WORD INTERNAL STRUCTURE IN CHINESE: EVENT STRUCTURE, PREDICATE-ARGUMENT STRUCTURE AND CATEGORIES IN SEPARABLE VERBS

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ABSTRACT

WORD INTERNAL STRUCTURE IN CHINESE: EVENT STRUCTURE, PREDICATE-ARGUMENT STRUCTURE AND CATEGORIES IN SEPARABLE VERBS

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The study of Chinese separable verbs has long been one of the unresolved and underdebated challenges in the field of Chinese linguistics due to their indivisible semantics, yet decomposable syntactic behaviors of separable verbs. In addition to this general conundrum that separable words pose for linguists, the second reason that makes the analysis of separable verbs difficult is the diverse range of syntactic modifications that separable verbs can accommodate. In this study, we analyze separable verbs as multi-word expressions to address the discrepancy in their behaviors at the syntactic and semantic levels via a radically lexicalized formalism, Combinatory Categorial Grammar (CCG).

In addition, as we observed that the event structures of separable verbs were linked to the previously mentioned diversity, we conducted a small-scale corpus study to investigate this issue. Our findings indicated that two composite events accounted for 40% of the syntactic flexibility observed in 21 different intervening structures in our experiment. It is noteworthy that the verbs involved in composite telic events (accomplishments) and non-composite telic events (achievements) exhibited contrasting syntactic flexibility. This distinct—compositionality—significantly influenced the syntactic flexibility of separable verbs. We incorporated these findings into our CCG analysis to complete our research.

Keywords: separable verbs, CCG, event structure, Chinese

ÖZ

ÇİNCE'DE SÖZCÜK İÇ YAPISI: AYRILABİLİR FİİLLERİN OLAY YAPISI, YÜKLEM-ÖĞE YAPISI VE KATEGORİLERİ

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Çince ayrılabilir fiillerin incelenmesi, bölünemez anlamlarıyla birlikte ayrıştırılabilir sözdizimsel davranışları nedeniyle Çin dilbilimi alanındaki çözülmemiş ve yeterince tartışılmamış konulardan biri olmuştur. Ayrılabilir sözcüklerin dilbilimcilere sunduğu bu genel özelliklere ek olarak, ayrılabilir fiillerin analizini karmaşık kılan ikinci neden, ayrılabilir fiiller arasında olabilen çeşitli sözdizimsel değişikliklerin geniş yelpazesidir. Bu çalışmada, ayrılabilir fiilleri, sözdizimi ve anlam düzeylerindeki farklı davranışları ele almak için kökten sözlükselleştirilmiş bir formalizm olan birleşimsel ulamsal dilbilgisi (CCG) aracılığıyla çok-sözcüklü ifadeleri olarak analiz ediyoruz.

Bu çalışmada, ayrılabilir fiillerin olay yapılarının önceden bahsedilen çeşitliliğe bağlı olduğunu keşfettik. Bu konuda küçük ölçekli bir korpus çalışması yapmaya bizi yönlendirdi. Sonuçlarımız, deneyimiz sırasında gözlemlediğimiz 21 farklı sözdizimsel ara yapıda gözlenen sözdizimsel esnekliğin %40'ını açıklayan iki bileşik olayın olduğunu göstermektedir. Bileşik telik olaylara (tamamlama) ve bileşik olmayan telik olaylara (bitirme) dahil olan fiillerin sözdizimsel esneklikte kontrast göstermesi dikkate değerdir. Bu ayrım—bileşimsellik—ayrılabilir fiillerin sözdizimsel esnekliğini önemli ölçüde etkiler. Bu bulguları CCG analizimize dahil ederek bu araştırmayı tamamladık.

Anahtar Kelimeler: ayrılabilir fiil, CCG, olay yapısı, Çince

To my family

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TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

LIST OF ABBREVIATIONS

ASSOC	Associative 的 *de*
BA	把 *bǎ*
BRIDG	Bridging 的 *de*
COP	Copula
CL	Classifier
FOC	的 *de* in cleft construction
DE^{+pot}	Positive potential 得 *de*
DE^{-pot}	Negative potential 得 *de*
DE^{des}	Descriptive morpheme 得 *de*
GE	Trivialness marker
GEN	Genitive 的 *de*
ICP	Idiomatically combining expression
IP	Idiomatic phrase
LIH	Lexical Integrity Hypothesis
MWE	Multiword expression
NI	Noun incorporation
NOM	Nominal 的 *de*
PART	Particle
PASS	Passive particle 被 *bèi*
PNI	Pseudo noun incorporation
PROG	Progressive marker
QW	Question word
RHET	Rhetorical question word
REL	Relative clause marker 的 *de*
RV	Resulative verb
RVC	Resulative verb construction
SV_H	A head of a separable verb
SV_T	A tail of a separable verb

CHAPTER 1

INTRODUCTION

1.1 Background to Separable Verbs

In the field of Chinese linguistics, separable verbs (離合詞 *líhécí*, SVs hereafter) have always been one of the hotly debated topics in the existing research. The literal meaning of SVs in Chinese, "separate combining word," illustrates that SVs are considered to be a type of word that can be either separated or combined. An SV consists of a verbal head (SV_H) and a nominal tail (SV_T). One of the main reasons that SVs are analyzed as words rather than as phrases is due to the LIH (Bresnan and Mchombo, 1995). The fixed semantics of SVs have led to them being viewed as lexical items. However, when SVs are syntactically separated, their semantics do not separate. This characteristic makes SVs incompatible with and a subject of controversy in the framework of Generative Grammar. Consider the example of SV 生氣 *shēngqì* 'be mad, get angry'. The literal meaning of the two morphemes are 生 *shēng* 'generate, grow, give birth' and 氣 *qì* 'air, gas'. However, regardless of whether these two morphemes are used in combination (1a) or separately (1b-c), we understand them in terms of their integrated semantic form rather than in terms of their separate forms; that is, 'generate air'.

(1) a. 張三 生 氣 了
Zhāngsān shēng qì le
Zhangsan generate air ASP
'Zhangsan got angry.'

b. 張三 生 了 好大 的 氣
Zhāngsān shēng le hǎodà de qì
Zhangsan generate ASP huge NOM air
'Zhangsan got very angry.' (lit. 'Zhangsan generated huge air.')

c. 張三 生 完 氣 了
Zhāngsān shēng wán qì le
Zhangsan generate finish air ASP
'Zhangsan stop being angry.' (lit. 'Zhangsan finished generating air.')

We summarized several characteristics of SVs that were mentioned frequently in the literature below (Chao, 1968; Li and Thompson, 1989; Her, 2010; Siewierska et al., 2010).

1. They involve at least one or more bound morphemes;
2. they may function as a word or as a phrase;
3. they can accept intervention patterns including aspect, modifiers, classifiers, quantifiers, additional objects, or resultative verbs, and some of them can undergo scrambling;
4. they have limited separability, and the syntactic separability of SVs differs;
5. they are disyllabic words with a verb-object (V-O) construction;
6. they are generally intransitive due to the internal V-O form;
7. they convey an idiomatic meaning as a whole;
8. not all the SVs can be split according to the same grammatical patterns. There does not appear to be a universal rule or pattern that applies to all SVs regarding separability; and
9. they may be ungrammatical or may not convey the same meaning when an SV_T is used independently without the co-occurrence of its SV_H.

The first two features are influenced by the wordhood status of SVs, together with individual examples of their features 3. A more significant characteristic of SVs emerges when the first three features are examined collectively. It appears that an obvious fact has been overlooked—the interruptions triggered by aspects and classifiers, particularly adjuncts and complements, are not optional, but are *mandatory*. This obligatoriness may shed light on the fundamental difference between SVs and V-O phrases. We will discuss these issues in more detail in Chapter 2.

Due to the obligatory separability and features 5 and 6, disyllabic inseparable verbs will fall outside the scope of our study. Furthermore, although disyllabic separable compounds that are constructed with a verb and a resultative verb, such as 看透 *kàntòu* 'see through' and 吃飽 *chībǎo* 'eat full', can be split by the negator 不 *bù*, the potential marker 得 *de*, or a combination of both, these resultative verb compounds will not be included in the definition of SVs.

The conundrum is that, if an SV were a standard combination of a verb and an object, as indicated in features 5 and 6, we would expect a synthetic semantic composition, which would contradict feature 7. The idiomaticity referred to in feature 7 does not necessarily involve figurative or metaphorical usage; instead, it points toward a non-composite meaning of an expression that cannot be deduced from its constituent parts. We will investigate some examples of this in Chapter 2, and will also discuss why some SVs that have two semantic variations can yield two possible readings.

Given that the heterogeneous syntactic behaviors of SVs observed in features 4 and 8, we can infer quite intuitively that there must be a reason or a motivation for native speakers to judge the grammaticality of an SV that is intervened by a language unit in this way as opposed to in another; for example, some SVs can undergo topicalization, while others cannot. Moreover, the idea of mandatory separability has not yet received full recognition, and related questions remain unanswered. The specific research questions that we aim to investigate in this research are the following:

1. How does the meaning of an SV, in comparison to that of a V-O phrase, remain unchanged by interventions, even with the addition of an argument?
2. What necessitates intervention in SVs but not in non-separable verbs, thereby distinguishing SVs from non-separable verbs?
3. In what ways do SVs differ from V-O phrases in terms of mandatory separability?
4. What factors contribute to the varying degrees of intervention tolerance in SVs?
5. How can these phenomena be systematically modeled in grammar?

Lastly, the idiomatic or specialized meaning of an SV tends to fall apart when its two constituents do not co-occur in the same sentence. For example, the compound 吃飯 *chīfàn* can denote *have a meal* as an SV or *eat rice* as a V-O phrase. However, only the V-O interpretation is possible when either the verb (3a) or the nominal part is used alone (3b). If the meaning can be influenced by the presence of an SV's components, the exploration of this co-determination of syntax and semantics becomes an intriguing question.

(2) 我 想 吃 飯
Wǒ xiǎng chī fàn
I want have/eat meal/rice
'I want to have meal.' or 'I want to eat rice'

(3) a. 你 想 吃 什麼？
Nǐ xiǎng chī shénme
You want eat what
'What would you like to have (specific food)?'

b. 飯
Fàn
Rice
'Rice.'

1.2 Organization of the Study

In Chapter 2, we will address the characteristics of the SVs that have been explored in the literature, as well as the challenges presented by different types of insertion patterns. We will also delve into the most difficult problem to overcome regarding SVs—wordhood, while simultaneously rejecting the possibility of SVs being considered to be noun incorporation (NI). Given that we intend to adopt the radically lexicalized grammar theory, Combinatory Categorical Grammar (CCG), we can free ourselves from previous constraints regarding whether SVs are words or phrases, thus revealing the real issues that linguists need to resolve regarding SVs.

In this study, we will treat SVs as a type of multiword expression (MWE) that is composed of two free forms. In Chapter 3, we will explain the reasons for adopting this analytical approach, supported by semantic and syntactic evidence.

In Chapter 4, we will briefly introduce CCG theory and its application to MWEs. We will apply CCG to the common types of splitting patterns mentioned in the literature, and will model the semantic and syntactic behaviors of SVs in these patterns. In this chapter, we will reveal how the syntax and semantics of SVs are processed in tandem through lexical grammar.

To investigate the heterogeneity of SVs, we will describe a small-scale, exploratory corpus-based study from the perspective of eventualities in Chapter 5. The purpose of this study was to identify the key factors that influenced the varying degrees of syntactic separation among SVs. Based on these factors, we will optimize the model proposed in Chapter 4.

In Chapter 6, we will summarize the entire study, including its limitations and the prospects for future research.

CHAPTER 2

DEBATES REGARDING SEPARABLE VERBS

In this chapter, we aim to explore the differences between SVs and V-O phrases via an analysis of common elements that interrupt SVs. We will examine the semantic characteristics of the components of SVs, and will attempt to reveal their true functions. It should be noted that each SV may exhibit different separation patterns. Lastly, we will discuss the issue of wordhood in Chinese, which has contributed to the unresolved problems concerning SVs.

2.1 Splitting Patterns in SVs

A number of studies have investigated the factors that contribute to the splitting of SVs, and many researchers have proposed close observations via qualitative studies. Chao (1968) pointed out that the most common factors leading to the separation of SVs included verbal suffixes and complements, modifiers of the SVT, SVH and SVT inversion, and question forms. Similar findings were reported by Li and Thompson (1989), who also mentioned aspect markers and inversion, as well as measure phrases and object constituents, as additional causes of SVs separation. In recent Chinese linguistics studies, discussions of the syntactic phenomena pertaining to SVs are continuing. Lin (2007) summarized the findings of four researchers over the last 30 years, and categorized these splitting patterns according to four main types.

1. **Aspect:** perfective 了 *le*, continuous 著 *zhe*, experiential 過 *guò*, inchoative 起 *qǐ*...來 *lái*, and 的 *de* in focus structures
2. **Additional clarification:** temporal measurement, occurrence of action, reduplication, and trivialness marker 個 *ge*
3. **Modification:** genitive, description, and refutation 什麼 *shénme*
4. **SVH and SVT inversion**

Conversely, the quantitative research conducted by Lin (2007) and Siewierska et al. (2010) provided descriptions of typical splitting patterns using the Academia Sinica balanced corpus of Modern Chinese (version 3) (Huang and Chen, 1998) and the Lancaster Los Angeles Corpus of Spoken Chinese (LLSCC) for spoken Chinese, as well

as the Lancaster Corpus of Mandarin Chinese (LCMC), respectively. These studies yielded conclusions that were consistent with qualitative observations, thus indicating similar splitting patterns and the statistical distributions thereof.

The two corpora that were studied by Siewierska et al. (2010), the LLSCC and the LCMC, contain a total of approximately two million tokens of spoken and written Chinese data. The authors found a total of 655 SV tokens, equivalent to 212 SV types. Over half (54%) of these SVs were accompanied by aspect markers 了 *le*, 著 *zhe*, 過 *guò*, or resultative verbs (RVs). With regard to the remaining SVs, the authors found that the most common elements that interrupted SVs were quantifiers, classifiers, modifiers, or combinations of these linguistic items. In Lin's study, which involved 1580 SV occurrences, 62% of them included aspect markers.[1][2] These included 了 *le*, 著 *zhe*, 過 *guò*, 起 *qǐ*... 來 *lái*. Classifiers accounted for the second-largest category (24%), followed by pronouns and question words (9%), DE including the adverbial marker 地 *de* and the complement marker 得 *de*, anaphoric determiners (2%), and time nouns (1%).[3]

Based on the analyses above, we adopted the terminology used by Siewierska et al. (2010), and divided the insertion structures into three major groups: verbal satellites, nominal satellites, and SVT fronting. In the data inf the two quantitative studies, aspects were found in over half of the total discontinuous uses of SVs, followed by nominal satellites. Only a few SVs can tolerate SVT's displacement. Approximately 19 different types of insertion patterns have been identified in the studies of SVs. Of these, we differentiated between two insertion patterns, question forms and temporal phrases, into two types based on the constituents they modified. We have renamed question forms as QW-adv and QW-attr, and temporal phrases as Time-adv and Time-attr. For a detailed discussion, please refer to §2.1.1. These 21 pattern structures were classified into the three groups proposed by Siewierska et al. according to their function of modifying the entire SV or part of the SVT, as shown in Table 2.1. We will present these results with more examples and will propose our observations based on the literature.

2.1.1 The Three Major Splitting Patterns

I. VERBAL SATELLITES

The grammatical units that are most commonly found between SVH and SVT include aspect markers such as perfective 了 *le*, continuous 著 *zhe*, experiential 過 *guò*, resultative verbs such as 完 *wán*, 好 *hǎo* and so forth, potential complements 不了 *bùliǎo* or 得了 *déliǎo*, and a morphological reduplication of SVH, which converts a disyllabic verb "AB" into a trisyllabic verb "AAB" as in 見面 *jiànmiàn* → 見見面 *jiàn**jiàn** miàn*. A feature of SVs is that the interrupting units, either verbal or nominal satellites, do not occur in a pre-verbal or a post-nominal position. Consider the SV 見面 *jiànmiàn* 'meet' as an example. The aspect can only interrupt it as in (4a), but cannot appear

[1] Lin did not specify whether the number was based on tokens or types.

[2] We converted all the data provided by Lin into percentages to facilitate a comparison with the data in the work of Siewierska et al.

[3] The term "DE" refers to the part-of-speech tag in the Sinica Corpus.

Table 2.1: Major insertion types in the literature

Function	Pattern	Instance
I. Verbal satellites	Aspect	了*le*, 著*zhe*, 過*guò*, 起*qǐ*... 來*lái*
	Reduplication	Verb-copying construction, AAB form
	Verbal complement	Resultative Verb, Verbal classifier Potential complement, Trivialness 個 *ge* QW-adv, Time-adv
	Object interference	Object
II. Nominal satellites	Quantification	Nominal classifier
	Modification	QW-attr, Time-attr, Adjective Genitive, Relative clause
III. SVT fronting	SVH and SVT inversion	Topicalization, 把 *bǎ* construction

after the entire word (4b).

(4) a. 我們 曾經 見 過 面
Wǒmen céngjīng jiàn guò miàn
we ever see ASP face
'We have met.'

b. * 我們 曾經 見 面 過
Wǒmen céngjīng jiàn miàn guò
we ever see face ASP
For 'we have ever met.'

The distributions of aspects in SVs are similar to those in V-O phrases. In a V-O phrase such as (5), aspects must immediately follow the verb, rather than being placed at the end of the entire phrase.

(5) a. 我們 曾經 見 過 這 位 老師
Wǒmen céngjīng jiàn guò zhè wèi lǎoshī
we ever see ASP this CL teacher
'We have ever met with this teacher.'

b. * 我們 曾經 見 這 位 老師 過
Wǒmen céngjīng jiàn zhè wèi lǎoshī guò
we ever see this CL teacher ASP
For 'we have ever met with this teacher.'

We can use the inseparable disyllabic verb 相見 *xiāngjiàn*, which has a similar meaning to 見面 *jiànmiàn*, as a comparison. The term "disyllabic separable verb" originates from the fact that an SV's meaning does not decompose through a syntactical

interruption, unlike a V-O phrase. Grammatically, an SV's surface syntactic sequence is comparable to that of a V-O phrase. Aspects cannot be added to the inseparable disyllabic verb (6). However, semantically, an SV is comparable to an inseparable disyllabic verb because the semantics remain indivisible even when they are interrupted.

(6) a. * 我們 曾經 相 過 見
Wǒmen céngjīng xiāng guò jiàn
we ever mutually ASP see
For 'we have ever met.'

b. 我們 曾經 相 見 過
Wǒmen céngjīng xiāng jiàn guò
we ever mutually see ASP
'We have ever met.'

The quantitative studies by Lin (2007) and Siewierska et al. (2010) showed that aspect was the main linguistic item that split SVs. Lin (2007) found that 62% of discontinuous SVs contained aspect, while Siewierska et al. (2010) discovered that 55% of discontinuous SVs did so. Of these, the perfective aspect 了 *le* accounted for the majority. Siewierska et al. (2010) further observed that, in their data, most of the elements that were inserted into SVs consisted of one to three morphemes, and many of them were verbal satellites. The authors explained that these verbal satellites closely followed the verbal head to modify telicity, progress, and so forth.

It can be seen that, compared to inseparable disyllabic verbs, the syntactic structure of disyllabic separable verbs is more similar to the V-O phrase. However, this tendency is not only applicable to aspects, but also to other inserted patterns, such as RVs and reduplication formations including the AAB reduplication at the morphological level and verb-copying constructions at the syntactic level. In the survey by Siewierska et al. (2010), RVs were the second most common linguistic form that interrupted SVs after aspects. Chinese has a wide variety of RVs, which are studied further in Chapter 5. RVs and aspects are distributed similarly in SVs and V-O phrases. RVs must immediately follow SVH, but not the entire SV. Accordingly, further extensive discussions of RVs will be omitted at this point. Below, we will use the reduplication AAB form as an example for purposes of illustration from the morphological perspective.

In Chinese, tentativeness of action verbs can be expressed through reduplication (Chao, 1968) or the delimitative aspect (Li and Thompson, 1989).[4] The reduplication of monosyllabic verbs takes the AA form; for example, 見 *jiàn* →見見 *jiàn**jiàn***, 看 *kàn* →看看 *kàn**kàn***, 唱 *chàng* →唱唱 *chàng**chàng***.

(7) a. 我們 去 見 老師
Wǒmen qù jiàn lǎoshī
we go see teacher
'We are going to see the teacher.'

[4] Chinese reduplication has various forms based on the parts of speech and functions. We will only discuss the formation related to SVs here.

b. 我們 去 見 見 老師
Wǒmen qù jiàn jiàn lǎoshī
we go see see teacher
'We are going to see the teacher.'

Inseparable disyllabic verbs are reduplicated in the ABAB form (8a). However, separable disyllabic verbs follow the same pattern as monosyllabic verb phrases (VPs), and are reduplicated in the AAB form (8b).

(8) a. 我們 去 相見 相見
Wǒmen qù xiāngjiàn xiāngjiàn
we go meet meet
'We are going to meet.'

b. 我們 去 見 見 面
Wǒmen qù jiàn jiàn miàn
we go see see face
'We are going to meet.'

From the perspectives of syntax and morphology, the behavior of SVs tends to lean toward phrases. If we place them in syntactic tree diagrams, the two morphemes in SVs need to appear separately in individual nodes. In this way, they can undergo syntactic operations. Therefore, the claims that aspects, RVs, and AAB formations *interpose* SVs are not valid because these modifying constituents that are related to verbs naturally appear in their appropriate post-verbal positions. Thus, is the *separation* simply a self-generated problem to comply with specific linguistic theories? It is well known that, in Chinese, apart from some prepositions marking instrument, genitive, dative, and locative cases, Chinese lacks a complete case system, which results in a restricted word order. Given that these verbal satellites can only legitimately appear between the two morphemes of the SV, and not at the end of the entire SV, this may indicate that there is no fundamental difference in the syntactic operations in SVs and V-O phrases from a grammatical perspective.

In the data in the work by Siewierska et al. (2010), around 20% of all the SVs were separated by the classifier. In Chinese, when expressing the quantity of a substance, a classifier must be used between the numeral and the noun when describing the quantity of a substance. However, quantifiers in Chinese should be examined based on their semantic usage because there are two types of quantifiers, and they do not differ in their syntactic positions. The nominal quantifiers specify the quantity of the substance denoted by SV$_T$ (9a), while the verbal quantifiers describe the frequency and number of times that an action denoted by the entire SV occurs (9b). Depending on the constituent being modified, we can analyze a nominal classifier as a nominal satellite and a verbal classifier as a verbal satellite.

(9) a. 我們 唱了 一 首 歌
Wǒmen chàngle yì shǒu gē
we sang one CL song
'We sang a song.'

b. 我們 唱了 一 次 歌
Wǒmen chàngle yì cì gē
we sang one CL song
'We sang once.'

It is not difficult to differentiate between nominal classifiers and verbal classifiers. However, ambiguity may arise in the following three situations: 個 *ge*, time-related constituents, and question forms. 個 *ge* is the most commonly used classifier; it can be generally understood as "piece" in English as a nominal classifier.

(10) 我們 有 五 個 杯子
Wǒmen yǒu wǔ ge bēizi
we have five CL cup
'We have five cups.'

However, 個 *ge* can modify the entire predicate as a pragmatic marker specifying the trivialness, casualness, or unremarkableness of an action (Biq, 2004). We will use two SVs 喝酒 *hējiǔ* and 跳舞 *tiàowǔ* to illustrate this. In example (11), both 個 *ge* and 小 *xiǎo* are utilized to soften the tone or to imply casualness when a person attempts to extend an invitation to someone. 小 *xiǎo* here does not refer to the size of the wine bottle or of the wine glass. In fact, it would be difficult to conceptualize the size of a dance if 小 *xiǎo* were to be used as an attribute with its literal meaning. Due to the primary function of trivalness 個 *ge* as modifying the entire verb, we can classify it as a verbal satellite. With regard to the common nominal classifier 個 *ge* in (10), we classified it as a nominal satellite.

(11) 我們 可以 喝 個 小 酒，跳 個 小 舞
Wǒmen kěyǐ hē ge xiǎo jiǔ tiào ge xiǎo wǔ
we can drink GE little wine dance GE little dance
'We can have a little wine, do a little dance.'

Apart from trivialness 個 *ge*, when interposed elements are related to time, they can also give rise to two interpretations, as in example (12). We designated the constituents that only modified SV$_T$ as Time-$_{attr}$, while we labeled the constituents that modified the entire SV Time-$_{adv}$.

(12) 我們 只 唱了 一 分鐘 的 歌
Wǒmen zhǐ chàngle yì fēnzhōng de gē
we only sang one minute ASSOC song
'We only sang for a minute.' or 'We only sang a one-minute song.'

The last splitting pattern that gives rise to ambiguity is question forms. For example, the question word in (13a) is a regular word that is used to request information about the type of wine or dance style. However, the pattern in (13b) is more similar to pragmatic usage. What the question word modifies is not the SV$_T$, but the entire SV

because the speaker was not asking about the style of the dance, but was expressing dissatisfaction with the people who were dancing at an improper time. Although the two sentences above superficially comprise identical SVs separated by precisely the same question word in the same order, they yield two different readings and analyses. While the question word in (13a) takes the nominal as its scope, the question word in (13b) takes scopes over the context, three o'clock in the morning, to reveal the speaker's intention, which is not expressed explicitly. That is to say, there are two types of question words here. Based on the elements that they modify and their semantic functions, we can refer to those that modify the entire predicate as Question-adv, abbreviated as QW-adv, and those that modify nominals as Question-attr, abbreviated to QW-attr.

(13) a. 你 想 喝 什麼 酒，跳 什麼 舞？
Nǐ xiǎng hē shéenme jiǔ tiào shénme wǔ
you want drink what wine dance what dance
'What wine do you want to drink? What dance do you want to do?'

b. 半夜 三點 了，你 跳 什麼 舞！
Bànyè sāndiǎn le nǐ tiào shéenme wǔ
midnight three o'clock ASP you dance what dance
'What the heck are you dancing at three o'clock midnight.'
(lit. 'what dance are you doing at midnight?')

After splitting question words into two types, it can be observed that not all of them can be inserted into SVs. Some question words can only appear in pre-verbal positions, such as 爲什麼 *wèishénme* 'why', 怎麼 *zěnme* 'how (come)', 如何 *rúhé* 'how', 何必 *hébì* 'why bother', and the like. These characteristics are part of the question word itself and are unrelated to whether the predicate is a single word (14b) or a phrase (14c).

(14) a. 你們 爲什麼 見面/ 買高麗菜？
Nǐmen wèishénme jiànmiàn/ mǎigāolìcài
you why meet/ buy cabbage
'Why do you meet/ buy cabbage?'

b. *你們 見 爲什麼 面？
Nǐmen jiàn wèishénme miàn
you see why face
For 'Why do you meet?'

c. *你們 買 爲什麼 高麗菜？
Nǐmen tiào wèishénme gāolìcài
you buy why cabbage
For 'Why do you buy cabbage?'

In addition to the question words, the two nominal components also seem to have a homographic relationship with each other. The SVT in (13a) can correspond to a specific style of dance, such as ballet, hip-hop, or jazz, whereas SVT is associated with

a generic and collective concept of dance, which is called a generic object, a dummy object, or a cognate object in some research (Cheng and Sybesma, 1998; Hong, 1999; Badan, 2015; Pan and Ye, 2015). In other words, there might actually be two types of 跳舞 *tiàowǔ*, a verb object (V-O) phrase (13a) and an SV (13b). This may explain why questioning the referential reading of the SVT of a true SV such as 見面 *jiànmiàn* in (15) is impossible.

(15) 沒事　見 什麼　面？
méishì jiàn shéenme miàn
nothing see what face
'There is no need to meet for anything' (lit. 'what face to see?')

II. NOMINAL SATELLITES

Nominal satellites have two functions, quantification and modification. The majority of their patterns, including nominal classifiers, QW-attr and Time-attr, mainly function as attributes modifying SVT. In this section, we will first discuss the remaining two types that cause discontinuity in SVs, namely adjective and relative clauses. With regard to the intervening elements that are introduced by the genitive 的 *de*, we will incorporate them in the explanation of these different structures.

