate-complement compound verbs and they are both composed of the simple verb 記 *ji* ‘memorize; remember’ with phase markers 住 *zhu* ‘reside’ and 得 *de* ‘get’. As the simple verb 記 *ji* ‘memorize; remember’ is an ‘activity verb’ in the situation aspects, with the phase markers, the compound verbs are ‘achievement verbs.’ Moreover, the phase markers result in a number of differences between 記住 *jizhu* ‘memorize’ and 記得 *jide* ‘remember’, namely, verb types and collocational restrictions. According to Tang T.-C. (2000: 14-15), on the one hand, the compound verbs containing the phase marker 住 *zhu* ‘reside’ are ‘actional verbs’ or ‘dynamic verbs’ and the agent tends to be ‘intentional’, ‘voluntary’ or ‘self-controllable’ and therefore the verbs are compatible with imperative constructions, can collocate with benefactive or patient roles, and can function as complements of intention verbs and causation verbs. On the other hand, the compound verbs containing the phase marker 得 *de* ‘get’ are ‘stative verbs’ and thus the experiencer tends to be ‘unintentional’, ‘non-voluntary’ or ‘non-controllable’ and consequently cannot be benefactive nor patient roles, and cannot function as complements of intention verbs and causation verbs.

2.5 Studies of Cognition Verbs in Syntax and Semantics

Cognition verbs have been studied from a number of theoretical paradigms in syntax and semantics⁴, including Formal Syntax (e.g. Postal 1970, 1971; Haegeman 1994; Cançado and Franchi 1999), Functional Syntax (e.g. Givón 1993a,b), Alternation-based Approach (Levin 1993), Usage-based Approach (Tao 2001, 2003), Role and Reference Grammar (Van Valin and Wilkins 1993), Frame Semantics and

⁴ Some of the paradigms discussed here pay attention to both syntactic and semantic characteristics, as a result, the theories in these two linguistic subfields are included in this section.

Construction Grammar (Liu 2002, Blanco-Carrion 2006; Garcia-Miguel & Comesana; Berkeley FrameNet Project (<http://framenet.icsi.berkeley.edu/>)).

First of all, in the theoretical paradigms of Formal Syntax, Postal (1970, 1971) studied the English verbal element *remind* and suggested that '[it] has a transformational derivation from a complex underlying source' (1970: 181) and can be decomposed into two elements, *strike* and *similar*. Moreover, in the Government and Binding paradigm, cognition verbs (or 'psych verbs' in general) are recognized in their exceptional behavior in case marking (known as 'exceptional case marking verbs', ECM verbs) and are involved in a number of syntactic operations, such as raising constructions (e.g. Haegeman 1994; Cançado and Franchi 1999).

In the field of functional grammar, Givón (1993a,b) considers English cognition verbs to be included in what he called 'Perception-cognition-utterance (P-C-U) verbs', and gives the following description: 'the subject of verbs in this important group...*cognizes* a state or event...' (1984: 133; italic by the original author). Syntactically, a) 'no co-reference restrictions hold between the subject or object of the main and the subordinate clause', b) 'the subordinate clause appears like a full-fledged main clause, with no missing subject', c) 'the subordinate clause may be preceded by the subordinator morpheme *that*, or in some cases by *if*'. Semantically, a) 'the main-clause verb codes ... the ... cognition... by the *dative* or *agent* subject', b) 'the complement clause codes the state or event that is the object of the mental...activity by the main-clause subject' (1984: 133-134; italic by the original author). Givón also suggests that some PCU verbs code 'epistemic attitude', which echoes the terminology used in Thompson and Mulac (1991): 'epistemic parentheticals'. Moreover, some 'PCU verbs of high epistemic certainty are characterized as presuppositional or factive, an observation also mentioned in Li (2003: 350).

In the alternation-based approach, Levin (1993) reviews previous research on verbs and their alternation patterns and some cognition verbs, such as *think*, are included. However, since cognition verbs do not exhibit similar alternation patterns, they are not regarded as a group. Individual cognition verbs are discussed along with verbs that are not semantically related but exhibit similar alternation patterns.

In the Role and Reference Grammar framework, Van Valin and Wilkins (1993) uses the English *remember* and its Mparntwe Arrernte equivalents to demonstrate the prediction of the syntactic structure of a predicate from its semantics. Focusing on the same English verb *remember*, Tao (2001) investigates its use in spoken English and later on compares *remember* with *forget* in Tao (2003) from usage-based approach.

From the perspective of Frame Semantics and Construction Grammar, (Liu 2002, Blanco-Carrion 2006; Garcia-Miguel & Comesana; Berkeley FrameNet Project) focus on the background knowledge that a speaker needs to possess to understand some cognition verbs as well as the constructions that interact with the cognition verbs. Take the Berkeley FrameNet Project (<http://framenet.icsi.berkeley.edu/>) to illustrate. FrameNet records a huge number of verbs in English, focusing on the frames these verbs evoke as well as the syntactic properties of these verbs. As for the English cognition verbs, there is no frame named 'cognition frame'. Among all the frames in FrameNet, the 'Mental_activity frame' is the one closest to the cognition domain in the current study. The definition of this frame given by FrameNet is that 'a Sentient_entity has some activity of the mind operating on a particular Content or about a particular Topic. The particular activity may be perceptual, emotional, or more generally cognitive.' It is a non-lexical frame, being set up for inheritance. It is

inherited⁵ by ‘Awareness frame’, meaning Awareness is a subtype of mental activities. There are seven frames using⁶ Mental_activity frame, including 1) Categorization, 2) Cogitation, 3) Coming-to-believe, 4) Differentiation, 5) Estimating, 6) Purpose and 7) Translating. This means these seven frames presuppose the existence of mental activities.

Despite of the fact that FrameNet provides such a great link to frames involving certain aspects of mental activity, yet as can be seen from the definition of the ‘Mental_activity frame’, ‘the particular activity may be perceptual, emotional, or more generally cognitive.’ Since it is not clear which of the eight frames mentioned above, or which subpart of these eight frames, involve cognizing states/events, it may not be adequate to base the current study on them solely.

Since the Sentient_entity in cognizing states/events may be understood as ‘Cognizer’, the author looked through all the frames in FrameNet, searching for frames containing the frame element ‘Cognizer’ as one of the core frame elements. And 39 frames are found: 1) Achieving_first, 2) Adding_up, 3) Awareness, 4) Be_in_agreement_on_assessment, 5) Becoming_aware, 6) Categorization ,7) Certainty, 8) Choosing 9) Cogitation, 10) Coming_to_believe, 11) Differentiation, 12) Estimating, 13) Eventive_cognizer_affecting, 14) Evoking, 15) Expectation, 16) Influence_of_event_on_cognizier, 17) Information, 18) Invention, 19) Judgment, 20) Make_cognitive_connection, 21) Memorization, 22) Memory, 23) Needing, 24) Opinion, 25) Remembering_experience, 26) Remembering_information, 27) Remembering_to_do, 28) Regard, 29) Reliance_on_expectation, 30) Scrutinizing_for, 31) Scrutiny, 32) Searching_scenario, 33) Seeking, 34) Subjective_influence, 35)

⁵ ‘Inheritance’ is one of the ‘frame-to-frame relations’ given in FrameNet. Inheritance is defined as ‘an “is-a” relation, i.e. A is a subtype of B, then A inherits from B. For details, please see Appendix I.

⁶ ‘Using’ is another ‘frame-to-frame relation’. It is a presupposition relation. ‘A using B’ means ‘A presupposes B as background.’ Again, for details, please see Appendix I.

Taking_sides, 36) Translating, 37) Waver_between_options, 38) Trust, and 39) Willingness. For detailed information of the frames, please see the Appendix II or check the website of FrameNet (<http://framenet.icsi.berkeley.edu/>) for updated analysis.

2.6 Remarks

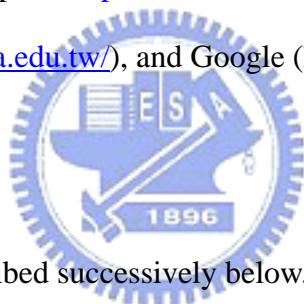
Cognition verbs in various languages have been studied from a variety of aspects. The diachronic studies account for the polysemous nature of cognition verbs as well as their etymological sources. The cross-linguistic study suggests the core status of cognition verbs in the human lexicon. The frame-based study, FrameNet, comprehensively documents semantic and syntactic information of English cognition verbs. Tang T.-C.'s(2000) study especially makes people see the beauty of Mandarin morphology and also enriches the understanding of Mandarin in general. Though a considerable number of studies have been dedicated to the unique behavior of cognitive or mental verbs in general, little has been said about the correlations between their syntactic and semantic properties and the way these verbs are interrelated with each other. The current paper takes up the task and aims to provide a systematic and well-motivated account for the syntax-to-semantics correlations of Mandarin cognition verbs as well as their interrelationships.

Chapter 3

The Database and the Methodology

3.1. Database

The database of the study came from corpus data as well as the native speakers' linguistic intuition to supplement the corpus data. The resources include the English lexical database FrameNet (<http://framenet.icsi.berkeley.edu/>), the Academia Sinica Bilingual Ontological WordNet (Sinica BOW, <http://bow.sinica.edu.tw/>), the dictionary software - Dr. Eye 7.0 Professional, the on-line word database 搜文解字 *souwenjiezi* (<http://words.sinica.edu.tw/>), Academia Sinica Balanced Corpus of Modern Chinese (Sinica Corpus, <http://www.sinica.edu.tw/SinicaCorpus/>), Chinese Wordnet (<http://cwn.ling.sinica.edu.tw/>), and Google (<http://www.google.com.tw/>).



3.2. Methodology

The steps taken are described successively below.

Step 1: Finding Mandarin Cognition Verbs

The author made reference to the English database FrameNet to find potential research targets. Since it is generally agreed that the most important participant role in any cognizing states/events is the cognizer, the author searched for the frames containing the frame element 'Cognizer', and found 39 frames, listed in the final part of section 2.5. As is mentioned in section 1.3, only the verbs depicting intellectual activities/states are concerned. The frames being considered are the following.

(5) Cognition frames in FrameNet

No.	Frame Name	Lemma
1	Awareness	<i>aware, believe, comprehend, know, etc.</i>
2	Becoming_aware	<i>detect, discern, discover, find, etc.</i>
3	Certainty	<i>believe, certain, doubt, sure, uncertain, etc.</i>
4	Cogitation	<i>consider, contemplate, ponder, think, etc.</i>
5	Coming_to_believe	<i>ascertain, conclude, determine, figure out , etc.</i>
6	Evoking	<i>bring to mind, recall, remind, ring a bell, etc.</i>
7	Invention	<i>come up, conceive, create, etc.</i>
8	Memory	<i>forget, recall, recollect, remember, retain , etc.</i>
9	Opinion	<i>feel, have feeling, suppose, think, view, etc.</i>
10	Remembering_experience	<i>forget, look back, recall, remember, etc.</i>
11	Remembering_information	<i>draw blank, forget, remember</i>
12	Remembering_to_do	<i>forget, remember</i>
13	Scrutiny	<i>analyze, check, examine, inspect, probe , etc.</i>

The English lemmas then served as the input to the Academia Sinica Bilingual Ontological WordNet (Sinica BOW), a bilingual database, and Dr. Eye, a translation product, to obtain the equivalent Mandarin lemma. Moreover, 搜文解字 *souwenjiezi* is consulted so as to exhaust the targets of research. In addition, Mandarin cognition verbs not found during this step are also added to the word pool. The equivalent Mandarin cognition verbs are listed in the table below.

(6) List of Mandarin Equivalents

No.	Frame Name	Lemma
1	Awareness	知道、認識、清楚、明白、懂、了解、曉得
2	Becoming_aware	察覺、發現、發覺、注意到
3	Certainty	確定、確信、相信、堅信、深信、懷疑
4	Cogitation	想、考慮、考量、思考、思索
5	Coming_to_believe	斷定、確定、推斷出、推論出
6	Evoking	想到、想起
7	Invention	想、想出、想到、發明、創造、構想出
8	Memory	想起、回想起、想到、記起、不記得、忘、 忘記
9	Opinion	想、認為、以為、覺得、感覺
10	Remembering_experience	想起、回想起、想到、記起、不記得、忘、 忘記
11	Remembering_information	想起、回想起、想到、記起、不記得、忘、 忘記
12	Remembering_to_do	想起、想到、記起、不記得、忘、忘記
13	Scrutiny	研究、分析、檢視、檢查、注意

Step 2: Obtaining Sentences Containing Mandarin Cognition Verbs

Having decided the target verbs, the author used one of the largest Mandarin corpora, the Academia Sinica Balanced Corpus of Modern Chinese (Sinica Corpus) to obtain the sentences containing the verbs in question. In addition to Sinica Corpus, the native speakers' intuition is also utilized to a great extent, and the search engine Google is used to verify the intuition.

Step 3: Observing the Morphological and Grammatical Characteristics

In the database, the following characteristics of the Mandarin cognition verbs were paid special attention to: 1) syntactic categories of the verbs; 2) grammatical functions of the verbs; 3) participant roles⁷ of the verbs; 4) syntactic patterns of the verbs with the participant roles; and 5) lexical aspect⁸ of the verbs.

Step 4: Postulating Conceptual Schema based on Frame Elements

A set of essential frame elements are found from the corpus data. Based on the frame elements, a conceptual schema is postulated. In the meanwhile, the analyses given by FrameNet are adjusted so as to fit in Mandarin cognition verbs.



⁷ The study uses 'participant roles' and 'frame elements' interchangeably. By using 'participant roles' or 'frame elements', the author focuses on the essential elements in the events depicted by the verbs. Participant roles or 'frame elements' may be broader than 'arguments' and 'adjuncts' in the traditional generative paradigm.

⁸ A.k.a. the 'Aktionart' of the verbs

Chapter 4

Findings

Following Huang et al. (2000), Chang et al. (2000) and Chiang (2006), the study examined the syntactic behaviors of Mandarin cognition verbs from a number of aspects: 1) syntactic categories of the verbs; 2) grammatical functions of the verbs; 3) participant roles of the verbs; 4) syntactic patterns of the verbs with the participant roles; and 5) lexical aspects of the verbs.

4.1. Syntactic Categories of the Verbs

In terms of the parts of speech of Mandarin cognition verbs, all of them can take direct objects, hence transitive verbs. Besides, based on the criteria summarized in Table (7) for the distinctions between actional verbs (or dynamic verbs) and stative verbs suggested in Tang T.-C.(2000: 14-15), some are Actional Verbs and the others are Stative Verbs, summarized in Table (8).

(7) The Distinctions between Actional Verbs and Stative Verbs⁹

Criteria \ Verb Types	Actional Verbs	Stative Verbs
Compatibility with Imperative Sentences	Yes	No
Collocation with Benefactive Role	Yes	No
Collocation with Patient Role	Yes	No
Functioning as Complements of Verbs of Intention	Yes	No
Functioning as Complements of Verbs of Causation	Yes	No

⁹ Imperatives「請你思考/*知道這個問題」; Benefactive Role「我替她思考/*知道這個問題」; Patient Role「你給我思考/*知道這個問題」; Complements of verbs of intention「想要思考/*知道這個問題」; Complements of verbs of causation「要他思考/*知道這個問題」.

(8) Verb Types of Mandarin Cognition Verbs

Actional Transitive Verbs	Stative Transitive Verbs
<p>想 <i>xiang</i> ‘ponder on’, 思考 <i>sikao</i> ‘ponder on’, 思索 <i>sisuo</i> ‘ponder on’, 考慮 <i>kaolu</i> ‘consider’, 考量 <i>kaoliang</i> ‘consider’, 確定 <i>queding</i> ‘make sure’, 確認 <i>queren</i> ‘confirm’, 斷定 <i>duanding</i> ‘conclude’, 發明 <i>faming</i> ‘invent’, 創造 <i>chuangzao</i> ‘create’, 構想出 <i>gouxiangchu</i> ‘conceive’, 推想 <i>tuixiang</i> ‘reason’, 推論 <i>tuilun</i> ‘reason’, 推斷 <i>tuiduan</i> ‘infer’, 想到 <i>xiangdao</i> ‘hit upon’, 想出 <i>xiangchu</i> ‘figure out’, 研究 <i>yanjiu</i> ‘research’, 分析 <i>fenxi</i> ‘analyze’, 檢視 <i>jianshi</i> ‘examine’, 檢查 <i>jiancha</i> ‘check’, 注意 <i>zhuyi</i> ‘pay attention to’, 注意到 <i>zhuyidao</i> ‘note’, 發現 <i>faxian</i> ‘find’, 發覺 <i>fajue</i> ‘discover’, 察覺 <i>chajue</i> ‘be aware of’, 記起 <i>jiqi</i> ‘remember’, 忘 <i>wang</i> ‘forget’, 忘記 <i>wangji</i> ‘forget’, 想起 <i>xiangqi</i> ‘remember’, 回憶 <i>huiyi</i> ‘recall’ and 回想起 <i>huixhaingqi</i> ‘recall’</p>	<p>想 <i>xiang</i> ‘have an opinion’, 認為 <i>renwei</i> ‘have an opinion’, 以為 <i>yiwei</i> ‘have an opinion’, 覺得 <i>juede</i> ‘feel’, 感覺 <i>ganjue</i> ‘feel’, 確定 <i>queding</i> ‘(make/be) sure’, 相信 <i>xiangxin</i> ‘believe’, 確信 <i>quexin</i> ‘be sure’, 懷疑 <i>huaiyi</i> ‘doubt’, 知道 <i>zhidao</i> ‘know’, 曉得 <i>xiaode</i> ‘know’, 清楚 <i>qingchu</i> ‘be clear about’, 明白 <i>mingbai</i> ‘understand’, 懂 <i>dong</i> ‘understand’, and 記得 <i>jide</i> ‘remember’</p>

In sum, the table shows that in terms of syntactic categories, Mandarin cognition verbs can be divided into two major groups: *actional transitive verbs* and *stative transitive verbs*.

4.2. Grammatical Functions of the Verbs

In terms of the grammatical functions of Mandarin cognition verbs, to begin with, all of them can function as **verbal predicates**. However, only three of them – 懂 *dong* ‘understand’, 清楚 *qingchu* ‘clear’ and 明白 *mingbai* ‘understand’ – can function as **verbal complements**, as in 他看 懂/清楚/明白 了這本書的內容。 *ta kan dong/qingchu/mingbai le zhe-ben shu de neirong* ‘He (read) and understood/became clear about the content of the book’. As for the modification function, none of them can function as **verbal modifiers** but a number of them can function as **nominal modifiers**, including 想 *xiang* ‘think’, 思考 *sikao* ‘think’, 思索 *sisuo* ‘ponder on’, 考慮 *kaolu* ‘consider’, 考量 *kaoliang* ‘consider’, 確定 *queding* ‘(make/be) sure’, 確認 *queren* ‘confirm’, 發明 *faming* ‘invent’, 創造 *chuangzao* ‘create’, 推想 *tuixiang* ‘reason’, 推論 *tuilun* ‘reason’, 相信 *xiangxin* ‘believe’, 懷疑 *huaiyi* ‘doubt’, 研究 *yanjiu* ‘research’, 分析 *fenxi* ‘analyze’, 檢視 *jianshi* ‘examine’, 檢查 *jiancha* ‘check’, 注意 *zhuyi* ‘pay attention to’ and 回憶 *huiyi* ‘recall’. Finally, the nominalized verbs which can function as **head nouns** are 思考 *sikao* ‘think’, 思索 *sisuo* ‘ponder on’, 考慮 *kaolu* ‘consider’, 考量 *kaoliang* ‘consider’, 確認 *queren* ‘confirm’, 推想 *tuixiang* ‘reason’, 推論 *tuilun* ‘reason’, 研究 *yanjiu* ‘research’, 分析 *fenxi* ‘analyze’, as in the pattern of ‘進行 *jinxing* ‘carry out’/做 *zuo* ‘do’ + Nominalized Verb’ (Chiang 2006: 20-21).

4.3. Participant Roles of the Verbs

There are a number of participant roles found to be essential in the events of cognition, and they will be introduced one by one.

4.3.1. The Agents of Cognition Events/States: Cognizer

To begin with, the most important role for Mandarin cognition verbs is the

Cognizer. Semantically, the Cognizer is typically a human whose intellectual activities or states are of concern. Sometimes non-human nominals, such as institutions (政府 *zhengfu* ‘government’, 財政部 *caichengbu* ‘Ministry of Finance’), companies (中油 *zhongyou* ‘Chinese Petroleum Corporation’), religions or schools (佛教 *fojiao* ‘Buddhism’、儒家 *rujia* ‘Confucianism’), or even human organs (腦袋 *naodai* ‘brain’) and location of human organs (心裡 *xingli* ‘inside the heart’) and other non-human nominals, may also be the Cognizer by way of metaphorical extensions (Liu et al. 2006). Syntactically, it is normally expressed as the sentence subject.

(9) Cognizer

Semantics: A person whose intellectual activities/states are of concern (a),
 sometimes a non-human nominal can also be a Cognizer by
 means of metaphorical extensions (b)

Syntax: Normally surfaced as an NP subject

Examples:

(a) [李文生/Cognizer]正在[思索/Cogitating][這個問題/Topic]。

Liwensheng zhengzai sisuo zhe-ge wenti

Name PROG ponder-on this-CL question

‘Liwensheng (Name) is pondering on the question.’

(b) [儒家/Cognizer][認為/Opinion][國君應該愛民如子/Content]。

rujia renwei guojun yinggai ai min ru zi

Confucians think king should love citizen like children

‘Confucians think that Kings should love their citizens like their children.’

4.3.2. The Targets for Cognition Events: Topic, Issue, Act, Ground

Secondly, the cognition activities or states may be pertaining to a Topic, an Issue, an Act or a Ground. For the Topic, semantically it may either be a subject of a field, such as 台灣原住民族時空的定位 *taiwan yuanzhuminzu shikong de dingwei* ‘the temporal and spatio position of Taiwan aborigines’, or a general term of a Content, such as 這個問題 *zhege wenti* ‘this problem.’. Syntactically it is always surfaced as a nominal phrase. It is normally expressed as the direct object of the prepositions 對於 *duiyu* and 關於 *guanyu* ‘about’, or it may sometimes be the direct objects of the cognition verbs with the potential to undergo topicalization.

(10) Topic

Semantics: A subject of a field or a general term of a Content

Syntax: Normally expressed as an NP object of Prepositions such as 對於 *duiyu*、關於 *guanyu* ‘about’ (a), or sometimes as an NP object of the cognition verb (b)

Examples:

(a) 對於[這一點/Topic]，[周先生/Cognizer][認為/Opinion][水鳥族群的減少是全世界皆如此/Content]。

duiyu zhe-yi-dian, zhouxiansheng renwei shuiniao zuqun de jianshao shi quanshijie jie ruci

about this-one-point, Mr. Chou thinks water-bird species DE decrease is whole-world all so

‘About this point, Mr. Chou thinks that the decrease of water birds is similar around the world.’

(b) [導演格里菲斯/Cognizer]也[思考/Cogitating][這個問題/Topic]。

daoyan gelifeisi ye sikao zhe-ge wenti

director GELIFEISI (Name) also consider this-CL problem

‘Director Griffith also considered the problem.’