In the field of Chinese linguistics, adjectives are commonly classified as a subset of verbs, namely stative or state verbs (Vs). Because Chinese adjectives can serve as predicates in a sentence without the need for a copula. When Vs are used to modify a noun, they sometimes can directly modify the noun; while in other cases, the addition of the nominal 的 *de* between them is necessary.

The pre-nominal attributes in Chinese are usually formed by noun/adjective + 的 *de*. However, 的 *de* is often omitted in spoken language. Due to the lack of inflection in Chinese, there arises confusion between the noun preceding SVT and the intervening object. Some studies therefore treat them as identical intervening constituents. The Chinese particle 的 *de* has many homographs. According to the classification by Li and Thompson (1989), 的 *de* can be divided into the three categories as shown in (17)-(19). Please note that the associative 的 *de* is used to associate two nouns together, while the nominal 的 *de* is used to modify a noun with an adjective followed by 的 *de*. The fourth type below was considered to be nominal 的 *de* by Li and Thompson. However, we treated it as a separate 的 *de* due to its more complex semantic properties and argument structure.[5]

[5] In a few studies, cleft sentences are considered as one of the structures that can decompose SVs However, the separation in this structure is optional. For example, the following two sentences do not have significant semantic differences. Therefore, our discussion does not include cleft sentences.

(16) a. 張三　是 昨天　買 的 衣服
Zhāngsān shì zuótiān mǎi de yīfú
Zhangsan COP yesterday buy FOC cloth
'It was yesterday that Zhangsan bought the cloth.'

b. 張三　是 昨天　買 衣服 的
Zhāngsān shì zuótiān mǎi yīfú de
Zhangsan COP yesterday buy cloth FOC
'It was yesterday that Zhangsan bought the cloth.'

1. **Genitive** 的 ***de***

   (17) 張三　　的　衣服
   Zhāngsān de　yīfú
   Zhangsan GEN cloth
   'Zhangsan's cloth.'

2. **Associative** 的 ***de***

   (18) 歐洲　　的　　衣服
   Ōuzhōu de　　yīfú
   Europe　ASSOC cloth
   'European cloth.'

3. **Nominal** 的 ***de***

   (19) 漂亮　　的　衣服
   piàoliàng de　yīfú
   beautiful　NOM cloth
   'beautiful cloth.'

4. **Relative** 的 ***de***

   (20) 張三　　買　的　衣服
   Zhāngsān mǎi de　yīfú
   Zhangsan buy　REL cloth
   'The cloth that Zhangsan bought.'

Being inspired by Li and Thompson (1989), we assume the presence of the nominal 的 *de* depends on whether the adjective phrase in question forms a collocation. Generally, collocations do not require the inclusion of the nominal 的 *de*.

(21) a. 高-人 gāo-rén: tall people → *master, expert*

b. 高-的-人 gāo-de-rén: tall NOM person → *a tall person*

c. 紫-菜 zǐ-cài: purple vegetable → *seaweed, laver*

d. 紫色-的-菜 zǐsè-de-cài: purple NOM vegetable → *purple vegetables*

Below, we examine two SVs (22a) and (22c) and their variations modified by adjectives. First, the nominal parts have distinct referents. (22a) and (22b) do not involve any arbitrary numbers, while (22a) refers to temperatures ranging from 38°C to 40°C, (22a) specifically denotes temperatures above 40°C. In English, when *to sing* is used to refer to a general action, the Chinese equivalent must add 歌 *gē* to the verb. However, this dummy object does not actually have a specific referent. However, the referents can be constructed when adjectives modify them; for example, (22b) and (22e). Furthermore, the presence of 的 *de* also affects the referent of the noun. This is similar to the observation made by Lehmann (1984); there is a greater likelihood for the

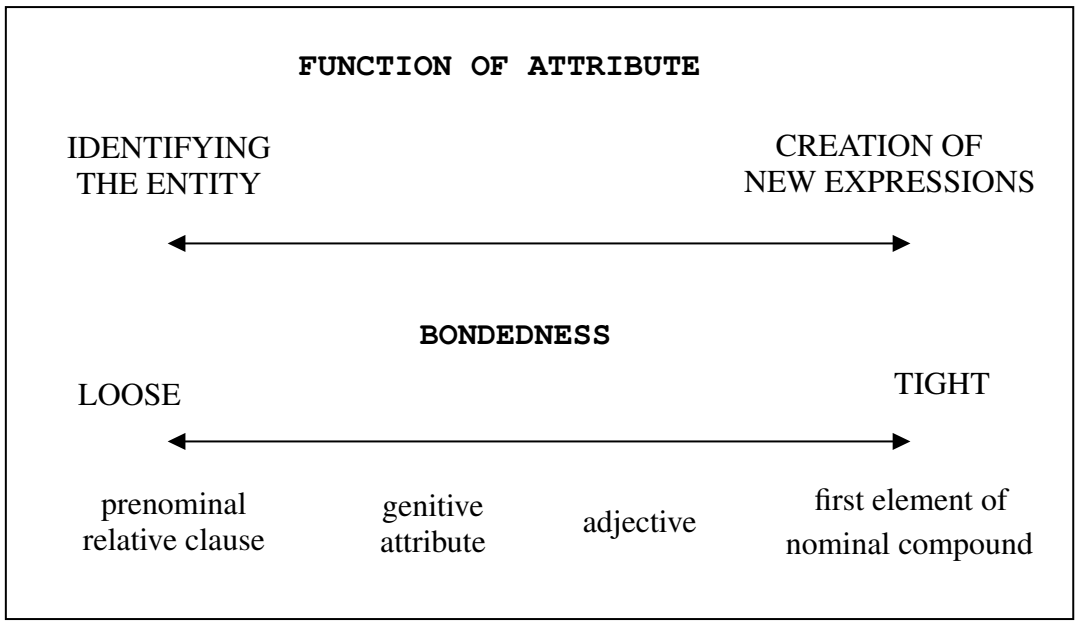


Figure 2.1: Lehmann's (1984:208) bondedness scale, adapted from Haig(1998:107)

modifier and nominal to jointly refer to new referents when the distance between the modifier and the nominal is shorter. Haig (1998) summarized the arguments proposed by Lehmann (1984), as presented in Figure 2.1.

(22) a. 發-燒 fā-shāo: *to fever*

b. 發-高燒 fā-gāoshāo: *to have a raging fever*

c. 發-高-(*的)-燒 fā-gāo-(*de)-shāo: *# to have a tall fever*

d. 唱-歌 chàng-gē: *to sing (songs)*

e. 唱-老歌 chàng-lǎogē: *to sing classic songs*

f. 唱-老-的-歌 chàng-lǎo-de-gē: *to sing **old** songs*

Therefore, apart from (22c), there are a total of 5 different lexical entries in (22). For the term 唱歌 *chànggē*, which functions as both an SV and a V-O phrase, it should have two distinct lexical entries. In this study, the linguistic structure of dividing SVs with adjectives is constrained to "Adj + nominal 的 *de*".

We now turn our attention to relative clauses in Chinese. In Chinese, relative clauses can be formed without relative pronouns. These clauses are constructed by placing the relative 的 *de* immediately before the nominal position, regardless of whether the head noun functions as the object (23a) or the subject (23b) of a transitive verb.

(23) a. 張三　　買 的 衣服。
Zhāngsān mǎi de yīfú
Zhangsan buy REL cloth
'The cloth that Zhangsan bought.'

b. 買 衣服 的 人
mǎi yīfú de rén
buy cloth REL person
'The person who bought the cloth.'

The two noun phrases above can be represented by the following logical forms. In the parentheses on the right, both *cloth′* and *person′* are not just any cloth or person, but depend on *x*, which establishes an intersection relationship through '∧'.

(24) a. : $\lambda x.(bought' xZh') \wedge (cloth' x)$ (23a)

b. : $\lambda x.(bought' cloth' x) \wedge (person' x)$ (23b)

According to Haig's (1998) explanation of the bondedness scale in Figure 2.1, the left-most relative clause transgresses the NP-internal syntax and establishes an anaphoric relation with the referent of the head noun. However, analyzing SVs in relative clauses poses numerous challenges due to SV's non-decomposable semantics. SVT is often considered as a bound morpheme without semantic contribution or substantial semantics, making it unable to function as a terminal. To comply with the Lexical Integrity Hypothesis (LIH), the relative clause analyses on SVT must involve copying, deleting, or moving. The assumptions of bound morpheme and the LIH have consistently failed to provide a satisfactory and convincing unified solution for the analysis of SVs that can be widely accepted by Chinese linguists. It raises doubts about the necessity and motivation behind these two assumptions. Since natural language phenomena cannot be explained by this theory, does it imply that these assumptions themselves are inadequate?

We have seen an example where an object interrupting SV with genitive 的 *de* previously. The following example involves similar phenomena with the verb SV 幫忙 *bāngmáng* 'help'. Pan and Ye (2015) argue that sentences of this kind (25a) are derived from (25b). It is claimed to be generated as shown in Figure 2.2.[6]

(25) a. 我 幫了 他的 忙
wǒ bāngle tā de máng
I helped he GEN busyness
'I helped him.' (lit. 'I helped his busyness.')

b. 我 幫忙了 他的 幫忙
wǒ bāngmángle tā de bāngmáng
I helped he GEN help
'I helped him.' (lit. 'I helped his help.')

In order to adhere to LIH, Pan and Ye (2015) propose that the word 忙*máng* in (25a) must enter the syntactic structure as an SV form. Then, it becomes an eventive noun through nominalization. Due to the complementarity between this eventive noun and

[6] We added the glosses and the translations.

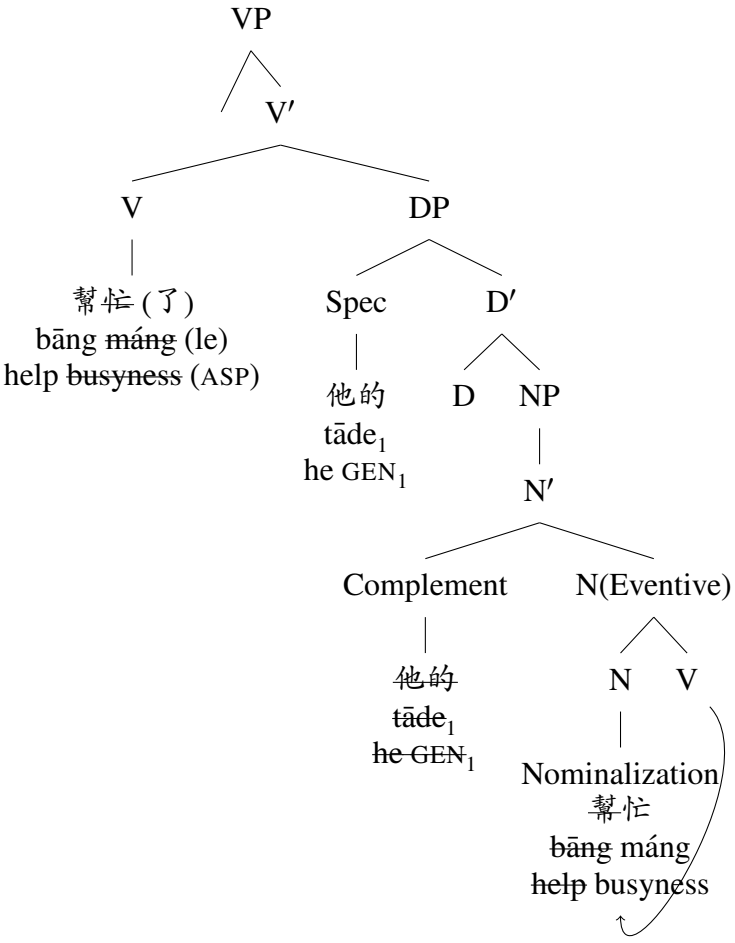


Figure 2.2: The tree diagram of SV 幫忙 *bāngmáng* 'help' inserted by an object, adapted from Pan and Ye (2015).

幫忙 *bāngmáng* in the V node at the higher level. The verbal part at lower level is elided, leaving only 忙 *máng*.

Regarding the analysis SVT, Pan and Ye (2015) claim it as an eventive or nominalized noun. Badan (2015), Cheng and Sybesma (1998), Hong (1999) define it as a cognate or prototypical object. From a semantic perspective, these SVT have distinct meanings and functions compared to the object in a V-O phrase. Hong (1999) points out that cognate objects have a delimitative function. They delimit the action of the main verb: SVH. Therefore, SVs and V-O phrases are not the same structures essentially. They have unique semantics and syntactically operate in similar but not entirely identical ways. For example, the two morphemes of SV must co-occur, which is not required for V-O phrase.

Therefore, the complementary distribution between SVT and other objects can be attributed to their shared syntactic position as arguments of predicates. However, the semantic arguments of these two predicates are different. Cheng and Sybesma (1998) argue that their complementary distribution is due their position at the same slot. We think it is only partially correct, as evidenced by the counterexamples from the coordination structure below. In the V-O phrase of 丟 *diū* 'lose' with 金錢 *jīnqián* 'money' and 汽車 *qìchē* 'car' in (26), the complementary distribution of the two nouns is expected (26a). The English word *and* corresponds to two Chinese words: 和 *hé* connecting two nouns and 也 *yě* connecting two clauses. Both of these nouns are ordinary nouns, allowing for two valid coordination sentences.

(26) a. * 他們 丟了 金錢 汽車
tāmen diūle jīnqián qìchē
they lost money car
For 'They lost money, cars.'

b. 他們 丟了 金錢 和 汽車
tāmen diūle jīnqián hé qìchē
they lost money and car
'They lost money and cars.'

c. 他們 丟了 金錢，也 丟了 汽車
tāmen diūle jīnqián yě diūle qìchē
they lost money and lost car
'They lost money and cars.'

However, SV 丟命 *diūmìng* 'lose life' and SV 丟財 *diūcái* 'lose fortune' not only exhibit complementary distribution with ordinary nouns (27a), but they also show complementary distribution between each other (27b). Although they can both enter clausal coordination structures. Unlike V-O phrases, the two SVs cannot enter nominal coordination structures (27d) highlighting the difference between SVs and V-O phrases. This suggests that there must be other factors contributing to the different surface syntax observed in (26b) and (27d).

Drawing on the knowledge derived from previous studies Pan and Ye (2015); Badan (2015); Hong (1999), it can be observed that each SVT possesses distinct semantic

characteristics in relation to its corresponding SVH, each SVT has its own unique semantics in relation to its SVH. According to the analysis of Hong (1999), SVT delimits its verbal head SVH. This also explains the ungrammaticality of (27e), which stems from the fact that the semantics of predicates in SV 丟命 *diūmìng* and the V-O phrase 丟汽車 *diūqìchē* are not the same.

(27) a. * 他們 丟了 命 汽車
tāmen diūle mìng qìchē
they lost life car
For 'They lost life, cars.'

b. * 他們 丟了 命 財
tāmen diūle mìng cái
they lost life fortune
For 'They lost life, fortune.'

c. 他們 丟了 命，也 丟了 財
tāmen diūle mìng yě diūle cái
they lost life and lost fortune
'They lost life and lost money.'

d. * 他們 丟了 命 和 財
tāmen diūle mìng hé cái
they lost life and fortune
For 'They lost life and fortune.'

e. * 他們 丟了 命 和 汽車
tāmen diūle mìng hé qìchē
they lost life and car
For 'They lost life and cars.'

The inspiration from Pan and Ye (2015) lies in their attempt to explain the semantic binding relationship between SVH and SVT at the syntactic level, as discussed in (27). The authors proposed a one-to-one relationship between SVH and SVT, while a V-O phrase exhibited a one-to-many relationship. Furthermore, as they pointed out, nominalization accounted for the acceptability of modifiers such as adjectives or relative clauses with SVT. Therefore, they argued that the correct constituent structure was (28a) rather than (28b).[7] when the modifier is complex. Although we may employ different grammatical theories, this aligns with our proposed perspective. SVT needs to be at a separate terminal, or else it would result in an incorrect constituent structure (28b). As the verbal classifier 一次 *yícì* cannot modify the verbal head SVH there.

(28) a. 我 幫了 他 一次 [[很大的] [别人怎麼也想不到的]] 忙
wǒ bāngle tā yícì hěndà-de biérén-zěnme-yě-xiǎngbúdào-de máng
I helped he once huge-NOM beyond anyone's expectations-REL busyness
'I gave him a favor which was huge and beyond anyone's expectations.'

[7] This sentence is adapted from Pan and Ye (2015) We have added the pinyin, glosses, and translations.

b. 我 幫了 他 *[一次 很大的 别人怎麼也想不到的 忙]
wǒ bāngle tā yícì hěndà-de biérén-zěnme-yě-xiǎngbúdào-de máng
I helped he once huge-NOM beyond anyone's expectations-REL busyness
'I gave him a favor which was huge and beyond anyone's expectations.'

From the comparison of these examples, we can see that although SVT may not have a concrete referent or transparent semantics, it does possess its own unique semantics that is closely tied to its dedicated verbal head SVH. It explains why SVT needs to co-occur with SVH in the same sentence. Our focus should be on modeling the one-to-one semantic relationship between SVH and SVT, as well as the similar grammatical operations of these two morphemes and V-O phrases. Regardless of whether we refer to SVT as a nominalized object, a prototypical object, or a cognate object, what is important is to understand how these elements are interconnected. So, when considering the logical form of a relative clause (24) within the context of SVs, one of our task is to substitute *cloth′* and *person′* with variables that can capture the semantics of SVT, rather than making arbitrary modifications to the dependency structure of these two logical forms specifically for SVs.

In summary, SVT functions as a terminal in syntax, allowing for syntactic operations. Its semantics are closely tied to its corresponding SVH, and its role is to delimit or specify the meaning of SVH.

III. SVH and SVT inversion

Many SVs may undergo SVT's transposition along with a classifier or determiner to the left of SVH and form a topic structure. Li and Thompson (1989) observe that topicalized phrases can be referential, as in (29b), or non-referential (generic), as in (29a). Of the referential constituents, they are always definite. A speaker's unknown indefinite nominal will be illegitimate to be fronted.

(29) a. 舞， 我 不 跳
wǔ wǒ bú tiào
dance I NEG dance
'I don't dance. (lit. 'dance, I don't do.')

b. 這 種 舞， 我 不 跳
zhè zhǒng wǔ wǒ bú tiào
this CL dance I NEG dance
'I don't do this type of dance.'

According to Li and Thompson (1989), the ungrammaticality of (30a) can ascribe to that the SVT of 見面*jiànmiàn* is a referential, indefinite nominal. Thus, it becomes a legitimate candidate to be inverted by shifting to a definite phrase (30b).

(30) a. * 面， 我 不 見
mià wǒ bú jiàn
face I NEG see
'For 'I don't do meeting.' (lit. 'face, I don't see.')

b. 這 個 面，我 不 見
zhè ge miàn wǒ bú jiàn
this CL face I NEG see
'I don't do this meeting.' (lit. 'this face, I don't see.)

However, adding referential units sometimes fails to make certain SVs a topical sentence; for example, (31). Therefore, even though the majority of topicalized noun phrase are referential, definite, or generic (Tsao, 1987b; Li and Thompson, 1989), referentiality cannot explain the ungrammaticality of (31b). According to Chao (1968), it is found that transposition is less likely to occur with a bound morpheme, such as SV_T, compared to a free one. If this is true, it becomes difficult to explain why a determiner can license the bound morpheme in (30b) to enter the topic construction. We propose that the difference between (30) and (31) may arise from the distinct semantic structures of the verbs themselves, specifically the differences between idiomatic combining expressions and idiom phrases (see §3.2).

(31) a. * 業， 我 沒 畢
yè wǒ méi bì
school studies I NEG finish
'For 'I didn't graduate.'

b. * 這 個 業， 我 沒 畢
zhè ge yè wǒ méi bì
this CL school studies I NEG finish
'For 'I didn't graduate.'

We come to examine the last construction that intervene SVs in Chinese, 把 *bǎ* construction. Its base structure and an example sentence is provided in (32).

(32) a. NP_1 + 把 *bǎ* + NP_2 + VP

b. 我們 把 汽車 賣了
wǒmen bǎ qìchē màile
we BA car sold
'We sold the car.'

The SVT of most ICs can be effortlessly incorporated into the base structure of the 把 *bǎ* construction, becoming an argument of 把 *bǎ* (33a, b). Conversely, the SVT of IPs is unable to achieve this (33c).

(33) a. 他們 把 臉 丟-光 了
tāmen bǎ liǎn diū-guāng le
they BA face lose-RV ASP
'They are utterly embarrassed.'

b. 他們 把 狀 告-上 了
tāmen bǎ zhuàng gào-shàng le
they BA complaint tell-RV ASP
'They have reported us to a higher authority.'

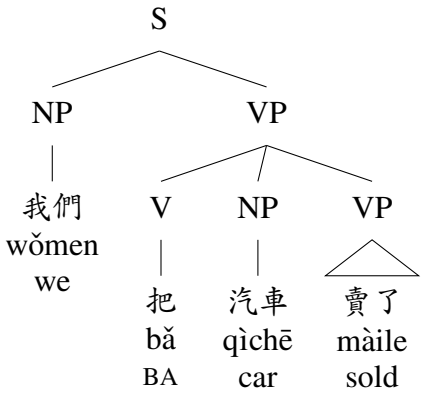


Figure 2.3: BA as a verb

c. * 他們 把 默 幽-到 了
tāmen bǎ mò yōu-dào le
they BA silence serene-RV ASP
For 'They have successfully teased (someone).'

Since Wang (1947), the 把 *bǎ* construction is most commonly referred to as the disposal construction. This construction depicts NP_1 performing a dispositional action towards NP_2, which is specified by the VP. For a valid 把 *bǎ* construction, we can pose the following questions: what has happened to NP_2, and what did NP_1 do to NP_2 (Liu, 1997). In addition to the disposal construction, some scholars have also analyzed it as a causative construction (Sybesma, 1992; Zou, 1993; Li, 1995). We will follow these scholars, regarding the 把 *bǎ* as a causative construction, and considering the post-把 *bǎ* argument to have an object-control relationship with the object in the main VP. See discussion in Chapter 4.

The 把 *bǎ* construction has been widely discussed, mainly because NP_2 is actually the semantic argument of the subsequent VP. In other words, the patient/recipient of the VP is headed by 把 *bǎ*. Under the framework of standard theory, there has been ongoing debate in the field of Chinese linguistics regarding whether 把 *bǎ* is a preposition or a verb. According to the analysis of Bender (2000), (32) can be analyzed in two tree diagrams. When 把 *bǎ* functions as a verb, it can form a structure similar to the serial verb construction as shown in Figure 2.3. When 把 *bǎ* is a preposition, a structure can be derived from Figure 2.4.

However, since the VP cannot become the head of NP_2 in these two tree diagrams, they fail to express the meaning of the VP disposing of NP_2.

Moreover, Lü (1955) observed that the VP in the 把 *bǎ* construction can sometimes be paired with an argument. This phenomenon is commonly referred to as a "retained object", as highlighted in (34). In this extended structure, Huang (1992) posited that the VP and NP_3 together formed a predicate, which assigns the thematic role to NP_2. NP_2 serves as the "logical object" of this predicate. Consequently, the 把 *bǎ* does not directly assign the thematic role to NP_2. The advantage of this analysis is that the entire causation argument structure does not augment from a three-place base structure to a four-place one, which might otherwise lead to cognitive processing burdens.

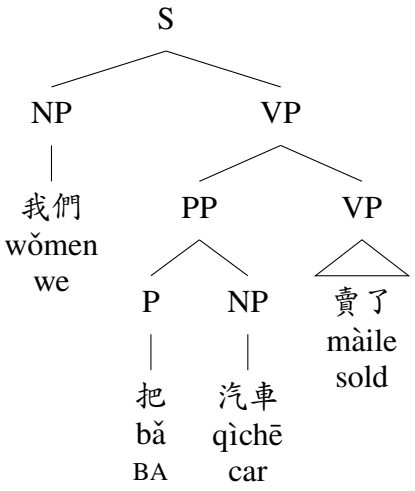


Figure 2.4: BA as a preposition

(34) a. NP_1 + 把 *bǎ* + NP_2 + VP + **NP_3**

b. V-O phrase as the VP: 請 把 這裡 當做 自己家
qǐ bǎ zhèlǐ dāngzuò zìjǐjiā
please BA here treat as one's own home
'Please treat this place as your own home.'

c. SV as the VP: 我們 [[把 汽車] [上了 鎖]]
wǒmen bǎ qìchē shàngle suǒ
we BA car put on lock
'We locked the car.'

However, if we follow the LIH and view SVs as operations before the syntactic process, then [把 *bǎ* + NP_2]needs to wait until the posterior [SV_H + SV_T]is fully processed. This seems to force all posterior 把 *bǎ* components to form a single constituent, like [把 *bǎ* + NP_2 + SV]. In fact, apart from the SV_T of IP not being able to become an argument of 把 *bǎ*, 把 *bǎ* and its argument can form a constituent independently. In a discontinued context, we can still handle these incomplete sentences without waiting for the complete posterior SV_H to appear.

(35) 我好丟臉， 我 把 鎖... 嗯... 你猜怎麼了？
wǒmhǎo diūliǎn wǒ bǎ suǒ ēn nǐcāi zěnme le
I am so embarrassed I BA lock mmm you guess what happened
'I am so embarrassed. I caused the lock... Mmm... you guess what happened?'

2.1.2 Heterogeneity in Insertion Patterns of SVs

While a variety of elements can interrupt SVs, as demonstrated, no general principle that can predict the specific splitting patterns that these SVs may undergo currently exists, according to Li and Thompson (1989).

- Splitting patterns of SVs by Siewierska et al. (2010):
  SV_H + NEG + ASP/RV + MC[8] + CL + Modifier + SV_T

Heterogeneity is a prominent trait of SVs, as they can undergo distinct separation processes. For example, juxtaposition is only tolerated by a few SVs. This heterogeneity is further observed based on the varying placements of additional participants. Some SVs require insertion (36), while others require these participants to appear after the entire SV (37), and others necessitate the pairing with another preposition (38).

(36) a. 他 很 生 弟弟 的 氣
Tā hěn shēng dìdi de qì
He very generate young brother ASSOC anger
'He is very mad at the young brother.'

b. * 他 很 生氣 弟弟
Tā hěn shēngqì dìdi
He very mad young brother
For 'he is very mad at the young brother.'

(37) a. 他 很 擔心 弟弟
Tā hěn dānxī dìdi
He very worry young brother
'He is very worried about the young brother.'

b. * 他 很 擔 弟弟 的 心
Tā hěn dān dìdi de xī
He very generate young brother ASSOC anger
For 'he is very worried about the young brother.'

(38) a. 他 會 回電 給 張三
Tā huì huídiàn gěi Zhāngsān
He will call back to Zhangsan
'He will call back Zhangsan.'

b. * 他 會 回 張三 電
Tā huì huí Zhāngsān diàn
He will call back Zhangsan phone
For 'He will call back Zhangsan.'

c. * 他 會 回電 張三
Tā huì huídiàn Zhāngsān
He will call back Zhangsan
For 'he will call back Zhangsan.'

[8] a quantificational phrase

Chinese linguists have used various features to address the heterogeneity observed in SVs. Recently, more attention has been paid to the semantic characteristics of SVs. In this vein, Teng (1972) categorized Chinese verbs according to three classes: action verbs, state verbs (Vs), and process verbs (Vp). Action verbs are time-sensitive, involve intentional control, and include *eat, run and dance*. By contrast, Vs are not time-sensitive, and are typically associated with mental states, such as *love, think and plan*. Given their similar syntactic behavior to Vs, it has been proposed that adjectives in Chinese are considered to be Vs. Lastly, Vps denote an instantaneous change from one state to another, with examples such as *die, break and drop*.

Building upon Teng's (1972) three-fold verb classification, Lin (2007) applied this system to categorize SVs in the Sinica Corpus. According to her analysis, the distribution of these types were as follows: Around 65% of the SVs were action verbs, 26% were Vps, and a mere 9% were Vs. These findings hint at a potential correlation between a verb's separability and its time sensitivity within the semantic context. However, using the three-fold verb classification to interpret and draw conclusions about the heterogeneous insertion patterns has certain limitations. For example, even though both 生氣 *shēngqì* 'get angry' and 擔心 *dānxīn* 'worry' are classified as state SVs, as shown in examples (36) and (37) respectively, they require different positioning regarding the person who provokes the state.

Drawing on the analysis by Nunberg et al. (1994), Wang and Müller (2013) proposed an important account of SVs as multiple word expressions (MWEs) within the framework of Head-Driven Phrase Structure Grammar (HPSG). Some scholars have also observed similarities between SVs and MWEs, which we will discuss in the next chapter. One of the central research questions regarding SVs is what distinguishes them from regular V-O phrases. If we agree that SVs are also MWEs, we may claim that the idiomatic relationship between SVH and SVT causes SVH to select a fixed SVT. This selection is specified in the lexical entry of SVH, ensuring that it consistently seeks its predetermined SVT during derivations.

We can further classify SVs according to the two main groups of decomposable SVs and non-decomposable SVs based on the semantic contribution of the two morphemes to the overall meaning of an SV. The semantic decomposability of an SV may determine its degree of syntactic flexibility. If the individual morphemes contribute more meaning to the entire SV, the SV is considered to be more syntactically flexible.

In the decomposable group, a free morpheme SVH pairs with a fixed SVT to assign an idiomatic meaning, similar to the idiomatic combination presented by Nunberg et al. (1994). Examples include 生氣 *shēngqì* and 洗澡 *xīzǎo*. Taking 生氣 *shēngqì* as an example, the term 生 *shēng* with literal meanings such as 'grow, give birth, be born', only translates to 'generate anger, be mad' when paired with 氣 *qì* as its nominal part. Unlike decomposable SVs, non-decomposable verbs, as argued, cannot have their meanings analytically interpreted from their constituent parts. Therefore, decomposable SVs permit a more radical displacement of their parts, such as topicalization, resulting in greater syntactic flexibility compared to non-decomposable SVs. A frequently cited example is 幽默 *yōumò*; its meaning of 'tease' or 'make a joke' cannot be analytically derived from SVH and SVT, both of which are generally considered to be meaningless on their own. The meaning of 'tease' only emerges when the two morphemes co-occur within a sentence.

We believe that the study by Wang and Müller (2013) is a significant attempt to capture the syntactic distinctions among SVs in relation to their semantic contributions. However, this model seems to have difficulty in addressing the nuanced syntactic behaviors of SVs, as will be discussed below. Although each SV in examples (36-38) could be classified as a decomposable SV, how to apply this dual classification to capture the distinct requirements of an additional object in individual SVs remains unclear. We observed a similar limitation when addressing instances of non-decomposable SVs based on the classification by Wang and Müller (2013).

(39) a. 老師 幽 了 學生 一 默
Lǎoshī yōu le xuéshē yí mò
Teacher ? ASP student one ?
'The teacher teased the student.'

b. * 老師 幽默 了 學生
Lǎoshī yōumò le xuéshēng
Teacher tease ASP student
For 'the teacher teased the student.'

c. * 老師 幽 了 一 默 學生
Lǎoshī yōu le yí mò xuéshēng
Teacher ? ASP one ? student
For 'the teacher teased the student.'

As a language that is rich in aspects, Chinese employs a variety of aspect markers to communicate event structures and time frames. In the examples below, two homographic aspects, 了 *le*, impart different semantics to the sentences. The sentential 了 *le* in (40a) signals a new situation, denoting a change from the state of *the child had not talked* to *he just recently spoke.* This sentence serves as an apt response to a question such as *what happened?* Conversely, (40b) does not. As 了 *le* precedes a bare nominal SVT, the communication is incomplete. As a result, a follow-up sentence such as *I am very relieved* is expected to complete the discourse in (40b). These examples suggest that separations at the surface structure can faithfully reflect semantic nuances. Siewierska et al. (2010) posited a similar viewpoint: Elements inserted around SVH modify the telicity or progress of the predicate. In other words, SVs do not split solely to fulfill the syntactic requirements imposed by the intervening unit. More importantly, the surface structure probably represents the end product of semantics, revealing the fine-grained meaning.

(40) a. 孩子 終於 開 口 了
Házi zhōngyú kāi kǒu le
Child finally open mouth ASP
'The child finally talked.'

b. ? 孩子 終於 開 了 口
Házi zhōngyú kāi le kǒu
Child finally open ASP mouth
'The child finally talked.'

A related question that arises is, if an SV is considered to be a word according to the consensus among the majority of Chinese linguists, why is the insertion of objects in examples (36-39) obligatory? We believe that the answer lies in the distinctive nature of SVs compared to ordinary verbs. Unlike SVs, regular disyllabic verbs do not split when an adjunct or complement is introduced. It seems that non-splitting verbs form a syntactic and semantic "closed island" that is inaccessible to an aspect, an adjunct or a complement. As discussed previously, the interplay between syntax and semantics may provide a critical foundation for our investigation of this question.

2.2 Wordhood of SVs

Chinese linguists have debated the "wordhood" of SVs for decades due to the ability of an SV to operate syntactically in a sentence as an integrated unit (in which the two morphemes appear sequentially) or as two separate units (in which the morphemes are interspersed with other post-verbal or pre-nominal modifiers). The distinction between words and phrases is crucial for our research, particularly in terms of their CCG category representations. In this section, we will present some observations based on the LIH, which is widely accepted as an important and universal test to examine wordhood (Dai, 1992; Huang, 1984).

2.2.1 The Phrase Claim

In accordance with some of the earliest versions of the LIH (Jackendoff, 1972; Selkirk, 1984), Huang (1984) defined the LIH as follows: "No phrase-rule may affect a proper subpart of a word." This suggests that a word, as the smallest syntactic item, obstructs the accessibility of its internal constituents. Therefore, sublexeme extraction, syntactic modification, coordination, and ellipsis in coordination structures are prohibited (Felíu-Arquiola, 2014). We will present some counterarguments based on these four LIH tests below.

According to Huang's definitions, the subparts of a word are invisible to syntactic operations, which suggests that neither SV$_H$ nor SV$_T$ can be manipulated independently in syntax. However, we have already seen some counterexamples of topicalized SV$_T$ in section 2.1.1. Here, we apply the yes-no question form *A-NOT-A* to demonstrate 1) the plausibility of extracting and topicalizing SV$_T$ (41a-c); 2) the potential for SV$_H$ to undergo more complex syntactic manipulations (41a-c); and 3) the ability of a topicalized SV$_T$ to extend its scope to a subsequent sentence (41c). These examples suggest that SVs violate LIH extraction and syntactic modification tests, which seems to imply that a phrase is a closer match.

(41) a. 舞，你跳不跳?
wǔ nǐ tiào bu tiào
dance you dance NEG dance
'Do you dance? (lit. 'dance, do you do or not?')

b. 這 個 面，我 見 還是 不 見?
zhè ge miàn wǒ jiàn háishì bú jiàn
this CL face I see or NEG see
'Should I do this meeting or not?' (lit. 'this face, should I see or not see?')

c. 這 個 面，我 見 不是; 不 見 也 不是
zhè ge miàn wǒ jiàn búshì bú jiàn yě búshì
this CL face I see wrong NEG see either wrong
'This meeting, either I do or not do is wrong.'
(lit. 'this face, I see is wrong; I don't see is wrong either.')

However, when applying coordination and ellipsis tests, SVs demonstrate word-like tendencies. If an SV's subcomponents were syntactically accessible, as the examples above suggest, we would expect the coordination of two SVTs, similar to the coordination of two objects. However, when comparing the phrase examples in (a) to their SV counterparts in (b) below, we observed different patterns.

(42) a. 他 在 美國 上 了 小學 和 中學
tā zài Měiguó shàng le xiǎoxué hé zhōngxué
he in America go ASP elementary school and middle school
'He went to elementary school and middle school in America.'

b. *他 在 美國 上 了 學 和 班
tā zài Měiguó shàng le xué hé bān
he in America go ASP school and work
For 'he went to school and work in America.'

(43) a. 他 向 老師 道 了 早安 和 午安
tā xiàng lǎoshī dào le zǎo'ān hé wǔ'ān
he to teacher express ASP good morning and good afternoon
'He said good morning and good afternoon to the teacher.'

b. *他 向 老師 道 了 歉 和 謝
tā xiàng lǎoshī dào le qiàn hé xiè
he to teacher express ASP apology and appreciation
For 'he express apology sorry and appreciation to the teacher.'

Similar contrasts can be found in the case of verb ellipsis. SVH's cannot share one SVT, as verbs in phrases do.

(44) a. 你 先 上 樓梯，再 下 (樓梯)
nǐ xiān shàng lóutī zài xià (lóutī)
you first up stair then down (stair)
'You go up stair first, and then go down (stair).'

b. 你 先 上 班，再 下 *(班)
nǐ xiān shàng bān zài xià *(bān)
you first up work then down *(work)
'You go to work first, and then get off *(work).'

(45) a. 我 昨天 買 了 Google 股票，今天 就 賣 了 (Google 股票)
wǒ zuótiān mǎi le Google gǔpiào jīntiān jiù mài le (Google gǔpiào)
I yesterday buy ASP Google stock today then sell ASP (Google stock)
'I bought Google stock yesterday, and then I sold (Google stock) today.'

b. 我 昨天 買 空， 今天 賣 *(空)
wǒ zuótiān mǎi kōng jīntiān mài *(kōng)
I yesterday buy empty today sell *(empty)
'I bought short yesterday and sold *(short) today.'

At first glance, the phrasal behaviors of SVs may appear to be superficial when compared to nominal coordination and verb ellipsis constructions. These contrasts reveal syntactic observations at the surface level, such as verbs and objects. The concepts of verb and object may not be sufficient to explain how an SVT differs from the object of a phrase, since both are defined as objects in the examples in this section based on the current theory. Case theory does not seem to provide much insight either. In examples (42) and (45), the SVT would receive the same case as the object of the phrase in each example.

2.2.2 The Word Claim

The argument for SVs being words has had a significant influence on the study of SVs. Chao (1968) posited that, if an expression contained a bound morpheme, this expression was a word. A bound morpheme, such as an affix, cannot stand alone as the smallest grammatical unit. The problems in this approach have been discussed extensively in the literature on Chinese linguistics (Lu, 1964; Lü, 1979). In essence, the definition of what is bound is largely reliant on intuition. Moreover, Chinese has numerous grammatical words, such as aspect markers, question markers, and so forth. There are indeed bound morphemes, which weakens the claim that bound morphemes cannot undergo syntactic operations.

Conversely, the nature of SVs as words presents a "chicken or egg" dilemma because the subparts of SVs exhibit syntactic behavior that is similar to the components of phrases, thus challenging the current theory. This can be exemplified by two famous SVs, 幽默 *yōumuò*, translated as 'tease, make fun', or 'humorous' when used as an adjective, and 將軍 *jiāngjūn*, which means to 'put somebody on the spot' or 'general' when used as a noun. These SVs are only considered to be SVs when they are interspersed with other linguistic units. By contrast, when combined, they consistently act as nouns, and have completely different semantics. Therefore, the principle of morphemic freedom may not be a sufficient criterion for discerning the wordhood of SVs.

The question that remains is whether morphology can provide insights into determining the wordhood of SVs, given their unique internal morphological structures and semantic compositions. In fact, SVs occupy a nebulous position among single words, compound words, complex words, and phrases. For example, while the bisyllabic SV 幽默 *yōumuò* 'tease' is considered to be a simple word, 游泳 *yóuyǒng*, 'swim' is considered to be a complex word due to the bound morpheme 泳 *yǒng* 'swim'. Based on

the assumption that complex words must contain at least one bound morpheme, categorizing 吃苦 *chīkǔ* 'suffer' or 'eat hardship' (lit.), becomes challenging. This determination hinges on whether the literal or the metaphorical meaning is considered. This conundrum mirrors the challenges posed by 幽默 *yōumò* and 將軍 *jiāngjūn*, as SV 吃苦 *chīkǔ* is predominantly used metaphorically, and its individual morphemes show less flexibility than do those with literal meanings.

This debate is likely to emerge when native speakers attempt to classify a morpheme as either bound or free. Overall, it is virtually impossible to categorize all the separable verbs as a single type of word or to use a consistent criterion to model SVs' behaviors based on the opposition of bound versus free morphemes. Such an opposition has minimal explanatory power in the study of SVs.

2.2.3 Noun Incorporation and SVs

A less frequently discussed yet worthwhile topic in the discussion of SVs' wordhood pertains to NI. One might question whether an SV is an instance of NI. Typically, an NI is established by linking two or more morphemes, although the resulting meaning is not a compositional sum of their individual parts. Instead, this union of partial meanings often undergoes semantic changes to generate a specialized and generic meaning for the entire word.

The widely recognized compound word *blackboard* is an example of this. A new lexeme with a specific stress pattern is created by combining two lexemes. This forms a new conceptual unit denoting an object (regardless of its color) that can be written on with chalk. Defining such a conceptual unit is not a straightforward task.

However, if an SV is said to convey the same conceptual unit or semantics, despite having two alternative syntactic forms - one as a word and the other as a phrase - this raises questions about the relationship between these two syntactically distinct yet semantically identical forms of SVs, and the subtleties that set SVs apart from regular phrases. If we choose to investigate this syntactic-semantic mismatch, we will find that, while SVs are not unique to Chinese, the typological diversity and the writing system might contribute to their distinctiveness in this language. This can be elucidated by comparing a well-known example of compounding, namely NI.

NI is a highly productive phenomenon in several morphologically rich languages, such as West Greenlandic, Mohawk, and Inuit, in which a new compound is created by incorporating a noun stem and a verb. One of the key characteristics of an NI is that the independent forms of its two components can always be found in normal syntactic phrases. This is exemplified by the following examples in Onondaga.

(46) a. Pet wa?-ha-hwist-ahtu-?t-a?
Pat PAST-3MS-money-lost-CAUS-ASP
'Pat lost money.'

b. Pet wa?-ha-htu-?t-a? ne? o-hwist-a?
Pat PAST-3MS/3N-lost-CAUS-ASP the PRE-money-SUF
'Pat lost the money.'

The characteristics of syntax and semantics have often been discussed in the existing literature, such as in the works by Massam (2009) and Gerdts (2017), and include the following. Syntactically, the noun "money" in the NI form (46a), when combined with its verb component, forms a syntactic island in which no other nominal modifiers may intervene. However, in a regular phrase (46b), "money" can be modified by a determiner and separated from the verb. The incorporated noun stem (usually the object, cf. agent incorporation in Turkish (Öztürk, 2009)) serves as the argument of the NI verb. Consequently, detransitivization in object incorporation is often observed in NI across various languages. SVs exhibit similarities to NI, leading researchers such as (Tang, 1991) to consider SVs to be a type of NI. Specifically, the nominal SV$_T$ acting as an object of the verbal SV$_H$ forms a new compound through NI.

Semantically, Sadock (1980), Mithun (1984), Gerdts (2017) noted that noun stems in NI were subject to specific restrictions. These are non-referential generics, and cannot be individually inflected. Consequently, proper nouns that have specific real-world references are cannot be incorporated with verbs. As the incorporated noun stems serve as notional objects in NI verbs, the overall meaning of an NI is idiomatic and conveys a general, institutionalized (in Mithun's (1984) terms), or habitual activity. By observing the question from two perspectives, syntax and semantics, as outlined here, we can obtain a more comprehensive understanding of the interface between these two levels in the example of Onondaga (46).

The meanings of the NI compound and the VP are fundamentally distinct. We expect (46b) as a response to the question *What did Pat do with the money?*, but (46a) as a response to *What happened to Pat?*. When the nominal stem is separated from the verb stem (46b), the idiomaticity of its counterpart NI verb is not maintained. In other words, the syntactic differences we observed between an NI and its VP counterpart reflected their semantic differences. The distinct semantics encoded in individual categories consistently project onto the syntactic level in different ways.

Therefore, an NI and its VP counterpart reasonably merit two separate entries, each specifying the correspondence between syntax and semantics. The interaction of these two levels should be given more serious consideration in modern linguistic theories. Otherwise, the NI debate in morphologically rich languages is simply another version of the SV debate in Chinese. We will now proceed to discuss the differences between these two types of phenomena.

The role of semantics has long been recognized as an autonomous section, and as a post-processing of syntactic derivations in generative and binding theory. We propose that neglecting the correspondence between semantics and syntax has led to the debates surrounding SVs, NI, and a related phenomenon, pseudo-NI (PNI) in Hindi (Dayal, 2015). According to Dayal (2015), the main feature that differentiates PNI from NI is that, even when the institutionalized, generic activity associated with NI is preserved, PNI does not necessitate syntactic fusion. The unitary concept originating from NI is not disrupted by flexible syntactic manipulations in PNI. This flexibility is evident in the examples provided by Dayal (2015) below, in which the incorporated object in PNI can inflect for numbers (47a), agree in gender with the verb (47b), be modified under certain restrictions (47b), or be scrambled (47c). Apart from the lack of agreement in Chinese, these flexible syntactic operations closely resemble the separated form of SVs that was discussed in the previous section.

(47) a. anu bacce sambhaaltii hai
Anu children manages
'Anu looks after children.'

b. anu-ne bahut sundar laRkii cunii
anu very pretty girl chose-FEM
'Anu chose a very pretty girl.'

c. baccaa anu bhii sambhaaltii hai
child Anu also manages
'Anu also looks after children.'

The intriguing and significant challenge that PNI poses for traditional grammars is that an institutionalized interpretation remains intact despite apparent syntactic manipulations, and does not necessitate the endorsement of word boundaries. Hence, comparing PNI to NI provides further evidence contradicting the LIH. Instead of focusing on the issue of wordhood, the phenomenon of PNI encourages us to pay closer attention to the logical forms of language expressions, which we can identify by observing their syntactic behaviors. This underscores the correspondence between semantics and syntax, which we highlighted previously for NI and now for PNI, and which Dayal (2015) also implied, as she distinguished among phrases, NI, and PNI with regard to their variations in semantics and syntax.

From the perspective of institutionalized semantics, PNI is clearly not equivalent to an ordinary phrase that conveys synthetic and compositional meanings. According to the observations made by Dayal (2015), the syntactic behavior of a PNI is not as flexible as is that of regular phrases. One example of this is the restricted modification of the incorporated noun; another is the accusative case marking in animate object incorporation. According to Dayal (2003), the obligation of accusative case-marking on an animate object with determiners, in contrast to the absence of an accusative case for animates without determiners, the latter is an instance of PNI.[9]

The discussion of PNI and NI has revealed several similarities to SVs. First, none of their semantics are compositional based on their constituent parts; the noun-verb combinations give rise to an institutionalized, generic meaning. Second, syntactic fusion is not a prerequisite for any of them. It is the institutionalized semantics that link PNI and NI. While PNI demonstrates syntactic restrictions and non-morphological amalgamation, NI is governed by more stringent morphological rules. If the institutionalized semantics of the integrated form of an SV can be preserved in its separate form, then the separate and integrated forms of SVs could share many commonalities with PNI and NI.

Nevertheless, we do not aim to provide a complete answer regarding whether SV is analogous to (P)NI. Instead, the focus will be on how to represent the semantic-syntactic correspondences that recursively occur in SVs, (P)NIs, and MWEs, which will be discussed in Chapter 3. These expressions intersect in that the idiomatic or

[9] Although the accusative case in inanimates may appear to be apparent in PNI, since it is optional for inanimates to mark accusative case in Hindi VPs, Dayal (2003) did not consider the situation of the accusative case for inanimates to be clear evidence of its incorporationality.

institutionalized semantics can be preserved, despite the restricted or somewhat flexible syntactic operations. The extent to which we can depict the correspondence in our grammar model is the primary issue that we would like to solve.

2.3 Conclusion

In summary, in this study, we will explore the nature of separable verbs and investigate their behavior using the established theoretical framework. We will examine the semantic characteristics of the separated elements, and will attempt to reveal their true functions. It is important to note that each separable verb may exhibit a different pattern of separation.

The inherent non-decomposable semantic characteristics of SVs have posed numerous challenges for Chinese linguists over the years. This has led to a dilemma in analysis. On one hand, the phrase claim does not align with our intuitions about their semantics. On the other hand, the word claim contradicts standard phrase structures. We believe that these problems arise from the traditional linguistic theories that treat semantics and grammar as separate entities, conducting syntax analyses first and followed by semantic analyses, or sometimes even disregarding semantics. However, in the case of SVs, the most valuable aspect to observe appears to be the interconnected relationship between semantics and grammar that they exhibit.

CHAPTER 3

THE DISCONNECT BETWEEN SYNTAX AND SEMANTICS

Numerous studies in the literature have examined the attributes of Chinese SVs. While these observations are valuable and relevant resources that reflect the inherent characteristics of SVs, we believe that they reveal a notable mismatch between syntax and semantics in SVs, which is an aspect that has not been examined previously. This discrepancy prompted an in-depth exploration of the objecthood of the SVT. We will present evidence to suggest that an SVT is neither a genuine semantic object that is capable of delivering composite meaning via its verbal head, nor an ordinary syntactic object that can be freely replaced by any nominal. In this regard, SVs have significant similarities to MWEs due to their fixed combination and semantics. The analogy of SVs and MWEs has been recognized in the literature, but we contend that the interaction and relationship between the syntax and the semantics of SVs have not been adequately modeled in previous works.

3.1 The Role of Idiomaticity in Language

In the framework of generative grammar, idiomaticity presents a significant challenge to the understanding of not only SVs, but also of various other language expressions. Their meanings, when considered holistically, are not entirely compositionally derived, yet they exhibit differing degrees of syntactic flexibility. If syntax and semantics are processed in sequence, then linguists are left with two conflicting perspectives. First, SVs are base-generated in the lexicon, and undergo transformations such as movement and copying to attain their surface syntax form. Second, SVs are simply phrases, since there is nothing that is notably distinct about them compared to regular phrases. In this section, we will argue that the idiomaticity of SVs should receive more attention to account for their flexible syntactic behaviors, rather than favoring one side in the debate about wordhood.

As Mel'čuk (1995) observed, many language expressions are presented in fixed and frozen forms rather than as freely combinable units, which he referred to as *phrasemes*; for example, *strong tea*, *throw a party*, and so forth. We argue that SVs are types of such expressions; that is, an SV's indivisible meaning is preserved, regardless of its syntactic presentation. In other words, the two components of Chinese SVs do not revert to their literal meanings when one part is modified. This differentiates SVs from regular phrases in two ways. First, the argumenthood of SVT, which has a predetermined meaning, cannot be identical to the typical arguments in V-O phrases. Second,

unlike a V-O phrase in which a verb is free to choose a plausible object and vice versa, an SV is only recognized as such when the combination of a verb and an object conveys a meaning that is conventionally accepted by the language community, similarly to collocations and idioms.

3.1.1 Idiomaticity and MWEs

Nicolas (1995) categorized word combinations, particularly V-NP ones, according to three semantic groups: free combinations, collocations, and idioms. His definitions are briefly outlined here. The meanings of free combinations are compositional, and are derived from usual meanings of their independent parts. Collocations differ from free combinations in that one of the two items in a collocation has the same sense that it would in a free combination, but the other does not. The former is termed the *base*, and the latter the *collocate*. For example, in *take decision*, *take* is a collocate because its meaning has deviated from that of *carry*, whereas the meaning of the base *decision* retains its core meaning, such as *choice*. Finally, idioms are defined as having meanings that are not derived from the usual independent meanings of their components, with *kick the bucket* serving as a prototypical example.

These concise descriptions outline an increasing degree of conventionality and idiomaticity among these three types of word combinations, which also implies a decreasing order of semantic contributions from the components' literal meanings. At one extreme are free combinations, in which meanings can be evenly decomposed into their parts; at the other extreme, idioms or phrasal idioms, in Nunberg et al.'s (1994) terms, have figurative meanings that bear no relation to the semantics generated by the component words.

However, his definition of collocations may be too restrictive and may struggle to cover all the word combinations within a three-fold typology. For example, in the expression *spill the beans*, neither the verb nor the noun have the usual meanings of their independent forms. However, even without the ability to predict the combined phrase's conventional meaning based on its individual components, one can successfully establish correspondences between the literal and conventional meanings given an informative context, as pointed out by Nunberg et al. (1994). This type of expression, in which "speakers can wholly recover the rationale for the figuration it involves" (Nunberg et al., 1994), was referred to as an "idiomatically combining expression" (ICP) or an "idiomatic combination" (IC) by the same authors. Based on this definition, the necessity for the presence of a base in a collocation diminishes, as long as a correspondence between the figurative interpretation and the denotation generated by the constituents can be established. We will adopt the concept of an IC(P) and its definition in Nunberg et al. (1994), instead of Nicolas's collocation, to provide a more comprehensive V-NP word combination typology.

(48)

Degree of idiomaticity:
free combinations < ICPs < idiomatic phrases (IPs)

The typology of word combinations, which we have adapted from and revised based on Nicolas (1995) and Nunberg et al. (1994), can be organized according to increasing order of idiomaticity. As the degree of conventionality and idiomaticity increases from left to right, the semantic contribution of each constituent to the meaning of the entire phrase decreases. Since idiomatic meanings are conventionally associated with specific expressions, this sequence also suggests a decreasing level of combinational freedom between the constituent words in each type. Consequently, for a specific verb that can be used in all three types of expressions, the range of its potential arguments in each type decreases as the degree of its idiomaticity increases.

To illustrate this, consider the verb *kick*. When it conveys the meaning of *striking with the foot* in free combinations, it can be paired with any object that can be physically touched with one's foot. No constraints such as conventionality, metaphor, or figurativeness are imposed by the language community, and only the semantic plausibility and reasonableness may justify the resulting composition of two base words.

For the ICPs, such as *kick the tires*, similar idiomatic usage cannot be established with any other part of a car, such as *tailpipe* or *engine*. It can only be combined with certain objects, such as *wheels*, which map the literal and conventional meanings in the same way as *tires* does in this ICP.

Finally, in the case of idioms such as *kick the bucket* in which to *die* is the intended meaning, the semantics do not decompose into their constituent parts. The fixed and intact sequence of constituents does not lend itself to semantic interpretation, which results in an extremely rigid combination. This rigidity is why the argument set of *kick* in *kick the bucket* consists of only one member, which Bozşahin and Güven (2018) aptly termed a "singleton".

3.1.2 Idiomaticity and SVs

In §2.2, we observed that a phrasal boundary did not limit the unitary concept contributed by a nominal and verb combination in PNI. With regard to this point, the separate forms of SVs may be regarded as being on par with PNI. In addition, the idiomatic nature of SVs is also manifested in a lesser degree of compatibility between a verb and its argument. Taken together, the inseparable idiomatic semantics and limited freedom to combine verbs and nouns essentially distinguishes SVs from normal VPs, regardless of whether an SV is represented in an integral or separate form in the syntax. In this section, we will demonstrate how the idiomatic semantics of SVs restrict the syntactic combinations of SV$_{\text{H}}$ with SV$_{\text{T}}$ by drawing on observations of idioms and collocations in Nunberg et al. (1994) and Nicolas (1995).

The overwhelming intact concept of SVs has caused the enduring debate regarding SVs' word versus phrase status. If we reconsider this the other way around, the meanings of an SV and PNI do not collapse when the constituents split in the syntax, which means that an SV's constituents do not semantically compose with the interrupting items as freely as in the case of a free combination of verb and noun. We illustrated this via the example of (49), as repeated below. 吃飯*chīfàn* is an ambiguous term referring to the ICP reading of *have a meal* or the free combination reading of *eat rice* when a nominal classifier such as 碗 *w ǎn* 'bowl' interrupts, as in (49c), in which the

sole reading is *rice* By contrast, it can simply denote a *meal* when the interrupting classifier is not a noun but a verb, known as verbal classifier counting the number of times an action occurs, as in (49b).