For the Issue, semantically it is a problem that calls for solution or decision. Therefore, syntactically it is normally expressed as an interrogative sentence, be it A-no-A questions, Yes-No questions or Wh questions.

(11) Issue

Semantics: A problem to be solved

Syntax: Normally surfaced as an interrogative clausal complement, including A-not-A questions (a), Yes-No questions (b) and Wh questions (c).

Examples:

(a) [我/Cognizer]正在[考慮/Cogitating][要不要辭去工作？/Issue]

wo zhengzai kaolu yao-bu-yao ci qu gongzuo

I PROG consider should-not-should quit job

‘I am considering whether I should quit the job.’

(b) [該地區其他航空公司/Cognizer]正在[考慮/Cogitating][是否調高票價/Issue]。

gai diqu qita hangkong gongsi zhengzai kaolu shifou diaogao piao jia

that area other airline company PROG consider yes-no raise fee

‘Other airline companies in that area are considering whether (they are) going to raise the price.’

(c) [每個人/Cognizer]都要通過[自然生命的角度/Perspective]，去[思考/Cogitating][如何開拓人生的前程/Issue]。

*mei-ge ren dou yao tong-guo ziran shengming de jiaodu, qu sikao ruhe
kaituo rensheng de qiancheng*

each-CL person all need pass-through nature live DE perspective to
consider how open live DE future

‘Everyone needs to think about how to open our prospects of live
through the perspective of natural lives.’

A cognizer may also think about whether he/she would conduct an Act. As the name suggests, an Act is usually realized as a verbal complement of the cognition verbs.



(12) Act

Semantics: An action that a Cognizer might or might not conduct

Syntax: Normally surfaced as a verbal complement of the cognition verbs

Example:

[他/Cognizer][考慮/Planning][更改吳鳳紀念園名稱/Act]

ta kaolu genggai wufeng jinian-yuan mingcheng

he consider change WUFENG (Name) memorial-park name

‘He considers changing the name of the Wufeng Memorial Park.’

In addition to the Topic, the Issue and the Act, the other possible target for cognition activities/states is a Ground. What singles out the Ground is that the Cognizer pays attention to the Ground so as to find a particular property (or

Phenomenon) that belongs to the Ground or is contained in the Ground. Thus there will be a characteristic about the Ground that is of concern. The Ground is expressed as a nominal phrase, as the following example.

(13) Ground

Semantics: A background or context associated with a Phenomenon, a particular property or characteristics belonging to the Ground or contained in the Ground

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[筆者/Cognizer][研究/Scrutinizing][社會結構/Ground]，發現兩人都很自我。

bizhe yanjiu shehui jiegou, faxian liang-ren dou hen ziwo

author study society structure, find two-people all very self centered

‘The author studied society structure and found that both of the two people are self-centered.’

The Ground may also be coded as a clause, typically in the form of a question, as is shown below. Note that the questions here are not really interrogative in nature, but rather is used to describe the Ground. In this case, it is given the name Ground_Proposition.

(14) Ground_Proposition

Semantics: A background or context examined by a Cognizer, usually associated with a Phenomenon describing a particular property or characteristics of the Ground

Syntax: Surfaced as an interrogative clausal complement of the cognition verbs

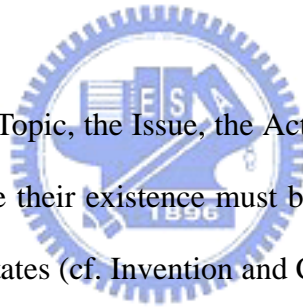
Example:

[我這位朋友/Cognizer][分析/Scrutinizing][其新老闆為何會有這樣不禮貌的舉動/Ground Proposition]。

wo zhe-wei pengyou fenxi qi xin laoban weihe hui you zhe-yang bu limao de judong

I this-CL friend analyze his new boss why will have this-kind no manner DE behavior

‘My friend analyzes (the reason) why his new boss behaves like this without manner.’



What is essential for the Topic, the Issue, the Act and the Ground is that they are pre-existing entities and hence their existence must be independent of the realization of the cognition activities or states (cf. Invention and Content), i.e. their existences are presupposed. Compare the following minimal pairs.

(15) Topic

a. 他思考過 這個問題

ta sikao guo zhe-ge wenti

‘He thought about the problem.’

b. 他沒思考過 這個問題

ta mei sikao guo zhe-ge wenti

‘He didn’t think about the problem.’

(16) Issue

a. 他考慮過 要不要去。

ta kaolu guo yao-bu-yao qu

‘He thought about whether to go.’

b. 他沒考慮過 要不要去。

ta mei kaolu guo yao-bu-yao qu

‘He didn’t think about whether to go.’

(17) Act

- a. 他考慮過 要去台北。 b. 他沒考慮過要去台北。
- ta kaolu guo yao qu taibei* *ta mei kaolu guo yao qu taibei*
- ‘He thought about going to Taipei.’ ‘He didn’t think about going to Taipei.’

(18) Ground

- a. 他分析過這個問題。 b. 他沒分析過這個問題。
- ta fenxi guo zhe-ge wenti* *ta mei fenxi guo zhe-ge wenti*
- ‘He analyzed the problem.’ ‘He didn’t analyze the problem.’

It is clear from the minimal pairs above that whether the main clause is affirmative or negative, the existence of the Topic, the Issue, the Act and the Ground is not cancelled.



4.3.3. The Created Products of Cognition Events: Invention, Content, Phenomenon and Knowledge

Contrary to the Topic, the Issue, the Act and the Ground, the existence of the following participant roles are heavily dependent on the realization of the cognizing activities, i.e., they are the products of cogitation activities. Moreover, unlike the Topic, the Issue and the Ground, which exist outside of a Cognizer’s mind, the following participants exist within a Cognizer’s mind.

To begin with, an Invention is the conceptual, intellectual products created from the cogitation activities. It is normally expressed as a nominal phrase, as in (19). Occasionally it may also be surfaced as a clause, hence termed Invention_Proposition, as in (20).

(19) Invention

Semantics: A conceptual, intellectual creation of a Cognizer

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[他/Cognizer]想來想去，[想出/Inventing]了[一個法子/Invention]。

ta xiang lai-xiang-qu-xiang chu,xiang-chu le yi-ge fazi

he think-come-think-go think-out PERF one solution

‘He thought and thought, and figured out a solution.’

(20) Invention Proposition

Semantics: A conceptual, intellectual creation of a Cognizer

Syntax: Surfaced as a clausal complement of the cognition verbs

Example:

後來，[他/Cognizer]果然[想出/Inventing][利用蒸氣機轉動車的方法/ Invention Proposition]，發明了火車。

houlai, ta guoran xiang-chu liyong zhengqiji zhuandong che de fangfa

faming le huoche

later he as-expected figure-out use steamer rotate vehicles DE way

invent PERF train

‘Later on, he figured out inventing the train using steamers rotating the vehicles, just as expected.’

The second frame element is a Content, which is a subjective thinking of a Cognizer, i.e. it may not be a generally accepted idea and is largely dependent on the individual cognizer as well as the point of view that one takes. Syntactically, it is realized as a clause, as in (21) but sometimes it may be expressed as an NP, as in (22)

and therefore it is termed Content_Description.

(21) Content

Semantics: A Cognizer's way of subjective thinking, which is not necessarily generally accepted, and is generally dependent on the Cognizer's point of view

Syntax: Surfaced as a clausal complement of the cognition verbs

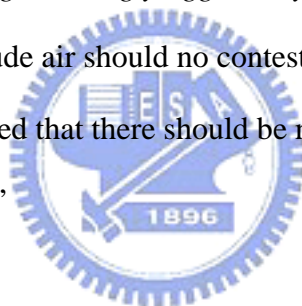
Example:

[裁判們/Cognizer][斷定/Coming-to-believe][天空應該沒有選手還在飛
/Content]。

caipan-men duanding tiankong yinggai meiyou xuanshou hai zai fei

judge-AFFIX conclude air should no contestant still PROG fly

'The judges concluded that there should be no contestants who are still flying in the air.'



(22) Content_Description

Semantics: A Cognizer's way of subjective thinking, which is not necessarily generally accepted, and is generally dependent on the Cognizer's point of view

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[她/Cognizer]憑[一個女孩子握筷子的高低/Evidence]，就能[斷定
/Coming-to-believe][她未來婆家的遠近/Content_Description]。

*ta ping yi-ge nuhaizi wo kuaizi de gao di, jiu neng duanding ta weilai
pojia de yuanjin*

she by one-CL girl hold chopstick DE high low, solely can conclude
she future family-of-her-husband DE far near
'She concludes the distance of a girl's future family of her husband
sorely by how high she holds the chopsticks.'

As opposed to the Content, a Knowledge is a generally accepted fact shared by the public. Accordingly, the view points a Cognizer takes is not important. Syntactically, the knowledge is realized as a clause, as in (23); sometimes it is expressed by a NP, as in (24), and in this case, it is named Knowledge_Description.

(23) Knowledge

Semantics: A piece of information in a Cognizer's mind, which is generally accepted or shared by the public (cf. 'Content')

Syntax: Surfaced as a clausal complement of the cognition verbs

Example:

[大家/Cognizer]都[知道/Knowing][遺傳基因是由去氧核酸構成
/Knowledge]。

dajia dou zhidao yichuan jiyin shi you quyanghesuan goucheng

everyone all know genes are DNA compose

'Everyone knows that genes are composed by DNA.'

(24) Knowledge_Description

Semantics: A piece of information in a Cognizer's mind, which is generally accepted or shared by the public (cf. 'Content')

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[你/Cognizer]也[知道/Knowing][後來的結果/ Knowledge Description]。

ni ye zhidao houlai de jieguo

you also know later DE result

‘You also know the afterward result.’

Finally, a Phenomenon may be added to the mind of a Cognizer after the realization of a Cognition activities (mostly activities of scrutinizing). Semantically, a Phenomenon is a characteristics or properties belonging to or being contained in a Ground. Thus, it may seem to be external to a Cognizer’s mind, just like Topic, Issue and Ground. However, it is in fact a property or characteristics identified by a Cognizer, and thus its existence is still dependent on the realization of the cognition events. In this regard, it is more similar to Invention, Content and Knowledge. Syntactically, a Phenomenon is generally surfaced as a nominal, as in (25). When it is expressed as a clause, as in (26), then it is termed Phenomenon_Proposition.

(25) Phenomenon

Semantics: A property that belongs to an entity or is contained in an entity

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[藝術家/Cognizer]在生命過程中透過[某種特殊靈感或天才

/Instrument]，[發現/Becoming-aware][永恆的曙光/Phenomenon]。

yishujia zai shengming guocheng zhong touguo mou-zhong teshu

linggan huo tiancai faxian yongheng de shuguang

artist at life process inside by some special inspiration or genius find
eternal DE first-gleam-of-the-day

‘Artists found ‘the eternal first gleam of the day’ through some special
inspiration or genius in the life process.’

(26) Phenomenon Proposition

Semantics: A property that belongs to an entity or is contained in an entity

Syntax: Surfaced as a clausal complement of the cognition verbs

Example:

[他們/Cognizer][發現/Becoming-aware][儒家並不是像他們所批判的那
麼不合情理/Phenomenon Proposition]。

*tamen faxian rujia bing bu shi xiang tamen suo pipan de name bu he
qingli*

they find the Confucian school also not is like they LIGHT criticize DE so
not match sense-reason

‘They found that the Confucian school is not as not conforming to
reason as the way they criticize.’

4.3.4. The Pre-existed Mental Content/Knowledge: Memory

The following participant role, Memory, is similar but slightly different from the
above mentioned Topic, Issue, Ground, Invention, Content, Knowledge and
Phenomenon. A Memory is similar to Topic, Issue and Ground in that their
existence is independent from the realization of the cognition events in question, but
unlike the three roles, a Memory is within a Cognizer’s mind, the property which is
shared by Content, Knowledge and Phenomenon. Hence, actually a Memory can be
seen as a pre-existing Content or Knowledge. Syntactically, it is expressed as an NP.

The definition and example of a Memory are given below.

(27) Memory

Semantics: A pre-existing Content or Knowledge

Syntax: Surfaced as a direct NP object of the cognition verbs

Example:

[我/Cognizer][想起/Remembering_Resultative State]了[營地「五一」棚的
來歷/Memory]。

wo xiang-qi le yingdi 「wu-yi」 peng de laili

I remember PERF campsite five-one shack DE history

‘I remembered the story of the campsite, Five-One Shack.’

In the same vein, when a Memory is realized as a clause, it is termed as
Memory_Proposition.



(28) Memory_Proposition

Semantics: A pre-existing Content or Knowledge

Syntax: Surfaced as a sentence

Example:

[我/Cognizer][想起/Remembering_Resultative State][在一本書上曾看到
過這種樹，叫傘松，又叫羅馬松/Memory_Proposition]。

*wo xiang-qi zai yi-ben shu shang ceng kan-dao guo zhe-zhong shu, jiao
sansong, you jiao luomasong*

I remember at one-CL book on once see PERF this-CL tree, call
SANSONG(Name), also call LUOMASHONG(Name)

‘I remembered that I once saw this kind of tree, named Sansong, or Luomashong, on a book.’

4.3.5. The External Forces: Instrument, Stimulus, Evidence, Means

In addition to the above participant roles that have a direct link to the cognition activities/states, it is also found from corpus data that there are roles that serve as ‘external forces’ that help the Cognizer to accomplish the cognition activities (the Instrument) or trigger the cognition activities (the Stimulus) or as ‘factual sources’ which the cognition activities can base on (the Evidence and the Means). To begin with, an Instrument denotes a tool used in a cognition event. It is usually as a direct NP object of 用 *yong* ‘use’、以 *yi* ‘by means of’, as in (29a), or as a sentence subject, as in (29b).



(29) Instrument

Semantics: A tool used by a Cognizer to carry out a task

Syntax: Usually surfaced as a direct NP object of 用 *yong* ‘use’、以 *yi* ‘by means of’ (a); sometimes it may appear as a sentence subject (b)

Examples:

(a) [他/Cognizer]用[真正超越的智慧/Instrument]來[分析
/Scrutinizing][世間的道理/Ground]。

ta yong zhenzheng chaoyue de zhihui lai fengxi shijian de daoli

he use genuine surpass DE wisdom to analyze world DE principle

‘He uses genuinely surpassing wisdom to analyze the world’s principles.’

(b)[動物實驗/Instrument][發現/Becoming-aware][天生瘦子基因
/Phenomenon] (Google 2007/6/1)

dongwu shiyan faxian tiansheng shouzi jiyin

animal experiment find natural thin-people gene

‘Animal experiments found natural thin-people gene.’

The second external force is an Evidence, which is a fact that a Cognizer’s belief is dependent on. It is usually realized in a phrase headed by 憑 *ping*、用 *yong*、藉 *jie* ‘by means of’.

(30) Evidence

Semantics: A fact that allows a Cognizer to come to believe a Content

Syntax: Usually surfaced as an NP object following 憑 *ping*、用 *yong*、藉

jie ‘by means of’

Example:

[她/Cognizer]憑[一個女孩子握筷子的高低/Evidence]，就能[斷定
/Coming-to-believe][她未來婆家的遠近/Content_Description]。

*ta ping yi-ge nuhaizi wo kuaizi de gao di, jiu neng duanding ta weilai
pojia de yuanjin*

she by one-CL girl hold chopstick DE high low, solely can conclude

she future family-of-her-husband DE far near

‘She concludes the distance of a girl’s future family of her husband sorely
by how high she holds the chopsticks.’

Sometimes a Cognizer may carry out a cognitive task by doing something. This is given the name of Means.

(31) Means

Semantics: An act conducted by a Cognizer to carry out a task

Syntax: Normally surfaced as a VP

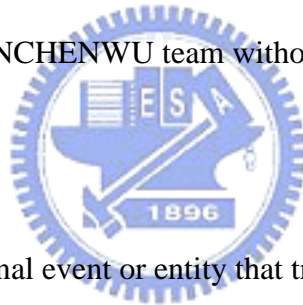
Example:

[我/Cognizer][留心聽了航班號/Means], [確認/Coming-to-believe][這架飛機的機組是錦雲乘務隊的無疑/Content]。

*wo liuxin ting le hangban hao, queren zhe-jia feiji de jizu shi jinyunchengwu
dui de wuyi*

I attentively listen PERF flight number confirm this-CL plane DE crew is
JINYUNCHENGWU (Name) team DE no-doubt

‘I attentively listened to the flight number and confirmed that the crew of
this plane is JINYUNCHENWU team without doubt.’



(32) Stimulus

Semantics: An external event or entity that triggers cognition activities

Syntax: Usually surfaced as a VP or an NP, as an external argument in the
causative constructions

Example:

[登岳陽樓/Stimulus], 使[我/Cognizer][想起/Remembering_Resultative
State][范仲淹/Memory]。

deng yueyanglou, shi wo xiang-qi fanzhongyan

climb YUEYANGLOU(Name), make me remember FANZHONGYAN
(Name)

‘Climbing Yueyanglou reminds me of Fan zhongyan.’

4.3.6. The Attributes of Cognition Events: Degree, Duration and Perspective

Finally, some elements denote certain characteristics of cognition activities/states, such as the Degree, the Duration and the Perspective. First of all, the Degree is referred to the scalar differences of the cognition states, as shown below.

(33) Degree

Semantics: A scale of a Cognizer's belief in the correctness of a Content

Syntax: Typically expressed as a degree adverb

Example:

[我/Cognizer][十分/Degree][懷疑/Certainty][上述對後現代政治這種陳腔濫調的描述/Content_Description]。(Google 20070531)

*wo shifen huaiyi shangshu dui houxiandai zhengzhi zhe-zhong
chenqianglandiao de miao shu*

I very doubt above about post-modern politics this-CL cliché DE
description

'I very much doubt the above timeworn description about the post-modern
politics.'

The next one is the Duration, here solely referring to the temporal duration of the event, as in 這個問題，他想了三年 *zhe-ge wenti, ta xiang le san nien* 'This question, he has been thinking for three years.', not the temporal distance between the reference time and the event time, as in 他死了三年 *ta si le san nien* 'He is dead for three years.' (Huang et al. 2000: 28)

(34) Duration

Semantics: The temporal length of an event

Syntax: Usually surfaced as an nominal phrase or an Adverb phrase
denoting temporal duration

Example:

[爸爸/Cognizer]認真[思考/Cogitating]了[一大會兒/Duration]。

baba renzheng sikao le yidahuier

Father seriously think PERF a-while

‘Father thought seriously for a while.’

Finally, some elements denote the Perspective a Cognizer takes to ponder on a Topic. The Perspective is usually expressed by a preposition phrase headed by 從 *cong* ‘from’ and 以 *yi* ‘by’.

(35) Perspective

Semantics: The point of view a Cognizer takes to ponder on a Topic

Syntax: Usually surfaced as preposition phrase headed by 從 *cong* ‘from’
and 以 *yi* ‘by’

Example:

[劉教授/Cognizer][從反面/Perspective]來[思考/Cogitating][問題/Topic]。

Liu jiaoshou cong fanmian lai sikao wenti

Liu professor from Opposite-side to consider problem

‘Prof. Liu considered the problem from the opposite side.’

In sum, the participant roles that are observed from the corpus data help us understand the essential elements of cognition events. In the following chapter, we will propose a conceptual schema of cognition domain plotted with these participant roles.

4.4. Syntactic Patterns of the Verbs with the Participant Roles

There are a number of basic syntactic patterns we observed from the corpus data. It is found that some verbs share the same syntactic patterns. To begin with, 想 *xiang* ‘think’, 思考 *sikao* ‘think’, 思索 *sisuo* ‘ponder on’, 考慮 *kaolu* ‘consider’, 考量 *kaoliang* ‘consider’ share the following patterns:

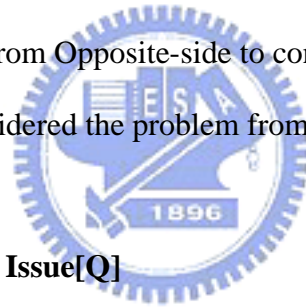
(36) Cognizer[NP]<{從/以/用/...}[Prep]+Perspective[NP]<* < Topic[NP]

Ex.: [劉教授/Cognizer][從反面/Perspective]來[思考/Cogitating][問題/Topic]。

Liu jiaoshou cong fanmian lai sikao wenti

Liu professor from Opposite-side to consider problem

‘Prof. Liu considered the problem from the opposite side.’



(37) Cognizer[NP]<* < Issue[Q]

Ex.: [我/Cognizer]正在[考慮/Cogitating][要不要辭去工作?/Issue]

wo zhengzai kaolu yao-bu-yao ci qu gongzuo

I PROG consider should-not-should quit job

‘I am considering whether I should quit the job.’

The verbs 考慮 *kaolu* ‘plan’, 打算 *dashuang* ‘plan’ and 計劃 *jihua* ‘plan’ share the following pattern:

(38) Cognizer[NP]<* < Act[VP]

Ex.: [他/Cognizer]正[考慮/Planning][送亞妮去接受專業訓練/Act]。

ta zheng kaolu song yani qu jiesuo zhunye xunlian

he PROG plan send YANI (Name) to receive professional training
'He is planning on sending Yani to take professional training.'

研究 *yanjiu* 'research', 分析 *fenxi* 'analyze', 檢視 *jianshi* 'examine', 檢查 *jiancha* 'check', 注意 *zhuyi* 'pay attention to' share the following patterns:

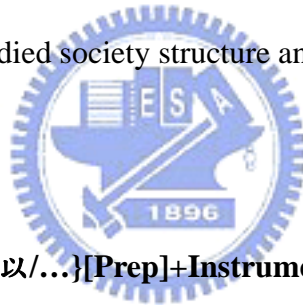
(39) Cognizer[NP] < * < Ground[NP]

Ex.: [筆者/Cognizer][研究/Scrutinizing][社會結構/Ground], 發現兩
人都很自我。

bizhe yanjiu shehui jiegou, faxian liang-ren dou hen ziwo

author study society structure, find two-people all very self centered

'The author studied society structure and found that both people are
self-centered.'



(40) Cognizer[NP] < {用/以/...}[Prep] + Instrument[NP] < * < Ground[NP]

Ex.: [他/Cognizer]用[真正超越的智慧/Instrument]來[分析
/Scrutinizing][世間的道理/Ground]。

ta yong zhenzheng chaoyue de zhihui lai fengxi shijian de daoli

he use genuine surpass DE wisdom to analyze world DE principle

'He uses genuinely surpassing wisdom to analyze the world's
principles.'

(41) Cognizer[NP] < * < Ground Proposition[Q]

Ex.: [我這位朋友/Cognizer][分析/Scrutinizing][其新老闆為何會有這樣
不禮貌的舉動/Ground Proposition]。

wo zhe-wei pengyou fenxi qi xin laoban weihe hui you zhe-yang bu

limao de judong

I this-CL friend analyze his new boss why will have this-kind no
manner DE behavior

‘My friend analyzes the reason why his new boss behaves like this
without manner.’