(49) a. 我 吃 了 三個小時 的 飯
Wǒ chī le sān ge xiǎoshí de fàn
I eat ASP three hour ASSOC meal/?rice
'I had a meal/?ate rice for three hours'
(lit. I had/?ate a three-hours meal/?rice)

b. 我 吃 了 三次 飯
Wǒ chī le sāncì fàn
I eat ASP three times meal/#rice
'I had a meal three times'

c. 我 吃 了 三碗 飯
Wǒ chī le sānwǎn fàn
I eat ASP three bowl #meal/rice
'I had three bowls of rice'

The examples in (49b and c) form an interesting minimal pair with regard to constituent constructions. The *rice* reading in (49c) can be replaced by any type of food as long as it is compatible with the nominal classifier *bowl*; for example, noodles, fruits, water, soup, and the like. This demonstrates that the nominal classifier *bowl* and the noun *rice* form a minimal semantic combination unit. This also indicates that the 飯 *fàn* of *rice* reading does not immediately interact with 吃 *chī*. It is only when we move to the next constituent, alternative foods like water and soup, that they can be eliminated due to their incompatibility with the verb *eat* in Chinese. Hence, it is evident that the 飯 *fàn* of *rice* reading is an object in a free combination, as we have seen that a plausible object can be selected by its adjacent item, the nominal classifier, in the immediate constituent but cannot be directly semantically constrained by 吃*chī*. By contrast, the unlikelihood of the *rice* reading when associated with a verbal classifier shows that no immediate constituent is established between the verbal classifier and 飯 *fàn* in the *meal* reading; otherwise, we could expect 飯 *fàn* to deliver the *rice* meaning if there were one. In addition, as the *meal* reading only emerges when 飯 *fàn* occurs with 吃 *chī*, this reveals that SV_H 吃 *chī* and SV_T 飯 *fàn* idiomatically combine as an ICP from the semantic perspective. This can be confirmed by the fact that, although another independent word, 餐 *cān* in Chinese means *meal*, it is illegitimate for 吃 *chī* and 餐 *cān* to be used together to produce the meaning *have a meal*, as 吃飯 *chīfàn* does. Overall, we can infer that 吃飯 *chīfàn have a meal* is an ICP, and that its constituent structure should be (50a), not (50b).

(50) a. 我 [[吃 了 三次] 飯]
Wǒ [[chī le sāncì] fàn]
I eat ASP three times meal/#rice
'I had a meal three times'

b. * 我 [吃 了 [三次 飯]]
Wǒ [chī le [sāncì fàn]]
I eat ASP three times meal/#rice
'I had a meal three times'

c. 我 [吃 了 [三碗 飯]]
Wǒ [chī le [sānwǎn fàn]]
I eat ASP three bowl rice
'I had a three bowls of rice'

Although time frequency can disambiguate two readings of 飯 *fàn*, *time duration* does not segregate them absolutely. In normal circumstances, without stressing and emphasizing the tone of 飯 *fàn*, it does not refer to *rice* in (49a). If this is the case, then the interpretations of both readings should not be *have/eat three-hour meals/rice*, but rather *have/eat three-hour-long meals/rice*. The greater likelihood of the *meal* reading instead of the *rice* reading provides one more important piece of information. The higher likelihood of the occurrence of the *meal* reading may be correlated with the fact that there is greater compatibility between *meal* reading and time duration. It can be assumed that the greater compatibility is due to the *meal* reading of 飯 *fàn* being an inherent and embedded component in the event of *have a meal*, but the *rice* reading is not. In fact, it is impossible for any type of food to have attributes related to time; the most accessible type refers to a tangible object conflicting with a time duration phrase, which causes it to fail to become the default reading of (49a). Hence, the dominant reading of the nominal here refers to an inbuilt part of an event, *have a meal*, that can extend over time and can be modified by the time duration. This can be further supported by the fact that, even in the very rare *rice* reading, the sentence should be interpreted as *eating three-hour-**long** rice*, but not *eating three-hours rice*.

The claims above support our previous argument that *have a meal* is an ICP, whereas *eat rice* is a free combination. With regard to the *rice* reading of 吃飯 *chīfàn* as a free combination, its most accessible type indicates a tangible object conflicting with a time duration phrase, which causes it to fail to become the default reading for (49a); thus, we need additional phonological stress to enable it to be a grammatical item for the time duration phrase. This suggests that the *meal* and the *rice* readings of 飯 *fàn* would be fundamentally distinct in semantics, which needs to be reflected in types.

3.1.2.1 The Impact of Idiosyncrasies on Semantic Compositionality

We want to reemphasize that the idiomaticity of an SV is independent of whether it is in integrated or split form.[1] This explains why ambiguity arises when the integrated form of 吃飯 *chīfàn* is used in (2), and why the idiomatic usage can be maintained when it is split in (49). We also argue that most SVs do not belong to the category of free combinations, but rather to ICPs. Hence, if two SV pairs have the same syntactic structure, this does not necessarily mean that they will have the same meaning when

[1] It is important to note that SVs that have different meanings in two different forms, as discussed in §3.1.2.2, should not be treated as counterexamples of this argument because they would be treated as two lexical items, one with only a fused form and the other with only a split form.

combined with other verbs, as shown in example (51). The same observation can be found in the case of SVH (52).

(51) a. 吃 紅 ; 分 紅
chī hóng ; fēn hóng
eat red ; divide red
'share profit'

b. * 喝 紅 ; *散 紅
hē hóng ; sàn hóng
drink red ; distribute red
For 'share profit'

(52) a. 黑 吃 黑
hēi chī hēi
black eat black
'double-cross'

b. * 黑 吞 黑
hēi tūn hēi
black SVallow black
For 'double-cross'

Red is considered to be a symbol of good fortune in the Chinese culture. This is unlike the Western culture, in which the increase in a stock price is indicated in green, and a decrease is indicated in red. Thus, an extra profit or benefit is called 紅利 *hónglì* 'red profit' in Chinese, with which 紅 *hóng* 'red' in example (51) is associated. With regard to the example of double-cross, two illegal organizations are metaphorically described by 黑 *hēi* 'black,' stemming from 黑道 *hēidào* 'mafia, underworld' (literally black-road). These examples demonstrate that the SVH in these combinations is not interchangeable with the synonyms. The same observations can be made in the case of SVT in the examples below.

(53) a. 上 樓 ; 下 樓
shàng lóu ; xià lòu
up/on floor ; down/below floor
'go upstairs; go downstairs'

b. * 上 層 ; *下 層
shàng céng ; xià céng
up/on floor ; down/below floor
For 'go upstairs; go downstairs'

(54) a. 上 船 ; 下 船
shàng chuán ; xià chuán
up/on boat ; down/off boat
'get on a boat; get off a boat'

b. * 上　　舶　; *下　　舶
shàng bó　; xià　　bó
up/on boat ; down/off boat
For ‘get on a boat; get off a boat’

Although 上 *shàng* ‘up, on’ and 下 *xià* ‘down, below’ above do not manifest observable metaphorical meanings, compared to those in 吃-紅 *chī-hóng* and 黑-吃-黑 *hēi-chī-hēi*, they all exhibit restricted freedom when two units combine. They appear in superficial free verb-noun combinations, yet their dependency on each other for a specific reading decreases the possibility of composing with a noun or verb other than the given SVH or SVT. The examples of 上 *shàng* ‘up, on’, 下 *xià*, and 吃 *chī* above can be seen as ICPs because their predicate-argument structures can easily be recovered according, to Nunberg et al. 1994.

3.1.2.2 Navigating Non-fixed Semantics in SVs

Note that, since the meanings of the two elements of an SV can only result in an idiosyncratic analysis, an SVH or an SVT may denote various meaning in separate SVs. Therefore, SVH and SVT do not have a prefix-root or root-suffix relationship with each other. The examples below are SVs that begin with the same SVH. While the verbs in (55a) involve physical displacement, those in (55b) may not necessarily do so.

(55) a. 上　　樓　; 上　　船
shàng lóu　; shàng chuán
up/on floor ; up/on boat
‘go upstairs; get on the boat’

b. 上　　課　; 上　　市
shàng kè　; shàng shì
up/on class ; up/on market
‘attend class/to teach a class; (stock) be listed’

There are a few dramatic cases in which the semantics of SVs are not the sum of their parts. These are 幽默 *yōumò* and 將軍 *jiāngjūn*, referring to *tease somebody* and *put somebody on the spot*, respectively, in their *separate* forms. Their meanings and the parts of speech in the split forms differ from those in their integral forms: adjective *humorous* in the former case and noun *general* in the latter. These aspects can be observed in the following examples.

(56) a. 老師　很　幽默
Lǎoshī　hěn　yōumò
Teacher very humorous
‘The teacher is very humorous.’

b. 老師 幽 了 學生 一 默
Lǎoshī yōu le xuéshēng yí mò
Teacher serene ASP student one silent
'The teacher teased the student.'

(57) a. 張三 是 一位 將軍
Zhāngsān shì yíwèi jiāngjūn
Zhangsan is a general
'Zhangsan is a general.'

b. 張三 將 了 李四 一 軍
Zhāngsān jiāng le Lǐsì yì jūn
Zhangsan shall ASP Lisi one army
'Zhangsan put Lisi on the spot.'

3.2 ICPs and IPs in SVs

In §3.1.1, we saw that free combinations and two types of MWEs could be scaled based on their degree of idiomaticity.

- Degree of idiomaticity:
  free combinations < ICPs < IPs

The scale can be reversed if we approach it from the opposite perspective: semantic syntheticity.

- Degree of semantic syntheticity:
  free combinations > ICPs > IPs

§3.1.2 explains why we classify SVs as MWEs instead of as free combinations. Based on the discussions in the literature, we demonstrated how we divided SVs into the two types of MWEs in this section. The reason that this classification is important is not due to a typological requirement, but because it reveals the extent of flexibility in syntactic structures, which reflects how we encode and process language.

3.2.1 ICPs in SVs

Nunberg et al. (1994) classified phrasal idioms according to two categories, namely an IC(P) and an IP. Let us first consider their definitions of ICPs.

> We will use the term 'idiomatically combining expression' (...) to refer to idioms whose parts carry identifiable parts of their idiomatic meanings. ..... On the other hand, saying an expression idiomatic combination

> doesn't require us to explain why each of its parts has the figural interpretation it does, so long as we can establish a correspondence between it and the relevant element of the idiomatic denotation. Nunberg et al. 1994:496-497

Take *spill the beans* as an example of an ICP. *Spill* and *the beans* refer to their idiomatic meanings *divulge* and *the information* separately. The main characteristic that distinguishes ICP from IPs is whether the idiomatic meaning can be decomposed into SVHand SV_T, in our case, in such a way that we can recover the rationale for the idiomatic reading based on what SVH does to SV_T. We argue that most of the Chinese SVs belong to the ICP category because, in the majority of the SVs, the meanings of SV_H and SV_T can be identified. The semantics of an SV could be a combination that truly reflects the sum of the literal meanings of the two morphemes, but they are mainly the result of metaphoric use that comprises a literal SV_T and a sense extension in SV_H.

For example, the literal meanings of 上 *shàng* and 下 *xià* that we have seen in previous examples actually refer to *up, on* and *down, below*, respectively. However, they can indicate actions of moving upward or downward to a higher or lower level of a place, as in (53a) and (54a). These vertical movements can be further connected to the activity of *entering* and *leaving* a physical space, as in (58a, b) below, or of *initiating* and *terminating* a virtual place, as in *class* in (58c) and *work* in (58d). In either case, there is always a connection between the extended usage and literal sense of SV_H or SV_Tthat speakers must establish.

(58) a. 上 樓 ; 下 樓
shàng lóu ; xià lóu
up floor ; down floor
'go upstairs; go downstairs'

b. 上 船 ; 下 船
shàng chuán ; xià chuán
up boat ; down boat
'get on a boat; get off a boat'

c. 上 課 ; 下 課
shàng kè ; xià kè
on class ; off class
'attend class/teach a class; finish class/get out of class'

d. 上 班 ; 下 班
shàng bān ; xià bān
on duty ; off duty
'be on duty; be off duty'

The semantic decomposability observed in these SVs appears to be compatible with the work of Nunberg et al. regarding their stretchable syntactic behaviors. The SVs above can tolerate most of the types of the insertion patterns summarized in §2.1.

Taking 上課 *shàngkè* 'attend class' as an example, we demonstrate one example of each insertion pattern with its shortest linguistic unit.

Verbal satellites

(59) a. 我 今天 上 過 課 了
wǒ jīntiān shàng guò kè le
I today on ASP class ASP
'I have attended the class today.'

b. 我 今天 上 不了 課
wǒ jīntiān shàng bùliǎo kè
I today on impossible class
'I cannot attend the class today.'

Nominal satellites

(60) a. 我 今天 上 兩門 課
wǒ jīntiān shàng liǎngmén kè
I today on two class
'I attend two classes today.'

b. 我 今天 上 王老師 的 課
wǒ jīntiān shàng Wánglǎoshī de kè
I today on teacher Wang POSS class
'I attend teacher Wang's class today.'

SVT fronting

(61) 你 今天 課 上 了 嗎?
yǒu jīntiān kè shàng le ma
you today class on ASP Q
'Did you attend the class today?'

Of course, the phrase that is inserted can be a lengthy combination of these patterns.

(62) 我 今天 上 不了 王老師 的 兩門 課
wǒ jīntiān shàng bùliǎo Wánglǎoshīde liǎngmén kè
I today on impossible teacher Wang's two class
'I cannot attend teacher Wang's two classes today.'

3.2.2 IPs in SVs

As the least free semantic combination type, IPs refer to phrases "whose idiomatic interpretations cannot be distributed over parts and which must therefore be entered

in the lexicon as complete phrases" (Nunberg et al., 1994). For IP instances such as *saw logs, kick the bucket, shoot the breeze*, there is no decomposition of *sleeping, death*, or *conducting a casual talk* into elements that can correspond to the verb or to the argument. Connections between *shoot* and *conducting*, as well as those between *the breeze* and *the talk*, appear to be inaccessible for speakers.

Similar to English, only a fwe SVs meet the criteria for IPs. They are 幽默 *yōumò* 'tease somebody, make fun of someone' and 將軍 *jiāngjūn* 'challenge, put somebody on the spot'. We argue that these two SVs are IPs because the literal meanings of the parts are not identifiable and recoverable in order for one to establish relationships with the activities that their idiomatic meanings denote. Note the highlighted literal meanings of these two SVs below. It seems implausible for the literal senses of each part to correspondingly denote the decompositions of these two actions; therefore, IP would be a reasonable option for them.

(63) 老師 幽 了 學生 一 默
Lǎoshī yōu le xuéshēng yí mò
Teacher **serene** ASP student one **silent**
'The teacher teased the student.'

(64) 張三 將 了 李四 一 軍
Zhāngsān jiāng le Lǐsì yì jūn
Zhangsan **shall** ASP Lisi one **army**
'Zhangsan put Lisi on the spot.'

More importantly, the idiomatic meanings of *tease somebody* and *challenge, put somebody on the spot* have always been manifested in a split way (65a), (66a). That is to say, these SVs are transitive verbs that are always interposed by an object, which differs semantically and syntactically from their intransitive integrated forms (65b), (66b).

(65) a. * 老師 幽默 了 學生
Lǎoshī yōumò le xuéshēng
Teacher humor/*tease ASP student
For 'the teacher teased the student.'

b. 老師 很 幽默
Lǎoshī hěn yōumò
Teacher very humorous/*tease
'The teacher is very humorous.'

(66) a. * 張三 將軍 了 李四
Zhāngsān jiāngjūn le Lǐsì
Zhangsan put someone on the spot/*general ASP Lisi
For 'Zhangsan put Lisi on the spot.'

b. 張三　　是 一位 將軍
Zhāngsān shì yíwèi jiāngjūn
Zhangsan is a general/*put someone on the spot
'Zhangsan is a general.'

In accordance with the observation by Nunberg et al. (1994), 幽默 *yōumò* and 將軍 *jiāngjūn* have more restricted syntactic manifestations. Only one variation (67a) other than the two grammatical sentences (63) and (64) could be found. In addition to the nonacceptance of the variant adjective modification (67b), 個 *ge* in (67a, b) can neither accept any numerals without restrictions (67b) nor classify SV_T like a normal nominal classifier encompassing classification and quantification functions. It appears to be a discourse participant that signals the salience of SV_T (Hopper and Thompson, 1984; Li, 2000; Biq, 2004).

(67) a. 老師　幽　了 學生　一 個 小 默
Lǎoshī yōu le xuéshēng yí ge xiǎo mò
Teacher serene ASP student one GE little silent
The teacher played a small joke on the student.'

b. * 老師　幽　了 學生　兩 個 大 默 [2]
Lǎoshī yōu le xuéshēng liǎng ge dà mò
Teacher serene ASP student two GE big silent
For 'the teacher played two big jokes on student.'

Finally, if an SV only has a separate form, this essentially contradicts the fundamental assumptions of SVs' having separate and integral status but identical semantics. This causes us to rethink whether there really is *a word that separates*, since split and integrated forms of an SV encode different readings and behave completely differently in terms of syntax. However, such SVs are also inconsistent with LIH-like analyses, since neither a phrase nor a word is an appropriate label for them because the meaning does not derive from the sum of the components, and the idiomatic sense only emerges if SVW and SVT are split.

This conundrum does not appear to be adequately resolved via top-down grammar, which simply notes a set of syntactical alignments of language strings, and treats semantics as an autonomous section of which the processing is delayed. The solution that we propose in this study is a single-layer grammar to which the syntax and semantics of an expression are assigned *at the same time* by examining the semantic correspondence of SVH and SVT to the predicate-argument structure. By observing the simultaneous interaction of semantics and syntax, the major difference between ICPs and IPs lies in whether language users can recover the semantic rationale encoded in the phrases Nunberg et al. 1994. In other words, they are expected to have slightly different syntactic behaviors to which their semantic nuances contribute which, we claim, should be reflected in their representations in a grammar system.

[2] The idiomatic meanings of 幽 *yōu* and 默 *mò* are used in the glossary instead of their literal senses.

3.3 The Deceptive Argumenthood in SVs

In the following section, we will present a few grammatical tests to show that SV_H and SV_T are not grammatically equivalent to other V-O phrases. As we will show, 1) the syntactic flexibility of combinations for all SVs is more constrained than it is for ordinary V-O phrases, and 2) the syntactic freedom of expression for the two subclasses of SVs varies depending on how much each lexeme contributes to the overall semantics. This will enable us to develop a grammatical model for SVs, and represent their genuine characteristics more appropriately.

3.3.1 Gapping Construction

We will examine two types of ellipses, gapping and null object constructions, to demonstrate the syntactic disparity between an SV_T and the object of a VP. While gapping construction in English usually involves a coordinate construction in which the main verb in the second clause is elided, as in (68), the gapping construction in Chinese is restricted to quantified NPs (69a-b) (Li, 1988).

(68) Mary loves dogs and John [ ] cats.

(69) a. * 張三　　吃了 蘋果，　李四 [ ] 橘子
Zhāngsān chīle píngguǒ, Lǐsì [ ] júzi
Zhangsan ate apple Lisi [ ] orange
For 'Zhangsan ate apples and Lisi oranges.'

b. 張三　　吃了 兩個　蘋果，　李四 [ ] 三個 橘子
Zhāngsān chīle liǎngge píngguǒ, Lǐsì [ ] sānge júzi
Zhangsan ate two apple Lisi [ ] three orange
'Zhangsan ate two apples and Lisi three oranges.'

Let us first examine the case of the ICP of SVs. The quantificational force may not always make gapping available, as gapping can only be established when the two SVs are identical in terms of the two clauses, as in SV 上課 *shàngkè* 'go to class' in (70a). Gapping will be unavailable. When the SVs in the construction are inconsistent even if the semantics of the two SVs are similar, as in SV_H上 *shàng* of two SVs 上課 *shàngkè* 'go to class' and 上班 *shàngbān* 'go to work' in (70b).

(70) a. 張三　　上了　兩門　　課，李四 [ ] 三門　課
Zhāngsān shàngle liǎngmén kè Lǐsì [ ] sānmé kè
Zhangsan went two class Lisi [ ] three class
'Zhangsan went to two classes and Lisi three classes.'

b. * 張三　　上了　兩天　　課，李四 [ ] 三天　　班
Zhāngsān shàngle liǎngtiān kè， Lǐsì [ ] sāntiān bān
Zhangsan went two days class Lisi [ ] three days work
For 'Zhangsan went to classes two days and Lisi to work three days.'

The example in (69) shows that, when a VP is formed by a free combination of any verb and noun, gapping can be constructed with a quantification phrase. However, this is not always true for the type of ICPs of SVs that include a fixed combination with idiomatic readings that can be identifiable from its parts. The SV_H can only be established as long as its corresponding SV_T is present in the second conjunct.

As seen in (a) and (b), a verb with a free combination VP has no restrictions on the object with which it combines. However, an SV_H can only be combined with an SV_T that has already been specified at the lexical level. In order for VPs and SVs to be differentiated correctly, we must reflect on such lexical relationships in syntax, which will be detailed in the next chapter.

The gapping construction in Chinese is considered to be more flexible than it is in English (Tang, 2001; Wei, 2008). The occurrence of gaps has been observed in more complex constructions, as shown in (71).

(71) a. 老師 送了 張三 兩個 蘋果， [ ] 李四 三個 橘子
lǎoshī sòngle Zhāngsān liǎngge píngguǒ [ ] Lǐsì sānge júzi
teacher gave Zhangsan two apple [ ] Lisi three orange
'The teacher gave Zhangsan two apples and Lisi three oranges.'

b. 張三 吃 蘋果 吃 得 很快， 李四 [ ] 很慢
Zhāngsān chī píngguǒ chī de hěnkuài Lǐsì [ ] hěnmàn
Zhangsan eat apple eat COMP very fast Lisi [ ] very slow
'Zhangsan eats apples very fast and Lisi very slowly.'

In the two structures above, the ICPs and the IPs of the SVs behave differently from one another. Compare an example of an ICP 開槍 *kāiqiāng* 'shoot' (lit. 'open gun') (72) to an example of an IP 幽默 *yōumò* 'tease, make fun of someone' (73).

(72) a. 張三 開了 王五 兩 槍， [ ] 李四 三 槍
Zhāngsān kāile Wángwǔ liǎng qiāng [ ] Lǐsì sān qiāng
Zhangsan opened Wangwu two gun [ ] Lisi three gun
'Zhangsan shot Wangwu twice and Lisi three times.'

b. 張三 開 槍 開 得 很快， 李四 [ ] 很慢
Zhāngsān kāi qiāng kāi de hěnkuài Lǐsì [ ] hěnmàn
Zhangsan open gun open COMP very fast Lisi [ ] very slow
'Zhangsan shoots very fast but Lisi very slowly.'

(73) a. * 老天 幽了 王五 一 默， [ ] 李四 一 默
lǎotiān yōule Wángwǔ yí mò [ ] Lǐsì yí mò
God serene Wangwu one silent [ ] Lisi one silent
For 'God made fun of Wangwu and Lisi.'

b. * 張三 幽 默 幽 得 很好， 李四 [ ] 很糟
Zhāngsān yōu mò yōu de hěnhǎo Lǐsì [ ] hěnzāo
Zhangsan serene silence serene COMP very well Lisi [ ] very bad
For 'Zhangsan teases very well but Lisi very badly.'

The above comparison illustrates that ICPs and IPs behave differently, although both are categorized as SVs. It is clear that the distinction between ICPs and IPs extends beyond classification, and can also be attributed to other factors. Our task is to reflect their differences in grammar to understand SVs better.

3.3.2 Null-Object Construction

We classify (74a) and (74b) as VP-ellipsis constructions and null-object constructions, respectively, based on the definitions by Hoji (1998) and Xu (2003). Unlike English, the VP-ellipsis is introduced by the copula 是 *shì* 'be' since Chinese lacks an auxiliary verb corresponding to *do, does* in English.

(74) a. 張三 吃了 蘋果， 李四 也 是
Zhāngsān chīle píngguǒ, Lǐsì yě shì
Zhangsan ate apple Lisi also be
'Zhangsan ate apples and Lisi did too.'

b. 張三 吃了 蘋果， 李四 也 吃了 [ ]
Zhāngsān chīle píngguǒ, Lǐsì yě chīle [ ]
Zhangsan ate apple Lisi also ate [ ]
'Zhangsan ate apples and Lisi ate too.'

Although ICPs are compatible with both of these structures (75), IPs fail to fit into null-object constructions (76). Again, even though both ICP and IP are SV, the syntactic representations in them are not the same. It is therefore necessary to model their syntactic differences via syntactic models.

(75) a. 張三 吃了 飯，李四 也 是
Zhāngsān chīle fàn, Lǐsì yě shì
Zhangsan ate meal Lisi also be
'Zhangsan had a meal and Lisi had too.'

b. 張三 吃了 飯，李四 也 吃了 [ ]
Zhāngsān chīle fàn, Lǐsì yě chīle [ ]
Zhangsan ate meal Lisi also ate [ ]
'Zhangsan had a meal and Lisi had too.'

(76) a. 老天 幽了 王五 一 默，命運 也 是
lǎotiān yōule Wángwǔ yí mò mìngyùn yě shì
God serene Wangwu one silent destiny also be
'God made fun on Wangwu and the destiny did too.'

b. * 老天 幽了 王五 一 默，命運 也 幽了 [ ]
lǎotiān yōule Wángwǔ yí mò mìngyùn yě yōule [ ]
God serene Wangwu one silent destiny also serene [ ]
For 'God made fun of Wangwu and the destiny did too.'

We have observed the locked relation between SV_H and SV_T in the gapping construction (70b). The SVs involved in the two conjuncts should be identical. The same restriction is also found in null-object constructions. (77a) can only be followed by (77b) when the SV 上課 *shàngkè* occurs. The inconsistent predicates of (77c) and (77a) make (77b) a poor subsequent sentence.

What we have observed here is that there are typological and semantic requirements for the two SVs involved in the two conjuncts for null-object constructions and VP ellipsis. None of these coordinate constructions can be formed by a combination of an SV and a free V-O combination.

(77) a. 張三 上了 課，李四 也 上了 [ ]
Zhāngsān shàngle kè, Lǐsì yě shàle [ ]
Zhangsan went class Lisi also went [ ]
'Zhangsan went to class and Lisi did too.'

b. 可是，李四 今天 只 上了 半天 課
kěshì Lǐsì jīntiān zhǐ shàngle bàntiān kè
But Lisi today only went half-day class
'But Lisi only attended a half-day class today.'

c. 可是，李四 今天 只 上了 半天 班
kěshì Lǐsì jīntiān zhǐ shàngle bàntiān bān
But Lisi today only went half-day work
'But Lisi only worked a half-day today.'

3.3.3 Pseudo Quantification in SVs

In Chinese, a quantification phrase is arranged in the order of a numeral, a classifier or a measure word, and a noun. For a classifier to be determined, it is necessary to consider the type of noun following it. However, we noted that SVs did not necessarily adhere to the standard format of quantification phrases in Chinese in all cases. The quantification phrases accepted by different SVs can vary greatly.

Although some SVs do not place any restrictions on the numerals in the quantification phrases 上課 *shàngkè* 'go to class' and 上班 *shàngbān* 'go to work' in (70b), the numerals in some SVs are restricted to the numeral 'one'. Other numerals appear to be incompatible with these SVs; for example,道歉 *dàoqiàn* 'apologize' and 幽默 *yōumò* 'tease, make fun of someone' in (78a-b).

(78) a. 張三 道了 一/?五 個 歉
Zhāngsān dàole yí/?wǔ ge qiàn
Zhangsan expressed one /?five CL apology
'Zhangsan apologized.'
(lit. 'Zhangsan expressed one apology. ?Zhangsan expressed five apologies.')

b. 老天 幽了 王五 一/?兩 默
lǎotiān yōule Wángwǔ yí/?liǎng mò
God serene Wangwu one /?two silent
'God made fun on Wangwu.'
(lit. 'God made one fun on Wangwu. ?God made two fun on Wangwu.')

Quantification phrases, which are one of the most frequently interpolated parts of SVs, describe the number of a quantity, such as the duration of an action or status or the number of times an action occurred; for example, 上課 *shàngkè* 'go to class' in (70a), 開槍 *kāiqiāng* 'shoot' in (72). There are classifiers in Chinese that only allow a combination with the number *one*. For example, temporary measures only permit *one* as the numeral, according to Chao (1968)'s unambiguous statements in his in-depth descriptions of Chinese classifiers. The "one + temporary measure + noun" also differs from other types of classifiers in that it consistently refers to something throughout the area to which the classifier refers, as shown in (79) from Chao (1968).

(79) a. 一 頭 白髮
yì tóu báifǎ
one CL white hair
'The entire head is white. (lit. 'a head of white hair'

b. 一 桌 食物
yì zhuō shíwù
one CL food
'The table is full of food. (lit. 'a table of food'

Apart from standard classifiers, Chao discussed another type of classifier, which did not associate directly with nouns, in the V-O construction. Although the numerals in the majority of these classifiers can be substituted freely, a few are restricted to the numeral one, as demonstrated by the example (80) from Chao (1968).

(80) a. 寫 一 手 好字
xiě yì shǒu hǎozì
write one CL good word
'write beautifully. (lit. 'write a hand of good words.')

b. 說 一 口 好英文
shuō yì kǒu hǎo yīngwén
talk one CL good English
'speak English well. (lit. 'speak a mouth of good English.')

According to Lyons (1977), classifiers individuate things according to the type of entity to which they refer, while measure words individuate things according to quantity.[3] The noun that comes after the classifier or measure word must therefore be an entity that can be individuated. It can be a unit of a class, a group of classes, or an amount

[3] Classifiers and measure words here refer to Lyons (1977)'s sortal and measural classifiers, respectively.

of substance. In other words, the SV_T, which only associates with "one + classifier" cannot become an entity that can be classified and enumerated as such. Furthermore, since an entity must have a certain potential for a reference that the speaker can infer (Lyons, 1977), we can conclude that this type of SV_T lacks a referent. That is, these SV_Ts cannot be connected to physical objects (first-order entities), events, processes, or states of affairs (second-order entities), or to abstract concepts such as propositions (third-order entities).

We argue that this is the key difference that differentiates these SV_Ts from regular nouns in V-O constructions, which is in line with the argument that SVs are MWEs. In a V-O construction, the object represents an entity that is being acted upon via the syntax. In other words, there would be many plausible candidates among which a speaker could select to create dynamic semantics but, in the case of SVs, an SV_H and its SV_T have been paired in the lexicon. Therefore, the proposition of an action taken and the effectiveness transferred to the affected participant (i.e., SV_T) are not generated by syntactical derivation.

3.4 The Interface of Syntax and Semantics

The non-referentiality of SV_T has been covered in a number of studies. Non-referential readings are typically provided for SVs. SV_T was analyzed by Cheng and Sybesma (1998) as a dummy object that prevented the occurrence of a referential *pro* for a referential reading because of its comparable structure and similar complimentary distribution to that of a VP. Since this non-referential reading is thought to be achieved transitively by employing a generic object, Tieu (2007) viewed SV_T as a generic object. Regardless of the theoretical names for SV_T, it is clear from the perspective of referentiality that SV_T and the object in a VP have quite different semantic properties.

From another perspective, the lack of a referent for SV_T may also explain why SV_H is unable to freely select an SV_T and produce semantics with it. The main reason that the semantics of SVs do not decompose when they are divided at the syntax level is that, when taken together, SV_H will have the idiomatic semantics of the entire SV because SV_T has no referent.

Note that stating that SV_T has no referent does not imply that SV_T makes no semantic contribution. In the empirical study by Tieu (2007), the author found that a linguistic item that was semantically incongruous in context could not be linked by the subjects. SV_T may serve to delimit the action of the SV_H in the same way as an object in English (Hong, 1999). In general, this is consistent with the claim by Pan and Ye (2015) that the separation of an SV was merely superficial and that, from a semantic standpoint, SVs have never been split.

We enumerated a number of SV properties that have been extensively addressed in the literature at the beginning of this chapter. It is obvious that the semantic distinctions between SVs and VPs can account for the syntactic differences between SVs and VPs that have been investigated in the literature.

We provided justifications for why SVs should be classified as MWEs in §3.2, and divided SVs into two groups in accordance with MWEs. These two classifications

can essentially explain the freedom of syntactic separation in SVs, with ICPs being more flexible than IPs due to the various degrees of the contributions of $_{H}$ and SV_{T} to the overall semantics. We illustrated this point using SV 吃飯 *chīfàn* 'have meal' and its VP form 'eat rice' in §1.1, as repeated here. Depending on the semantics, a combination of a verbal and a nominal element may sometimes appear as a VP and sometimes as an SV. For example, 吃飯 *chīfàn* is a genuine VP when its semantic meaning is 'eat rice.' As a VP, its nominal component has a unique referent and can be used on its own. When it is preceded by a quantification phrase, as in (82b), its number is not restricted to one.

(81) 我 想 吃 飯
Wǒ xiǎng chī fàn
I want have/eat meal/rice
'I want to have meal.' or 'I want to eat rice'

(82) a. 你 想 吃 什麼？
nǐ xiǎng chī shénme
you want eat what
'What would you like to have (specific food)?'

b. 飯。我 今天 想吃 五 碗 飯。
fàn. Wǒ jīntiān xiǎngchī wǔ wǎn fàn.
rice. I today want to eat five bowl rice.
'Rice. I want to have five bowls of rice today.'

The quantification phrase quantifies the entire event, not only the SV_{T}, when the meaning is 'have a meal', which is an SV. In the example below, it quantifies the event of 'having a meal', instead of the purely nominal part *meal*.

(83) 我們 吃過 幾 次 飯
wǒmen chīguò jǐ cì fàn
we had several CL meal
'We had meals several times.'

Is it possible that SV_{H} is being quantified here? Given that SV_{H} carries the overall semantic meaning, the quantified phrase must necessarily modify the overall semantic meaning, which is *have a meal* when the quantification phrase quantifies the event of the verb preceding it. That is, in order to restrict the quantification phrase modifying 吃 *chī* to the reading of *to eat*, the reading of the nominal component has to be the *rice* reading as the object of a VP. We will present the grammar models that we developed to account for this in the following chapter.

From the examples above, it is clear that SVs such as 吃飯 *chīfàn* are homonyms. Therefore, 吃飯 *chīfàn* should have at least two grammar rules to reflect their meaning, as well as their syntactic distinctions. What we want to emphasize here is that the syntactic distinctions between SVs and VPs, as well as those between ICPs and IPs,

represent the underlying semantic differences between SVs and VPs, and between ICPs and IPs. It is for these reasons that an SV's semantics do not collapse when it splits syntactically, and ICPs are syntactically more flexible than are IPs because each component of an ICP contributes more than do those of an IP. This is called syntax-semantic interaction, which has attracted a tremendous amount of interest in Chinese linguistics over the past two decades.

However, how the syntactic model that represents the *simultaneous* interplay between syntax and semantics is more important. According to the rule-to-rule hypothesis by Bach (1976), syntax and semantics correspond so closely to one another that each syntactic rule has a corresponding semantic interpretation rule. That is, every constituent that is constructed by a syntactic rule must have a semantic interpretation. We believe that CCG would be a preferable syntactic model for SVs because, whenever a syntactic constituent is constructed, it can provide a meaning that is comprehensible but not necessarily comprehensive.

While most studies in the literature have used Chomsky's generative phrase structure, a few researchers have employed Head-Driven Phrase Structure Grammar or Lexical-Functional Grammar to study SVs. However, these syntactic theories divide semantics and syntax into distinct levels, and only address semantics once the syntactic parsing of an entire sentence has been completed. An example is the garden-path effect. Despite being temporally ambiguous, there is only one correct form of parsing. People can identify they have made a misinterpretation before they have read the entire sentence. In the study by Trueswell et al. (1993), the participants took longer to read the words *was* in the garden-path sentence (84a) than they did in the control sentence (84b). This implies that *was* is the point at which they realized that their previous parsing was incorrect, and they reanalyzed the sentence. Based on the research in psychological linguistics, we know that understanding language is a complicated, dynamic, and interactive process with regard to syntax, semantics, and probabilities that necessitate continuous adjustment and updated interpretations. Therefore, syntax and semantics should not be aligned at successive layers for processing.

(84) a. The student forgot the solution was in the back of the book.

b. The student forgot that the solution was in the back of the book.

3.5 Conclusion

Thus far, we have examined SVs from the semantic perspective, and have argued that the meaning of an SV is neither synthesized nor freely combined according to its two components, which are fixed combinations. SVs, like MWEs, have a positive correlation between the degree of separability and the semantic contributions of their parts, as noted by Nunberg et al. for English. Therefore, we divided SVs into two categories based on the components' semantic contributions to the overall semantics. We will demonstrate how to model the dynamic interaction between the syntax and the semantics of SVs in the next chapter.

CHAPTER 4

WORD INTERNAL STRUCTURES OF SEPARABLE VERBS

As we adopted CCG as the theoretical foundation for analyzing SVs, we will first provide a brief introduction to CCG Steedman (1996) and its application in analyzing compound words through paracompositionality Bozşahin and Güven (2018) and Bozşahin (2023). Finally, we will demonstrate application of CCG in the analysis of Chinese SVs.

4.1 A Brief Introduction to CCG

4.1.1 A Radically Lexicalized Theory of Grammar

In the early 20th century, Ajdukiewicz (1935) explicitly defined the first lexicalized grammar, namely CG. Steedman (1996) further developed it as CCG. As a radically lexicalized grammar form, CCG places the entire weight of syntax on the lexicon. That is, all language-specific properties must be explicitly specified as types or categories in the lexicon. The types can be constrained by the *Principle of Categorial Type Transparency*.

(85) *The Principle of Categorial Type Transparency*
For any given language, the semantic type of the interpretation, together with a number of language-specific directional parameter settings, uniquely determines the syntactic type of a category. Steedman 2000:36

(86) is an example of the type for the English verb *see* in the third person singular simple present tense. We will use this to illustrate some fundamental aspects of CCG that are relevant to our current work.

(86) $\overbrace{\text{sees}}^{\text{phonological form}} := \overbrace{\overbrace{(S_{\text{fin}}\backslash NP_{3s})/NP}^{\text{syntactic type}} : \overbrace{\underbrace{\lambda x \lambda y.}_{\lambda\text{-binders}} \quad \underbrace{see' x y}_{\text{predicate-argument structure}}}^{\text{logical form}}}^{\text{category}}$
(feature: fin)

We will first examine the syntactic type. Chomskian Generative Grammar suggests that language is derived through top-down phrase structure rules, as depicted in (87). By contrast, CCG adopts a bottom-up approach to the derivation. According to Steedman (1996) and Steedman and Baldridge (2011), the syntactic type can either be a primitive one, such as *NP, PP, PP, S* (88), or a functional one such as intransitive verbs $S\backslash NP$, transitive verb $(S\backslash NP)/NP$, and so forth (89). Functional categories are named in the mathematical sense. They yield a result when provided with the specified argument. Both the result and argument can be either a primitive type or a function. In order to define the language order, slashes are utilized to determine the direction in which to search for their arguments. Taking the intransitive verb *laughed* (89) as an example, *S* is the result, and *NP* is the argument. When a string with the *NP* appears to the left of *laughed*, due to a backward slash, a complete sentence can be derived as an *S*.

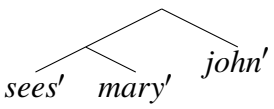
(87) $S \rightarrow NP\ VP$
$VP \rightarrow TV\ NP$
$TV \rightarrow \{\ hit,\ see,\ like,\ \cdots\}$

(88) Primitive categories:
John $:= NP :\ john'$
$\alpha := A :\ \alpha'$

(89) Functional categories:
laughed $:= S\backslash NP :\ \lambda x.laughed'\,x$
$\beta := B\backslash A :\ \lambda x.\beta' x$

The logical form (LF)consists of two components: λ binders and the predicate-argument structure. The predicate-argument structure for the sentence *John sees Mary* can be linearized as $sees'mary'\ john'$ using the left-associative convention, which is a linearized form of (90). The leftmost element in the predicate argument structure is the predicate *sees*, which appears in the leftmost node in (90). The traditional c-command is also preserved in the LF tree below.

(90)



Based on Bach's (1976) hypothesis, syntactic derivations are closely linked to semantic composition in a synchronous manner. Each time a syntactic type is substituted, the corresponding semantic rule will be applied. The semantics of words are then incrementally composed whenever a valid constituent structure is constructed, as shown in (91). CCG notation follows a structure in which the input segments are located at the top, while the results are positioned at the bottom. The lockstep derivation between syntax and semantics is mediated by the use of the ":" notation, which results in lexical co-determination. Consequently, the syntax-semantic interface is inherently integrated into the type-dependent structures without requiring any additional manipulations (Bozşahin, 2012).

(91)

John	sees	Mary
$NP: john'$	$(S\backslash NP)/NP: \lambda x\lambda y.see'xy$	$NP: mary'$
	$S\backslash NP: \lambda y.see'mary'y$ (>)	
$S: see'mary'john'$ (<)		

4.1.2 CCG Rules and Combinators

As CCG commits to incorporate all language-particular information within categories, the type provides the sole avenue for expressing our assumptions about languages. Once we establish the correct categories, they will be projected onto surface structures through universal rules. The projective mechanism can be facilitated through the application rules and combinators. While CG is expanded to CCG through the inclusion of combinators, thus allowing for a larger set of rules to be derived, CCG restricts the set of rules to those that conform not only to the *Principle of Categorial Type Transparency*, but also to the following principles listed below (Steedman and Baldridge, 2011). In addition to these principles, combinatory rules are not allowed to override the directionality specified in the types, but must project it (Steedman and Baldridge, 2011).

(92) a. *The Principle of Adjacency:*
Combinatory rules may only apply to finitely many phonologically realized and string-adjacent entities.

b. *The Principle of Consistency:*
All syntactic combinatory rules must be consistent with the directionality of the principal function.

c. *The Principle of Inheritance:*
If the category that results from the application of a combinatory rule is a function category, then the slash type of a given argument in that category will be the same as the one(s) of the corresponding argument(s) in the input function(s). Steedman and Baldridge 2011:190

The application rules described in (93) are the most straightforward to understand. The functional category substitutes one argument at a time. The rightward slash in (93a) indicates that the functional category X/Y expects its argument Y to appear on its right. When these two types are combined syntactically, their semantics are composed synchronically, resulting in fa. The pure application rules are context-free binary rules that only accept arguments and cannot produce directionality such as a combinator **T**. They can be viewed as a revised version of phrase structure rules from a lexical perspective (Steedman, 1996).

(93) a. Forward Application:
$X/Y: f \quad Y: a \quad \Rightarrow \quad X: fa$ (>)

b. Backward Application:
$Y: a \quad X\backslash Y: f \quad \Rightarrow \quad X: fa$ (<)

Nevertheless, the expressive power that the function application rules in (93) provide are limited. To overcome these, CCG incorporates combinators that operate over functions such as function composition (94). Two adjacent functions can compose via the Y, represented as the variable x in the LF of the result category. Function composition in the forward (crossed) compositions can be understood as the second function, producing precisely what the first function seeks. Conversely, in backward (crossed) compositions, the first function yields the result that the second function seeks.

(94) a. Forward Composition:
$X/Y : f \quad Y/Z : g \;\Rightarrow\; X/Z : \lambda x.f(gx)$ (> **B**)

b. Backward Composition:
$Y\backslash Z : g \quad X\backslash Y : f \;\Rightarrow\; X\backslash Z : \lambda x.f(gx)$ (< **B**)

c. Forward Crossed Composition:
$X/Y : f \quad Y\backslash Z : g \;\Rightarrow\; X\backslash Z : \lambda x.f(gx)$ (> $\mathbf{B}_\times$)

d. Backward Crossed Composition:
$Y/Z : g \quad X\backslash Y : f \;\Rightarrow\; X/Z : \lambda x.f(gx)$ (< $\mathbf{B}_\times$)

The next combinator is **T** for type-raising, which is essential in order for CCG to explain coordination and unbounded dependency (Steedman, 1996). Type raising takes simple categories and elevates them to functions. There can be two schemas of type raising, as shown in (95). Type raising involves taking a category X and converting it into a function T that requires another function, $T\backslash X$ or T/X, which takes the original category as its argument.

(95) a. Forward Type Raising:
$X : a \;\Rightarrow\; T/(T\backslash X) : \lambda p.p\,a$ (> **T**)

b. Backward Type Raising:
$X : a \;\Rightarrow\; T\backslash(T/X) : \lambda p.p\,a$ (< **T**)

4.2 The Ideotypes for MWEs

In CCG, there is a correspondence between each syntactic type and its counterpart in the LF, as exemplified in (86), establishing a connection between syntax and semantics. Whenever a syntactic type is substituted, its corresponding element in LF is replaced with a specific semantic value. (91) is an example of this incremental processing. That is to say, the corresponding element of a syntactic type needs to be situated at a node within a predicate argument structure (90).

However, the challenge presented by MWEs and SVs lies in the fact that their *VP*s can only combine with specific *NP*s. This limits co-occurrence patterns to being incorporated into their types within CCG. In addition, due to the fixed semantics of MWEs and SVs, the corresponding LF for a specific *NP* does not contribute to the argument structure of its *VP*. Instead, it provides an extension of information about the event in its SV$_{\text{H}}$, which will be further elucidated later. Therefore, in contrast to non-idiomatic

predicates, the nominal components of MWEs and SVs cannot function independently as a node within (90).

Bozşahin and Güven (2018) and Bozşahin (2023) defined the aforementioned characteristics of MWEs as paracompositionality, and proposed CCG ideotypes to explain MWEs behaviors. In CCG, it is essential to encode all the language-specific information within categories. Ideotypes, while preserving the substitution mechanisms of CCG, utilize non-vacuous abstractions to capture the paracompositionality that is inherent in MWEs.

Nicolas (1995) categorized V-O combinations according to three classes based on their degree of idiomaticity (96), as discussed in §3.1.1. Nunberg et al. (1994) observed a negative relationship between semantic idiomaticity and syntactic flexibility. The more semantically fixed a combination is, the more syntactically rigid it becomes. Bozşahin and Güven (2018) and Bozşahin (2023) proposed three types based on the freedom of syntactic and semantic combinations: polyvalent types, head-dependent types, and singleton types.[1] These three types correspond, in order, to the three categories from left to right in (96). Head-dependent types and singleton types are considered to be subtypes of ideotypes.

(96) Free combinations < ICPs < IPs

The subcategorization of the English verb *kick* could be exemplified as shown below.

(97) a. John kicked the ball. Polyvalent
kicked := $(S\backslash NP)/NP : \lambda x\lambda y.kick' x y$
ball := $N_{\text{ball}} : ball'$

b. John kicked the habit of procrastination. Head-dependent
kicked := $(S\backslash NP)/NP_{\text{habit}} : \lambda x\lambda y.stop'_{\circ x} habit' y$
habit := $N_{\text{habit}} : habit'$

c. John kicked the bucket. Singleton
kicked := $(S\backslash NP)/\!\!\!\diagup_{\star}$ *"the bucket"* $: \lambda x\lambda y.die'_{\circ x} y$
bucket := $N_{\text{bucket}} : bucket'$

We will begin with the syntactic types of (97). The subsequent discussion is based on the studies by Bozşahin and Güven (2018), Bozşahin (2022), and Bozşahin (2023).

The key difference that distinguishes idiotypes from polyvalent types is that a phonological string can be treated as a syntactic type with a semantic value in ideotypes. The verb *kick* in (97a), as a polyvalent type, subcategorizes for the *NP*. Since CCG deviates through type substitutions rather than via lexical insertions, the difference in (97) lies in the set of values for which it can be substituted. Polyvalents, as a CCG type for free combinations, (97a) has the widest possible set of values to be subcategorized because *NP* can refer to a class of expressions, rather than to a single phonological form.

[1] Head-dependent is synonymous with head-marked polyvalent as it is headed by a polyvalent type. We use the term head-dependent for brevity.

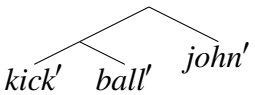
Kick in (97b) subcategorizes for a condensed category NP_{habit}. This category encompasses the relatively restricted syntactic flexibility observed in ICs by limiting its combinations to a narrower range of expressions headed by the phonological form 'habit', while still allowing for adjunction and complementation to the *NP*.

With regard to the singleton, the *kick* in (97c) subcategorizes the phonological string *"the bucket"*. Consequently, a singleton type can only serve as a result, and can be substituted via the application rules indicated by $\star$.[2] It appears unlikely for a phonological form to be the result of a function. The singleton type has the narrowest reference among these three types, since the surface string *"the bucket"* itself is the only valid expression, as a syntactic type, that can be substituted for the singleton type.

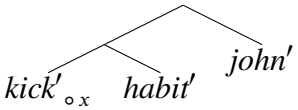
The LIH poses one of the major challenges for phrase-structure rules when dealing with MWEs and SVs. However, this challenge does not apply to radically lexicalized grammar. From a syntactic standpoint, it is possible to assign a dedicated type to each unit that functions independently within the syntax, as exemplified in (97). There is no requirement in CCG to treat the entire expression of SVs or MWEs as a single lexical unit. Semantically, the nominal components of SVs and MWEs are typically considered to be semantically inactive or vacuous. CCG enacts derivations via lexical types, which are constructed by the mutual constraints between syntactic types and semantic values. As long as one-to-one correspondences between syntactic types and semantic values can be established, adjacent types can be combined and projected onto the surface structure. Let us now proceed to a discussion of the concept of semantic correspondence in relation to (97).

The verbal heads and nominal parts of SVs and MWEs are independent entities in syntax, thus requiring separate types. In the case of the two ideotypes of *kick*, the NP_{habit} in the head-dependent type (97b) and the *"the bucket"* in the singleton (97c) correspond to variable x's in their predicate-argument structures. This means that these variable x's are expected to be replaced by strings having the syntactic type NP_{habit} and the syntactic type *"the bucket"*, respectively. Their relatively vacuous semantic contributions may be a result of not being c-commanded by *kick* in the predicate-argument structure (98b, c), as opposed to (98a).

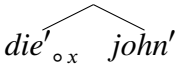
(98) a. Poly-valent



b. Head-dependent



c. Singleton



Bozşahin (2023) used the diacritic '∘' notation in (98) to indicate that the semantics of non-true semantic arguments within MWEs and SVs; for example, *bucket* or

[2] Baldridge and Kruijff (2003) proposed slash modalities as a means of restricting the possible combinations. The slashes, represented as { \, /, ⋯ }, can be embellished with { $\star$, $\diamond$, $\times$, $\cdot$ }, arranged in ascending order based on their degree of compositionality. Among these modalities, the application rule is associated with all four by default, while $\star$ only operates under the default rule. $\diamond$ and $\times$ also allow the composition rule in a harmonic and permutative manner, respectively. The $\cdot$ modality encompasses all the aforementioned rules.

habit function as the modality of the event underlying the predicate, but are not arguments of the predicate itself. This notation reflects the consensus that *bucket* and *habit* do not play thematic roles. Instead, they represent a semantic aspect known as "event modality" (Bozşahin and Güven, 2018) or "contingency" (Moens and Steedman, 1988), which refers to the extension of the happenings, such as properties, manner, time, and space associated with an event. Their main function is to restrict the set of values to which their predicate can refer. For example, *kick the bucket* could be seen as a form of "euphemistic reporting." Choosing to use *kick the bucket* instead of directly using *die* would be a less offensive language choice when discussing sensitive, controversial, or unpleasant topics or events.

Event modality can be observed in structures beyond MWEs or SVs. Consider the example of removing-type surface contact verbs or *wiping* verbs (Levin and Hovav, 1991) in English. According to Levin and Sells (2009), when these verbs combine with particles such as *off* or *out*, the resulting semantics can exhibit significant variations depending on the properties of the object involved. Let us consider the examples below. When the object represents the location of the action, the particle is not attributed to the object. Levin and Sells (2009) proposed that the distinction between these two behaviors arose due to the presence of "unpredicated particles" such as *off* in (99b), rather than from the verbs. These unpredicated particles also fall under the umbrella of event modality. The sentence produces a similar interpretation to *wipe the table clean* by adding telicity through the unpredicated particle (Levin and Sells, 2009). In this sense, *off* conveys a specific meaning or function, and should not be considered to be devoid of meaning on its own.

(99) a. He wiped the crumbs off. (cf. The crumbs are off.)

b. He wiped the table off. (cf. *The table is off.) Levin and Sells 2009:304

4.3 The CCG Analysis of Chinese SVs

Building on the ideotypes established by Bozşahin and Güven and Bozşahin, we proceeded to develop ideotypes for SVs and analyzed them within the CCG framework. Most of the characteristics of SVs mentioned in Chapter 3 become self-explanatory through the CCG types.

Let us take 吃飯 *chīfàn* as an example. In (101), head-dependency features are used to explain the interdependent relationship between SVH and SVT, illustrating the unfeasibility of using them separately. This corresponds to the traditional issue of bound morphemes in SVT.

4.3.1 Common SVs Properties in CCG

(100) a. 吃 chī:= VP/NP : $\lambda x \lambda y.eat' x y$ Polyvalent

b. 飯 fàn := N : $\lambda x.rice' x$

c. 水果 shuǐguǒ:=N : $fruit'$

(101) a. 吃 chī:= $VP/\ NP_{\text{fàn}}$: $\lambda x\lambda y.have'_{\circ x} meal' y$ Head-dependent

b. 飯 fàn := $N_{\text{fàn}}$: $rice'$

Based on the categories above, we preserved the property of 吃 *chī* as a transitive verb in the grammar. Nevertheless, its LF represents a partially filled predicate argument structure that requires an agent to complete it. This mirrors the commonly perceived intransitive nature of SVs. When the polyvalent 吃 *chī* is combined with a head-dependent type 醋 *cù*, they can be derived syntactically, but fail to convey a collective meaning such as the derivation below. They can only produce interpretations that are specific to ICPs when both words co-occur in the same sentence.

(102) a. 吃 chī:= $VP/\ NP_{\text{cù}}$: $\lambda x\lambda y.be\ jealous'_{\circ x} y$ Head-dependent

b. 醋 cù:= $N_{\text{cù}}$: $vinegar'$

c.

# Zhāngsān	xǐhuān	chī	cù
Zhangsan	like	eat	vinegar
NP	$(S/NP)\$/VP\$$	VP/NP	NP
: Zh'	: $\lambda p\lambda y.like' py$	: $\lambda x\lambda y.eat' xy$	: $vinegar'$
		VP : $\lambda y.eat' vinegar' y$ (>)	

The argument that most SVs are inherently intransitive, which is often found in the literature, can also be explained by the types. As seen in (98b), the verb argument is already saturated in the lexicon. The type of the inseparable verb, 出版 *chūbǎn* 'publish', in which the object must appear after the entire verb, can be similar to (103a). Compare this to other types of SVs that can incorporate pseudo-objects, such as 傷心 *shāngxīn* 'hurt, be sad' (literally translated as 'hurt heart'). A detailed analysis will be presented in the upcoming section.

(103) a. 出版 chūbǎn := VP/NP : $\lambda x\lambda y.publish' xy$

b. 傷 shāng := $VP/NP_{\text{xīn}}$: $\lambda x\lambda y.hurt'_{\circ x} y$

c. 心 xīn := $N_{\text{xīn}}$: $heart'$

4.3.2 Categories of Nominal Satellites

Many language units in Chinese can form nominal satellites with 的 *de*. Several types of homographs 的 *de* that were examined in our research are listed below for reference. In Chinese, several grammatical words and particles manifest not only as homographs, but also as homophones. These different types are motivated by the variations in their semantics and syntactic distributions.

(104) a. Nominal 的 de := $(NP/NP)\backslash(NP/NP)$: $\lambda x\lambda y.xy$

b.

piàoliàng	de	yīfú
beautiful	NOM	cloth
$\overline{NP/NP}$	$\overline{(NP/NP)\backslash(NP/NP)}$	$\overline{NP}$
	$\overline{NP/NP}\ <$	
	$\overline{NP}$: $beautiful'\,cloth'\ >$	

(105) a. Associative 的 de := $(NP/NP)\backslash NP$: $\lambda x\lambda y.xy$

b.

Ōuzhōu	de	yīfú
Europe	ASSOC	cloth
$\overline{NP}$	$\overline{(NP/NP)\backslash NP}$	$\overline{NP}$
	$\overline{NP/NP}\ <$	
	$\overline{NP}$: $Europe'\,cloth'\ >$	

Some nominal satellites, although positioned before SVT, do not directly modify SVT semantically. Instead, they collectively serve as the event modality for SVH. For example, using the categories in (102a) and (104a), one can derive (106c).