The verbs 想 *xiang* ‘think’, 思考 *sikao* ‘think’, 思索 *sisuo* ‘ponder on’, 考量 *kaoliang* ‘consider’, 考慮 *kaolu* ‘consider; plan’, 打算 *dashuang* ‘plan’ and 計劃 *jihua* ‘plan’, 研究 *yanjiu* ‘research’, 分析 *fenxi* ‘analyze’, 檢視 *jianshi* ‘examine’, 檢查 *jiancha* ‘check’, 注意 *zhuyi* ‘pay attention to’ all share the following pattern:

(42) Cognizer[NP] < * < Duration[AdvP/NP]

Ex.: [爸爸/Cognizer]認真[思考/Cogitating]了[一大會兒/Duration]。

baba renzheng sikao le yidahuier

Father seriously think PERF a-while

‘Father thought seriously for a while.’

The group of verbs 想 *xiang* ‘think’, 想出 *xiangchu* ‘figure out’, 想到 *xiangdao* ‘hit upon’, 發明 *faming* ‘invent’, 創造 *chuangzao* ‘invent’, 構想出 *gouxiangchu* ‘conceive’ share the following patterns:

(43) Cognizer[NP] < * < Invention[NP]

Ex.: [他/Cognizer]想來想去，[想出/Inventing]了[一個法子/
Invention]。

ta xiang lai-xiang-qu-xiang chu, xiang-chu le yi-ge fazhi

he think-come-think-go think-out PERF one solution

‘He thought and thought, and figured out a solution.’

(44) Cognizer[NP] < * < Invention_Proposition[VP/CL]

Ex.: 後來，[他/Cognizer]果然[想出/Inventing][利用蒸氣機轉動車的方法/ Invention_Proposition]，發明了火車。

*houlai, ta guoran xiang-chu liyong zhengqiji zhuandong che de fangfa
faming le huoche*

later he as-expected figure-out use steamer rotate vehicles DE way
invent PERF train

‘Later on, he figured out inventing the train using steamers rotating the vehicles, just as expected.’

想 *xiang* ‘think’, 認為 *renwei* ‘think’, 以為 *yiwai* ‘think’, 覺得 *juede* ‘feel’, 感覺 *ganjue* ‘feel’ share the following patterns:



(45) Cognizer[NP] < * < Content[CL]

Ex.: [我/Cognizer][想/Opinion][未來的兩年裡，算了吧！/Content]

wo xiang weilai de liang-nian li, suanle ba

I think future DE two-year inside, forget PART

‘I think in the future two years, forget it.’

(46) {針對/對於/...}[Prep]+Topic[NP]< Cognizer[NP] < * < Content[CL]

Ex.: 對於[這一點/Topic]，[周先生/Cognizer][認為/Opinion][水鳥族群的減少是全世界皆如此/Content]。

*duiyu zhe-yi-dian, zhouxiansheng renwei shuinao zuqun de jianshao
shi quanshijie jie ruci*

about this-one-point, Mr. Chou thinks water-bird species DE decrease
is whole-world all so

‘About this point, Mr. Chou thinks that the decrease of water birds is
similar around the world.’

確定 *queding* ‘(make/be) sure’, 確認 *queren* ‘confirm’, 斷定 *duanding*
‘conclude’, 推斷出 *tuiduanchu* ‘conclude’、推論出 *tuilungchu* ‘reason out’
share the following patterns:

(47) Cognizer[NP]<{由/藉由/從/憑/...}[Prep]+Evidence<* < Content[CL]

Ex.: [裁判們/Cognizer][斷定/Coming-to-believe][天空應該沒有選手還
在飛/Content]。

caipan-men duanding tiankong yinggai meiyou xuanshou hai zai fei
judge-AFFIX conclude air should no contestant still PROG fly

‘The judges concluded that there should be no contestants who are
still flying in the air.’

(48) Cognizer[NP]<{由/藉由/從/憑/...}[Prep]+Evidence * < Content_

Description [NP]

Ex.: [她/Cognizer]憑[一個女孩子握筷子的高低/Evidence]，就能[斷定
/Coming-to-believe][她未來婆家的遠近/Content_Description]。

*ta ping yi-ge nuhaizi wo kuaizi de gao di, jiu neng duanding ta weilai
pojia de yuanjin*

she by one-CL girl hold chopstick DE high low, solely can conclude
she future family-of-her-husband DE far near

‘She concludes the distance of a girl’s future family of her husband

sorely by how high she holds the chopsticks.’

(49) {從/藉/由/...}[Prep]+Evidence[NP]<*<Content_Description[NP]

Ex.: 從[火山口延伸至平原上的地面顏色深淺度/Evidence]，可[推斷出
/Coming-to-believe][火山噴發時間的久遠/Content_Description]。

*cong huoshankou yanshen zhi pingyuan shang de dimian yanse
shenqiandu ke tuiduan chu huoshan penfa shijian de jiu yuan*

from volcano-mouth extend to plain on DE ground color

deep-shallow-degree can determine volcano outburst time DE distance

‘Based on the degree of color from the crater to the plain, (one) can

determine the temporal distance of the outburst of the volcano.’



(50) Cognizer[NP]<Means[VP] <*<Content[CL]

Ex.: [我/Cognizer][留心聽了航班號/Means]，[確認/Coming-to-believe][這
架飛機的機組是錦雲乘務隊的無疑/Content]。

*wo liuxin ting le hangban hao, queren zhe-jia feiji de jizu shi
jinyunchengwu dui de wuyi*

I attentively listen PERF flight number confirm this-CL plane DE crew
is JINYUNCHENGWU (Name) team DE no-doubt

‘I attentively listened to the flight number and confirmed that the crew
of this plane is JINYUNCHENWU team without doubt.’

確定 *queding* ‘sure’, 相信 *xiangxin* ‘believe’, 確信 *quexin* ‘sure’, 堅信
jianxin ‘firmly believe’、深信 *shengxin* ‘deeply believe’、懷疑 *huaiyi* ‘doubt’ share
the following patterns:

(51) Cognizer[NP] <Degree[Adv]<* < Content[CL]

Ex.: [我/Cognizer][深深/Degree][相信/Certainty]，[沒有諒解與寬恕的心，就沒有溫柔敦厚好禮的社會/Content]。

wo shenshen xiangxin, mei you liangjie yu kuanshu de xin, jiu mei you wenrou dunhou haoli de shehui

I deeply believe no have understand and forgive DE heart then no have tender good-natured good-mannered DE society

‘I deeply believe that without understanding and forgiveness, there would be no tender, good-natured, good-mannered society.’

(52) Cognizer[NP] <Degree[Adv]<* < Content_Description[NP]

Ex.: [我/Cognizer][十分/Degree][懷疑/Certainty][上述對後現代政治這種陳腔濫調的描述/Content_Description]。(Google 20070531)

wo shifen huaiyi shangshu dui houxiandai zhengzhi zhe-zhong chenqianglandiao de miao shu

I very doubt above about post-modern politics this-CL cliché DE description

‘I very much doubt the above timeworn description about the post-modern politics.’

發現 *faxian* ‘find’, 發覺 *fajue* ‘discover’, 察覺 *chajue* ‘be aware of’, 注意到 *zhuyidao* ‘note’ share the following patterns:

(53) Cognizer[NP]<{透過/經由/...}[Prep]+Instrument[NP] <* <Phenomenon[NP]

Ex.: [藝術家/Cognizer] 在生命過程中透過[某種特殊靈感或天才

/Instrument]，[發現/Becoming-aware][永恆的曙光

/Phenomenon]。

yishujia zai shengming guocheng zhong touguo mou-zhong teshu

linggan huo tiancai faxian yongheng de shuguang

artist at life process inside by some special inspiration or genius find

eternal DE first-gleam-of-the-day

‘Artists found ‘the eternal first gleam of the day’ through some special

inspiration or genius in the life process.’

(54) Cognizer[NP] < {透過/經由/...}[Prep] + Instrument[NP] < * <

Phenomenon Proposition[CL]

Ex.: [他們/Cognizer] [發現/Becoming-aware][儒家並不是像他們所

批判的那麼不合情理/Phenomenon Proposition]。

tamen faxian rujia bing bu shi xiang tamen suo pipan de name bu he

qingli

they find the Confucian school also not is like they LIGHT criticize

DE so not match sense-reason

‘They found that the Confucian school is not as not conforming to

reason as the way they criticize.’

(55) Instrument[NP] < * < Phenomenon Proposition[CL]

Ex.: [動物實驗/Instrument][發現/Becoming-aware][天生瘦子基因

/Phenomenon] (Google 2007/05/31)

dongwu shiyan faxian tiansheng shouzi jiyin

animal experiment find natural thin-people gene

‘Animal experiments found natural thin-people gene.’

知道 *zhidao* ‘know’, 曉得 *xiaode* ‘know’, 清楚 *qingchu* ‘be clear about’,
明白 *mingbai* ‘understand’, 懂 *dong* ‘understand’ share the following patterns:

(56) Cognizer[NP] < * < Knowledge[NP]

Ex.: [你/Cognizer]也[知道/Knowing][後來的結果/ Knowledge]。

ni ye zhidao houlai de jieguo

you also know later DE result

‘You also know the afterward result.’

(57) Cognizer[NP] < * < Knowledge Proposition[CL]

Ex.: [我們/Cognizer]似乎也[知道/Knowing], [中國之所以落後於世界列強, 關鍵就在於清代/ Knowledge Proposition]。

*women sihu ye zhidao, zhongguo zhi suoyi luohou yu shijie-lieqiang,
guanjian jiu zaiyu qingdai*

we seem also know, China DE LIGHT fall-behind LIGHT

World-Powers key LIGHT at the Ching Dynasty

‘We also seem to know that the key to the reason why China was left
behind the World Powers is at the Ching Dynasty.’

回憶 *huiyi* ‘recall’, 回想 *huixiangqi* ‘recall’, 忘 *wang* ‘forget’, 忘記 *wangji*
‘forget’ share the following patterns:

(58) Cognizer[NP] < * < Memory[NP]

Ex.: [那個可憐的小孩子/Cognizer]正在努力[回想

/Remembering_Process][媽媽跟他說的話/Memory]。

回想起 *huixhaingqi* ‘recall’, 回憶起 *huiyiqi* ‘recall’, 記起 *jiqi* ‘remember’
想起 *xiangqi* ‘remember’, 想到 *xiangdao* ‘remember’ and 忘 *wang* ‘forget’ share the
following pattern:

**(59) Stimulus[NP/VP]<{教/讓/使/令/...}[Verb]< Cognizer[NP]<* <
Memory[NP]**

Ex.: [登岳陽樓/Stimulus], 使[我/Cognizer][想起/Remembering_
Resultative State][范仲淹/Memory]。

deng yueyanglou, shi wo xiang-qi fanzhongyan

climb YUEYANGLOU(Name), make me remember

FANZHONGYAN (Name)

‘Climbing Yueyanglou reminds me of Fan zhongyan.’

記得 *jide* ‘remember’, 忘 *wang* ‘forget’, 忘記 *wangji* ‘forget’ share the
following pattern:

(60) Cognizer[NP]<* +{ , }<Memory[NP]

Ex.: :[我/Cognizer][記得/Remembering_Homogeneous State], [那步出家
門被陽光溶化的那個畫面/Memory]

wo jide, na bu chu jiamen bei yangguang ronghua de na-ge huamian

I remember that walk out house-door BEI sun-shine melt DE that-CL
picture

‘I remember the picture that I was melted by the sun shine when I walked
out of the door of my house.’

(61) Cognizer[NP]< * +{ , }<Memory_Proposition[CL]

Ex.: [我/Cognizer][記得/Remembering_Homogeneous state], [我在念中學

時, 有一個叫首仙仙的女孩自殺了。/Memory_Proposition]

wo jide, wo zai nian zhongxue shi, you yi-ge jiao shou-xian-xian de nuhai zisha le

I remember I PROG study high-school time have one-CL named SHOU-XIAN-XIAN (Name) DE girl suicide PERF

‘I remember that when I was in high school, a girl named Shou Xian-Xian killed herself.’

(62) Cognizer[NP]< * <Act[VP]

Ex.: [歌德/Cognizer][忘/Remembering_Homogeneous State]了[提一件事 /Act]。

gede wang le ti yi-jian shi

Gothe forget PERF mention one-CL thing

‘Gothe forgot to mention one thing.’



4.5. Aspectual Properties of the Verbs

This section discusses the aspectual properties of Mandarin cognition verbs. Following the criteria for the distinction of lexical aspects given in Tang T.-C. (2000: 15) and Huang et al. (2000), the author examined the following aspects:

(63) Tests for Lexical Aspects

(a) whether the verbs can be reduplicated (記記看 *jijikan* ‘try to memorize’)

- (b) whether the verbs can be repeated (記了又記 *ji-le-you-ji* ‘memorize again and again’)
- (c) whether the verbs can collocate with
- i. progressive aspect markers such as 在 *zai* and 著 *zhe*
 - ii. aspectual verbs 開始 *kaishi* ‘begin to do something’, 繼續 *jixu* ‘continue doing something’ and 停止 *tingzhi* ‘stop doing something’
 - iii. the verb 一直 *yizhi* ‘keep (doing something)’
 - iv. durational phrases such as 一個小時 *yi-ge-xiaoshi* ‘an hour’¹⁰.
- (d) whether the verbs can collocate with perfective aspect markers such as 了 *le*

The verbs satisfying any of the conditions (a) to (c) would be classified as activity verbs; the verbs satisfying the condition (d) would be classified as achievement verbs; the verbs which do not fit all these conditions would be classified as state verbs. The results are shown below.

(64) Aspectual Properties of Mandarin cognition verbs

Situation Types	Mandarin cognition verbs
Activity	想 <i>xiang</i> ‘think’, 思考 <i>sikao</i> ‘think’, 考慮 <i>kaolu</i> ‘consider’, 考量 <i>kaoliang</i> ‘consider’, 思索 <i>sisuo</i> ‘ponder on’, 確定 <i>queding</i> ‘(make/be) sure’, 確認 <i>queren</i> ‘confirm’, 回憶 <i>huiyi</i> ‘recall’, 研究 <i>yanjiu</i> ‘research’, 分析 <i>fenxi</i> ‘analyze’, 檢視 <i>jianshi</i> ‘examine’, 檢查 <i>jiancha</i> ‘check’, 注意 <i>zhuyi</i> ‘pay attention to’
Achievement	確定 <i>queding</i> ‘(make/be) sure’, 確認 <i>queren</i> ‘confirm’, 斷定 <i>duanding</i> ‘conclude’, 構想出 <i>gouxiangchu</i> ‘conceive’, 推斷 <i>tuiduan</i> ‘infer’,

¹⁰ With the interpretation of the temporal duration of the event, as in 這個問題，他想了三年 *zhe-ge wenti, ta xiang le san nien* ‘This question, he has been thinking for three years.’, instead of the temporal distance between the reference time and the event time, as in 他死了三年 *ta si le san nien* ‘He is dead for three years.’ (Huang et al. 2000: 28)

	想到 <i>xiangdao</i> ‘think of, hit upon’, 想出 <i>xiangchu</i> ‘figure out’, 發現 <i>faxian</i> ‘find’, 發覺 <i>fajue</i> ‘discover’, 察覺 <i>chajue</i> ‘be aware of’, 注意到 <i>zhuyidao</i> ‘note’, 記起 <i>jiqi</i> ‘remember’, 忘 <i>wang</i> ‘forget’, 忘記 <i>wangji</i> ‘forget’, 記得 <i>jide</i> ‘remember’, 想起 <i>xiangqi</i> ‘remember’, and 回想起 <i>huixhaingqi</i> ‘recall’
State	認為 <i>renwei</i> ‘think’, 以為 <i>yiwei</i> ‘think’, 覺得 <i>juede</i> ‘feel’, 感覺 <i>ganjue</i> ‘feel’, 相信 <i>xiangxin</i> ‘believe’, 確信 <i>quexin</i> ‘sure’, 堅信 <i>jianxin</i> ‘firmly believe’, 深信 <i>shenxin</i> ‘deeply believe’, 懷疑 <i>huaiyi</i> ‘doubt’, 知道 <i>zhidao</i> ‘know’, 認識 <i>renshi</i> ‘know’, 清楚 <i>qingchu</i> ‘clear’, 明白 <i>mingbai</i> ‘understand’, 懂 <i>dong</i> ‘understand’, 曉得 <i>xiaode</i> ‘know’

4.6. Summary

This chapter presents the collo-grammatical characteristics of Mandarin cognition verbs. Section 4.1 discusses the syntactic properties of Mandarin cognition verbs: they can be divided into two major groups, viz. actional transitive verbs and stative transitive verbs. Section 4.2 discussed the grammatical functions of Mandarin cognition verbs: all of them can function as verbal predicates but only three of them can be verbal complements; some of them can modify nouns but none of them can modify verbs; some can be nominalized, fitting in the pattern of 進行 *jinxing* ‘carry out’/做 *zuo* ‘do’ + Nominalized Verb’. Section 4.3 lists the essential participant roles in the cognition events with detailed information of the definition and the syntactic realization of the roles. On the basis of these participant roles, Section 4.4 lists the basic syntactic patterns of the verbs with the participant roles. It is found that based on the criterion of sharing certain syntactic patterns, Mandarin cognition verbs can be divided into subgroups. Finally, Section 4.5 discusses the aspectual properties of Mandarin cognition verbs and concludes that there are three lexical aspects, viz. activity verbs, achievement verbs and state verbs.

Chapter 5

Analysis

This chapter presents a frame-based analysis of Mandarin cognition verbs. Section 5.1 compares the proposal in the present study with that of FrameNet. Section 5.2 introduces the conceptual schema postulated to capture the cognitive essence of cognition events. Section 5.3 discusses the frames in the cognition domain one by one. Section 5.4 provides a table with the summary of the information of the frames.

5.1. Frame-based Analyses

Like FrameNet, the study adopts Frame Semantics (Fillmore and Atkins 1992), and verbal behavior is analyzed and anchored in semantic frames associated with grammatical patterns. However, there are some difference between the current study and FrameNet. In what follows, a comparison of the present study with the English database FrameNet will be discussed.

FrameNet (<http://framenet.icsi.berkeley.edu/>) provides a frame-based analysis of the English lexicon. In FrameNet, a frame is defined with its essential participant roles, or, Frame Elements (FEs). The syntactic patterns with the frame elements are listed in the annotation data of each lemma in the frame.

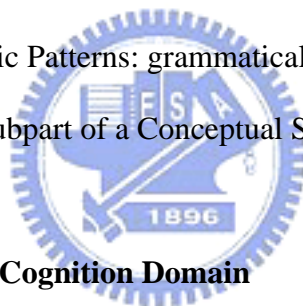
In the current study, besides naming the frame-internal elements, a ‘semantic frame’ is defined with a *conceptual schema*, plotted with the interrelations of the Frame Elements. A domain-specific conceptual schema is taken as a subset of the human conceptual structure. The frames belonging to a domain highlight subparts of the conceptual schema (Liu, Chiang and Chang 2004; Chiang 2006). Moreover, the syntactic patterns relevant to the frame, i.e. *frame-level basic patterns*, will be

provided as defining syntactic criteria for the frame. In other words, only the verbs which can fit into the frame-level basic patterns can be classified as belonging to the frame, because the frame-level basic patterns are argued to be language-specific syntactic realizations of a frame. This is corresponding to the theoretical assumptions of Construction Grammar (Goldberg 1995, 2006): constructions are form-meaning pairs.

In sum, a frame is specified with the following information.

(65) Basic Constructs of Frame Information

- (a) Definition with Frame Elements
- (b) Representative Lemma
- (c) Frame-level Basic Patterns: grammatical realization of Frame Elements
- (d) Highlight of a Subpart of a Conceptual Schema



5.2. Conceptual Schema of Cognition Domain

In this section, a conceptual schema for the cognition domain will be postulated based on the participant roles listed in Section 4.3 and the aspectual properties of Mandarin cognition verbs discussed in Section 4.5.

In Section 4.5, it is shown that Mandarin cognition verbs may encode three different event types, viz. activity verbs, achievement verbs and state verbs.

(66) Event Types of Mandarin Cognition Verbs

- (a) Activity: 他正在 想/考慮/思考 這個問題。
ta zhengzai xiang/kaolu/sikao zhe-ge wenti
he PROG think/consider/ponder-on this-CL problem
'He is thinking about/considering/pondering on this problem.'

- (b) Achievement: 他 想/想出/想到/發現 了 一個辦法。
ta xiang/xiang-chu/xiang-dao/faxian le yi-ge banfa
 he **think/think-out/ think-arrive/find** PERF one-CL way
 ‘He came out with/thought out/hit upon/found one way.’
- (c) State: 他 想/認為/知道/相信 這是個好辦法。
ta xiang/renwei/ zhidao/xiangxin zhe shi ge hao banfa
 he think/consider/ know /believe this is CL good way
 ‘He thinks/considers/knows/believes that it’s a good way.’

The three event types actually mark consecutive stages of human cognizing processes:

(67) Human Cognition Stages

(a) Thought Creation:

- 1) **Process:** a Cognizer with an initial mental state undergoes a process of cogitation on a Topic
- 2) **Resultative State:** with the input of external Evidence, a new state with a mental Content appears
- 3) **Homogeneous State:** the mental Content stays in the Cognizer’s mind

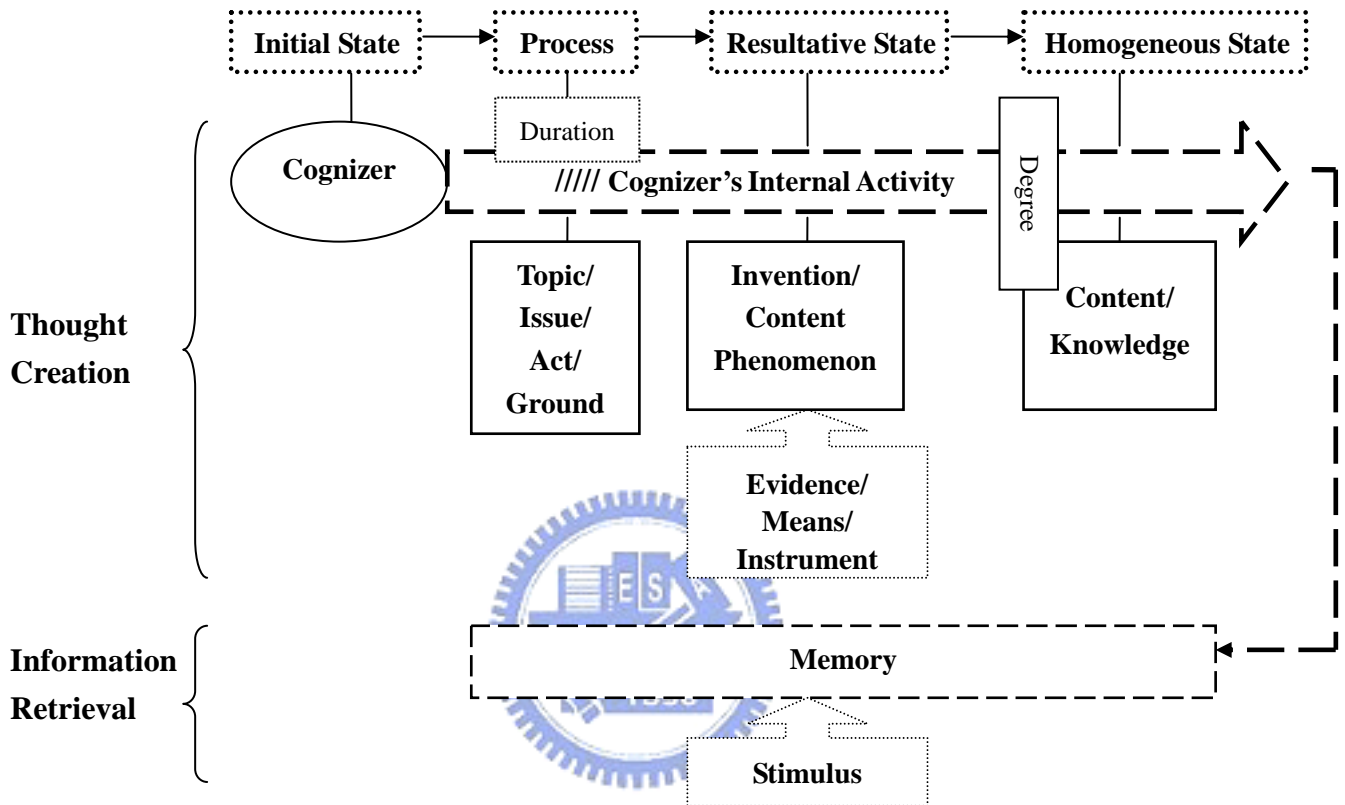
(b) Information Retrieval

- 1) **Process:** a Memory formed by the existed mental Content gets disconnected from the mind
- 2) **Resultative State:** due to an external Stimulus, the link is re-connected again
- 3) **Homogeneous State:** the Memory, stays in the Cognizer’s mind

Moreover, it can be seen from the examples in (66) that the verb 想 *xiang* ‘think’ is a polysemous verb with senses correspond to the cognizing stages discussed in (67).

The cognizing processes can then be schematically represented as the following schema with the essential frame elements:

(68) Conceptual Schema of the Cognition Domain



The conceptual schema captures the stage-by-stage process of cognition and provides a conceptual link for the different cognition frames. Each frame will be highlighting a subpart of the schema and thus can be uniquely defined with a set of frame elements realized in given frame-level syntactic patterns. The cognition frames serve as a semantic anchor for a distinct set of cognition verbs. The detailed information of each frame will be presented in the next section.

5.3. The Cognition Frames

This section introduces frames in the cognition domain. The first set of frames that will be introduced involves the creation of new thoughts (Section 5.3.1). The second set involves the Retrieval of the pre-existed thoughts, viz. Memory (Section 5.3.2).

5.3.1. Thought Creation

The cognition frames that will be introduced below all involve the creation of a thought. That is, the mental Content pertaining to these frames are *new information*, which will exist only with the realization of the cognizing activities. This is contrary to the frames that will be discussed in section 5.3.2., namely, Remembering_Process, Remembering_Resultative State and Remembering Homogeneous State frames.



5.3.1.1. Process

The three frames introduced in this section (Cogitating, Planning and Scrutinizing frame) are all depicting the dynamic process of human cognition, and so the cognition verbs evoked by these frames can collocate with progressive aspect markers 在 *zai* and 正在 *zhengzai* as well as duration phrases such as 三個鐘頭 *san-ge-zhong-tou* ‘three hours.’

5.3.1.1.1. Cogitating Frame

Def.: A Cognizer thinks about something in general (Topic), or an Issue to be solved over a period of time (Duration) from certain Perspective.

Representative Lemma: 想 *xiang* ‘think’, 思考 *sikao* ‘think’, 思索 *sisuo*

‘ponder on’, 考慮 *kaolu* ‘consider’, 考量 *kaoliang*

‘consider’

Frame Elements: Cognizer, Topic, Issue, Duration, Perspective

Basic Patterns Observed:

a. Cognizer[NP]<{從/以/用/...}[Prep]+Perspective[NP]<* < Topic[NP]

Ex.: [劉教授/Cognizer][從反面/Perspective]來[思考/Cogitating][問題
/Topic]。

Liu jiaoshou cong fanmian lai sikao wenti

Liu professor from Opposite-side to consider problem

‘Prof. Liu considered the problem from the opposite side.’

b. Cognizer[NP]<* < Issue[Q]

Ex.: [我/Cognizer]正在[考慮/Cogitating][要不要辭去工作?/Issue]

wo zhengzai kaolu yao-bu-yao ci qu gongzuo

I PROG consider should-not-should quit job

‘I am considering whether I should quit the job.’

c. Cognizer[NP]<* < Duration[AdvP/NP]

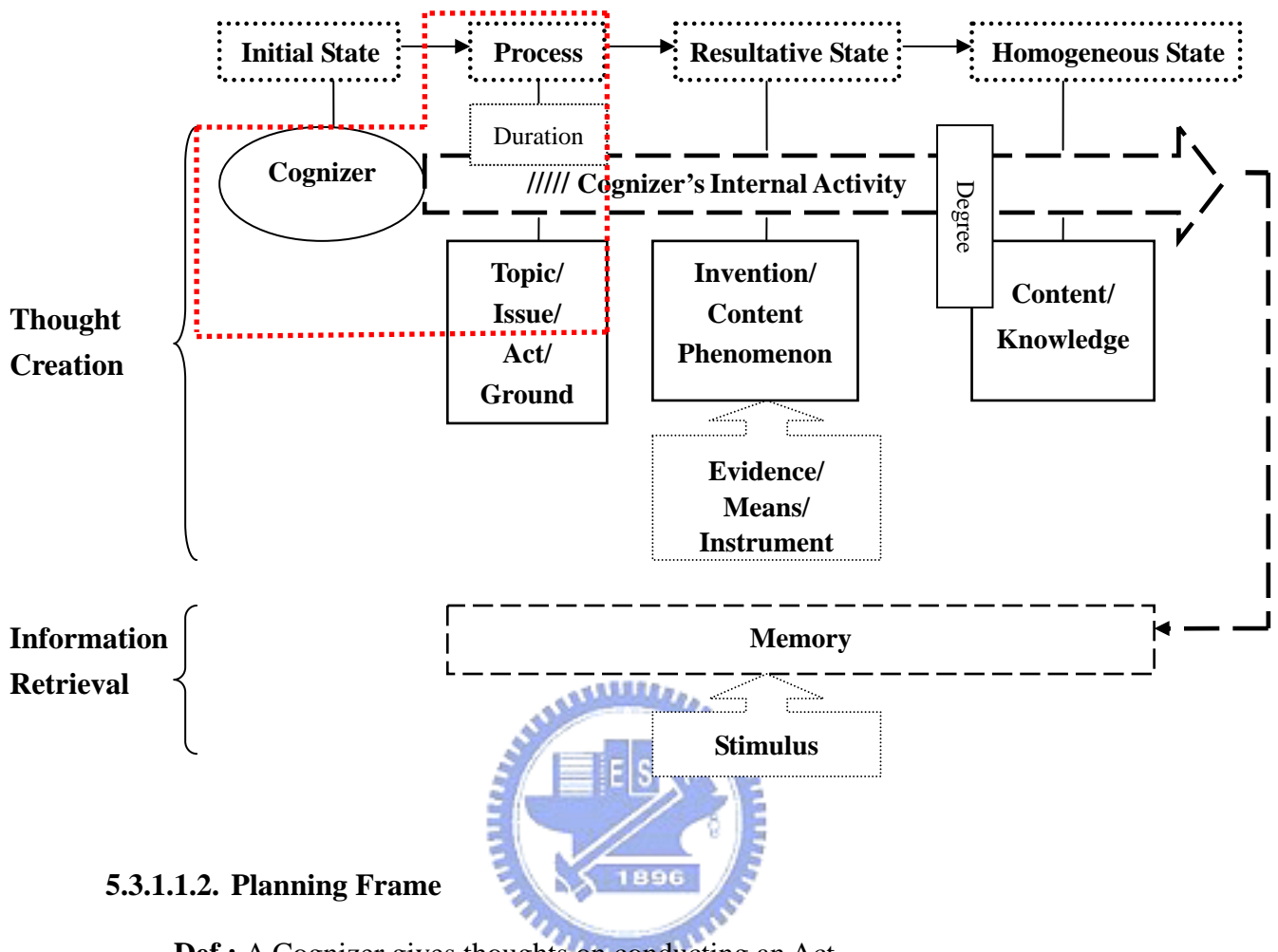
Ex.: [爸爸/Cognizer]認真[思考/Cogitating]了[一大會兒/Duration]。

baba renzheng sikao le yidahuier

Father seriously think PERF a-while

‘Father thought seriously for a while.’

Conceptual Schema:



5.3.1.1.2. Planning Frame

Def.: A Cognizer gives thoughts on conducting an Act

Representative Lemma: 考慮 *kaolu* 'plan', 打算 *dashuang* 'plan' and 計劃 *jihua* 'plan'

Frame Elements: Cognizer, Act

Basic Pattern Observed:

a. Cognizer[NP]<* <Act[VP]

Ex.: [他/Cognizer]正[考慮/Planning][送亞妮去接受專業訓練/Act]。

ta zheng kaolu song yani qu jieso zhuenye xunlian

he PROG plan send YANI (Name) to receive professional training

'He is planning on sending Yani to take professional training.'

b. Cognizer[NP]<* < Duration[AdvP/NP]

[我/Cognizer][計劃/Planning]了[很久很久/Duration]。(Google

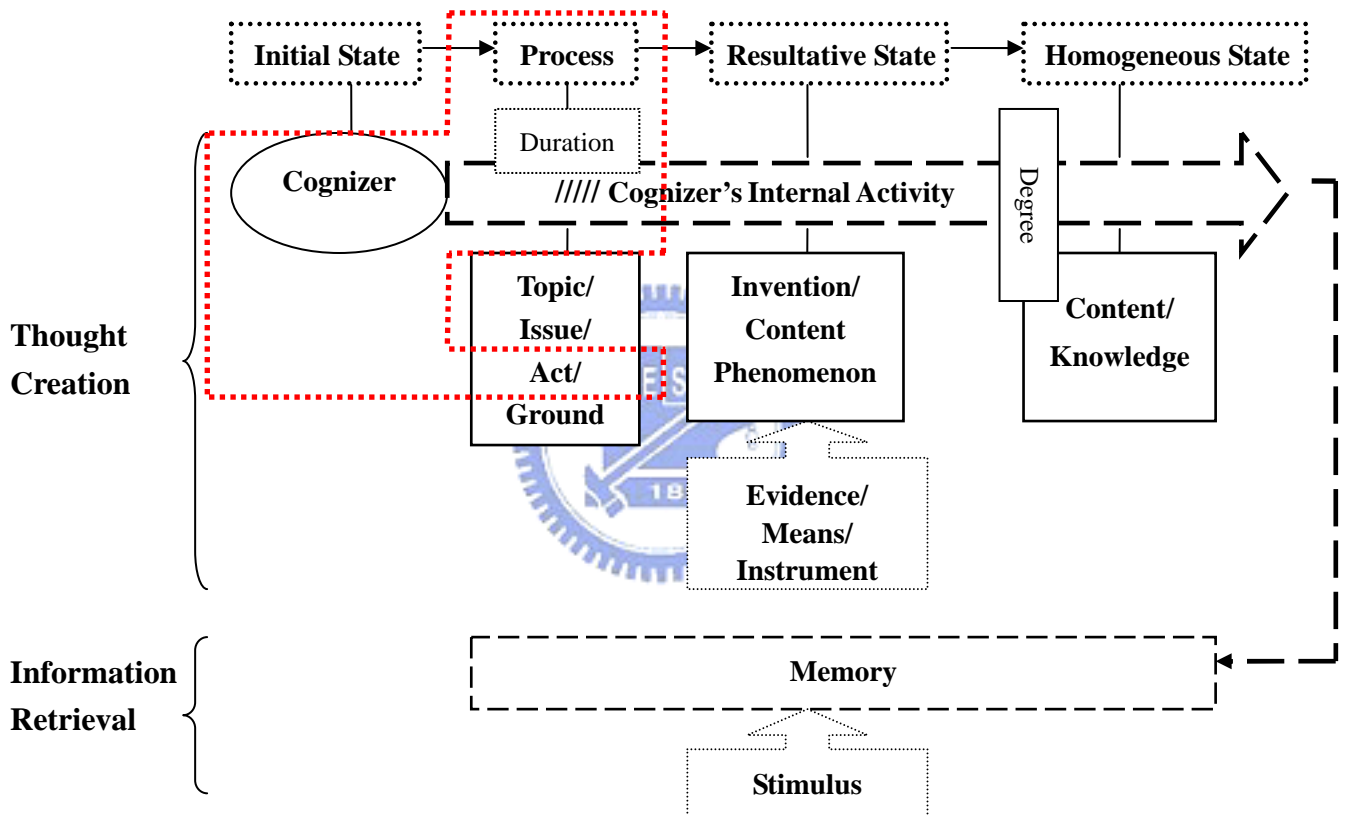
2007/6/3)

wo jihua le hen jio hen jio

I plan very long very long

‘I have been planning for a long time.’

Conceptual Schema:



5.3.1.1.3. Scrutinizing Frame

Def.: A Cognizer pays close attention to something, the Ground¹¹ by an Instrument, in order to discover a particular characteristic or entity that belongs to the Ground or is contained in the Ground.

Representative Lemma: 研究 *yanjiu* ‘research’, 分析 *fenxi* ‘analyze’, 檢視 *jianshi* ‘examine’, 檢查 *jiancha* ‘check’, 注意 *zhuyi* ‘pay attention to’

Frame Elements: Cognizer, Ground, Instrument

Basic Patterns Observed:

- a. Cognizer[NP] < * < Ground[NP]

Ex.: [筆者/Cognizer][研究/Scrutinizing][社會結構/Ground]，發現兩人都很自我。

bizhe yanjiu shehui jiegou, faxian liang-ren dou hen ziwo

author study society structure, find two-people all very self centered

‘The author studied society structure and found that both people are self-centered.’

- b. Cognizer[NP] < {用/以/...}[Prep]+Instrument[NP] < * < Ground[NP]

Ex.: [他/Cognizer]用[真正超越的智慧/Instrument]來[分析/Scrutinizing][世間的道理/Ground]。

ta yong zhenzheng chaoyue de zhihui lai fengxi shijian de daoli

he use genuine surpass DE wisdom to analyze world DE principle

‘He uses genuinely surpassing wisdom to analyze the world’s principles.’

¹¹ ‘Ground’ differs from ‘Topic’ in that Ground ‘serves as the background or context for the Phenomenon.’ (FrameNet http://framenet.icsi.berkeley.edu/index.php?option=com_wrapper&Itemid=118&frame=Scrutiny&)

c. Cognizer[NP] < * < Ground_Proposition[Q]

Ex.: [我這位朋友/Cognizer][分析/Scrutinizing][其新老闆為何會有這樣
不禮貌的舉動/Ground_Proposition]。

*wo zhe-wei pengyou fenxi qi xin laoban weihe hui you zhe-yang bu
limao de judong*

I this-CL friend analyze his new boss why will have this-kind no
manner DE behavior

‘My friend analyzes the reason why his new boss behaves like this
without manner.’

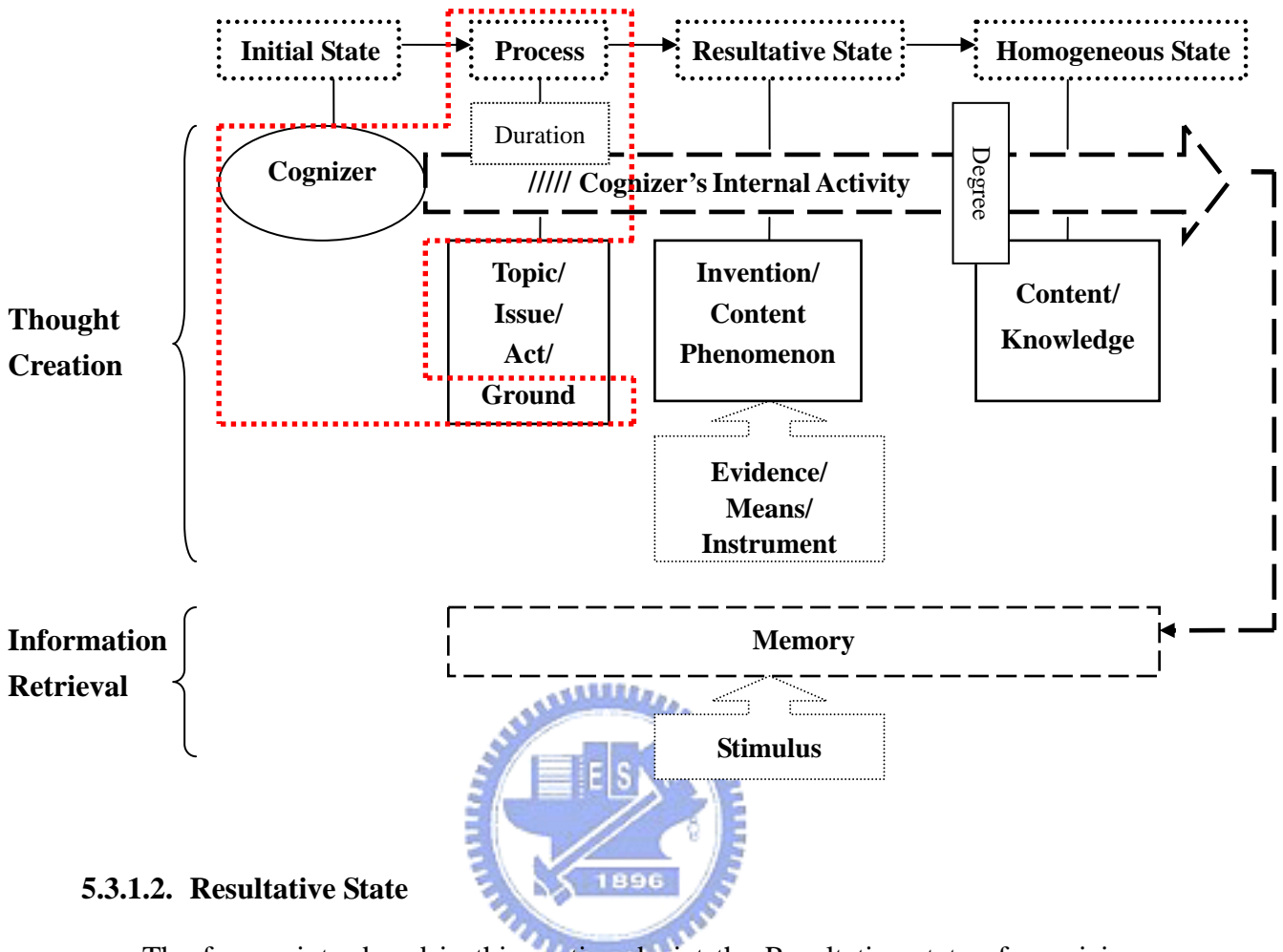
d. Cognizer[NP] < * < Duration[AdvP/NP]

Ex.: [他們/Cognizer] 辛苦的 [研究/Scrutinizing] 了 [六年/Duration]，仍
然沒有成功。

tamen xinkude yanjiu le liu-nian, rengan mei-you chenggong
they painstaking analyze PERF six-year still no-have success

‘They’ve studied hard for six years, but still without success.’

Conceptual Schema:



5.3.1.2. Resultative State

The frames introduced in this section depict the Resultative state of cognizing activities. Morphologically, the verbs in these frames can be composed with an activity simple verb, such as 想 *xiang* ‘think’, with a phase marker, such as 出 *chu* ‘out’. Yet what is more crucial about the frames here is that the verbs in these frames can be achievement verbs in nature (i.e. the lexical aspect of the verbs are achievement verbs), such as 斷定 *duanding* ‘make sure’ and 發現 *faxian* ‘find out’. Syntactically, the verbs in these frames can collocate with perfective markers 了 *le* but cannot collocate with perfective markers 在 *zai* and 正在 *zhengzai*. When collocating with duration phrases, the interpretation can only be the temporal length of the resultative state but not of the cognizing activities (cf. frames in Section 5.3.1).

5.3.1.2.1. Inventing Frame

Def.: A Cognizer creates a new conceptual, intellectual entity, the Invention.

Representative Lemma: 想 *xiang* ‘think’, 想出 *xiangchu* ‘figure out’, 想到 *xiangdao* ‘hit upon’, 發明 *faming* ‘invent’, 創造 *chuangzao* ‘invent’, 構想出 *gouxiangchu* ‘conceive’

Frame Elements: Cognizer, Invention, Invention_Proposition

Basic Patterns Observed:

- a. Cognizer[NP] < * < Invention [NP]

Ex.: [他/Cognizer]想來想去，[想出/Inventing]了[一個法子/
Invention]。

ta xiang lai-xiang-qu-xiang chu, xiang-chu le yi-ge fazi

he think-come-think-go think-out PERF one solution

‘He thought and thought, and figured out a solution.’

- b. Cognizer[NP] < * < Invention_Proposition[VP/CL]

Ex.: 後來，[他/Cognizer]果然[想出/Inventing][利用蒸氣機轉動車的
方法/ Invention_Proposition]，發明了火車。

houlai, ta guoran xiang-chu liyong zhengqiji zhuandong che de fangfa

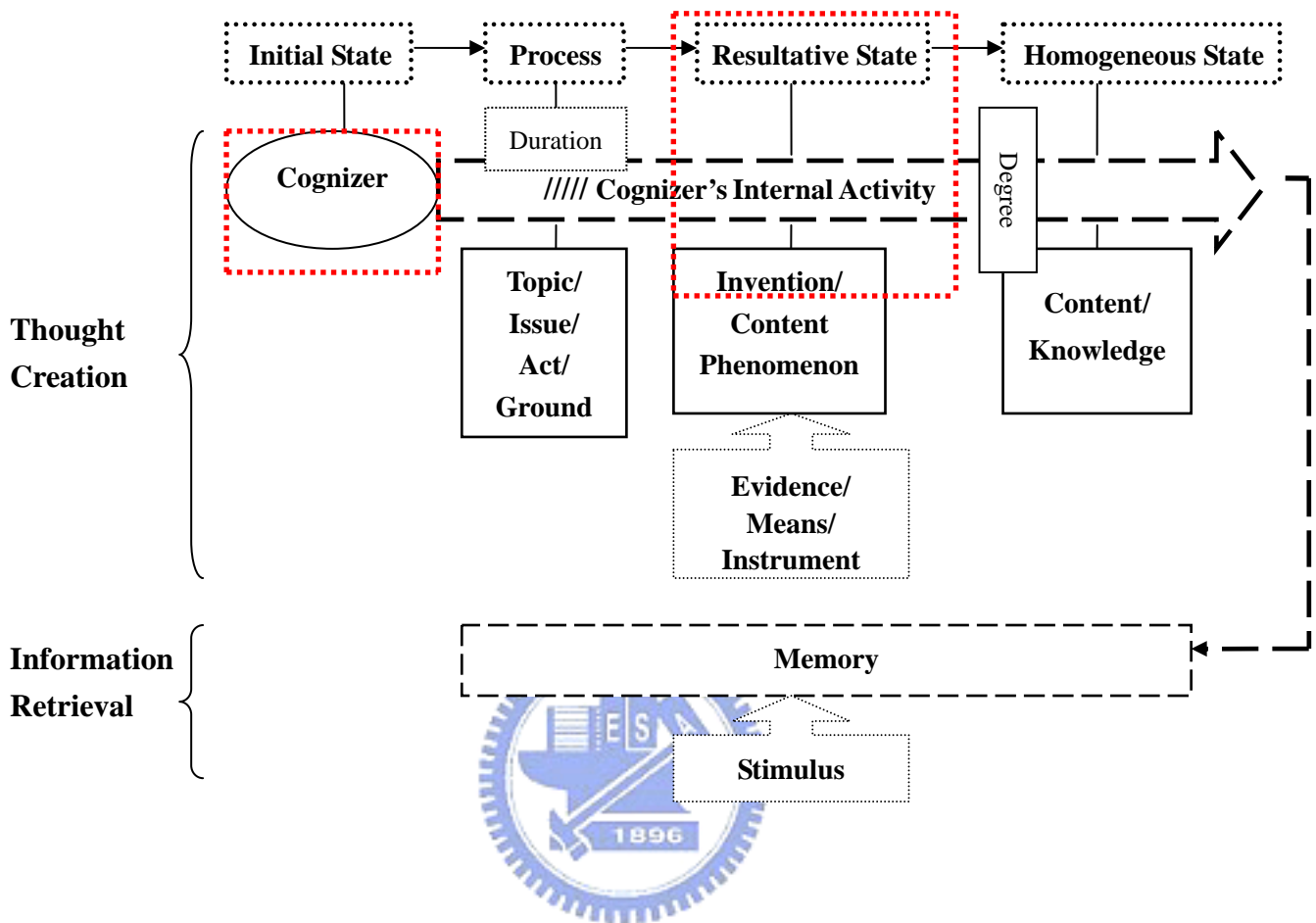
faming le huoche

later he as-expected figure-out use steamer rotate vehicles DE way

invent PERF train

‘Later on, he figured out inventing the train using steamers rotating the vehicles, just as expected.’