(106) a. Intensifier of adjective 好 hǎo := $(NP/NP)/(NP/NP)$: $\lambda x.very'x$

b. Adjective 大 dà:= NP/NP : $\lambda x.big'x$

c.

Zhāngsān	chī	hǎodà	de	cù
Zhangsan	eat	very big	NOM	vinegar
$\overline{NP}$	$\overline{VP/\ NP_{cù}}$	$\overline{NP/NP}$	$\overline{(NP_h/NP_h)\backslash(NP/NP)}$	$\overline{NP_{cù}}$
$\overline{S/VP}^{T}\ >$			$\overline{NP_h/NP_h}\ <$	
			$\overline{NP_{cù}}\ >$	
		$\overline{VP}\ >$		
S : $be\ jealous'_{\circ very'big'vinegar'}Zh'$ $>$				

According to the definition of event modality provided by Bozşahin (2023), SVT acts as a modality of the event rather than as the argument within the predicate-argument structure. Therefore, the relationship between SVH and SVT is not one of "who does what to whom." Some SVs are compatible with a variety of intervening structures, not only due to semantic factors (e.g., Chapter 5), but also because some SVs may have both an SV category and a V-O category. With regard to the combination of a verb and a noun, if there is a "who does what to whom" relationship, it is categorized as a V-O phrase; otherwise, it is categorized as an ideotype. When an SV serves the latter function, it is often considered to be a cognate verb. Taking 唱歌 *chànggē* 'sing' as an example, it has the category VP/NP of a V-O phrase because (107c) can respond to the question *What does Zhangsan sing?*.

(107) a. Genitive 的 de := $(NP/NP)\backslash NP$: $\lambda x\lambda y.poss'yx$

b. Zhāngsān de yīfú
Zhangsan GEN cloth
$\overline{NP}$ $\overline{(NP/NP)\backslash NP}$ $\overline{NP}$
$\overline{NP/NP}\ <$
$\overline{NP : poss'cloth'Zh'}\ >$

c. Zhāngsān chàng Zhōujiélún de gē
Zhangsan sing Jay Chou GEN song
$\overline{S/VP}$ $\overline{VP/NP}$ $\overline{NP}$ $\overline{(NP/NP)\backslash NP}$ $\overline{NP}$
$\overline{NP/NP}\ <$
$\overline{NP}\ >$
$\overline{VP}\ >$
$\overline{S : sing'(poss'song'Ch')Zh'}\ >$

In Chinese, it is the semantics that reveal whether a relative 的 *de* applies the non-subject participle strategy (OP) in (108) or the subject participle strategy (SP) in (109).

(108) a. OP relative 的 de := $(NP/NP)\backslash(S/NP) : \lambda p\lambda x\lambda q.(px) \wedge (qx)$

b. Zhāngsān mǎi de yīfú
Zhangsan buy OP-REL cloth
$\overline{NP}$ $\overline{VP/NP}$ $\overline{(NP/NP)\backslash(S/NP)}$ $\overline{NP}$
$\overline{S/VP}^{\,\mathbf{T}}\ >$
$\overline{S/NP}^{\,\mathbf{B}}\ >$
$\overline{NP/NP}\ <$
$\overline{NP : \lambda q.(buy'cloth'Zh') \wedge (q\, cloth')}\ >$

(109) a. SP relative 的 de := $(NP/NP)\backslash VP : \lambda p\lambda x\lambda q.(px) \wedge (qx)$

b. mǎi yīfú de Zhāngsān
buy cloth SP-REL Zhangsan
$\overline{VP/NP}$ $\overline{NP}$ $\overline{(NP/NP)\backslash VP}$ $\overline{NP}$
$\overline{VP}\ >$
$\overline{NP/NP}\ <$
$\overline{NP : \lambda q.(buy'cloth'Zh') \wedge (q\, Zh')}\ >$

The categories of the relative 的 *de* can also apply to head-dependent types. $\circ z$ for *join after-school′* has an event modality meaning, which could be *learning to cram, catching up on learning*. We exemplify this using the SP relative 的 *de*.

(110) a. 補 bǔ:= $VP/NP_{\text{xí}} : \lambda z\lambda w.join\ after\text{-}school'_{\circ z} w$

b. Zhāngsān bǔ de xí hěnduō
Zhangsan supplement OP-REL learning a lot

$$\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{\dfrac{NP}{S/VP}\,\mathrm{T} \quad \dfrac{VP/NP_{\text{xí}}}{} \quad \dfrac{(NP/NP_{\text{h}})\backslash(S/NP_{\text{h}})}{}}{S/NP_{\text{xí}}}\,\mathrm{B} \quad \dfrac{NP_{\text{xí}}}{}}{NP/NP_{\text{xí}}} \quad \dfrac{VP}{}}{NP}}{S/VP:\ \lambda q.(join\ after\text{-}school'_{\circ learning'}Zh') \wedge (q\ learning')}\,\mathrm{T}}{S:\ (join\ after\text{-}school'_{\circ learning'}Zh') \wedge (a\ lot'\ learning')}$$

唱歌 *chànggē* 'sing' can be a $VP/NP_{\text{gē}}$ or a VP/NP. For example, the noun in the sentences below can be any type of song, rather than being interpreted as a cognate object. We will examine 唱歌 *chànggē* as an $VP/NP_{\text{gē}}$ in the next section.

(111) a. Numeral 三 sān := $(NP/NP)/CL:\ \lambda m\lambda f.sk^{m}_{3;f}$

b. Nominal classifier 首 shǒu := $CL:\ SHOU'$[3]

c. Zhāngsān chàng sān shǒu gē
Zhangsan sing three CL song

$$\dfrac{\dfrac{\dfrac{\dfrac{NP}{S/VP}\,\mathrm{T} \quad \dfrac{VP/NP}{} \quad \dfrac{\dfrac{(NP/NP)/CL}{} \quad \dfrac{CL}{}}{NP/NP} \quad \dfrac{NP}{}}{NP}}{VP}}{S:\ sing'\ sk^{SHOU}_{3\,;\,song}\ Zh'}$$

In Chinese, numerals require classifiers to form quantifier phrases that modify nouns. Tse (2013) considered the numeral to be the head of the quantification phrase. Based on this syntactic type, we added the Skolem term $sk^{(m)}_{n;f}$, n=numeral, f=noun, m=classifier or measure word, to describe the semantic relationship of the "numeral + classifier or measure word + noun". n and m are optional. f selects n numbers of elements from a collection that is determined by m.

While we know very little about the meanings of each classifier, and do not focus on which noun should be paired with which measure word or classifier in this study, employing Skolem terms can assist us to understand the logical semantic relationship between the noun and the classifier. The examples below demonstrate how the same phonological string 雞 *jī* can have different references via the classifiers. We accessed the referent of 雞 *jī* in the model world that the classifier established.

[3] We used capital letters to differentiate it from the singleton type when possible ambiguity arose.

(112) a. 三　隻　雞
sān　zhī jī
three CL chicken
'Three chickens.'

b. 三　塊　雞
sān　kuài jī
three CL　chicken
'Three pieces of chicken.'

In this section, we will only discuss cases in which the time span serves as a nominal satellite; that is, the combination of Time-attr and the polyvalent type. In the next section, we will demonstrate the integration of the time span with the head-dependent type.

(113) a. Time span 分鐘 fēnzhōng := $CL: minute'$

b.

Zhāngsān	chàng	sān-fēnzhōng	de	gē
Zhangsan	sing	three-minutes	NOM	song
S/VP	VP/NP	NP/NP	$(NP/NP)\backslash(NP/NP)$	NP
		NP/NP (<)		
		NP (>)		
	VP (>)			
$S: sing'sk^{minute}_{3;song}Zh'$ (<)				

In Chapter 2, we explained that question words such as 什麼 *shénme* could have two interpretations. One is to ask a question about the complement, serving as a modifier. The second form is used in a rhetorical question or sarcastic remark, expressing dissatisfaction with someone's actions. We will analyze the former with SV 補習 *bǔxí* first, and the latter in the next section.

In Chinese culture, 補習 *bǔxí* can refer to any type of after-school learning, be it rote learning for exams, a crash course, or an enrichment program to enhance talents and skills. We can interpret "inquiring about the purpose of after-school education" as the explanation for $\circ\, what'learning'$ serving as an event modality.

(114) a. 什麼 shénme := $((S_{whq}\backslash NP)\backslash TV\$_i)/NP_i: \lambda x\lambda p.p(what'x)$

b.

Zhāngsān	chàng	shénme	gē
Zhangsan	sing	QW	song
NP	VP/NP	$((S_{whq}\backslash NP)\backslash TV\$)/NP$	NP
		$(S_{whq}\backslash NP)\backslash TV\$$ (>)	
	$S_{whq}\backslash NP$ (<)		
$S_{whq}: sing'(what'song')Zh'$ (<)			

c. Zhāngsān bǔ shénme xí
Zhangsan supplement QW learning
NP VP/NP$_{xí}$ ((S$_{whq}$\NP)\TV$_{i}$)/NP$_{i}$ NP$_{xí}$
(S$_{whq}$\NP)\TV$_{xí}$ >
S$_{whq}$\NP <
S$_{whq}$: *join after-school*′ ∘(*what*′ *learning*′) *Zh*′ <

In Chinese, the question words are in-situ, and different syntactic types can emerge depending on the syntactic distribution of the wh-element. For example, 爲什麼 *wèishénme* 'why' can be placed between the subject and the predicate, or at the very beginning of the sentence. However, this type of question word cannot be inserted between the SVs, as shown below.

(115) a. 爲什麼 wèishénme := (S$_{whq}$\NP)/VP$: λ*p*.*why*′ *p*

b. * Zhāngsān pǎo wèishénme bù
Zhangsan jog QW step
NP VP/NP$_{bù}$ (S$_{whq}$\NP)/VP$ NP$_{bù}$
***

4.3.3 Categories of Verbal Satellites

In the section, we will first examine the phrases that are relevant to the quantification that was discussed in the previous section: Time-adv. The previous discussion mainly revolved around how 的 *de* typically treated the component to its left as a modifier of the noun to its right. For example, 三分鐘 *sānfēnzhōng* 'three minutes' in (113b) modifies the noun to its right through an associative 的 *de*. Consequently, a classifier can precede Time-attr, as in *Zhangsan sang a three-minute-long song* in (116).

(116) Zhāngsān chàng sì-shǒu sān-fēnzhōng de gē
Zhangsan sing four-CL three-minute NOM song
S/VP VP/NP NP/NP NP/NP (NP/NP)\(NP/NP) NP
NP/NP <
NP >
NP >
VP >
S: *sing*′ *sk*$^{SHOU}_{4;\,sk^{minute}_{3;\,song}}$ *Zh*′ >

However, the 的 *de* following a time span does not always function in this manner. For example, the time span in (117) can be syntactically derived as Time-attr, and the semantics represented by *song*′ as an event modality can be interpreted as *sing*′ ∘ $sk^{year}_{3;\,song}$: *singing a song in an abstract sense based on a yearly basis, lasting for three years*.

(117)

Zhāngsān	chàng-le	sān-nián	de	gē
Zhangsan	sing-ASP	three-year	NOM	song
NP	$(S\backslash NP)/NP_{\text{gē}}$	NP/NP	$(NP_{\text{h}}/NP_{\text{h}})\backslash(NP/NP)$	$NP_{\text{gē}}$
		$NP_{\text{h}}/NP_{\text{h}}$ (<)		
		$NP_{\text{gē}}$ (>)		
	$S\backslash NP$ (>)			
S: $sing'_{\circ sk^{year}_{3;song}} Zh'$ (<)				

However, if 三年 *sānnián* 'three years' is considered to modify a noun, as in (117), this allows SV$_{\text{T}}$ to accept the modification of any quantity. Since Time-attr is NP/NP, this results in a semantically challenging interpretation, such as $sing'_{\circ sk^{SHOU}_{4;sk^{year}_{3;song}}} Zh'$. According to this semantic interpretation, the dependency between "a song of three years" as an event modality and the measure word becomes difficult to comprehend.

Therefore, Time-adv deserves a distinct category. The category for the numeral of an adverbial (118a) must diverge from that of an attribute (111a). Furthermore, since the time span does not attribute properties to the noun, employing the nominal 的 *de* would still result in an interpretation of Time-attr. To address this, we introduce a bridging 的 *de*, denoted as BRIDG. This function links the adverbial that is positioned to the left of 的 *de* to the object of a transitive verb. The specific derivations and semantics are detailed as follows.

(118) a. Numeral 三 sān := $(VP\$_i\backslash_\star VP\$_i)/\ CL_{\text{span}}$: $\lambda m\lambda p.sk^m_{3;span}p$

b. Time span 年 nián := CL_{span} : $year'$

c. Bridging 的 de := $TV\backslash TV$: $\lambda q.q$

d.

Zhāngsān	chàng-le	sān	nián	de	gē
Zhangsan	sing-ASP	three	CL	BRIDG	song
NP	$(S\backslash NP)/NP_{\text{gē}}$	$(\text{VP\$}_i\backslash_\star\text{VP\$}_i)/\ CL_{\text{span}}$	CL_{span}	$TV\backslash TV$	$NP_{\text{gē}}$
		$VP\$\ \backslash_\star VP\$$ (>)			
		$(S\backslash NP)/NP_{\text{gē}}$ (<)			
		$(S\backslash NP)/NP_{\text{gē}}$ (<)			
		$S\backslash NP$ (>)			
S: $sk^{year}_{3;span}(sing'_\circ song' Zh')$ (<)					

The intervening QW-adv also modifies the predicate, since the speaker is not inquiring about the object, but is expressing his bewilderment or confusion instead.

(119) a. 跑 pǎo := $VP/NP_{\text{bù}}$: $\lambda x\lambda y.jog'_{\circ x}y$

b. Rhetorical 什麼 shénme := $(S_{\text{rhet}}\backslash NP)\$_i\backslash TV\$_i$: $\lambda p.rhetorical' p$

c.

Zhāngsān	pǎo	shénme	bù
Zhangsan	jog	RHET	step
NP	$VP/NP_{\text{bù}}$	$(S_{\text{rhet}}\backslash NP)\$_i\backslash TV\$_i$	$NP_{\text{bù}}$
	$(S_{\text{rhet}}\backslash NP)/NP_{\text{bù}}$ (<)		
	$S_{\text{rhet}}\backslash NP$ (>)		
S_{rhet} : $rhetorical'(jog'_{\circ step'}Zh')$ (<)			

We will now consider examples in which SVs are separated by an object. Object interference essentially involves placing the object into the predicate's argument position. However, it does not increase the number of arguments in our model, given that SVT serves as an event modality. Compare this to non-separable disyllabic verbs, such as 出版 *chūbǎn* 'publish' in (103a) (repeated below).

(120) a. 出版 chūbǎn := VP/NP : $\lambda x \lambda y.publish' x y$

b. 幫 bāng := $VP/NP_{\text{máng}}/NP$: $\lambda x \lambda z \lambda w.help'_{\circ z} x w$

c.

Zhāngsān	bāng-le	Lǐsì	máng
Zhangsan	help-ASP	Lisi	fault
NP	$(S\backslash NP)/NP_{\text{máng}}/NP$	NP	$NP_{\text{máng}}$
	$(S\backslash NP)/NP_{\text{máng}}$ (>)		
	$S\backslash NP$ (>)		
S (<)			

The trivialness 個 *ge* between a verb and an object is believed to be a shortened form of 一個 *yíge*. Since trivialness 個 *ge* only appears with transitive and ditransitive verbs, it is not limited to SVs or to V-O phrases. We define its type as follows.

(121) a. Trivialness 個 ge := $(VP/NP)\$_i\backslash(VP/NP)\$_i$: $\lambda p.trivial' p$

b. Trivialness 一個 yíge := $(VP/NP)\$_i\backslash(VP/NP)\$_i$: $\lambda p.trivial' p$

c.

Zhāngsān	pǎo	ge	bù
Zhangsan	jog	GE	step
S/VP	$VP/NP_{\text{bù}}$	$(VP/NP)\$_i\backslash(VP/NP)\$_i$	$NP_{\text{bù}}$
	$VP/NP_{\text{bù}}$ (<)		
	VP (>)		
S : $trivial'(jog'_{\circ step'}Zh')$ (>)			

Aspects were found to be the main linguistic item that interrupted SVs (Siewierska et al., 2010). Chinese has two homographs 了 *le*, as shown in (122a-b). The verbal 了 *le*, together with most aspects and other components that modify verbs, have the characteristic of closely following the verbal root. We implemented this restriction via the double slash in CCG. The double slash takes a lexical input and outputs a lexical

item decorated with *LEX*. As it operates at the level of the lexicon, it remains invisible in the syntactic process (Steedman and Baldridge, 2011). We consider the process of aspects or other elements that tightly adhere to the root as a morpholexical operation within the lexicon.

(122) a. verbal 了 le := $(S\backslash NP)\$_i \backslash\backslash VP\$_i : \lambda p.le'p$

b. phrasal 了 le := $(S\backslash NP)\$\backslash(S\backslash NP)\$: \lambda p.le'p$

c.

Zhāngsān	chàng	le	gē
Zhangsan	sing	ASP	song
NP	$VP/NP_{gē}$	$(S\backslash NP)\$_i \backslash\backslash VP\$_i$	$NP_{gē}$
		$<$LEX	
		$(S\backslash NP)/NP_{gē}$	
		$>$	
		$S\backslash NP$	
		$<$	
		S	

d.

Zhāngsān	chàng	le	gē	le
Zhangsan	sing	ASP	song	ASP
NP	$VP/NP_{gē}$	$(S\backslash NP)\$_i \backslash\backslash VP\$_i$	$NP_{gē}$	$(S\backslash NP)\$\backslash(S\backslash NP)\$$
		$<$LEX		
		$(S\backslash NP)/NP_{gē}$		
		$>$		
		$S\backslash NP$		
		$<$		
		$S\backslash NP$		
		$<$		
		S		

Considering that the experiential aspect 過 *guò* lacks a phrasal type, this effectively showcases the uniqueness of the double slash operation, thereby emphasizing the significance of treating aspects as morpholexical operations. In 123, $\backslash\backslash VP\$$ seeks a lexical input on its left. Nevertheless, the *VP*s present in these examples are phrases that are derived from syntactic combinations. Regardless of whether it is an SV as illustrated in (123b) or a V-O phrase as in (123c), there is no significant distinction in this context.

(123) a. Experiential 過 guò:= $(S\backslash NP)\$_i \backslash\backslash VP\$_i : \lambda p.guò'p$

b. *

Zhāngsān	chàng	gē	guò
Zhangsan	sing	song	ASP
NP	$VP/NP_{gē}$	$NP_{gē}$	$(S\backslash NP)\$_i \backslash\backslash VP\$_i$
	$>$		
	VP		
	$***$		$<$*LEX

c. *

Zhāngsān	qù	hǎibiān	guò
Zhangsan	go	beach	ASP
NP	VP/NP	NP	$(S\backslash NP)\$_i \backslash\backslash VP\$_i$
	$>$		
	VP		
	$***$		$<$*LEX

We will now delve into the rich and complex non-argument complements following verbs in Chinese. Given the vast scope of complements, we will only discuss resultative verbs (RVs) and potential complements that are most frequently associated with

SVs in this study. Chinese has an abundance of RVs that attach to the verbal root to denote the result or degree of an action. We will take 完 *wán* 'finish, complete' as an example. Similar to aspects, we reflect the morphological restriction in types, just as we did in (123). (124) can also validate this characteristic.

(124) a. RV 完 wán := $VP\$_i \backslash\backslash VP\$_i : \lambda p.finish' p$

b.

Zhāngsān	chàng	wán	gē
Zhangsan	sing	RV	song
$S\backslash VP$	$VP/NP_{gē}$	$VP\$_i \backslash\backslash VP\$_i$	$NP_{gē}$
		<LEX	
	$VP/NP_{gē}$		
		>	
	VP		
		>	
$S : finish'(sing'_{\circ song'} Zh')$			

c. *

Zhāngsān	chàng	gē	wán
Zhangsan	sing	song	RV
$S\backslash VP$	$VP/NP_{gē}$	$NP_{gē}$	$VP\$_i \backslash\backslash VP\$_i$
	>		
	VP		
	***<*LEX		

Within the patterns that are interposed in SVs, potential complements frequently pair with RVs. These complements are headed by 得 *de*, which behaves completely differently from its homophone 的 *de*, as discussed in the previous section. Potential 得 *de* complements are composed of three components, as shown below.

(125) a. Positive form: Subj. Verb 得 *de* RV (Obj.) Potential 得 *de*

b. Negative form: Subj. Verb ~~得 *de*~~ 不 *bù* RV (Obj.)

Although both potential complements and descriptive complements are constructed via the homograph 得 *de*, there are subtle yet important differences in their semantics and in their syntactic distributions. We will first discuss the potential 得 *de*. Compare the positions of the objects below. The objects cannot appear between the predicate and the potential 得 *de*, regardless of whether it is a head-dependent type (c) or an ordinary NP (d). Again, a double slash will be utilized to represent this phenomenon.

(126) a. 張三 唱 得 了 歌
Zhāngsān chàng de liǎo gē
Zhangsan sing DE^{+pot} RV song
'Zhangsan is able to sing (songs).'

b. 張三 歌 唱 得 了
Zhāngsān gē chàng de liǎo
Zhangsan song sing DE^{+pot}
'Zhangsan is able to sing (songs).'

c. * 張三　　唱　　歌　得　　了
Zhāngsān chàng gē　de　　liǎo
Zhangsan sing　song DE^{+pot} RV
'For 'Zhangsan is able to sing (songs).'

d. * 張三　　唱　　這三首歌　　得　　了
Zhāngsān chàng zhè-sānshǒu-gē　de　　liǎo
Zhangsan sing　these three songs DE^{+pot} RV
'For 'Zhangsan is able to sing these three songs.'

Li and Cheng (1998) highlighted the following key points. The negative form of the potential 得 *de* is (125b), rather than 得 *de* + NEG. Similar to this phenomenon, no modifying components can occur before the RV. This illustrates that the potential 得 *de* and the subsequent RV are a morpholexical combination. Only positive auxiliary verbs or adverbs of possibility can appear before the verb.

This suggests that the potential 得 *de* generates interpretations concerning the possibility (for inanimate subjects) or capability (for animate subjects) of an action reaching its culmination. The state brought about by potential 得 *de* complement is likely to be a culmination, due to the RV, such that any modification to it is disallowed. The interpretation of sentences with the potential 得 *de* would be comparable to evaluating whether an accomplishment event can be realized or not.

(127) a. 張三　　能　唱　　得　　了　歌
Zhāngsān néng chàng de　　liǎo gē
Zhangsan can　sing　DE^{+pot} RV　song
'Zhangsan is able to sing (songs).'
(lit.) 'Zhangsan can be able to sing (songs).'

b. *張三　　能　唱　　不　　了　歌
Zhāngsān néng chàng de　　liǎo gē
Zhangsan can　sing　DE^{-pot} RV　song
(lit.) 'Zhangsan can be unable to sing (songs).'

c. *張三　　不　能　唱　　不　　了　歌
Zhāngsān bù　néng chàng de　　liǎo gē
Zhangsan NEG can　sing　DE^{-pot} RV　song
(lit.) 'Zhangsan cannot be able to sing (songs).'

Based on the observations above, we will now present the hypotheses and examples for potential 得 *de* as follows.

(128) a. Positive potential 得 *de*:= $(VP\$_i \backslash\backslash VP\$_i) /\!/ (VP \backslash\backslash VP)$: $\lambda p \lambda q.able'(pq)$

b. Negative potential 不 *bù* := $(VP\$_i \backslash\backslash VP\$_i) /\!/ (VP \backslash\backslash VP)$: $\lambda p \lambda q.unable'(pq)$

(129)

Zhāngsān	pǎo	bù	wán	bù
Zhangsan	jog	DE$^{\text{-pot}}$	RV	step
S/VP	$VP/NP_{\text{bù}}$	$(VP\$_i\backslash\backslash VP\$_i)//(VP\backslash\backslash VP)$: $\lambda p\lambda q.unable'(pq)$	$V\$\backslash\backslash VP\$$: $\lambda p.finish'p$	$NP_{\text{bù}}$
		$VP\$_i\backslash\backslash VP\$_i$: $\lambda q.unable'(finish'q)$ (>LEX)		
		$VP/NP_{\text{bù}}$ (<LEX)		
		VP (>)		
	S : $unable'finish'jog'_{\circ step'}Zh'$ (>)			

Our discussion will now consider another homograph of 得 *de*, known as the descriptive 得 *de*, which is sometimes also referred to as the complement 得 *de*. To differentiate it from the potential 得 *de*, the descriptive 得 *de* being discussed in this study pertains to the structure indicated in (130). In (130b), a (di)transitive verb requires *copying* or *duplication* when both its object and adverbial elements are present; this phenomenon is referred to as the verb-copying structure. Li and Thompson (1989) suggested that the presence of aspects between the initial verb and the object was prohibited, thereby creating a frozen unit. From a pragmatic perspective, Tsao (1987a) analyzed verb-copying as a topic-comment structure, and the verb within the 得 *de* complement was considered to be the main predicate. Verb repetition is not only a requirement for the descriptive 得 *de*, but also for the 了 *le* + duration complement and the 過 *guò* + frequency complement. The complement introduced by the descriptive 得 *de* describes the status, degree, or action represented by the initial VP (Li and Cheng, 1998; Teng, 2018). Other homographs of 得 *de*, used in comparison structures, are outside the purview of the current study. In the majority of literature, discussions about 得 *de* have predominantly focused on the contents of the complement. However, we posit that the semantics and the structure of 得 *de* reflect the event structure of the verb. Comparing the descriptive 得 *de* and the potential 得 *de* is essential for understanding the syntactic behaviors of SVs or V-O phrases.

(130) a. Subj. Verb 得 *de* (NEG) Vs ~~Obj.~~ Descriptive 得 *de*

b. Subj. Verb Obj. Verb 得 *de* (NEG) Vs

With regard to their similarities, both forms of 得 *de* prohibit a sequence in which a verb and its object pair with 得 *de*. Moreover, 得 *de* does not allow modifications from other elements, as shown in Table 4.1. This reveals that, similar to other previously discussed verb-modifying components, both 得 *de*s align closely with the verb root.

The semantic function of both 得 *de*s forms seems to be the main reason for their different syntactic distributions. We will summarize some of the syntax highlights identified by Li and Cheng (1998).

The first concerns the object's position. Although the object of both forms can move to the left or the right of the subject, the object of a transitive verb cannot appear in the descriptive complement and must appear to the left of 得 *de* via verb-copying, as shown in (130b). However, the potential complement can include the predicate's object, and a potentiality meaning cannot be achieved if verb-copying is used.

Table 4.1: Similarities between descriptive 得 *de* and potential 得 *de*

Similarities	**Descriptive 得 *de***	**Potential 得 *de***
I. Object fronting	Obj. Subj. *de* Vs	Obj. Subj. *de* RV
	Subj. Obj. *de* Vs	Subj. Obj. *de* RV
	Verb ~~Obj.~~ *de* Vs	Verb ~~Obj.~~ *de* RV
II. Modifiers	Verb ~~NEG~~ *de* Vs	Verb ~~NEG~~ *de* RV
	Verb ~~ASP~~ *de* Vs	Verb ~~ASP~~ *de* RV

The second concerns the interrogative form. While both forms can form a "yes-no question" at the end of the sentence using the particle 嗎 *ma*, they are not consistent in the "V NEG V" form of "yes-no question", as shown in the last row in Table 4.2.

Third, about the types of verbs in the two complements. We agree that, semantically, the main verb in the potential complement describes the possible outcome of the pre-得 *de* verb, while the verb in the descriptive complement describes the degree or manner of the pre-得 *de* verb. However, because many verbs contain both meanings (e.g., 好 *hǎo* 'good', 懂 *dǒng* 'understood'), analyses can easily confuse the two 得 *de* forms. Although they can be distinguished via other syntactic tests, we have limited the verbs in the potential complement to RVs, and those in the descriptive complement to stative verbs (Vs).

Because the Vs includes the property of the state variability in degree, it can co-occur with both intensifiers and negators. However, the RV signifies a culmination point of an action. We can only specify the types of culmination and discuss the probability of an action occurring with the potential 得 *de*, since culmination inherently embodies an extreme state without gradability. This accounts for the differences observed in II and III in Table 4.2. One can describe the relativity of a property in terms of degree and manner. However, the absoluteness of a concept can only be evaluated in a binary form. We contend that this semantic disparity is accurately reflected in their respective object positioning requirements and syntactic distributions.

Table 4.2: Dissimilarities between descriptive 得 *de* and potential 得 *de*

Dissimilarities	**Descriptive 得 *de***	**Potential 得 *de***
I. Object position	*de* Vs ~~object~~	*de* RV object
	Verb Obj. Verb *de* Vs	~~Verb Obj.~~ Verb *de* RV
II. Modifiers	*de* intensifier Vs	*de* ~~intensifier~~ RV
	Verb *de* NEG Vs	Verb ~~*de*~~ NEG RV
III. Question form	Verb *de* Vs NEG Vs	Verb *de* RV Verb NEG RV

Given the hypothesis that language is processed in a linear way, it appears to be obvious that the syntactic differences between the two markers reflect the semantic nuances that they describe. We know that objects can affect the eventuality. The potential 得 *de* denotes whether a certain +telic event is likely to occur. Therefore, the RV needs to pair with the potential 得 *de* first to define the type of culmination event.

For example, for 看 *kàn* 'see, read', the reading action may culminate in a state of understanding or comprehension, as indicated by 看得懂 *kàndedǒng* 'read DE^{+pot} understood'. Visual perception occurs when our eyes hit the desired target, expressed as 看得到 *kàndedào* 'see DE^{+pot} arrive'. The merged semantics of these three components select an object that is semantically compatible. When a doctor uses an eye chart to check a patient's vision, they would ask 看得到 *kàndedào* 'see DE^{+pot} arrive' rather than 看得懂 *kàndedǒng* 'see DE^{+pot} understood.'

The descriptive 得 *de* is used to describe the result, the degree, or to comment on events that have already happened or that occur frequently. Park and Zhang (2006) claimed that the descriptive 得 *de* complement delimited the situation of the first part. Let us take the transitive non-SV as an example (131). The sentence *Zhangsan sells cars very well* appears to mean that *Zhangsan's act of selling cars or the action of Zhangsan selling cars* culminates in the state of being *very well* in Chinese. The descriptive 得 *de* complement *very well* is predicated on *Zhangsan sells cars*. This is a topic-comment structure. This aligns with Tsao (1987a)'s perspective on the verb-copying structure from a pragmatic standpoint. It is also in line with Liu (1995)'s claim that the clause to the left of 得 *de* provides background information for the main verb on the right.

(131) 張三　　賣 車 賣 得　很好
Zhāngsān mài chē mài de　hěnhǎo
Zhangsan sell car sell DE^{des} very well
'Zhangsan sells car very well' (lit.) 'Zhangsan sells car (and) sells well.'

According to the *Principle of Categorial Type Transparency* (85), semantics serve as the guiding principle that organizes surface syntactic structures into a specific sequence. Therefore, the potential 得 *de* does not require verb duplication because the RV does not describe the event, which is reserved for the descriptive 得 *de*.

Thus far, we have identified some traits of verb-copying structures in terms of event structures. First, Tai (1984) observed that verb-copying prohibited verbs with an instantaneous change of state, and that action could not span a period of time. This means that a -composite event (Moens and Steedman, 1988; Steedman, 2011) cannot undergo a verb-copying structure. Second, note that aspects cannot intervene in the "frozen unit" formed by the first verb and its object (Li and Thompson, 1989), which is an infinite *VP*. The internal event structure of the composite event within this frozen unit then appears to be inaccessible for the descriptive 得 *de*.

Taking these points into consideration, the copied verb appears to serve as a bridge on two levels. Semantically, it allows the descriptive 得 *de* to access the event information, such as who does what to whom, as defined by the first verb and the object. Syntactically, it is a functional root form *VP* that connects morpholexical and syntactical operations.

We will integrate all of this information into the types, and will then provide an example of SV (b) and intransitive verb (c). The semantics resemble those of accusative verbs, but differ in that it culminates in a state in which *Zhangsan runs/jogs fast*, not *Zhangsan runs/jogs slowly*. The correspondence of *p* to *fast′* and *q* to *run′Zh′* capture the LF of the topic-comment structure.

(132) a. Descriptive 得 *de*:= $(VP\backslash\backslash VP)/VP : \lambda p\lambda q.culminate'(pq)$

b.

Zhāngsān	pǎo	de	hěn	kuài
Zhangsan	run	DE^{des}	very	fast
S/VP	VP	$(VP\backslash\backslash VP)/VP$	VP/VP	VP
$: \lambda p.pZh'$	$: \lambda y.run'y$	$: \lambda p\lambda q.culminate'(pq)$	$: \lambda q.very'q$	$: \lambda w.fast'w$
			VP (>)	
			$: \lambda w.very'fast'w$	
		$VP\backslash\backslash VP$ (>)		
		$: \lambda q.culminate'(very'fast'q)$		
	VP (<)			
	$: \lambda y.culminate'(very'fast'(run'y))$			
S (>)				
$: culminate'(very'fast'(run'Zh'))$				

c.

Zhāngsān	pǎo	bù	pǎo	de	kuài
Zhangsan	jog	step	jog	DE^{des}	fast
S/VP	$VP/NP_{\text{bù}}$	$NP_{\text{bù}}$	$VP\backslash_\star VP_{\text{inf}}$	$(VP\backslash\backslash VP)/VP$	VP
$: \lambda p.pZh'$	$: \lambda x\lambda y.jog'_{\circ x}y$	$: step'$	$: \lambda p.p$	$: \lambda p\lambda q.culminate'(pq)$	$: \lambda w.fast'w$
	VP (>)			$VP\backslash\backslash VP$ (>)	
	$: \lambda y.jog'_{\circ step'}y$			$: \lambda q.culminate'(fast'q)$	
			$VP\backslash_\star VP_{\text{inf}}$ (<LEX)		
			$: \lambda p.culminate'(fast'p)$		
	VP (<)				
	$: \lambda y.culminate'(fast'jog'_{\circ step'}y)$				
S (>)					
$: culminate'(fast'jog'_{\circ step'}Zh')$					

4.3.4 Categories for SV_T fronting

According to the analysis by Alsina (1992), the predicate argument structure of a causative construction contains a causer (*ag*), a causee (*pt*) and a caused event, as outlined in (133). In contrast to the analysis of a two-place predicate, Alsina (1992) stated that the combination of a causative morpheme and a predicate yielded a new semantic argument (θ) that was shared by the CAUSE predicate and the embedded predicate PRED. The line in (133) indicates the fusion of the thematic roles.

(133) The argument structure of a three-place causative predicate (adapted from Alsina 1992:521)

$$\text{CAUSE}\langle \text{ag}\ \underbrace{\text{pt}\ \overbrace{\text{PRED}\langle \cdots \theta \cdots \rangle}^{\textit{caused event}}}_{\theta} \rangle$$

Alsina (1992) suggested that there were two variants of the shared thematic role. One variant entails the causer acting on the individual as a "logical-subject" of the embedded predicate in the caused event. The other entails the causer acting on the individual as an affected "logical-object" of the embedded predicate in the caused event.[4]

Following this definition, the complements of 叫 *jiào*, 讓 *ràng*, 使 *shǐ* in Chinese have the characteristics of a logical-subject, whereas the complement of 把 *bǎ* features the second variant, namely the logical-object.[5] Based on the syntactic type of 把 *bǎ* as described by Tse (2013), we applied the dollar convention to capture the phenomena of the retained object, and added the LF to reflect the semantic interpretation as shown below. The LF reads as the matrix predicate *cause′* with three arguments: a causer *y*, a causee *x*, and a caused event *cause′*(*init′*(*pxy*)). In the 讓 *ràng* construction, the causee *x* serves as the logical subject of the embedded predicate; in the 把 *bǎ* construction, the causee *x* functions as the logical object of the embedded predicate.

(134) a. complement as a logical-subject
讓 ràng := $(VP/VP\$)/NP : \lambda x\lambda p\lambda y.cause'(init'(px))xy$

b. complement as a logical-object
把 bǎ:= $(VP/TV\$)/NP : \lambda x\lambda p\lambda y.cause'(init'(pxy))xy$

Below is an example sentence in which *Zhangsan* is the causer and 唱歌 *chànggē* 'sing' is the caused event in the 讓 *ràng* construction.

(135) a.

Zhāngsān	ràng	Lǐsì	chàng-le	gē
Zhangsan	cause	Lisi	sing-ASP	song
S/VP	$(VP/VP\$)/NP$	NP	$(S\backslash NP)/NP_{gē}$	$NP_{gē}$
$: \lambda p.p\,Zh'$	$: \lambda x\lambda p\lambda y.cause'(init'(px))xy$	$: L'$	$: \lambda z\lambda w.sing'_{\circ z}w$	$: song'$
	$VP/VP\$: \lambda p\lambda y.cause'(init'(p\,L'))L'y$		$S\backslash NP : \lambda w.sing'_{\circ song'}w$	
	$VP : \lambda y.cause'(init'(sing'_{\circ song'}L'))L'y$			
$S : cause'(init'(sing'_{\circ song'}L'))L'Zh'$				

b. #

Zhāngsān	ràng	gē	chàng-le
Zhangsan	cause	song	sing-ASP
S/VP	$(VP/VP\$)/NP$	$NP_{gē}$	$(S\backslash NP)/NP_{gē}$
$: \lambda p.p\,Zh'$	$: \lambda x\lambda p\lambda y.cause'(init'(px))xy$	$: song'$	$: \lambda z\lambda w.sing'_{\circ z}w$
	$VP/VP\$: \lambda p\lambda y.cause'(init'(p\,song'))song'y$		
	$VP : \lambda y.cause'(init'(\lambda w.sing'_{\circ song'}w))song'y$		
$S : cause'(init'(\lambda w.sing'_{\circ song'}w))song'Zh'$			

[4] Please note that the logical object defined by Alsina differs from that defined by Huang (1992). Huang (1992) limits the logical object to the retained object structure.

[5] Object control verbs, such as *allow, want, persuade*, etc., are included under this verb classification. We adopted the dichotomy of logical-object versus logical-subject to analyze two causative morphemes in Chinese.

Due to the complement of 讓 *ràng* being a logical subject, when SVT occupies the logical subject position as (135b), this results in the caused event lacking a subject.

We will now consider the 把 *bǎ* construction. Liu (1997) stated that the 把 *bǎ* construction had unmarked passive characteristics, which aligns with the analysis of the logical object. According to Alsina (1992), the logical-object, the complement of 把 *bǎ*, is the patient within the embedded predicate. However, there is no need to propose two different analyses for 把 *bǎ* to accommodate SVs/MWEs and non-MWEs. The same 把 *bǎ* category can retain the idiomatic semantics of SVs and MWEs.This analysis captures the semantic distinctions more accurately than does simply considering the object of 把 *bǎ* to be a patient. Due to the flexibility in CCG, although SVT functions as an argument for both the embedded predicate and for the matrix predicate, their semantic contributions to the two predicates differ. One serves as the causee in the caused event, while the other acts as the event modality of the embedded predicate. This is exemplified by comparing the two *song′*s in the final LF in (136).

(136)

Zhāngsān	bǎ	gē	chàng-le
Zhangsan	cause	song	sing-ASP
S/VP	$(VP/TV\$)/NP$	$NP_{gē}$	$(S\backslash NP)/NP_{gē}$
$: \lambda p.p\,Zh'$	$: \lambda x\lambda p\lambda y.cause'(init'(pxy))xy$	$: song'$	$: \lambda z\lambda w.sing'_{\circ z}w$
	$VP/TV\$: \lambda p\lambda y.cause'(init'(p\,song'\,y))song'\,y$ (>)		
	$VP : \lambda y.cause'(init'(sing'_{\circ song'}y))song'\,y$ (>)		
$S : cause'(init'(sing'_{\circ song'}Zh'))song'Zh'$ (>)			

Because of (134b), the 把 *bǎ* requires the argument to its right to be a *NP*. Therefore, the combination with a non-*NP* SVT is ungrammatical. Compare (a) and (b).

(137) a. 告 gào $:= VP/CLP_{zhuàng}/NP : \lambda x\lambda z\lambda w.report'_{\circ z}xw$

b. *

Zhāngsān	bǎ	yí-zhuàng	gaò	Lǐsì
Zhangsan	cause	one-fault	report	Lisi
S/VP	$(VP/TV\$)/NP$	$CLP_{zhuàng}$	$VP/CLP_{zhuàng}/NP$	NP
$: \lambda p.p\,Zh'$	$: \lambda x\lambda p\lambda y.cause'(init'(pxy))xy$	$: fault'$	$: \lambda x\lambda z\lambda w.report'_{\circ z}xw$	$: L'$
	(***>)			

c.

Zhāngsān	bǎ	Lǐsì	gaò	yí-zhuàng
Zhangsan	cause	Lisi	report	one-fault
S/VP	$(VP/TV\$)/NP$	NP	$VP/CLP_{zhuàng}/NP$	$CLP_{zhuàng}$
$: \lambda p.p\,Zh'$	$: \lambda x\lambda p\lambda y.cause'(init'(pxy))xy$	$: L'$	$: \lambda x\lambda z\lambda w.report'_{\circ z}xw$	$: fault'$
	$VP/TV\$: \lambda p\lambda y.cause'(init'(p\,L'\,y))L'y$ (>)			$VP\backslash(VP/CLP_{zhuàng}) : \lambda q.q\,fault'$ (<T)
			$VP/NP : \lambda g\lambda w.report'_{\circ(\lambda q.q\,fault')}gw$ (<B)	
	$VP : \lambda y.cause'(init'(report'_{\circ(\lambda q.q\,fault')}L'y))L'y$ (>)			
$S : cause'(init'(report'_{\circ(\lambda q.q\,fault')}L'Zh'))L'Zh'$ (>)				

At the end of this section, we will analyze two types of SVT fronting. One involves the object that precedes the subject, forming a topicalized SVT in OSV format (138a), and the other involves the object being positioned between the subject and predicate, SOV, commonly referred to as a preposed SVT (138b).

(138) a. 歌 張三 唱 了
gē Zhāngsān chàng le
song Zhangsan sing ASP
'Song, Zhangsan sang.'

b. 張三 歌 唱 了
Zhāngsān gē chàng le
Zhangsan song sing ASP
'Song, Zhangsan sang.'

For SVO languages, both object-fronting structures utilize the combinator **T** to achieve the same resolution, as noted by (Özge and Bozşahin, 2010). According to the definition of Schönfinkel's combinator **T** compiled by Bozşahin (2012), the semantics of combinators **T** are as in (139a); thus, the function b and its argument a, combine through this **T** to form $ba = \mathbf{T}ab$, as shown in (139b).

(139) a. $\mathbf{T} \stackrel{\text{def}}{=} \lambda x \lambda y.yx$

b. $Y : a \quad X/Y : b \quad \rightarrow \quad X : \mathbf{T}ab$ (**T**)

In (140), if α appears to the right of β, they can combine through forward application to yield $X : ba$. Thus, this derivation essentially represents a movement of α to the left of β. According to (139), when $ba = \mathbf{T}ab$, irrespective of whether α appears to the left or the right of β, equivalent semantics can be generated. The most common linguistic application is when b is a verb and a is its object. (140a) corresponds to the leftward displacement of the object in SVO languages, while (140b) pertains to the rightward displacement of the object in SOV languages (Özge and Bozşahin, 2010). Due to this asymmetry of juxtaposition, $\mathbf{T}_\times$ distinct from the order preserving type-raising **T**.

(140) a. $Y \quad \rightarrow \quad X/(X/Y)$ ($>\mathbf{T}_\times$)

$$\dfrac{\dfrac{\dfrac{\alpha}{Y : a}}{X/(X/Y) : \lambda x.ax}\,{>\mathbf{T}_\times} \quad \dfrac{\beta}{X/Y : b}}{X : ab}\,{>}$$

b. $Y \quad \rightarrow \quad X\backslash(X\backslash Y)$ ($<\mathbf{T}_\times$)

$$\dfrac{\dfrac{\beta}{X\backslash Y : b} \quad \dfrac{\dfrac{\alpha}{Y : a}}{X\backslash(X\backslash Y) : \lambda x.ax}\,{<\mathbf{T}_\times}}{X : ab}\,{<}$$

Based on Bozşahin (prep) and the definition of $>\mathbf{T}_{\times}$, the types and derivations of (138a) and (138b) can be assumed to be (141) and (142), respectively. Paul (2002) analyzed a topicalized object as an external topic and a preposed object as an internal topic. Our types are in accordance with this. The type of a topicalized object applies to a function of which the external argument has been saturated, whereas a preposed object applies to a function that first needs to combine with its internal argument.

(141) a. topicalized object 歌 $g\bar{e}$:= $S_{\text{top}}/(S/NP_{g\bar{e}})$: $\lambda p.p\,song' \wedge topic'\,song'$

b.

gē	Zhāngsān	chàng	le
song	Zhangsan	sing	ASP
$S_{\text{top}}/(S/NP_{g\bar{e}})$	NP	$VP/NP_{g\bar{e}}$	$(S\backslash NP)\$i\backslash\backslash VP\$i$
	$S/(S\backslash NP)$ (>T)	$(S\backslash NP)/NP_{g\bar{e}}$ (<LEX)	
	$S/NP_{g\bar{e}}$ (>B)		
$S_{\text{top}} : le'(sing'_{\circ song' \wedge topic' song'} Zh')$ (>)			

(142) a. preposed object 歌 $g\bar{e}$:= $(S_{\text{top}}\backslash NP)/((S\backslash NP)/NP_{\text{def, }g\bar{e}})$: $\lambda p.p\,def'\,song'$

b.

Zhāngsān	gē	chàng	le
Zhangsan	song	sing	ASP
NP	$(S_{\text{top}}\backslash NP)/((S\backslash NP)/NP_{\text{def, }g\bar{e}})$	$VP/NP_{g\bar{e}}$	$(S\backslash NP)\$i\backslash\backslash VP\$i$
		$(S\backslash NP)/NP_{g\bar{e}}$ (<LEX)	
	$S_{\text{top}}\backslash NP$ (>)		
$S_{\text{top}} : le'(sing'_{\circ def' song'} Zh')$ (>)			

The 把 *bǎ* construction and topicalization are among the most challenging separation structures in SVs (Li and Thompson, 1989). As a result, not all SVs are amenable to such separation. The ability of an SV to be separated by these two structures may also be influenced by other semantic factors, including the information structure, discourse, and pragmatics (Leuckert, 2017). Therefore, further research and discussion are still needed. The next chapter will examine one type of restriction.

4.4 Conclusion

In this chapter, we outlined the theoretical foundation of CCG and established categories for SVs as MWEs, as well as for the interpolation sentence patterns discussed in the literature. Even when SVs are separated phonologically, their unitary semantics are preserved due to sophisticated yet consistent categorial lexical assumptions. We also showed how categories might combine with other language components. The combinational process of each step, as well as the semantics of each constituent, are the transparent and verifiable outcomes of logical algorithms. The problems with SVs that could not be resolved using HPSG or GB theories are therefore adequately explained.

CHAPTER 5

EVENTUALITIES AND THE SEPARABILITY OF SEPARABLE VERBS

Based on the analyses in the previous chapter, it is evident that the syntactic and semantic constraints of SVH and SVT represent the main difference between SVs and other structures formed with V-O phrases. However, we observed that semantics and event structures appeared to cause syntactic heterogeneity among SVs. In this chapter, we will conduct a preliminary empirical corpus-based study based on these observations. Finally, we will revise the categories outlined in the previous section according to the findings in this chapter.

5.1 Eventualities and Separability

To the best of our knowledge, none of the research in the literature has examined the relationship between SVs and event types. However, based on Lin (2007)'s study, we can indirectly observe that SVs tend to appear in specific event types.

In the Vendlerian (1957) and post-Vendlerian (Dowty, 1982; Moens and Steedman, 1988) landscape of event types, a five-way classification of events as states, activities, accomplishments, achievements and semelfactives has been proposed. Teng (1972) classified Chinese verbs based on Case Grammar and transitivity into three groups: action verbs, process verbs (Vps), and state verbs (Vs). Teng (1985) posited that this classification overlapped with Vendler's classification. Teng's action verbs encompassed Vendler's activity and accomplishment, while Vps were similar to achievement.

Lin (2007) categorized SVs in the Sinica Corpus (Huang and Chen, 1998) based on Teng's tripartite system. The proportions of action verbs, Vps, and Vs were 65%, 26%, and 9%, respectively. According to Vendler's framework, approximately 60% of the SVs in the Sinica Corpus are composed of actions and accomplishments, 30% are achievements, and 10% are states.

According to the criteria provided by Teng, we note that event types may affect the separability of SVs. Specifically, Vps, which correspond to achievement, are linked to more constrained separable structures. Examples include 斷氣 *duànqì* 'to stop breathing' and 畢業 *bìyè* 'graduate'. Conversely, action verbs, representing action events and accomplishment events, are observed in a broader range of separable structures.

(143) a. * 張三　　斷　著　氣　　Continuous aspect
Zhāngsān duàn zhe qì
Zhangsan cut ASP air
For 'Zhangsan is stopping breathing.'

b. * 張三　　斷　起　氣 來　　Inchoative aspect
Zhāngsān duàn qǐ qì lái
Zhangsan cut ASP air ASP
For 'Zhangsan began to stop breathing.'

c. * 張三　　斷　斷　氣　　AAB form
Zhāngsān duàn duàn qì
Zhangsan cut cut air
For 'Zhangsan tried to stop breathing.'

d. * 張三　　斷　氣 斷　得　很快　　Verb-copying construction
Zhāngsān duàn qì duàn de hěnkuài
Zhangsan cut air cut DE^{des} very quickly
For 'Zhangsan quickly stopped breathing.'

The majority of the action verbs, such as 走路 *zǒulù* 'walk', 游泳 *yóuyǒng* 'swim', and 讀書 *dúshū* 'study', exhibit compatibility with the splitting patterns exemplified in (143). It is crucial to emphasize the significant diversity that is present among SVs. The association between verb types and their separability outlined herein should be regarded not as an absolute rule, but rather as a general tendency that has been preliminarily identified.

Pustejovsky (1991) argued that syntax must be aligned with a predicate's internal event structure. He suggested that a predicate's argument structure or adverbial modification could be systematically predicted and explained by its event structure. This perspective posits that, when speakers use grammatical elements in addition to the predicate, these elements should be in accordance with the predicate's event structure, which pertains to the predicate's internal temporal composition. Event structures typically correlate with sequences of an initial point, internal subperiods, and a final point. We inferred that the incompatibility observed in (143) was due to the aspects pointing toward the predicate's internal subperiod, in which verbs such as 斷氣 *duànqì* 'stop breathing' are lacking. Accordingly, we propose that the temporal references produced by grammatical units within a sentence should correspond to the predicate's internal temporal structure.

5.1.1 The Semantic Motivations for Separation

Given that the syntactic elements associated with temporal references in Chinese are situated immediately after the predicate and before the object, thus causing an apparent division in the case of SVs, we suggest that the syntactic separation observed in SVs may be connected to the underlying event structure. To lay the groundwork for our hypothesis, we will first summarize the grammatical interactions between non-SV verbs and event structures from both verbal and nominal perspectives. Following this overview, we will present our research hypotheses derived from these discussions.

Verbal Perspectives of Separation Motivation

Based on their research, Siewierska et al. (2010) deduced that aspect markers and resultative verb complements (RVCs) played crucial roles in SVs because they were positioned after verbal heads to modify telicity, progression, and the like. Despite Chinese not utilizing overt morphemes to denote the time of a situation relative to the time of an utterance—known as an absolute tense (Comrie, 1976)—time remains a critical dimension for evaluating conditional truths. The absence of morphological tense markers in Chinese does not preclude the use of other linguistic elements to indicate a temporal reference, as highlighted by Comrie (1976); Wu (2002); Lin (2006); Sun and Grisot (2020). Sun and Grisot (2020) elaborated on the linguistic tools that were previously identified for marking temporal references in Chinese, including RVCs, negators 不 *bù,* 沒 *méi*, aspect markers 了 *le,* 著 *zhe,* 過 *guò,* 在 *zài*, temporal adverbials, temporal adverbs such as 經常 *jīngcháng* 'often', 已經 *yǐjīng* 'already', and lexical aspects or event types. The authors further asserted that temporal locations could also be determined by information at the discourse level via anaphorical devices, in addition to sentential elements.

Teng (1985) explicitly stated that, in Chinese, the function of aspect markers was influenced by the event type of the predicate.[1] For example, he posited that the perfective aspect marker 了 *le* was considered to be ungrammatical when used with a combination of a verb and a bare nominal.[2] Teng further argued that combinations such as (144a), which represent activities, required a quantification, as seen in (144b), to constitute a telic event that is compatible with the perfective 了 *le*.

(144) a. 張三　　唱　　了　歌
Zhāngsān chàng le　gē
Zhangsan sing　ASP song
'Zhangsan sang.'

b. 張三　　唱　　了　一首　歌
Zhāngsān chàng le　yìshǒu gē
Zhangsan sing　ASP one　song
'Zhangsan sang a song.'

Teng's argument was further extended in Smith (1994). Here, we summarize the relationships identified by Smith concerning several event types and Chinese aspects. First, the progressive aspect marker 在 *zài*, the perfective aspect 了 *le*, and the tentative duplication form (AAB) are applicable exclusively to non-state events. Second, RVCs are incompatible with atelic events. Third, the verb-copying construction, which is typically associated with activities as discussed by Tai (1999), incorporates a duration adverbial placed after the duplicated verb. Fourth, the imperfective aspects 在 *zài,* 著 *zhe* are suitable for events that possess a duration characteristic, such as activities, accomplishments, and states (cf. Klein et al. (2000)).[3]

[1] Although the term "situations" was used in his work, we have adopted the term "event types" for consistency.

[2] It is important to note that sentences such as those exemplified in (144a) might reflect discourse incompleteness, rather than outright ungrammaticality. Such sentences become complete and coherent when appropriately expanded; for example, *His voice attracts everyone's attention*. Hence, we refrain from labeling (144a) as being ungrammatical.

[3] The aspect-event relationship elaborated on by Smith is not debated here; instead, we aim to provide a

Nominal Perspectives of Separation Motivation

The current consensus in traditional linguistics is that an event is a property of a sentence, not of a single verb.[4] Comrie (1976:45) explicitly stated that event types were not described "by the verb together with its arguments (subjects and objects)." As a key feature of eventuality, many scholars believe that telicity usually concerns the internal argument of the verb. Tenny (1989) shared this view, and suggested that direct internal arguments delimited the event.

English differentiates between singular and plural forms, as well as between count and mass nouns. It is acknowledged that, in English, a verb with a definite object *the house* or an indefinite quantified object *two houses* yields a telic reading. For example, Dowty (1979) suggested that the noun form of the direct object could change the event type. He concluded that, when the direct objects of accomplishments and achievements were indefinite plural NPs or mass NPs, these VPs became activity events (Dowty, 1979:62-63).

Although Chinese nouns do not have similar distinctions, Chinese often uses overt generic bare nouns to indicate non-referential indefiniteness (Tieu, 2008). The examples below show that bare nouns and quantified nouns have different compatibility restrictions with *for*-adverbials.

(145) a. * 張三 蓋 兩棟 房子 蓋 了 一年
Zhāngsān gài liǎngdòng fángzi gài le yìnián
Zhangsan build two house build ASP one year
Lit. 'Zhangsan built two houses for one year.'

b. 張三 蓋 房子 蓋 了 一年
Zhāngsān gài fángzi gài le yìnián
Zhangsan build house build ASP one year
'Zhangsan built a house for one year.'

Liu (2003, 2006) observed that, unlike English, definite objects in Chinese did not contribute to telicity, but indefinite quantified objects did so (146a). In addition, the author mentioned that telicity could be added to an atelic event introduced by a definite NP via an indefinite adjunct, such as the verb 一 *yī* verb 'verb a little' (146b).

(146) a. 張三 在十分鐘內 看了 一/*那 本 書
Zhāngsān zài shífēn zhōng nèi kànle sān/*nà běn shū
Zhangsan in ten minutes read one/*that CL book
'Zhangsan read one book/*that book in ten minutes.'

b. 張三 在十分鐘內 看了一看 那 本 書
Zhāngsān zài shífēn zhōng nèi kànle yíkàn nà běn shū
Zhangsan in ten minutes read-one-read that CL book
'Zhangsan took a look at that book in ten minutes.'

synopsis of relevant discussions found in the literature.