Conceptual Schema:



5.3.1.2.2. Coming-to-believe Frame

Def.: After a process of reasoning, a Cognizer reaches a Conclusion, usually initiated by a piece of Evidence.

Representative Lemma: 確定 *queding* '(make/be) sure', 確認 *queren* 'confirm', 斷定 *duanding* 'conclude', 推斷出 *tuiduanchu* 'conclude'、推論出 *tuilungchu* 'reason out'

Frame Elements: Cognizer, Evidence, Content, Content_Description

Basic Patterns Observed:

a. Cognizer[NP]<{由/藉由/從/憑/...}[Prep]+Evidence<* < Content[CL]

Ex.: [裁判們/Cognizer][斷定/Coming-to-believe][天空應該沒有選手還在飛/Content]。

caipan-men duanding tiankong yinggai meiyou xuanshou hai zai fei

judge-AFFIX conclude air should no contestant still PROG fly

‘The judges concluded that there should be no contestants who are still flying in the air.’

b. Cognizer[NP]<{由/藉由/從/憑/...}[Prep]+Evidence * < Content_ Description [NP]

Ex.: [她/Cognizer]憑[一個女孩子握筷子的高低/Evidence]，就能[斷定/Coming-to-believe][她未來婆家的遠近/Content_Description]。

ta ping yi-ge nuhaizi wo kuaizi de gao di, jiu neng duanding ta weilai pojia de yuanjin

she by one-CL girl hold chopstick DE high low, solely can conclude she future family-of-her-husband DE far near

‘She concludes the distance of a girl’s future family of her husband sorely by how high she holds the chopsticks.’

c. {從/藉/由/...}[Prep]+Evidence[NP]<* <Content_Description[NP]

Ex.: 從[火山口延伸至平原上的地面顏色深淺度/Evidence]，可[推斷出/Coming-to-believe][火山噴發時間的久遠/Content_Description]。

cong huoshankou yanshen zhi pingyuan shang de dimian yanse shenqiandu ke tuiduan chu huoshan penfa shijian de jiu yuan

from volcano-mouth extend to plain on DE ground color

deep-shallow-degree can determine volcano outburst time DE distance

‘Based on the degree of color from the crater to the plain, (one) can determine the temporal distance of the outburst of the volcano.’

d. Cognizer[NP]<Means[VP] <* <Content[CL]

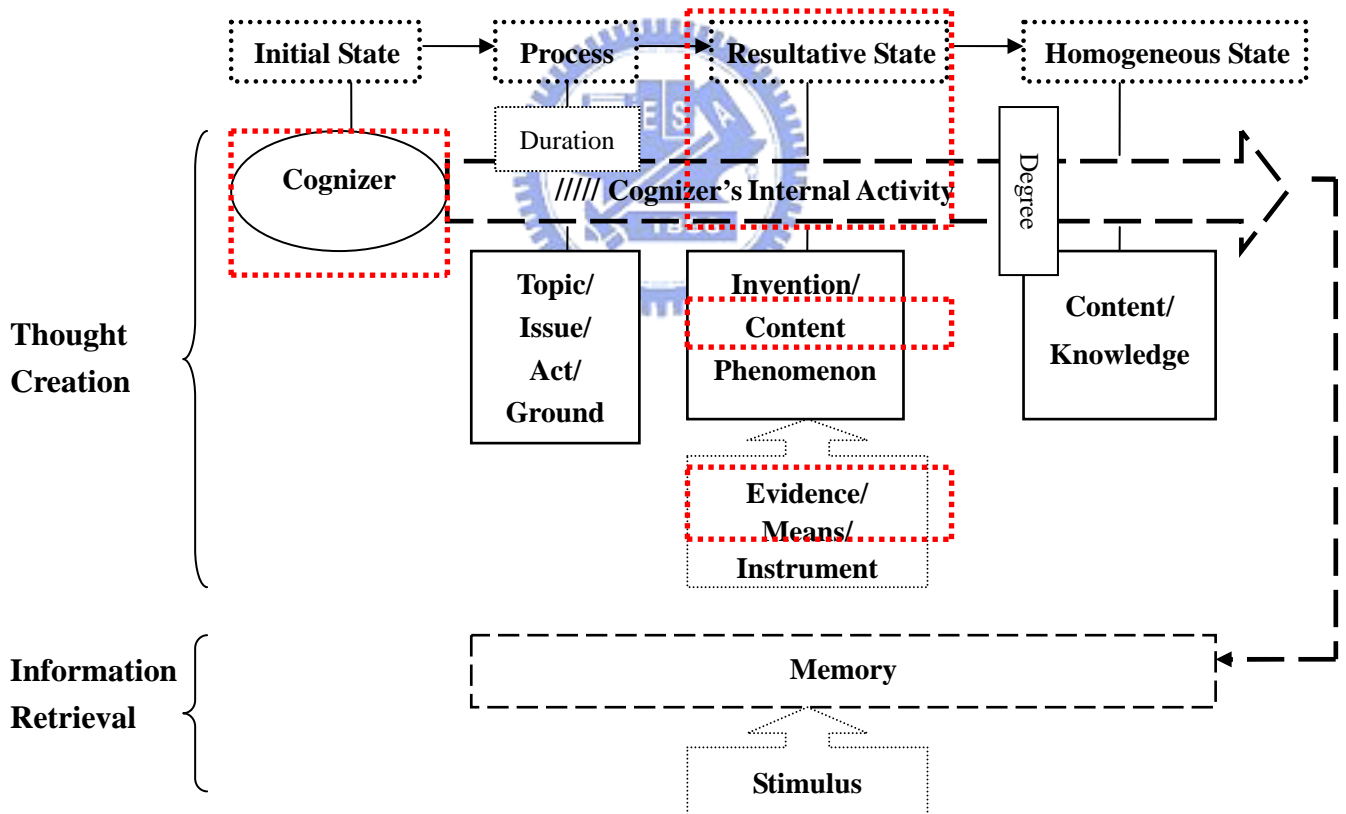
Ex.: [我/Cognizer][留心聽了航班號/Means], [確認/Coming-to-believe][這架飛機的機組是錦雲乘務隊的無疑/Content]。

wo liuxin ting le hangban hao, queren zhe-jia feiji de jizu shi jinyunchengwu dui de wuyi

I attentively listen PERF flight number confirm this-CL plane DE crew is JINYUNCHENGWU (Name) team DE no-doubt

‘I attentively listened to the flight number and confirmed that the crew of this plane is JINYUNCHENWU team without doubt.’

Conceptual Schema:



5.3.1.2.3. Becoming-aware Frame

Def.: A Cognizer adds some Phenomenon to their model of the world through some Instruments.

Representative Lemma: 發現 *faxian* ‘find’, 發覺 *fajue* ‘discover’, 察覺 *chajue* ‘be aware of’, 注意到 *zhuyidao* ‘note’

Frame Elements: Cognizer, Phenomenon, Phenomenon_Proposition, Instrument

Basic Patterns Observed:

- a. Cognizer[NP]<{ 透過/經由/...}[Prep]+Instrument[NP] < *
<Phenomenon[NP]

Ex.: [藝術家/Cognizer] 在生命過程中透過 [某種特殊靈感或天才
/Instrument], [發現/Becoming-aware][永恆的曙光
/Phenomenon]。

*yishujia zai shengming guocheng zhong touguo mou-zhong teshu
linggan huo tiancai faxian yongheng de shuguang*

artist at life process inside by some special inspiration or genius find
eternal DE first-gleam-of-the-day

‘Artists found ‘the eternal first gleam of the day’ through some special
inspiration or genius in the life process.’

- b. Cognizer[NP]<{ 透過/經由/...}[Prep]+Instrument[NP] < * <
Phenomenon_Proposition[CL]

Ex.: [他們/Cognizer] [發現/Becoming-aware][儒家並不是像他們所
批判的那麼不合情理/Phenomenon_Proposition]。

*tamen faxian rujia bing bu shi xiang tamen suo pipan de name bu he
qingli*

they find the Confucian school also not is like they LIGHT criticize

DE so not match sense-reason

‘They found that the Confucian school is not as not conforming to reason as the way they criticize.’

c. Instrument[NP] < * < Phenomenon Proposition[CL]

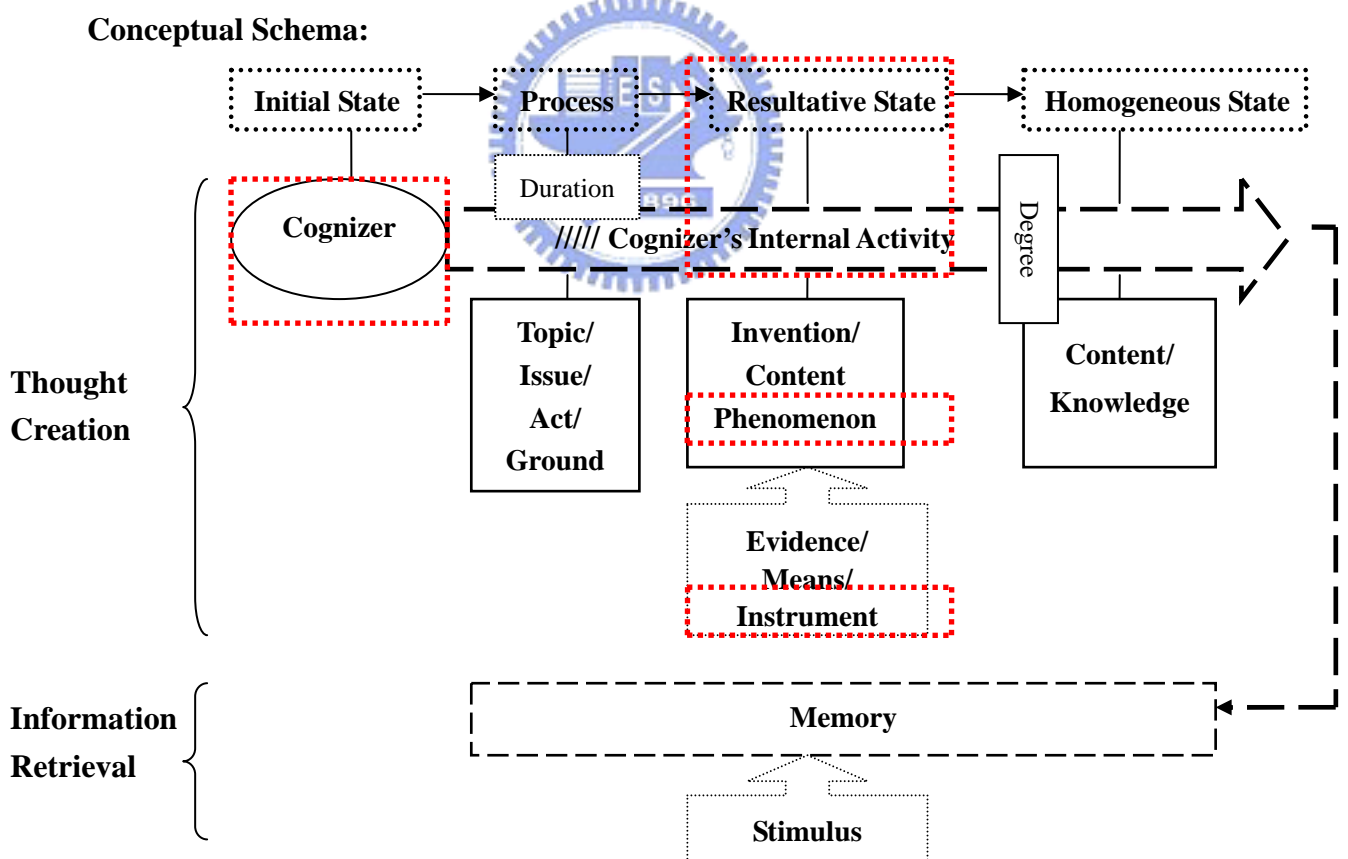
Ex.: [動物實驗/Instrument][發現/Becoming-aware][天生瘦子基因

/Phenomenon] (Google 2007/05/31)

dongwu shiyan faxian tiansheng shouzi jiyin

animal experiment find natural thin-people gene

‘Animal experiments found natural thin-people gene.’



5.3.1.3. Homogeneous State

The frames that will be introduced here depict the homogeneous state of cognition. Thus, they cannot collocate with progressive markers nor perfective markers.

5.3.1.3.1. Opinion Frame

Def.: A Cognizer has a particular Content, which may be portrayed as being about a particular Topic.

Representative Lemma: 想 *xiang* ‘think’, 認為 *renwei* ‘think’, 以為 *yiwei* ‘think’, 覺得 *juede* ‘feel’, 感覺 *ganjue* ‘feel’

Frame Elements: Cognizer, Content, Topic

Basic Patterns Observed:

a. Cognizer[NP] < * < Content[CL]

Ex.: [我/Cognizer][想/Opinion][未來的兩年裡，算了吧！/Content]

wo xiang weilai de liang-nian li, suanle ba

I think future DE two-year inside, forget PART

‘I think in the future two years, forget it.’

b. {針對/對於/...}[Prep]+Topic[NP]< Cognizer[NP] < * < Content[CL]

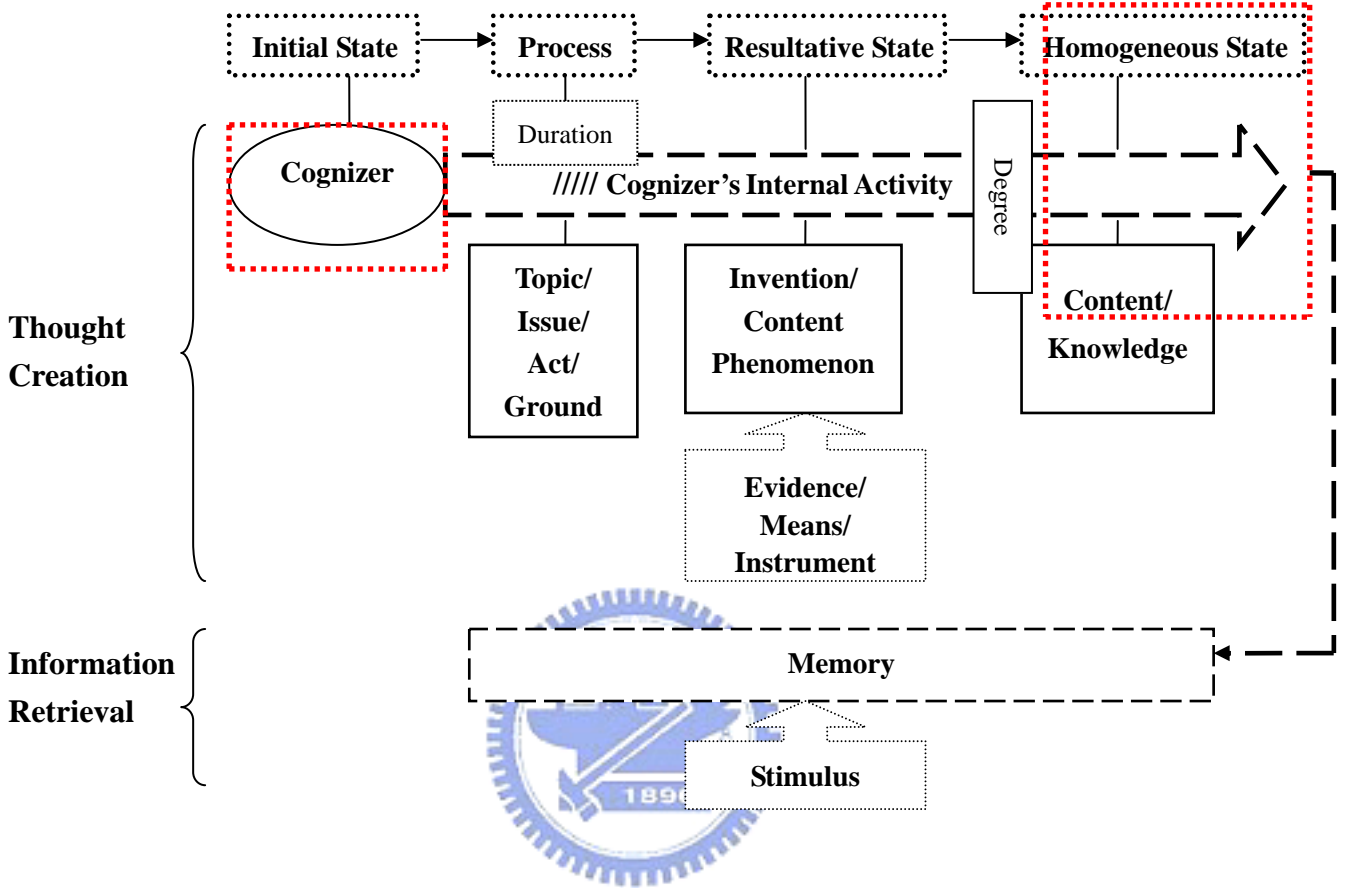
Ex.: 對於[這一點/Topic]，[周先生/Cognizer][認為/Opinion][水鳥族群的減少是全世界皆如此/Content]。

duiyu zhe-yi-dian, zhouxiansheng renwei shuiniaozuqun de jianshao shi quanshijie jie ruci

about this-one-point, Mr. Chou thinks water-bird species DE decrease is whole-world all so

‘About this point, Mr. Chou thinks that the decrease of water birds is similar around the world.’

Conceptual Schema:



5.3.1.3.2. Certainty Frame

What differentiates Certainty frame from the Opinion frame is that corpus data show that verbs in this frame can collocate with degree adverbs but those in Opinion frame cannot. Therefore it is argued that Certainty frame concerns a Cognizer's Degree of certainty about the correctness of a Content. This can also be seen in Mandarin that the Degree is even lexicalized as part of a MV-structured lexical item, such as 堅 *jian* 'firmly' and 深 *sheng* 'deeply' in 堅信 and 深信.

Def.: This frame concerns a Cognizer's Degree of certainty about the correctness of a Content.

Representative Lemma: 確定 *queding* 'sure', 相信 *xiangxin* 'believe'¹², 確信 *quexin* 'sure', 堅信 *jianxin* 'firmly believe'、深信 *shengxin* 'deeply believe'、懷疑 *huaiyi* 'doubt'

Frame Elements: Cognizer, Degree, Content, Content_Description

Basic Patterns Observed:

a. Cognizer[NP] <Degree[Adv]< * < Content[CL]

Ex.: [我/Cognizer][深深/Degree][相信/Certainty], [沒有諒解與寬恕的心, 就沒有溫柔敦厚好禮的社會/Content]。

wo shenshen xiangxin, mei you liangjie yu kuanshu de xin, jiu mei you wenrou dunhou haoli de shehui

I deeply believe no have understand and forgive DE heart then no have tender good-natured good-mannered DE society

'I deeply believe that without understanding and forgiveness, there would be no tender, good-natured, good-mannered society.'

b. Cognizer[NP] <Degree[Adv]< * < Content_Description[NP]

Ex.: [我/Cognizer][十分/Degree][懷疑/Certainty][上述對後現代政治這種陳腔濫調的描述/Content_Description]。(Google 20070531)

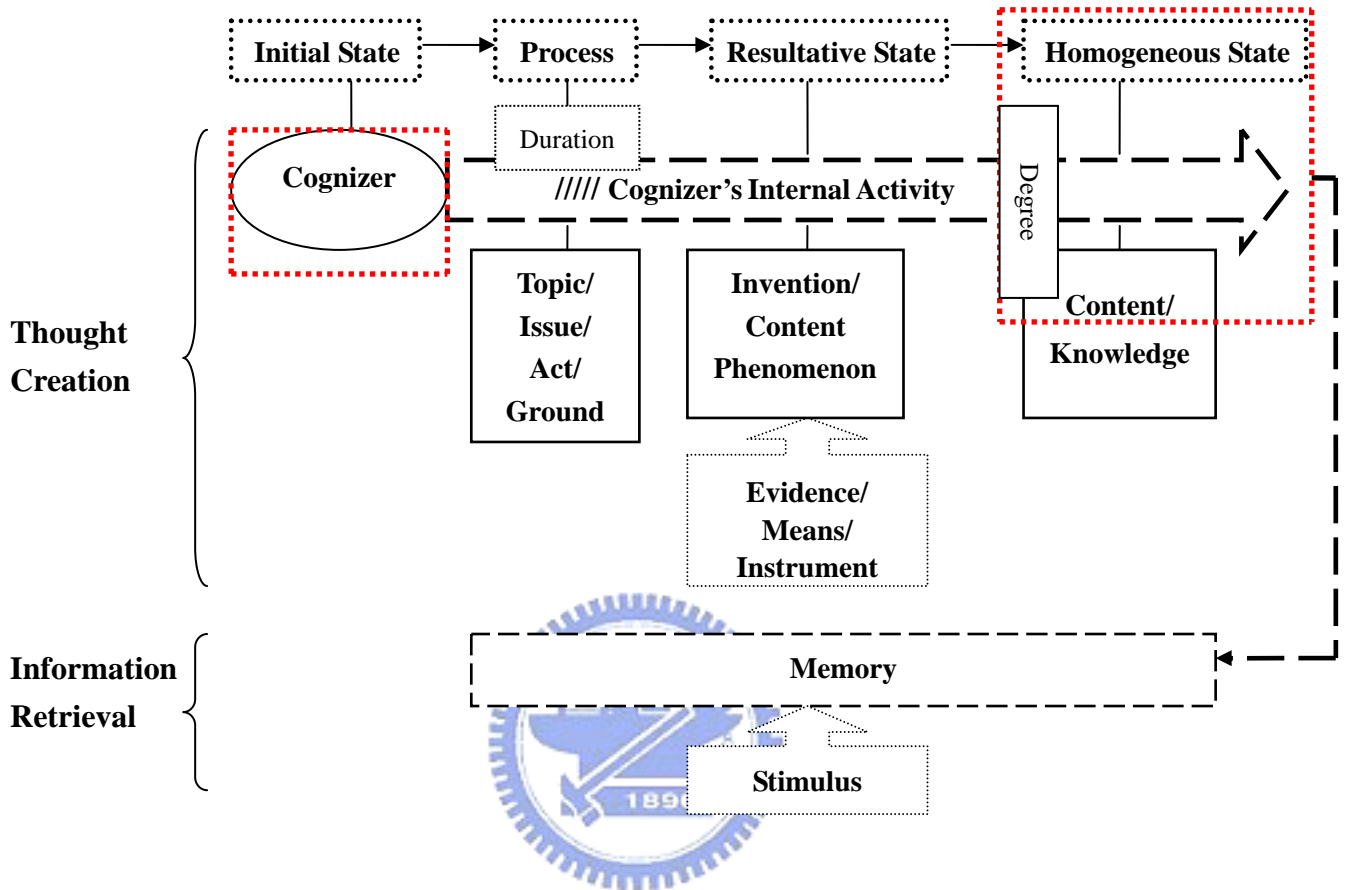
wo shifen huaiyi shangshu dui houxiandai zhengzhi zhe-zhong chenqianglandiao de miao shu

I very doubt above about post-modern politics this-CL cliché DE description

¹² There are two senses of 相信, which can be translated as 'be certain of' and 'trust' respectively. While the sense of 'trust' is not cognitive in nature, it is not concerned in the present study.

‘I very much doubt the above timeworn description about the post-modern politics.’

Conceptual Schema:



5.3.1.3.3. Knowing Frame

Def.: A Cognizer has some Knowledge, which may be portrayed as Knowledge_Description about certain Topic; sometimes the Degree or strength of the Cognizer's knowing the fact is of concern.

Representative Lemma: 知道 *zhidao* 'know', 晓得 *xiaode* 'know', 清楚 *qingchu* 'be clear about', 明白 *mingbai* 'understand', 懂 *dong* 'understand'

Frame Elements: Cognizer, Knowledge, Knowledge_Description, Degree

Basic Patterns Observed:

a. Cognizer[NP] <* < Knowledge[NP]

Ex.: [你/Cognizer]也[知道/Knowing][後來的結果/ Knowledge]。

ni ye zhidao houlai de jieguo

you also know later DE result

‘You also know the afterward result.’

b. Cognizer[NP] <* < Knowledge_Proposition[CL]

Ex.: [我們/Cognizer]似乎也[知道/Knowing]，[中國之所以落後於世界列強，關鍵就在於清代/ Knowledge_Proposition]。

women sihu ye zhidao, zhongguo zhi suoyi luohou yu shijie-lieqiang, guanjian jiu zaiyu qingdai

we seem also know, China DE LIGHT fall-behind LIGHT

World-Powers key LIGHT at the Ching Dynasty

‘We also seem to know that the key to the reason why China was left behind the World Powers is at the Ching Dynasty.’

c. Cognizer[NP] <Degree <* < Knowledge[NP]

Ex.: [她內心/Cognizer]卻[非常/Degree][明白/Knowing][父母的希望/ Knowledge]。(Google 2007/6/2)

ta nei-xin que feichang mingbai fu-mu de xiwang

she inside-heart however very much understand father-mother DE hope

‘However, inside her heart, she very much understands her parents’ hopes.’

d. Cognizer[NP] <Degree <* < Knowledge_Proposition[CL]

Ex.: [他/Cognizer][非常/Degree][明白/Knowing][黃翔對演藝圈沒有興趣/ Knowledge_Proposition]。(Google 2007/6/1)

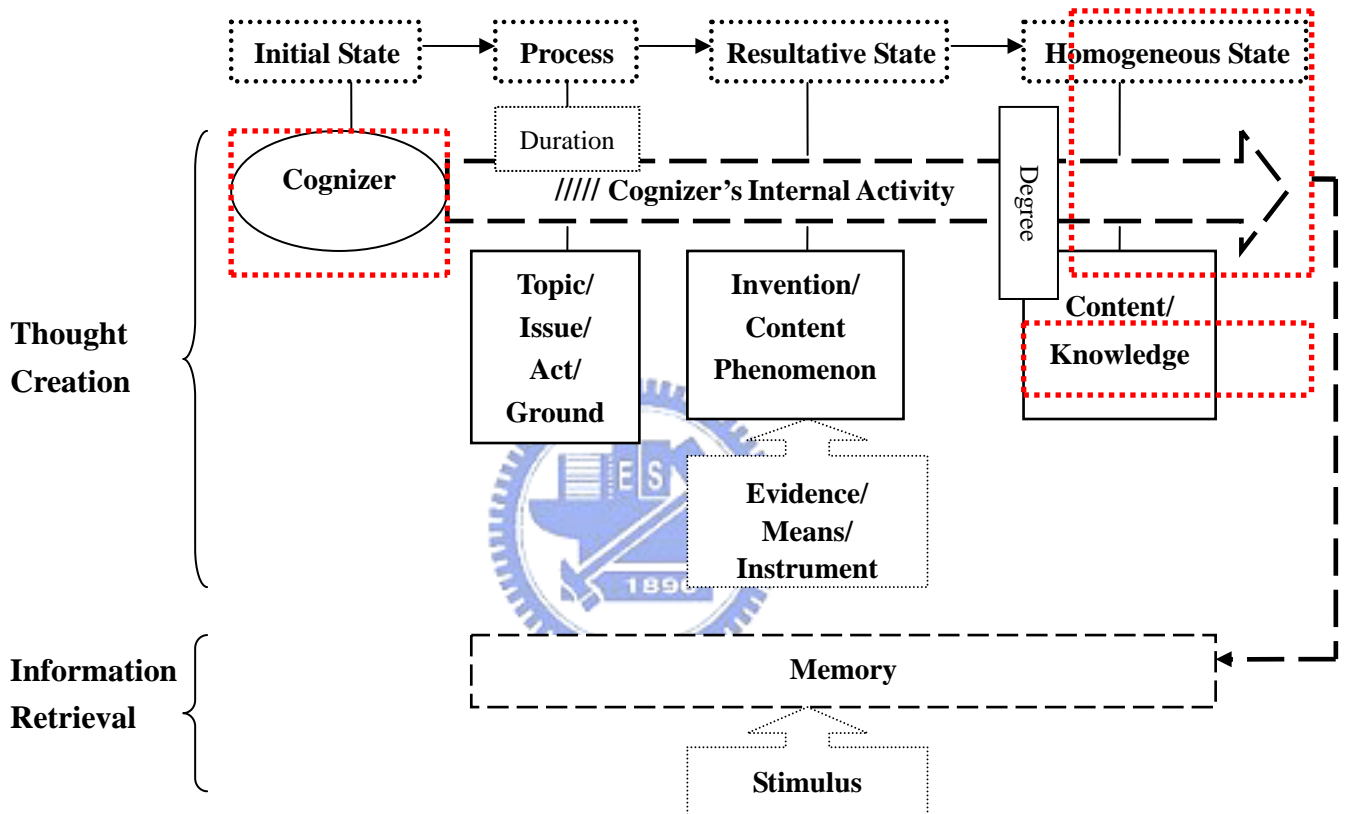
ta feichang mingbai huangxiang dui yanyiquan meiyou xingqu

he very understand HUANGXIANG (Name) about entertainment

circle no-have interest

‘He very much understand that Huang Xiang is not interested in the entertainment business.’

Conceptual Schema:



5.3.2. Information Retrieval

Contrary to the frames discussed in Section 5.3.1, the mental content in the frames here are old information and the frames here describe the retrieval of the pre-existed mental content, viz. Memory.

5.3.2.1. Remembering_Process Frame

Def.: This frame is concerned with the process stage of the disconnection or reconnection between a Memory and a Cognizer's mental state.

Representative Lemma: 回憶 *huiyi* 'recall', 回想 *huixiangqi* 'recall', 忘

wang 'forget', 忘記 *wangji* 'forget'

Frame Elements: Cognizer, Memory

Basic Pattern Observed:

Cognizer[NP]< * <Memory[NP]

Ex.: [那個可憐的小孩子/Cognizer]正在努力[回想/Remembering_Process][媽

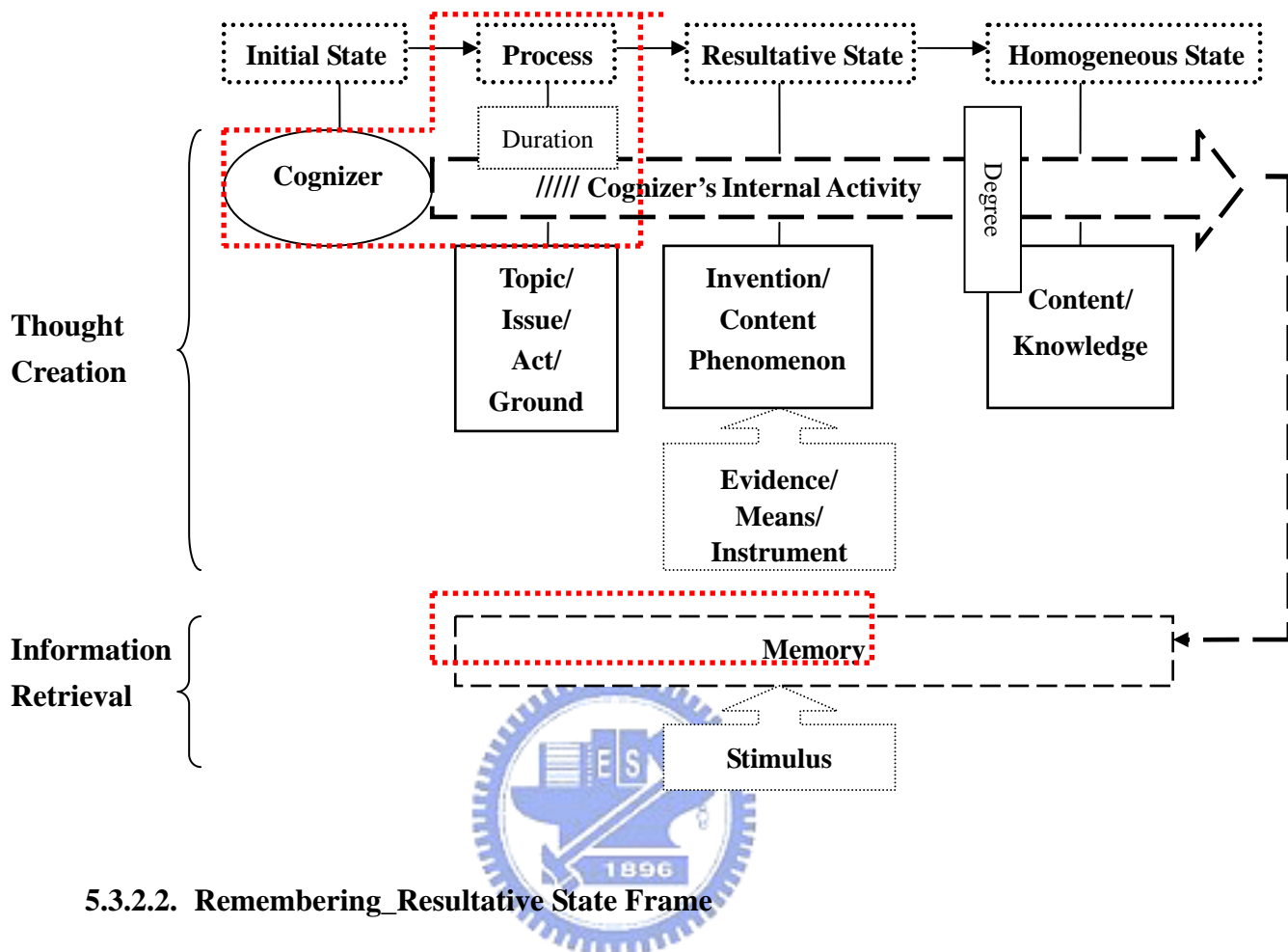
媽跟他說的話/Memory]。

na-ge kelien de xiaohaizhi zhengzai nuli huixiang mama gen ta shuo de hua

that-CL poor DE kid PROG hard recall mother to he say DE words

'That poor child is (trying) hard to recall his mother's words.'

Conceptual Schema:



5.3.2.2. Remembering Resultative State Frame

Def.: This frame is concerned with the Resultative state of the disconnection or reconnection between a Memory and a Cognizer's mental state due to an external Stimulus.

Representative Lemma: 回想起 *huixiangqi* 'recall', 回憶起 *huiyiqi* 'recall', 記起 *jiqi* 'remember' 想起 *xiangqi* 'remember', 想到 *xiangdao* 'remember' and 忘 *wang* 'forget'

Frame Elements: Cognizer, Stimulus, Memory

Basic Patterns Observed:

Stimulus[NP/VP]<{教/讓/使/令/...}[Verb]< Cognizer[NP]< * <

Memory[NP]

Ex.: [登岳陽樓 /Stimulus] , 使 [我 /Cognizer][想起

/Remembering_Resultative

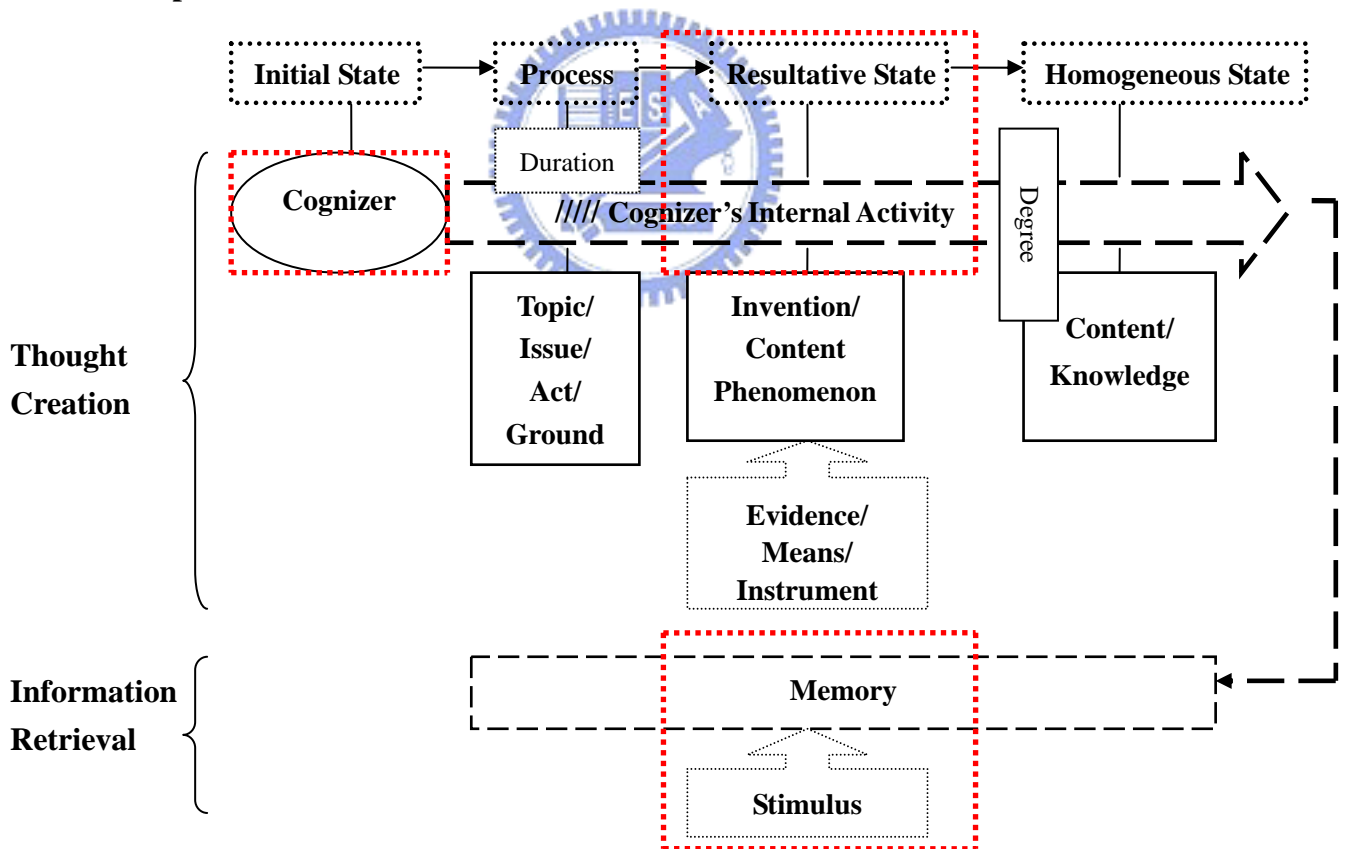
State][范仲淹/Memory]。

deng yueyanglou, shi wo xiang-qi fanzhongyan

climb NAME, make me remember NAME

‘Climbing Yueyanglou reminds me of Fan zhongyan.’

Conceptual Schema:



5.3.2.3. Remembering_Homogeneous State Frame

Def.: This frame is concerned with the homogeneous state of the disconnection or reconnection between a Memory and a Cognizer's mental state; sometimes the Degree or the strength of this connection is also of concern.

Representative Lemma: 記得 *jide* 'remember', 忘 *wang* 'forget', 忘記 *wangji* 'forget'

Frame Elements: Cognizer, Memory, Act, Degree

Basic Patterns Observed:

a. Cognizer[NP]<*+{ , }<Memory[NP]

Ex.: [我/Cognizer][記得/Remembering_Homogeneous State], [那步出家門被陽光溶化的那個畫面/Memory]。

wo jide, na bu chu jiamen bei yangguang ronghua de na-ge huamian

I remember that walk out house-door BEI sun-shine melt DE that-CL picture

'I remember the picture that I was melted by the sun shine when I walked out of the door of my house.'

b. Cognizer[NP]<*+{ , }<Memory_Proposition[CL]

Ex.: [我/Cognizer][記得/Remembering_Homogeneous state], [我在念中學時，有一個叫首仙仙的女孩自殺了。/Memory_Proposition]

wo jide, wo zai nian zhongxue shi, you yi-ge jiao shou-xian-xian de nuhai zisha le

I remember I PROG study high-school time have one-CL named SHOU-XIAN-XIAN (Name) DE girl suicide PERF

'I remember that when I was in high school, a girl named Shou Xian-Xian killed herself.'

c. Cognizer[NP]<Degree[Adv]<*<Memory[NP]

Ex.: [她的同學/Cognizer]都[十分/Degree][記得

/Remembering_Homogeneous State][她閉門苦讀和認真求學的
態度/Memory]。(Google 2007/6/1)

*ta de tongxue dou shifen jide ta bimenkudu he renzhen qiuxue de
taidu*

she DE classmate all very-much remember she

close-door-hard-study and serious-pursue-study DE attitude

‘Her classmates remember well her serious attitude in the pursue
of studying.’

- d. Cognizer[NP]<Degree[Adv]< * <Memory_Proposition[CL]

Ex.: [我/Cognizer]卻[十分/Degree][記得

/Remembering_Homogeneous State][劉藍溪小姐當年走性感路
線/Memory_Proposition]。(Google 2007/6/1)

wo que shifen jide liulanxi xiaojie dangnian zou xinggan luxian

I however very-much remember LIULANXI (Name) Miss then
go sexy road

‘However, I remember very much that Miss Liu was trying to
look sexy then.’

- e. Cognizer[NP]< * <Act[VP]

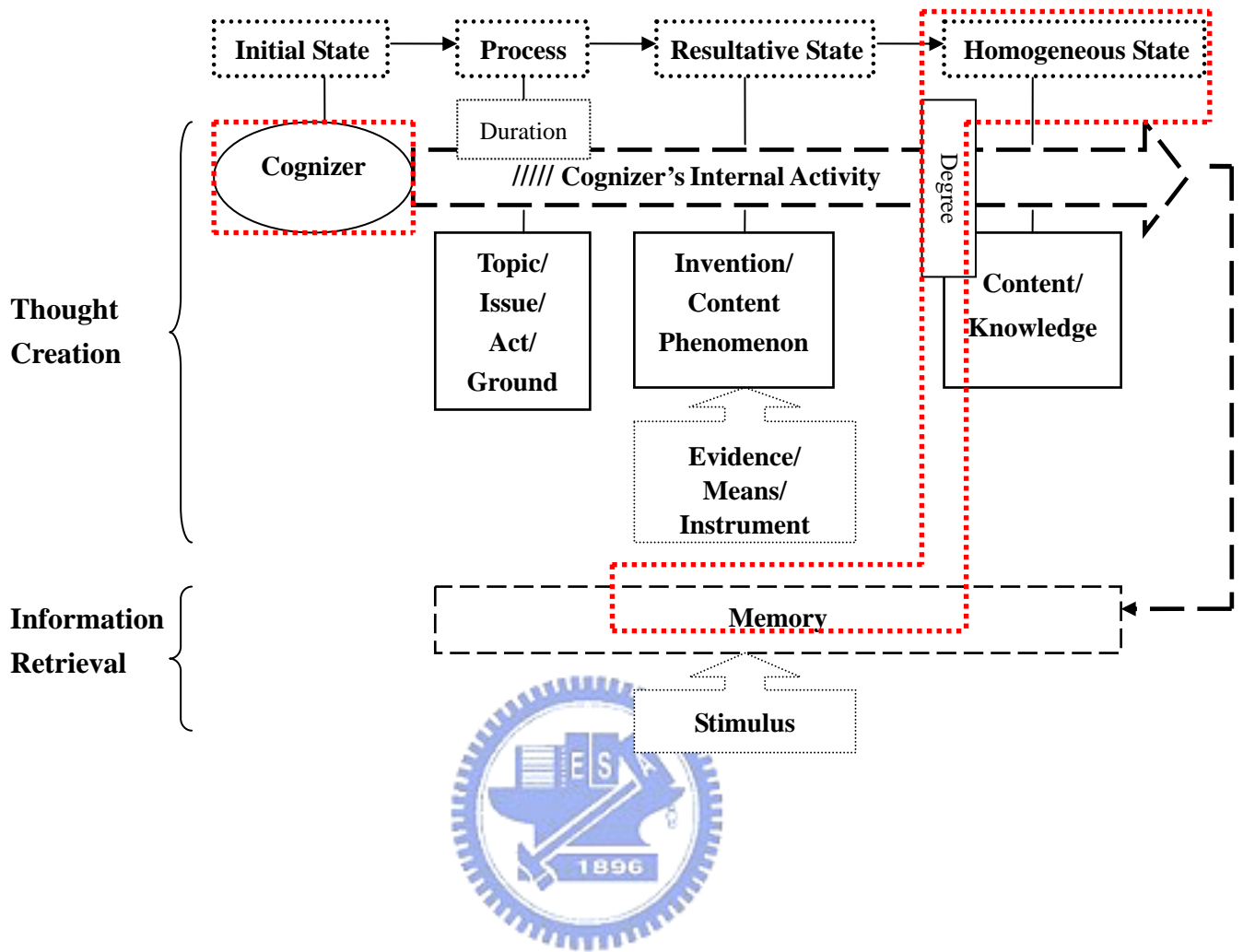
Ex.: [歌德/Cognizer][忘/Remembering_Homogeneous State]了[提一件事
/Act]。

gede wang le ti yi-jian shi

Gothe forget PERF mention one-CL thing

‘Gothe forgot to mention one thing.’

Conceptual Schema:



5.3.3. Summary

This section summarizes the discussions of the frames introduced in the previous sections. As the following table shows, Mandarin cognition verbs can be divided into different groups according to their event types, distinct sets of frame elements and the basic syntactic patterns of the frame elements.

(69) Cognition Frames

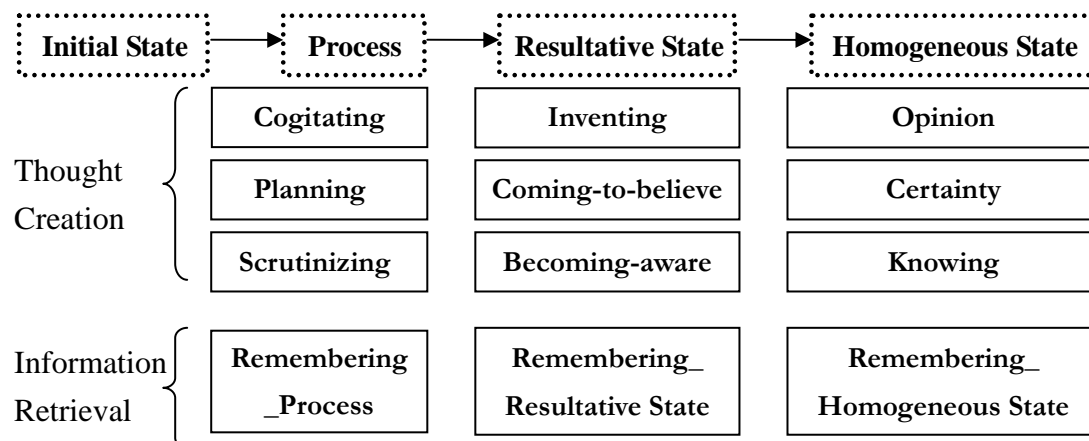
Frame	Event Type	Frame Elements	Lemmas and Basic Pattern
Cogitating	Activity	Cognizer, Topic, Issue, Duration, Perspective	<p>想、思考、思索、考慮、考量</p> <p>a. [劉教授/Cognizer][從反面/Perspective]來[思考/Cogitating][問題/Topic]。</p> <p>b. [我/Cognizer]正在[考慮/Cogitating][要不要辭去工作?/Issue]</p> <p>c. [爸爸/Cognizer]認真[思考/Cogitating]了[一大會兒/Duration]。</p>
Planning	Activity	Cognizer, Act	<p>考慮、打算、計劃</p> <p>a. [他/Cognizer]正[考慮/Planning][送亞妮去接受專業訓練/Act]。</p> <p>b. [我/Cognizer][計劃/Planning]了[很久很久/Duration]。</p>
Scrutinizing	Activity	Cognizer, Ground, Instrument	<p>研究、分析、檢視、檢查、注意</p> <p>a. [筆者/Cognizer][研究/Scrutinizing][社會結構/Ground]，發現兩人都很自我。</p> <p>b. [他/Cognizer]用[真正超越的智慧/Instrument]來[分析/Scrutinizing][世間的道理/Ground]。</p> <p>c. [我這位朋友/Cognizer][分析/Scrutinizing][其新老闆為何會有這樣不禮貌的舉動/Ground Proposition]。</p> <p>d. [他們/Cognizer]辛苦的[研究/Scrutinizing]了[六年/Duration]，仍然沒有成功。</p>
Inventing	Achievement	Cognizer, Evidence, Content,	<p>想、想出、想到、發明、創造、構想出</p> <p>a. [他/Cognizer]想來想去，[想出/Inventing]了[一個法子/Invention]。</p> <p>b. 後來，[他/Cognizer]果然[想出/Inventing][利用蒸氣機轉動車的方法/Invention Proposition]，發明了火車。</p>

Coming-to-believe	Achievement	Cognizer, Content, Evidence	<p>確定、確認、斷定、推斷出、推論出</p> <p>a. [裁判們/Cognizer][斷定/Coming-to-believe][天空應該沒有選手還在飛/Content]。</p> <p>b. [她/Cognizer]憑[一個女孩子握筷子的高低/Evidence]，就能[斷定/Coming-to-believe][她未來婆家的遠近/Content_Description]。</p> <p>c. 從[火山口延伸至平原上的地面顏色深淺度/Evidence]，可[推斷出/Coming-to-believe][火山噴發時間的久遠/Content_Description]。</p>
Becoming-aware	Achievement	Cognizer, Phenomenon, Phenomenon Proposition, Instrument	<p>發現、發覺、察覺、注意到</p> <p>a. [藝術家/Cognizer]在生命過程中透過[某種特殊靈感或天才/Instrument]，[發現/Becoming-aware][永恆的曙光/Phenomenon]。</p> <p>b. [他們/Cognizer][發現/Becoming-aware][儒家並不是像他們所批判的那麼不合情理/Phenomenon Proposition]。</p> <p>c. [動物實驗/Instrument][發現/Becoming-aware][天生瘦子基因/Phenomenon]。</p>
Opinion	State	Cognizer, Content, Topic	<p>想、認為、以為、感覺、覺得</p> <p>a. [我/Cognizer][想/Opinion][未來的兩年裡，算了吧!/Content]</p> <p>b. 對於[這一點/Topic]，[周先生/Cognizer][認為/Opinion][水鳥族群的減少是全世界皆如此/Content]。</p>
Certainty	State	Cognizer, Degree, Content, Content_Description	<p>相信、懷疑、確定、確信</p> <p>a. [我/Cognizer][深深/Degree][相信/Certainty]，[沒有諒解與寬恕的心，就沒有溫柔敦厚好禮的社會/Content]。</p> <p>b. [我/Cognizer][十分/Degree][懷疑/Certainty][上述對後現代政治這種陳腔濫調的描述/Content_Description]。</p>
Knowing	State	Cognizer, Knowledge, Knowledge_Description, Degree	<p>知道、曉得、清楚、明白、懂</p> <p>a. [你/Cognizer]也[知道/Knowing][後來的結果/Knowledge]。</p> <p>b. [我們/Cognizer]似乎也[知道/Knowing]，[中國之所以落後於世界列強，關鍵就在於清代/Knowledge Proposition]。</p> <p>c. [她內心/Cognizer]卻[非常/Degree][明白</p>

			/Knowing][父母的希望/Knowledge]。 d. [他/Cognizer][非常/Degree][明白/Knowing][黃翔對演藝圈沒有興趣/Knowledge Proposition]。
Remembering_ Process	Activity	Cognizer, Memory	回憶、回想、忘、忘記 [那個可憐的小孩子/Cognizer]正在努力[回想/Remembering_Process][媽媽跟他說的話/Memory]。
Remembering_ Resultative State	Achievement	Cognizer, Stimulus, Memory	回想起、回憶起、記起、想起、想到、忘 [登岳陽樓/Stimulus]，使[我/Cognizer][想起/Remembering_Resultative State][范仲淹/Memory]。
Remembering_ Homogeneous State	State	Cognizer, Memory, Act, Degree	記得、忘、忘記 a. [我/Cognizer][記得/Remembering_Homogeneous State]，[那步出家門被陽光溶化的那個畫面/Memory]。 b. [我/Cognizer][記得/Remembering_Homogeneous state]，[我在念中學時，有一個叫首仙仙的女孩自殺了。/Memory Proposition] c. [她的同學/Cognizer]都[十分/Degree][記得/Remembering_Homogeneous State][她閉門苦讀和認真求學的態度/Memory]。 d. [我/Cognizer]卻[十分/Degree][記得/Remembering_Homogeneous State][劉藍溪小姐當年走性感路線/Memory Proposition]。 e. [歌德/Cognizer][忘/Remembering_Homogeneous State]了[提一件事/Act]。

As subtypes of cognition verbs are characterized by different event types, distinct sets of frame elements and the basic syntactic patterns of the frame elements, the classification is in fact grounded in the conceptual schema proposed here (see (68) in p. 57). In other words, subtypes of cognition verbs highlight subparts of the conceptual schema. As a result, the schema functions as a cognitive motivation for the classification of Mandarin cognition verbs. In this way, we can also plot subtypes of cognition verbs, or the distinct frames evoked by the verbs, into the conceptual schema:

(70) Cognition Frames¹³ Plotted in the Cognition Schema



In sum, with this domain-specific conceptual schema, the links between cognition verbs are made explicit and well-motivated.

5.4. Remarks

This chapter is an analysis of Mandarin cognition verbs from the perspective of Frame Semantics (Fillmore and Atkins 1992). Based on the collo-grammatical properties of different cognition verbs discussed in the previous chapter, a domain-specific conceptual schema is postulated and the frames evoked by different classes of cognition verbs may be plotted to this overarching conceptual schema. With this domain-specific conceptual schema, the links between cognition verbs are made explicit and well-motivated.

¹³ The name of the frames postulated here are not necessarily identical to the names of the frames in FrameNet. For example, the ‘Cogitating’ frame here is corresponding to the ‘Cogitation’ frame in FrameNet. The suffix ‘-ing’ is intended to emphasize the distinctive aspectual information encoded in Mandarin cognition verbs, which are not significant in English cognition verbs.

Chapter 6

Conclusion and Further Research

6.1. Conclusion

Adopting the theory of Frame Semantics (Fillmore and Atkins 1992), this study treats verbal meanings as anchored in conceptual frames. Verbs of a semantic domain share the same conceptual schema but highlight subparts of the schema. Verbs in the same frame syntactically display similar constructional and collocational patterns.

The thesis investigates the domain of cognition verbs in Mandarin, aiming to clarify the interrelations between subsets of cognition verbs and ultimately tackles the questions: *what are cognition verbs? What is the event structure encoded in cognition verbs?* By examining the collo-grammatical characteristics of different subgroups of Mandarin cognition verbs, the study provides a detailed analysis of the lexical distinctions encoded in Mandarin cognition verbs as evidenced in their syntax-to-semantics correlations. Specifically, cognition frames with different event types are plotted into the schema as different stages of the cognizing process. The same approach can be applied to other domains of verbs, establishing a conceptual schema as the archi-frame with essential participants of the archi-frame as the defining background for verbs of the same domain (for communication verbs, please see Liu, Chiang and Chang 2004). The study ultimately provides a unified framework in analyzing and representing verbal semantics.

6.2. Further Research

Based on the research results of the paper, the issue of polysemy, meaning extension and the shift of modality involved in Mandarin cognition verbs can be tackled in the future research.

To begin with, for the issue of polysemy and meaning extension, many of the cognition verbs are polysemous due to the fact that they derived from other ontological domains. For instance, Sweetser (1990) discussed extension from perception and manipulation to cognition. In Mandarin there are similar examples, such as those from perception domain 感覺 *ganjue* ‘feel’, 覺得 *juede* ‘feel’, 看 *kan* ‘see’ and 摸 *mo* ‘touch’, and those from manipulation domain e.g. 抓 *zhua* ‘grasp’. It would be interesting to compare the ‘genuine’ cognition verbs with ‘derived’ ones. Besides, it is found that there seem to be other factors in addition to human cognition and metaphor structure that contribute to meaning extensions (Sweetser 1990: 38, Diagram 1), as the question arises: why did only some perception verbs extend to cognition but not all the perception verbs? For example, among the vision perception verbs, *see* is extended to be used as cognition but not others, such as *stare*, as in *I see your point* but **I stare at your point*. About this question, Sweetser argues that only words of ‘basic-level category’ (Rosch 1973, 1978) will metaphorically extend to other domains, which is the reason why *see* but not *stare* extended to be used as a cognition verb. However, there are still problems. For example, if we compare *see* with *look*, both arguably belonging to ‘basic-level category’, we will find that while *see* extended to cognition domain, *look* did not but *look up to*, *look forward to*, *overlook*, *look into*, and so on. This leads to one more interesting question: while conceptually *look* and *look up to*, *look forward to*, *overlook*, *look into* are extremely closely related, why do they not show similar behaviors in terms of semantic extensions? Now it is apparent that in addition to

cognitive-motivated account as proposed by Sweetser (1990), there must be other reasons to explain the asymmetry for the phenomenon. One possible answer is that ‘constructions’ (Goldberg 1995, 2006) also play a role in semantic extensions. That is, while some lexical units may have the cognitive potential to extend to other domains, they still need to fulfill the syntactic requirements. Take the above-mentioned case of *look* versus *look up to*, *look forward to*, *overlook*, *look into* to illustrate this point. The verb *look* differs from the phrasal verbs *look up to*, *look forward to*, *overlook*, *look into* in the syntactic skeleton they occur: unlike the verb *look* that takes a preposition phrase headed by *at*, these phrasal verbs take a noun phrase as a direct object, just like what *see* does. Beside the case of English perception verbs, Mandarin verbs also exhibit similar phenomena. For instance, both the verbs 覺得 *juede* ‘feel’ and 感覺 *ganjue* ‘feel’, but not 感到 *gandao* ‘feel’, exhibit polysemy across perception, emotion and cognition:



(71) Multiple Senses across Perception, Emotion and Cognition

a. Perception: 我覺得/感覺/感到胃痛。

wo juede/ganjue/gandao weitong

‘I feel stomachache.’

b. Emotion: 我覺得/感覺/感到很快樂。

wo juede/ganjue/gandao hen gaoping

‘I feel happy.’

c. Cognition: 我覺得/感覺/*感到他說的很有道理。

*wo juede/ganjue/*gandao ta suo de hen you daoli*

‘I feel what he said makes sense.’

Now similar question arises. While all the three verbs belong to the same conceptual domain (perception domain) and are arguably in the ‘basic-level category’, only 覺得 *juede* ‘feel’ and 感覺 *ganjue* ‘feel’ extend to emotion and cognition but 感到 *gandao* ‘feel’ does not. Hence a reasonable account must be provided to answer the question. Again, we see that the complement types of the verbs in the three domains are different. In the case of (3), perception verbs take a noun phrase (胃痛 *weitong* ‘stomachache’), emotion verbs take a adjective phrase (很快樂 *hen kuaile* ‘very happy’) and cognition verbs take a full clause (他說的很有道理 *ta suo de hen you daoli* ‘what he said makes sense.’) as their direct objects. Even if perception verbs take a full clause as direct objects (我 覺得 / 感覺 / 感到 胃 很 痛 *wo juede/ganjue/gandao wei hen tong* ‘I feel (my) stomach aches’), just like the clausal complement in (3c), these two sentences are still different: in 我 覺得 / 感覺 / 感到 胃 很 痛, the subjects of the main clause and the complement clause ‘partially co-index’ with each other, but in 我 覺得 / 感覺 / *感到 他 說 的 很 有 道 理, the subjects do not co-index with each other (for more detail, please see Tang (2000: 16-17) and Wu’s (2006) quoting of Meng (1997:57)). The linguistic phenomena then lead to a hypothesis: there may be certain ‘domain-specific constructions’ that are associated with certain conceptual domains. This hypothesis is similar to the argument proposed in Goldberg (1995, 2006) that constructions have their own meanings as well. Consequently, only when a lexical unit is capable of fitting into the ‘domain-specific constructions’ can it undergo semantic extensions to the domains (cf. the case of *cry me a river* in Goldberg 2006: 27, footnote 7). Thus it may be interesting to the constructions of the verbs that extend to other domains with those that do not so as to falsify or verify the current hypothesis.

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研究所知識化語料研究室. NSC 92-2411-H-009-020-ME.

Website Resources

Academia Sinica Bilingual Ontological WordNet (Sinica BOW)

<http://bow.sinica.edu.tw/>

Academia Sinica Balanced Corpus of Modern Chinese (Sinica Corpus)

<http://www.sinica.edu.tw/SinicaCorpus/>

Chinese Wordnet

<http://cwn.ling.sinica.edu.tw/>

FrameNet

<http://framenet.icsi.berkeley.edu/>

Google

<http://www.google.com.tw/>

搜文解字 *souwenjiezi*

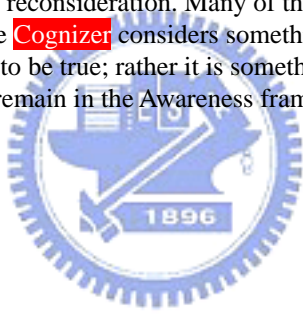
<http://words.sinica.edu.tw/>

Appendix I

The frame-to-frame relations in FrameNet (Ruppenhofer et al. 2006:8, 103-111)

Frame-to-frame Relations	Definition	Example
Inheritance	An 'is-a' relation. A is a subtype of B.	Revenge frame inherits from the Rewards_and_punishments frame.
Perspective_on	A provides a particular perspective on an un-perspectivized frame.	Hiring frame and Get_a_job frame perspectivize on the Employment_start frame.
Subframe	A (a simple event) is a subpart of B (a complex event).	Arrest frame, Arraignment frame, Trial frame and Sentencing frame are subframes of Criminal_process frame.
Precedes	A precedes B.	Being_aware frame precedes Fall_asleep frame, which precedes Sleep frame, which precedes Waking_up or Getting_up frame, which in turn precedes the Being_aware frame.
Resultative_of	A is Resultative of B.	Change_position_on_a_scale frame is Resultative of Position_on_a_scale frame.
Causative_of	A is causative of B.	Cause_change_position_on_a_scale frame is causative of Change_position_on_a_scale frame.
Using	A presupposes B as background.	Speed frame uses Motion frame.
See_also	A and B are similar and should be carefully differentiated, compared and contrasted.	When seeing Scrutiny frame, one should also see Seeking frame.

Appendix II Cognition Frames in FrameNet

Frame Names, Definition, Core Frame Elements	Lexical Units
<p><u>Achieving first</u> A Cognizer introduces a New_idea into society. Ex. How did you DISCOVER the trick to opening it ?</p> <ol style="list-style-type: none"> Cognizer [Cog] New_idea [New] 	<p><i>coin.v, coinage.n, discover.v, discoverer.n, discovery.n, invent.v, invention.n, inventor.n, originate.v, originator.n, pioneer.n, pioneer.v, pioneering.a</i></p>
<p><u>Adding up</u> A Cognizer computes a Result on the basis of input Numbers by addition. Ex. Chaperones TALLIED the number of tickets sold at the school dance at more than 1000.</p> <ol style="list-style-type: none"> Cognizer [] Numbers [] Result [] 	<p><i>add up.v, tally.v, total.v</i></p>
<p><u>Awareness</u> A Cognizer has a piece of Content in their model of the world. The Content is not necessarily present due to immediate perception, but usually, rather, due to deduction from perceivables. In some cases, the deduction of the Content is implicitly based on confidence in sources of information (<i>believe</i>), in some cases based on logic (<i>think</i>), and in other cases the source of the deduction is deprofiled (<i>know</i>). Note that this frame is undergoing some degree of reconsideration. Many of the targets will be moved to the Opinion frame. That frame indicates that the Cognizer considers something as true, but the Opinion (compare to Content) is not presupposed to be true; rather it is something that is considered a potential point of difference. In the uses that will remain in the Awareness frame, however, the Content is presupposed. Ex. Your boss is AWARE of your commitment.</p> <ol style="list-style-type: none"> Cognizer [Cog] Content [Cont] Expressor [Expr] Topic [Top] 	<p><i>aware.a, awareness.n, belief.n, believe.v, cognizant.a, comprehend.v, comprehension.n, conceive.v, conception.n, conscious.a, consciousness.n, hunch.n, ignorance.n, imagine.v, know.v, knowledge.n, knowledgeable.a, presume.v, presumption.n, reckon.v, supposition.n, suspect.v, suspicion.n, think.v, thought.n, understand.v, understanding.n</i></p>
<p><u>Be in agreement on assessment</u> The Cognizers have a similarity (or dissimilarity) in their Opinion. The Cognizers may be expressed separately, with Cognizer_2 being the basis for establishing the Opinion of Cognizer_1. Rather than a specific Opinion, a phenomenon about which a similar or differing Opinion is held, the Topic, may be specified. A specific Opinion may also go unmentioned when the Opinions of the Cognizers are understood as answers to a Question. Ex. Dr. Gerry and Mr. Pond AGREE in their impressions.</p> <ol style="list-style-type: none"> Cognizer_1 [cog1] Cognizer_2 [cog2] Cognizers [cogs] Opinion [opi] Question [que] 	<p><i>agree.v, agreement.n, concur.v, see eye to eye.v</i></p>
<p><u>Becoming aware</u> A Cognizer adds some Phenomenon to their model of the world. They are similar to Coming-to-believe words, except the latter generally involve reasoning from Evidence. The words in this frame take direct objects that denote entities in the world, and indicate awareness of those entities, without necessarily giving any information about the content of the Cognizer's belief or knowledge. These words also resemble perception words, since creatures often become aware of things by perceiving them. Ex. Later that night, they FOUND the barely-alive victim inside the Red Hall estate flat.</p>	<p><i>chance_(across).v, chance_(on).v, come_(across).v, come_(upon).v, descry.v, detect.v, discern.v, discover.v, discovery.n, encounter.v, espy.v, fall_(on).v, find.v, find_out.v, happen_(on).v</i></p>

<ol style="list-style-type: none"> Cognizer [Cog] Instrument [ins] Means [Mns] Phenomenon [Phen] Topic [Top] 	<i>learn.v, locate.v, note.v, notice.v, observe.v, perceive.v, pick up.v, recognize.v, register.v, spot.v, spy out.v</i>
<p><u>Categorization</u></p> <p>A Cognizer construes an Item as belonging to a certain Category. In this process, the Cognizer may either passively perceive the Item and note that it fits the Criteria for a Category, or, alternatively, actively examine the Item for certain Criteria that define a Category (or set of Categorys).</p> <p>Ex. You 've already STEREOTYPED me as a bimbo, have n't you?</p> <ol style="list-style-type: none"> Category [Cat] Cognizer [Cog] Criteria [Crit] Item [Item] 	<i>categorization.n, categorize.v, class.v, classification.n, classify.v, conceive.v, consider.v, construe.v, count.v, define.v, identify.v, interpret.v, interpretation.n, peg.v, perceive.v, pigeonhole.v, regard.v, render.v, see.v, stereotype.v, translate.v, typecast.v, understand.v, view.v</i>
<p><u>Certainty</u></p> <p>This frame concerns a Cognizer's certainty about the correctness of beliefs or expectations. It only includes uses where a Cognizer is expressed.</p> <p>Ex. Lermontov was CERTAIN he would come to the party.</p> <ol style="list-style-type: none"> Cognizer [Cognizer] Content [Content] Expressor [Exr] Topic [Topic] 	<i>believe.v, certain.a, certainty.n, confidence.n, confident.a, convinced.a, doubt.n, doubt.v, doubtful.a, dubious.a, positive.a, sure.a, trust.v, uncertain.a, uncertainty.n, unsure.a</i>
<p><u>Choosing</u></p> <p>A Cognizer decides upon the Chosen (either an item or a course of action) out of a set of Possibilities. The Cognizer may have an Intended purpose for the Chosen. Often a Reason, which serves as the basis of the choice, is given.</p> <p>Ex. The council PICKED you out of all the pilots available to head this mission.</p> <ol style="list-style-type: none"> Chosen [Chosen] Cognizer [Cog] Possibilities [Possib] 	<i>choice.n, choose.v, decide.v, elect.v, opt.v, pick.v, select.v, selection.n, settle on.v</i>
<p><u>Cogitation</u></p> <p>A person, the Cognizer, thinks about a Topic over a period of time. What is thought about may be a course of action that the person might take, or something more general.</p> <p>Ex. The men were silently MULLING OVER the proposition of committing an assassination</p> <ol style="list-style-type: none"> Cognizer [Cog] Topic [Top] 	<i>brood.v, consider.v, consideration.n, contemplate.v, contemplation.n, deliberate.v, deliberation.n, dwell.v, give thought.v, meditate.v, meditation.n, mull_over.v, muse.v, ponder.v, reflect.v, reflection.n, ruminate.v, think.v, thought.n, wonder.v</i>
<p><u>Coming to believe</u></p> <p>A person (the Cognizer) comes to believe something (the Content), sometimes after a process of reasoning. This change in belief is usually initiated by a person or piece of Evidence. Occasionally words in this domain are accompanied by phrases expressing Topic, i.e. that which the mental Content is about.</p> <p>Ex. Based on the most recent census I have CONCLUDED that most Americans sleep too much.</p> <ol style="list-style-type: none"> Cognizer [Cog] Content [Cont] 	<i>ascertain.v, conclude.v, conclusion.n, deduce.v, deduction.n, determine.v, figure out.v, find out.v, find.v, guess.n, guess.v, infer.v, inference.n, learn.v, puzzle out.v, realization.n, realize.v, surmise.v, work out.v</i>

<ol style="list-style-type: none"> 3. Evidence [Evid] 4. Means [Mns] 5. Medium [med] 6. Topic [Top] 	
<p>Differentiation</p> <p>A Cognizer is aware (or not being aware) of the difference between two Phenomena, which may be expressed jointly or disjointly. Ex. It is very difficult for people to visually DISTINGUISH between living and non-living things from such a great distance.</p> <ol style="list-style-type: none"> 1. Cognizer [Cog] 2. Phenomena [Phen-pl] 3. Phenomenon_1 [Phen-1] 4. Phenomenon_2 [Phen-2] 5. Quality [Qual] 	<p><i>differentiate.v,</i> <i>discriminate.v,</i> <i>discrimination.n,</i> <i>distinguish.v, sort.v,</i> <i>tell_apart.v</i></p>
<p>Estimating</p> <p>A Cognizer carries out an approximate calculation or considers some Evidence so as to arrive at an approximate Value for some Feature of an Item. There are two alternative construals. In one, the Feature is presented as a Question about the Item and the Value is conceived as an answer to the Question. In the second construal, a fully propositional Estimation by the Cognizer is presented which expresses the result of the Cognizer's approximation. Ex. When Congress passed the Medicare bill in late 2003, the Congressional Budget Office ESTIMATED its cost at \$395 billion over 10 years.</p> <ol style="list-style-type: none"> 1. Cognizer [cog] 2. Estimation [est] 3. Feature [fea] 4. Item [ite] 5. Question [que] 6. Value [val] 	<p><i>estimate.v, estimation.n,</i> <i>guess.v</i></p>
<p>Eventive cognizer affecting</p> <p>An Event or an Agent causes the Cognizer to accept some Content. Although the Cognizer forms an intention, it is not entailed that he/she acts. Ex. He CONVINCED me of his innocence.</p> <ol style="list-style-type: none"> 1. Agent [Agt] 2. Cognizer [Cognizer] 3. Content [Content] 4. Event [Evt] 	<p><i>convince.v, decide.v</i></p>
<p>Evoking</p> <p>Some Stimulus causes a Cognizer to think of a prior Phenomenon due to its perceived similarity. Ex. I burned down the malt shop where we used to go just because it REMINDS me of you.</p> <ol style="list-style-type: none"> 1. Cognizer [Cognizer] 2. Phenomenon [Phen] 3. Stimulus [Stim] 	<p><i>bring to mind.v, call to mind.v, conjure.v, evoke.v,</i> <i>put in mind_(of).v,</i> <i>recall.v, remind.v,</i> <i>reminder.n, ring a bell.v</i></p>
<p>Expectation</p> <p>A Cognizer believes that some Phenomenon will take place in the future. Some words in the frame (e.g. <i>foresee.v</i>) indicate that the Phenomenon is asserted also to be true, while others do not. Ex. From the look on her face Michael EXPECTED that she would say she got the job.</p> <ol style="list-style-type: none"> 1. Cognizer [Cog] 2. Phenomenon [Phen] 3. Topic [top] 	<p><i>anticipate.v, await.v,</i> <i>expect.v, expectation.n,</i> <i>foresee.v, foreseeable.a,</i> <i>predict.v, predictable.a,</i> <i>prediction.n,</i> <i>premonition.n,</i> <i>unforeseeable.a,</i> <i>unpredictable.a, wait.v</i></p>
<p>Influence of event on cognizer</p> <p>A Situation or Protagonist creates conditions that push the Cognizer towards executing an Action, or which influence the Cognizer in an Activity. The words in this frame imply that the Cognizer actually</p>	<p><i>guide.v,</i> <i>influence((mass)).n,</i> <i>influence.n, influence.v,</i></p>

<p>does something.</p> <p>Ex. The murder of my brother INFLUENCED me to study Law.</p> <ol style="list-style-type: none"> 1. Action [act] 2. Activity [tiv] 3. Cognizer [cog] 4. Protagonist [pro] 5. Situation [sit] 	<p><i>influential.a</i></p>
<p>Information</p> <p>A Cognizer knows or comes to know some piece of Information about a Topic. In this frame, many LUs encode a specific Means_of_Gathering and/or Source, but these may also be expressed separately.</p> <p>Ex. Anyone got the STRAIGHT DOPE on this?</p> <ol style="list-style-type: none"> 1. Information [inf] 2. Topic [top] 	<p><i>data.n, dirt.n, dope.n, info.n, information.n, intel.n, intelligence.n, scoop.n, skinny.n, straight dope.n</i></p>
<p>Invention</p> <p>A Cognizer creates a new intellectual entity, the Invention. These words are similar to words of physical creation such as <i>build</i> and <i>make</i>, and in some cases may be understood as metaphorically based on such words. However, the Inventions in this frame are predominantly conceptual in nature. Compare this frame with Being_first.</p> <p>Ex. It is difficult to imagine how different our lives would be without Edison's INVENTION of the light bulb.</p> <ol style="list-style-type: none"> 1. Cognizer [Cog] 2. Invention [Inv] 	<p><i>coin.v, come up.v, conceive.v, concoct.v, concoction.n, contrivance.n, contrive.v, cook_up.v, create.v, design.n, design.v, devise.v, formulate.v, hatch.v, improvise.v, invent.v, invention_artifact.n, invention_process.n, think up.v</i></p>
<p>Judgment</p> <p>A Cognizer makes a judgment about an Evaluee. The judgment may be positive (e.g. <i>respect</i>) or negative (e.g. <i>condemn</i>), and this information is recorded in the semantic types Positive and Negative on the Lexical Units of this frame. There may be a specific Reason for the Cognizer's judgment, or there may be a capacity or Role in which the Evaluee is judged.</p> <p>This frame is distinct from the Judgment_communication frame in that this frame does not involve the Cognizer communicating his or her judgment to an Addressee.</p> <p>JUDGMENT: She ADMIRED Einstein for his character.</p> <p>JUDGMENT_COMMUNICATION: She ACCUSED Einstein of collusion.</p> <p>Currently, however, some lexical units and annotation for both remain in this frame.</p> <ol style="list-style-type: none"> 1. Cognizer [Cog] 2. Evaluee [Eval] 3. Expressor [Exr] 4. Reason [Reas] 	<p><i>accolade.n, accuse.v, admiration.n, admire.v, admiring.a, applaud.v, appreciate.v, appreciation.n, appreciative.a, approbation.n, approving.a, blame.n, blame.v, boo.v, contempt.n, contemptuous.a, critical.a, damnation.n, deify.v, deplore.v, derisive.a, disapproval.n, disapprove.v, disapproving.a, disdain.n, disdain.v, disdainful.a, disrespect.n, esteem.n, esteem.v, exalt.v, exaltation.n, fault.n, fault.v, mock.v, mockery.n, prize.v, reprehensible.a, reproach.n, reproachful.a, respect.n, respect.v, revere.v, reverence.n, scorn.n, scorn.v, scornful.a, set store.v, stigma.n, stigmatize.v, stricture.n, uncritical.a,</i></p>

	<i>value.v, vilification.n</i>
<p><u>Make cognitive connection</u></p> <p>Using Evidence, which may or may not be expressed, a Cognizer recognizes or proves that Concept1 is associated causally or collocationally with another concept, Concept2. These may be expressed collectively as associated Concepts.</p> <ol style="list-style-type: none"> Cognizer [Cog] Concept_1 [Concept1] Concept_2 [Concept2] Concepts [Concepts] 	<i>connect.v, connection.n, link.n, link.v, linked.a, tie.n, tie.v</i>
<p><u>Memorization</u></p> <p>A Cognizer applies themselves to commit a Pattern to memory, so that the Cognizer would recognize future examples of the Pattern or be able to reproduce it.</p> <p>A gaggle of students were frantically MEMORIZING the answers out in the hall.</p> <p>It is possible to MEMORIZE by rote and at the same time have a full grasp of the underlying meaning. CNI [NI] This frame differs from Education_teaching in that the Cognizer is construed as acting alone, with no indication of an interacting individual that provides guidance.</p> <ol style="list-style-type: none"> Cognizer [cog] Pattern [pat] 	<i>commit_to_memory.v, learn.v, memorise.v, memorization.n</i>
<p><u>Memory</u></p> <p>This frame is concerned with Cognizers remembering and forgetting mental Content.</p> <ol style="list-style-type: none"> Cognizer [Cognizer] Content [Content] Topic [Topic] 	<i>bethink_oneself.v, forget.v, memory.n, recall.v, recollect.v, recollection.n, remember.v, retain.v</i>
<p><u>Needing</u></p> <p>The speaker believes that some state of affairs or entity (the Requirement) must be present in order to cause some other dependent state of affairs to occur (the Dependent). In the typical case, the Cognizer desires the occurrence of the Dependent and so also desires the obtainment or occurrence of the Requirement.</p> <p>I NEED one more bolt. DNI</p> <p>I NEED one more nail to finish building the cabinet.</p> <p>In order to complete the treaty, the United States will REQUIRE several more diplomats.</p> <p>He NEEDS everyone to leave his office to finish his work.</p> <ol style="list-style-type: none"> Cognizer [cog] Consequences [con] Dependent [dep] Requirement [req] 	<i>need.n, need.v, require.v</i>
<p><u>Opinion</u></p> <p>A Cognizer holds a particular Opinion, which may be portrayed as being about a particular Topic.</p> <p>John THINKS that it looks better back .</p> <p>Well, my OPINION about that is none of your business.</p> <p>What's your TAKE on the recent oil crisis ?</p> <p>Your VIEW of Smithers as an excellent secretary is not shared by the rest of the UN.</p> <p>I THINK of him as my own little pet.</p> <ol style="list-style-type: none"> Cognizer [cog] Opinion [opi] 	<i>belief.n, expect.v, feel.v, figure.v, have feeling.v, hunch.n, opinion.n, suppose.v, take.n, think.v, view.n</i>
<p><u>Remembering experience</u></p> <p>A Cognizer calls up an episodic memory of past Experience or an Impression of a Salient_entity formed on the basis of past experience. The Cognizer may also remember the Salient_entity in a particular State, which serves as a frame of reference in the Cognizer's mind. When attention is focused on a Salient_entity, then mention of a global Experience is excluded and typically, but not always, either a State or Impression of the Salient_entity is presented.</p>	<i>forget.v, look back.v, memory.n, recall.v, remember.v, reminisce.v</i>

Episodic memory is the explicit memory of events. It includes time, place, and associated emotions (which affect the quality of the memorization). Episodic memory contrasts and interacts with semantic memory, the memory of facts and concepts. The Remembering_information frame is concerned with this latter type of memory.

Kozmo could REMEMBER when his modem was the fastest he could buy.

That's probably before my time, which was long time ago, Fish may REMEMBER that time.

Who REMEMBERS me being a total dork and going up to everyone saying "Hey, I'm Ashley Hunt from Chicago" !?!

I wanted to REMEMBER how good that felt.

Hummel says staff, both students and professional, REMEMBER her as a "very good friend, available for new staff and well-respected by everyone."

Somehow I REMEMBER him as older, with long eyelashes, and doe eyes.

When he died he was just a kid himself but for some reason at the age of 44 I still REMEMBER him as older than me.

Retro games are great, but a lot of the time people get clouded by nostalgia and REMEMBER them to be better than they really were

He REMEMBERED him as a kindly man but not a very lively one.

The part I vividly REMEMBER was about a South Seas tramp steamer captain.

1. Cognizer [cog]
2. Experience [exp]
3. Impression [imp]
4. Salient_entity [sal]
5. State [sta]

Remembering_information

A Cognizer retains facts in memory and is able to retrieve them. The Mental_content may be presented in clearly propositional form as a finite clause. It may also take the form of an embedded question or be a concealed question in the form of a simple NP.

I was impressed that she 'd actually REMEMBERED Radish 's name (= what Radish's name is)

Oh, and for those who like to continually whinge about how the French are 'surrender monkeys' -

REMEMBER Napoleon (= who Napoleon was)?

I ca n't REMEMBER what DSP stands for.

And Bill can still REMEMBER the pattern (= what the pattern is).

What do you REMEMBER about your grandma?

Notice that this frame is very general. It can be used to talk about detailed reports of past experience.

I don't know if I lost consciousness for a while. But I REMEMBER that I was lying in the middle of the road with people trying to assist me.

Notice that Mental_content reported within this frame is presented as factive, i.e. as reliable and accurate. Consider the following contrasts:

1a. I REMEMBER her as selfish--but I might be wrong.

1b. ??I REMEMBER that she was selfish--but I might be wrong.

2a. Bill REMEMBERS her as smarter than she is.

2b. *Bill REMEMBERS that she is smarter than she is. The (b) sentences, which belong in this frame, are less acceptable than the (a)-sentences as they suggest that the Cognizer takes their memory to be accurate while suggesting at the same time that the memory might be or is inaccurate. In the (a) sentences, which belong to the Remembering_experience frame, there is no contradiction as the remembering is taken to be subjective and not necessarily accurate.

The concealed question uses with personal names that occur in this frame are not always easy to distinguish from instances of the Remembering_experience frame where a Salient_entity alone is referred to. In 3a and 3b, which belong to the Remembering_experience frame, there is no question of identity: remembering here means thinking of one's memories of the relevant person. 3c is different: the hearer is asked whether they know who the person is; it belongs in this frame.

3a. I REMEMBER her fondly

3b. Please take a moment to REMEMBER Caesar and his Family.

3c. Do you REMEMBER Alexander the Great? He was one of history's most prolific conquerors, and he did it all in his twenties.

This frame differs from Remembering_to_do in that this frame is strictly talking about a fact, whereas

draw blank.v, forget.v, remember.v

<p>the Remembering_to_do frame is strictly about tasks which the Cognizer would be expected to do. Remembering_to_do uses normally occur with infinitival complements.</p> <ol style="list-style-type: none"> Cognizer [cog] Mental_content [men] 	
<p>Remembering to do A Cognizer thinks of and performs an Action that is a self- or other-imposed task or some other kind of desirable behavior. The Action may involve a Salient_entity in some way affected by the Cognizer. If a Salient_entity is mentioned, the Action is left unexpressed. You invited everybody but you FORGOT Harry. Thank God Smithers REMEMBERED to return the video. If you FORGET your textbook and there is an assignment to be done, the highest grade you will receive on the work is aC (70%). Did you REMEMBER about the letter?</p> <ol style="list-style-type: none"> Action [act] Cognizer [cog] Salient_entity [sal] 	<p><i>forget.v, remember.v</i></p>
<p>Regard A Cognizer has a Judgment of an Evaluee, expressing how high or low their regard for the Evaluee is. What do you THINK of him as a linguist? She secretly THOUGHT well of him for his role in defrocking Mr. Matthews. Please understand, I hold you in the highest REGARD. My low OPINION of him was of long standing.</p> <ol style="list-style-type: none"> Cognizer [cog] Evaluee [eva] Judgment [jud] 	<p><i>appreciate.v, appreciative.a, esteem.n, impression.n, opinion.n, regard.n, regard.v, think.v</i></p>
<p>Reliance on expectation A Cognizer takes a certain Expectation to be a reliable fact, such that their plans can be based on it.</p> <ol style="list-style-type: none"> Cognizer [] Expectation [] 	<p><i>bank (on).v, count (on).v</i></p>
<p>Scrutinizing for A Cognizer examines a Ground closely, alert to the presence of a Phenomenon.</p>	<p>N/A</p>
<p>Scrutiny This frame concerns a Cognizer (a person or other intelligent being) paying close attention to something, the Ground, in order to discover and note its salient characteristics. The Cognizer may be interested in a particular characteristic or entity, the Phenomenon, that belongs to the Ground or is contained in the Ground (or to ensure that such a property of entity is not present). Some words in this frame allow alternate expressions of the Ground and the Phenomenon: We SEARCHED the yard for my contact lens.</p> <ol style="list-style-type: none"> Cognizer [Cog] Ground [Ground] Phenomenon [Phen] 	<p><i>analyse.v, analysis.n, analyst.n, analytic.a, assay.v, check.v, comb.v, double-check.v, examination.n, examine.v, eyeball.v, frisk.v, go_(through).v, inspect.v, inspection.n, inspector.n, investigate.v, investigation.n, look.v, monitor.v, once-over.n, perusal.n, peruse.v, probe.v, proof-read.v, ransack.v, reconnoitre.v, rummage.v, scan.v, scour.v, scout.v, scrutinize.v, scrutiny.n, search.n, search.v, sift.v, skim.v, spy out the land.v, study.n, study.v, survey.n, survey.v, surveyor.n,</i></p>

	<i>sweep.n, sweep.v</i>
<p><u>Searching_scenario</u> A Cognizer seeks a Phenomenon within the Ground.</p> <ol style="list-style-type: none"> Cognizer [Cog] Ground [Ground] Phenomenon [Phen] 	N/A
<p><u>Seeking</u> A Cognizer_agent attempts to find some Sought_entity by examining some Ground. The success or failure of this activity (the Outcome) may be indicated. NB: This frame should be compared to the Scrutiny frame, in which the primary focus is on the Ground.</p> <ol style="list-style-type: none"> Cognizer_agent [Agt] Sought_entity [Phen] 	<i>omb.v, examine.v, feel.v, forage.v, frisk.v, fumble.v, grope.v, hunt.v, listen.v, look.v, nose.v, palpate.v, pan.v, pat down.v, probe.v, ransack.v, rummage.v, scour.v, search.v, seek.v, sniff.v, watch.v</i>
<p><u>Subjective_influence</u> A Situation or Entity has an influence on a Cognizer. The influence may be general; or it may be manifested in the Cognizer's engaging in an Action as a consequence of the influence; or the Cognizer may be influenced in how they carry out a Behavior that they are engaged in already. Alternatively, a Product may be specified whose production or design was influenced by the Cognizer's experience of the Situation or Entity. The mediation of the Cognizer's psyche distinguishes this frame from the Objective_influence frame, where dependent events occur automatically given the appropriate kind of influencing force. In this frame, by contrast, a Cognizer may perceive an influence yet not respond to it in any way. These works had a profound effect and INFLUENCED her in the creation of a successful series capturing this sun-drenched region. I'm sure if I asked Mattel what INSPIRED this car I would be told it's an original design, and not supposed to represent any actual car.</p> <ol style="list-style-type: none"> Action [act] Behavior [beh] Cognizer [cog] Entity [ent] Product [pro] Situation [sit] 	<i>effect.n, impact.n, impact.v, influence.n, influence.v, influential.a, inspiration.n, inspire.v</i>
<p><u>Taking_sides</u> A Cognizer has a relatively fixed positive or negative point of view towards an Issue (or a Side in a debate concerning an Issue). The Cognizer's Degree of alignment may also be specified. In interviews , it seems like everyone is completely AGAINST this expenditure .</p> <ol style="list-style-type: none"> Action [pos] Cognizer [cog] Issue [iss] Side [sid] 	<i>against.prep, for.prep, in favor.prep, opponent.n, oppose.v, opposition_((act)).n, opposition_((entity)).n, pro.adv, side.n, side.v, support.v, supporter.n, supportive.a</i>
<p><u>Translating</u> A Cognizer produces a Target_symbol which represents, in the Target_representation format, a Content that pre-exists in the form of a Source_symbol in a Source_representation format.</p> <p>This word is sometimes TRANSLATED as 'girl'. CNI They all wore symbolic black clothes over bright yellow T-shirts and all spoke in Welsh, their statements being TRANSLATED into English afterwards. CNI His texts were TRANSLATED from French into Scots by Carl Gronau. Perhaps when Irish monks spoke in Latin about lionn, meaning ale, they TRANSLATED the word literally from Irish into Latin as biber, 'drink'. Each of the ten Greek nouns below can be accurately TRANSLATED by using just one English word.</p>	<i>translate.v, translation.n</i>

<p>CNI.</p> <ol style="list-style-type: none"> Cognizer [Cog] Content [con] Source_representation [sour] Source_symbol [sous] Target_representation [tarr] Target_symbol [tars] 	
<p>Waver between options</p> <p>A Cognizer faces a choice on some Issue. They have several Options available but keep changing their mind between Option_1 and Option_2. The Cognizer may in fact act on their choice at some point but they need not; the Options can simply be considered for some time with one being favored for a while and then the other.</p> <p>Dave Hayes WAVERED about moving to California because so many of his friends are in Baltimore. He had WAVERED between half a dozen places; it was pure chance that he had chosen Marvis Bay. In any event, I still GO BACK AND FORTH on what I want to do.</p> <p>He was firm in his beliefs, never WAFFLED from one platform to another and was always harshly clear in his stance.</p> <p>Upper management WAFFLED whether Fletcher fit their salary structure.</p> <ol style="list-style-type: none"> Cognizer [Cog] Issue [iss] Option_1 [op1] Option_2 [op2] Options [ops] 	<p><i>dither.v, flip-flop.v, go back and forth.v, vacillate.v, waffle.v, waver.v</i></p>
<p>Trust</p> <p>A Cognizer thinks that the Information given by a particular Source is correct. The specific Content or Topic of the Information may also be described.</p> <ol style="list-style-type: none"> Cognizer [Cognizer] Expressor [Exr] Information [inf] Source [sou] 	<p><i>believe.v, credence.n, credulous.a, reliability.n, reliable.a, trust.n, trust.v, trustworthy.a</i></p>
<p>Willingness</p> <p>A Cognizer would engage in an Activity if asked or otherwise prompted to do so.</p> <p>The court is WILLING to depart from the usual range of sentencing.</p> <p>The Nicaraguan National Assembly has been RELUCTANT to destroy the remaining stockpile.</p> <p>The Turks are in GRUDGING acceptance of terms set by EU.</p> <p>Would you be PREPARED to give up some of your privacy to industry to help improve customer service?</p> <ol style="list-style-type: none"> Activity [act] Cognizer [Cog] 	<p><i>grudging.a, loath.a, prepared.a, reluctant.a, unwilling.a, unwillingness.n, willing.a, willingness.n</i></p>