[4] CG takes the opposite view; see Bozşahin (prep).

Finally, it can be seen that the 把 *bǎ* construction in SVT fronting patterns is also sensitive to eventuality. In the extensive study by Yong (1993), the author suggested that 把 *bǎ* was completely constrained by event types; he then concluded that 把 *bǎ* could only appear in telic events.[5] Liu (1997) further stated that, in addition to event types, 把 *bǎ* was constrained by aspects.

(147) a. 張三　　把 汽車 賣　*(了)
Zhāngsān bǎ qìchē mài le
Zhangsan BA car　sell ASP
'Zhangsan sold the car.'

b. 張三　　把 汽車 賣　*(掉)
Zhāngsān bǎ qìchē mài diào
Zhangsan BA car　sell RV
'Zhangsan sold the car.'

5.1.2 The Research Questions for the Corpus Study

In the previous section, we examined the connections between aspect and events, as well as among (in)definite objects, quantified NPs, and events, from the perspectives of both the predicate and the object. In Chinese, apart from the progressive aspect 在 *zài* being pre-verbal, all other aspect markers and RVCs are closely attached to the right-hand side of the verb root. Conversely, Chinese nominal modifiers, including adjectives, relative clauses, and quantification, all appear to the left of the noun. The order of these modifications naturally applies to SVs as well. Therefore, we infer that the separation of the two components in V-O phrases or SVs may be related to the event structure.

Previous research related to SVs has not investigated this perspective. However, the connections between syntactic phenomena and the event structure have been discussed extensively in the literature. This phenomenon is not unique to Chinese, or specific to SVs. In the previous section, we saw that prior research also found discussions supporting this argument in non-SV verbs. Therefore, we designed a small-scale quantitative study to explore the relationship between event types and separable verbs. To further validate this relationship, we investigated the following properties:

1. What role does an SV's event diversity play in syntactic flexibility? We hypothesized that the greater the number of event types in which an SV could appear, the more diverse the syntactic environments in which they could occur.

2. What relationship does each event type have to the SVs' syntactic flexibility? We hypothesized that event types could influence the diversity of syntactic environments in which an SV could occur.

[5] Although the author used the term "bounded event" in his paper, Yong equated boundedness with telicity. For consistency in terminology, we use the term telic event.

5.2 Event Structure of SVs

Given the various definitions and classifications of events in the literature, it is necessary to explain the definition of events and the criteria for their identification that were adopted in this study before introducing the research methods and the data.

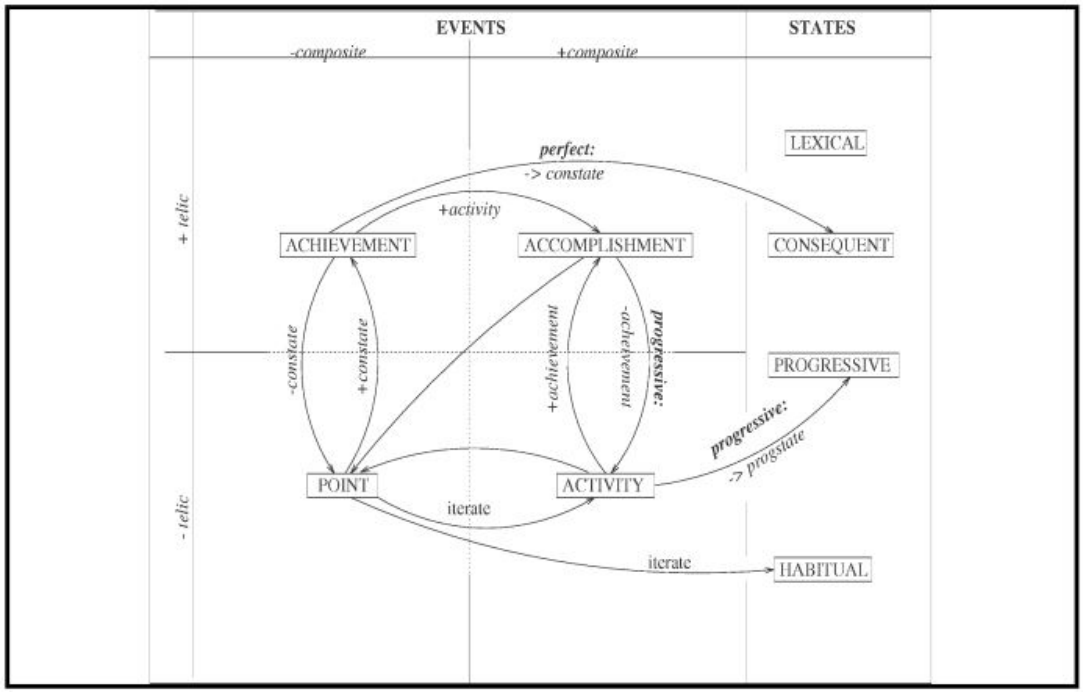


Figure 5.1: The aspectual coercion scheme (Steedman, 2011) adapted from Moens and Steedman (1988)

In this study, we excluded state and focused solely on achievement, accomplishment, point, and activity because only dynamic events are embedded in event structures. In addition, given that Chinese does not have primitive accomplishment verbs (Tai, 1984; Lin, 2003), lexical verbs encompass the other three dynamic events can theoretically shift to state with corresponding derivation methods, as the arrows moving from event to state show in Figure 5.1. This can be illustrated by the following examples.

(148) a. 老師 很 生氣
lǎoshī hěn shēngqì
teacher very angry
'The teacher is very angry.'

b. 老師 生 著 氣
lǎoshī shēng zhe qì
teacher generate ASP anger
'The teacher is angry.'

c. 老師 生 了 好大 的 氣
lǎoshī shēng le hǎodà de qì
teacher generate ASP great ASSOC anger
'The teacher got very angry.'

A primitive state SV 生氣 *shēngqì* 'be angry' with an adverb of degree (148a) represents a typical state. Although (148b) may appear to present a state, we argue that it actually has a dynamic event structure, which is why the interruption occurs.

The basic function of 著 *zhe* in simple sentences "presents internal stages of durative events as static " (Smith, 1997), and it can only occur with Carlson's (1977) stage-level predicates (Yeh, 1993) that denote transitory properties that are temporal in nature.[6] This echos Smith's definition of 著 *zhe*, since the predicate that it modifies is more similar to events. Therefore, the status denoted by stage-level Vs, such as 傷心 *shāngxīn* 'be sad', and 生病 *shēngbìng* 'be sick', is more closely related to temporal-bounded situations that only arise after certain events or culminations take place. Instead, the stable properties predicated by Carlson's individual-level verbs, such as 是 *shì* 'be', 姓 *xìng* 'be surnamed', and 知道 *zhīdào* 'know', can hold permanently or can constitute who an individual is. As a result, we can infer that the dynamic event denotation can (148b) only be established after a semantic bounded event that has been realized or completed is signaled by 了 *le* in the previous example (148c).

Based on the examples and the discussion above, it is worth mentioning the intrinsic event types here. Although a bare verb may associate with an inherent eventuality, it has often been discussed that the event type is a property of a phrase or sentence; therefore a predicate's event type will be recursively defined in the syntax (Pustejovsky, 1991), and can easily change from one category to another via aspectual shift or coercion (Bach, 1986; Verkuyl, 1989; Moens and Steedman, 1988; Smith, 1997).

The effect of aspectual shift or coercion is more evident in the case of Chinese SVs. While some verbs in Chinese, which were typically classified as Vps by Teng (1972), can denote an instantaneous change of state by themselves, such as 死 *sǐ* 'die', 破 *pò* 'be broken', and 病 *bìng* 'be sick', Tai (1984); Lin (2003) claimed that achievements and accomplishments were not primitive verbal types in Chinese, and must be derived from RVs to attain the goals of the verbs; for example, 到 *dào* 'arrive', 見 *jiàn* 'see', and 會 *huì* 'acquire.' Although whether Chinese has primitive achievement or accomplishment verbal types is not the focus of this study, it is safe to say that these two events can be obtained through syntactic processes.

In fact, the RVCs and other expressions that have been widely acknowledged to cause event shifts, such as duration, count nouns, aspect markers, and the like must syntactically separate an SV, as shown in (148). Based on the linguistic items that separate SVs, a split SV may then may attain four eventualities at most, regardless of the eventuality it that it encodes in unsplit usages. In the following exploration, we report on the evaluation of separation with this in mind.

5.2.1 Diagnostic Tests of Event Types

The four event types that we examined covered two telic events, achievement and accomplishment, and two atelic events, point and activity. Both syntactic and semantic tests were applied to determine the classification of eventualities. We will begin with telic event types.

[6] The intensifier construction 著 *zhe* ... 呢 *ne* is beyond the scope of our discussion.

Achievement [+telic -composite]

The major semantic feature of achievement is the instantaneous change without prior preparation. In brief, they transition to a new state once the event occurs. This is the main criterion that we applied to test and classify SVs. We identified some primitive achievement verbs that denoted a punctual event without being accompanied by additional linguistic units, such as, 畢業 *bìyè* 'graduate' and 得分 *défēn* 'score.' These lexical achievement verbs are similar to Teng's (1972) Vps, which require their subjects to have the patient case. Nevertheless, it appeared that an achievement event did not always require a patient subject, considering the subjects in the typical examples listed by Smith (1997), such as *break a cup, tear a paper, explode a bomb*. Hence, we did not aim to determine whether a verb was an achievement event based on the case of its subject.

Chinese achievement events can be constructed in a variety of ways. It has been acknowledged that achievement and accomplishment events in Chinese can be derived through a combination of a verb and an RV, such as 到 *dào* 'arrive,' 見 *jiàn* 'see,' 破 *pò* 'be broken,' and so on. According to the definitions used in the literature, an RV can create an RVC when it is preceded by another verb for which an RV can describe the result or process. Due to the overwhelming number of adjectives that can be used as RVs, we only address Li and Thompson's (1989) four main types of RVCs: cause (149a), achievement (149b), direction (149c), and phase (149d). We will first review each of these four RVC types briefly before discussing which ones will be most useful for determining an achievement event.

(149) a. 老師 開 開 了 門
lǎoshī kāi kāi le mén
teacher open open ASP door
'The teacher opens the door.'

b. 老師 買 到 了 手機
lǎoshī mǎi dào le shǒujī
teacher buy arrive ASP cellphone
'The teacher managed to buy the cellphone.'

c. 老師 寄 出 了 帽子
lǎoshī jì chū le màozi
teacher send out ASP hat
'The teacher sent out the hat.'

d. 老師 改 完 了 作業
lǎoshī gǎi wán le zuòyè
teacher correct finish ASP homework
'The teacher finished correcting homework.'

Despite the fact that Li and Thompson (1989) did not provide details about cause and achievement RVCs, cause RVCs appear to parallel resultative constructions in English based on Li and Thompson's examples. The object affected by the main verb in a Chinese RVC has the status that the RV denotes. Thus, for (149a), *the door is open*

must be true. However, this deduction is not necessarily true for the other types of RVCs. Achievement RVCs are an obvious example. 到 *dào* 'arrive, reach, succeed' in (149b) refers to the end state of the process of purchasing. The teacher may have exerted effort and energy to buy the latest cellphone, and ultimately achieved their goal.

The directional RVCs mentioned in Li and Thompson consist of a motion verb followed by a direction verb (DV). There are two subclasses of DVs; the eight members of the first subclass are: 上 *shàng* 'ascend, up', 下 *xià* 'descend, down', 進 *jìn* 'enter, into', 出 *chū* 'exit, out', 起 *qǐ* 'rise, up', 回 *huí* 'return, back', 過 *guò* 'cross, over', and 開 *kāi* 'open, apart'. We labeled this class of verbs as DVs because they are true verbs that can be used independently. The second subtype is speaker-oriented DVs (SODVs). We have 來*lái* 'come' and 去*q ù* 'go' depending on whether the movement is directed toward or away from the speaker. The three types of directional RVCs can be formed as follows:

Motion Verb + DV

(150) 老師 寄 出 了 帽子
lǎoshī jì chū le màozi
teacher send out ASP hat
'The teacher sent out the hat.'

Motion Verb + SODV

(151) 老師 寄 了 帽子 去
lǎoshī jì le màozi qù
teacher send ASP hat away
'The teacher sent the hat in a direction away from the speaker.'

Motion Verb + DV + SODV

(152) 老師 寄 了 帽子 出 去
lǎoshī jì le màozi chū qù
teacher send ASP hat out away
'The teacher sent out the hat in a direction away from the speaker.'

According to the definition provided by Li and Thompson, phase RVCs, the final category of RVCs, do not express the result of an action in the same way as the resultative construction in English *pound the metal flat, wipe the table clean*, and so on. Instead, they either characterize the type of the action of the first verb (V1), or the phase or degree to which the action is carried out. The typical phase RVs include 完 *wán* 'finish', 著 *zháo* 'be on target', and 到 *dào* 'arrive, reach, succeed'. According to Lin (2004), there are some parallels between the prepositions that are used in the construction of English verb particles and those in Chinese phase RVs, as they both serve to delimit the event and do not contribute significantly to the semantics. Since phase RVCs usually imply the completion of an event, they naturally turn a proposition into a telic.

Activity		Achievement	Achievement Accomplishment
English	**Chinese**	**English**	**Chinese**
to look for	找 *zhǎo*	to find	找-到 *zhǎo-dào*
to look (at)	看 *kàn*	to see	看-到 *kàn-dào*
to listen	聽 *tīng*	to hear	聽-到 *tīng-dào*

Unlike English, achievement and accomplishment are derived via RVCs in Chinese, as shown below.

Note the event types of RVCs in the table above. Depending on the semantic and syntactic diagnostic tests that are being used, researchers may disagree regarding whether the Chinese equivalents of these English monomorphemic achievement verbs indicate achievement or accomplishment. For example, Tai (1984); Smith (1997) considered these phase RVCs to be accomplishment, whereas Lin (2004); Chang (2001) regarded them as achievement. This shows that it is not always easy to tell the difference between accomplishment and achievement. Parsons (1990) posited that accomplishment events and achievements were not fundamentally dissimilar. It is commonly acknowledged that the difference between achievement and accomplishment is that achievement lacks a developing phase prior to the culmination. Based on this argument, the incompatibility with progressives is used to identify an achievement event in Chinese He (1992); Chang (2001). Similar to activity (153a), accomplishment (153b) can be used in the progressive tense, whereas achievement (153c) cannot.

(153) a. I am drawing a picture.

b. I am looking for my dog.

c. * I am finding my dog.

Apart from a few lexical achievement verbs, achievement and accomplishment are primarily expressed using RVCs in Chinese. We will mainly apply semantic criteria to differentiate between achievement and accomplishment in this study because syntactic tests alone appear to encounter several issues in differentiating between these options. We will illustrate this via two syntactic tests.

First, there are debates regarding the unacceptability of the progressive test, which has frequently been used for determining achievement, because it has been claimed that the progressive tense is incompatible with a punctual event such as achievement. However, a few of the achievement constellations below are grammatical in colloquial speech for English native speakers.

(154) a. Mary is winning the game.

b. John is reaching the top.

Smith (1997) thought that the progressive tense could be used in this context because it relates to the initial phase of the event that give rises to the change of state rather

than to the actual change of state. Nevertheless, achievement would be a composite event if there were a preliminary stage. Lin (2004) assumed that the validity of the progressive test varied according to the verb as a solution to the ambiguity. However, this shows that the progressive test for achievement appears to be non-falsifiable.

Second, Smith (1997) claimed that, because achievement is a punctual event, the durative word 花 *huā* 'spend, take' cannot be used to convey achievement. We present a revised version of her examples in the following sections. For ease of reading, we highlighted the RVC, added Chinese characters, and translated the entire line into English.

(155) a. * 餓-死 花 了 他 三 個 月
è-sǐ huā le tā sān ge yuè
die-of-hunger take ASP he three CL month
For 'It took three months to starve him to death.'

b. * 睡-著 花 了 孩子們 五 分 鐘
shuì-zháo huā le háizimen wǔ fēn zhōng
fall-asleep take ASP children five CL minute
For 'It took five minutes for the children to fall asleep.'

However, the durative verb 花 *huā* 'spend, take' may not be what causes these sentences to be grammatically incorrect, as these sentences are ungrammatical without 花 *huā*. Due to the absence of full sentence translations of (155) in (Smith, 1997), the ambiguity of 餓死 *èsǐ* cannot be resolved based on her example (155a), as 餓 *è* has a causative reading. Compare the two sentences below.

(156) a. 他 餓-死 了
tā è-sǐ le
he die-of-hunger ASP
'He is starving.'

b. 餓-死 他 了
è-sǐ tā le
die-of-hunger he ASP
'He was starved. (Someone forcefully kept him from eating.)'

Of these two sentences, only (156b) is compatible with 花 *huā* 'spend, take' in (157b). According to a flexible definition of Lu et al. (2019) inspired by Travis (2010), an eventuality is an accomplishment if the development process prior to the culmination is syntactically accessible; it is otherwise only an achievement if the culmination is accessible. According to the test results for 花 *huā*, 餓死 *èsǐ* in (156a) would be an achievement RVC for which the period of being hungry prior to the culmination of the metaphorical death is inaccessible. By contrast, the causative 餓死 *èsǐ* in (156b) would be a cause RVC or a phase RVC for which the preparatory stage prior to the culmination would be present, and could thus to be measured by 花 *huā* since it naturally takes time to starve someone to death (or close to death). Hence, we may conclude that (157a) is achievement, and (157b-c) are accomplishment.

(157) a. * 他 花 了 三 個 月 餓-死
tā huā le sān ge yuè è-sǐ
he take ASP three CL month die-of-hunger
For 'It took three months to for him to starve.'

b. 花 了 三 個 月 餓-死 他
huā le sān ge yuè è-sǐ tā
take ASP three CL month die-of-hunger he
'It took three months to starve him to death.'

c. 孩子們 花 了 五 分 鐘 才 睡-著
háizimen huā le wǔ fēn zhōng cái shuì-zháo
children take ASP five CL minute then fall-asleep
'It took five minutes for the children to fall asleep.'

The problem with using 花 *huā* 'spend, take' to determine achievement is that achievement verbs could appear to be compatible with 花 *huā* in sentences. We illustrate this via two RVCs, 找到 *zhǎodào* 'find' and 聽到 *tīngdào* 'hear,' which were considered to be achievement by Lin (2004) and Chang (2001).

(158) a. 他 花了 五分鐘 才 找 到 這本書
tā huāle wǔfēnzhōng cái zhǎo dào zhèběnshū
he spent five minutes then find arrive this book
'It only took him five minutes to find the book.'

b. 他 花了 五分鐘 才 聽 到 聲音
tā huāle wǔfēnzhōng cái tīng dào shēngyīn
he spent five minutes then listen arrive sound
'It took him five minutes to hear the sound.'

We claim that these verbs only superficially appear with 花 *huā*, as they indicate accomplishment events. In the first example, the action of *looking for* (找 *zhǎo*) may be repeated several times within the five minutes until he *finds* (找到 *zhǎodào*). Similarly, one needs to make several attempts to *listen* (聽 *tīng*) in a conference call with a bad internet connection until the moment at which one can finally *hear* (聽到 *tīngdào*) the sound. The shift of achievement verbs to accomplishment in sentences (158) could have been because most of the achievement and accomplishment verb constellations in Chinese are derived through a sequence of two verbs, with the second verb (hereafter V2) indicating the result, direction, or phase of the *action* denoted by the V1. RVCs presumably generate ambiguity between achievement and accomplishment in Chinese because a complex event compound would be available for the speakers.

Adopting the definition provided by Collins (1997), Lin (2004) regarded Chinese RVCs to be instances of serial verb constructions. Such an analysis can reasonably explain why an achievement RVC can switch to an accomplishment, and can therefore appear with a durative verb as in (158). The two verbs in an RVC resemble a freely combined VP because the meanings of the two verbs synthetically combine in the derivation in such a way that the eventualities denoted by the two verbs in an RVC

could be accessible to the syntax. In an RVC, V1 is an action or motion verb associating with activity; because V2 functions to specify the result or phase of the action expressed by V1, it must introduce the telicity of an action. Whether an RVC as a whole is an achievement or an accomplishment theoretically depends on the speaker's perspective. If one decomposes the two verbs in an RVC and views them as being isolated, the RVC could be an accomplishment because two eventualities are present for the speaker, as in 找到 *zhǎodào* 'find' and 聽到 *tīngdào* 'hear' in (158). The speaker shows how an action leads to the culmination. By contrast, the action expressed by the V1 may be trivial in terms of the achievement because it is the result of the state transmission that the speaker intends to describe. The action that V1 denotes could be performed consciously or subconsciously. For example, 想到 *xiǎngdào* composed of 想 *xiǎng* 'think,' and 到 *dào* 'arrive, reach, succeed' can have the sense of *having an epiphany* to denote an intuitive grasp of reality, although the sudden realization may not necessarily be the result of thinking or a deep consideration that is indicated by the V1 想 *xiǎng* in Chinese.

Due to the ambiguity of RVCs, it does not appear to be feasible to distinguish achievement from accomplishment based on purely syntactic diagnostic tests. Since the primary concerns in this research are not the diagnostic tests to differentiate between achievement and accomplishment, we can simply discuss a few brief issues in the use of purely grammatical tests to differentiate between achievement and accomplishment. In addition, because the semantics of RVs are so varied and intricate, we will only introduce a few types of RVCs in Chinese. We posit that there may not be a one-to-one correspondence among RVs with various meanings and eventualities. Therefore, together with the syntactic tests, the primary diagnostic test used in this study will be the semantic distinction between achievement and accomplishment; specifically whether an RVC contains a preparatory process. Smith (1997) integrated this semantic property to identify accomplishment, and claimed:

> For every perfective Accomplishment sentence with a completive RVC, an associated imperfective sentence can be constructed. Smith 1997:289

For example, the accomplishment sentence (159a) with a completive RV 完 *wán* 'finish' will entail an imperfective sentence (159b).

(159) a. 他 看 完 了 這本書
tā kàn wán le zhèběnshū
he read finish ASP this book
'He finished reading the book.'

b. 他 在 看 這本書
tā zài kàn zhèběnshū
he PROG read this book
'He was reading the book.'

The semantic-based test proposed by Smith (1997) provided insights. We needed to adapt it to the semantic and syntactic properties of achievement in Chinese, since

this test was designed for accomplishment. We have observed that Chinese has numerous RVs, which are not limited to completive RVs, to create accomplishment and achievement in our previous discussions. The crux of the matter is how to distinguish achievement from accomplishment; in other words, how to verify that an event does or does not contain a development portion is the essence of the issue. Because a completive RV implies a state of completion brought about by an action, completive RVs need to be excluded in order to test achievement, as in 完 *wán;* 好 *hǎo* 'finish', 成 *chéng* 'turn into'. However, it is not mandatory for non-completive RVs to have a preparatory stage prior to culmination. These include 著 *zháo* 'be on target', 到 *dào* 'arrive, reach, succeed', and 見 *jiàn* 'perceive,' to name a few. An imperfective test for achievement could be modified as shown below:

> For every perfective Achievement sentence with a **non**-completive RVC,
> an associated imperfective sentence **cannot** be constructed.

We can then differentiate between these two eventualities by applying the entailment tests. Consider 看到 *kàndào* 'see' as an example. When a flash of lightning suddenly illuminates the sky, someone saw the sudden moment without intentionally waiting and watching for the lightning. This is an achievement event. However, (160a) does not entail (160b). Of course, this does not exclude the possibility that (160a) is an accomplishment when one has been watching continuously for lightning in the sky. However, in this case, the entailment relationship holds between these two sentences.

(160) a. 他 看 到 了 閃電
tā kàn dào le shǎndiàn
he see arrive ASP lightning
'He saw lightning.'

b. 他 在 看 閃電
tā zài kàn shǎndiàn
he PROG see lightning
'He was watching the lightning.'

Unlike completive RVCs, a non-completive RVC can be compatible with having imperfective sentences as its complement (161a). It can be inferred that the action of 看 *kàn* 'watch, see' might extend for a short time (161b).

(161) a. 他 看 到 了 大地 在 冒著熱氣
tā kàn dào le dàdì zài màozhe rèqì
he see arrive ASP ground PROG steaming
'He saw the ground steaming.'

b. 他 在 看 大地 在 冒著熱氣
tā zài kàn dàdì zài màozhe rèqì
he PROG see ground PROG steaming
'He was watching the ground steaming.'

Accomplishment [+telic +composite]

We would first like to reiterate that the focus of this research on testing methods for event structures is twofold. We have observed that the separability of SVs is not only related to the types of SV_H and SV_T, but also appears to be influenced by the event structure of an SV. Therefore, our emphasis is not on determining whether a particular sentence is an A event or a B event, but rather on identifying the types of events in which an SV can occur. These two questions impacted on the research methodology, as the former involved discerning the type of event in any given random sentence. In most cases, a sentence can only have one event type. However, the latter concerns ways of identifying reliable diagnostic tests that could validate a specific event. We then applied these diagnostic tests to examine whether an SV could potentially occur in a given event type. As SVs do not appear in a separate manner in states, states are not within the scope of our research. In our research scope, an SV can potentially appear in up to four types of events. We provide English examples to explain our rationale below.

(162) a. Fred built two houses in one year.

b. Fred built houses for one year.

Our goal is not to investigate whether the singular or plural forms of the object affect eventuality, but o determine the eventuality in which the verb *built* can occur. However, in order to identify diagnostic tests with higher discriminability, we need to explain how we selected the testing methods that could assess various eventualities.

In the previous section, we observed that accomplishment and achievement in Chinese were often established via RVCs. While there are structures other than RVCs that can establish accomplishment, such as complements and frame adverbials, in the case of SVs, the complement is already lexically incorporated into the verb. Therefore, it does not usually combine with another direct object. Thus, can we use a distinction similar to *houses* in (162) to test SVs? The answer is no. First, not every SV_T has both a count noun form and a bare plural or mass nominal form. This would make it difficult to compare the outcomes of the results using different baselines. Furthermore, it is not the goal of this study to discuss the possible syntactic structures or semantic tests that each type of event might pass. Therefore, it is not necessary to validate and discuss every diagnostic test. We only need to identify the tests for accomplishment in both achievement and activity using minimalist VPs (Verkuyl, 1972), as shown in Figure 5.1.

For example, frame adverbials (e.g., *in* an hour) and durative adverbials (e.g., *for* an hour) are commonly employed as a diagnostic test for identifying accomplishment. This test is mainly used to differentiate between telic events and atelic events. In the case of Chinese, due to RVCs being a serial verb construction, V2 (the RV) marks the end state of V1 (the main verb). This characteristic eliminates the need to use the frame adverbial test to distinguish it from activity.

Due to the main difference between achievement and accomplishment being the development process prior to culmination, we can utilize the entailment test by Smith (1997)

to identify accomplishment, as discussed previously. Unlike Smith's accomplishment entailment test, our test does not restrict the types of RVCs to completive RVCs. Any RVC that can express culmination is acceptable, including the cause, achievement, direction, and phase RVCs listed in Li and Thompson (1989) because, for each category of RVCs in (149), repeated below, we can see an imperfective correspondence.

(163) a. 老師 開 開 了 門 ⊨ 老師 在 開 門
lǎoshī kāi kāi le mén lǎoshī zài kāi mén
teacher open open ASP door teacher PROG open door
'The teacher opened the door.' 'The teacher was opening the door.'

b. 老師 買 到 了 手機 ⊨ 老師 在 買 手機
lǎoshī mǎi dào le shǒujī lǎoshī zài mǎi shǒujī
teacher buy arrive ASP cellphone teacher PROG buy cellphone
'The teacher managed to buy the cellphone.' 'The teacher was buying the cellphone.'

c. 老師 寄 出 了 帽子 ⊨ 老師 在 寄 帽子
lǎoshī jì chū le màozi lǎoshī zài jì màozi
teacher send out ASP hat teacher PROG send hat
'The teacher sent out the hat.' 'The teacher was sending the hat.'

d. 老師 改 完 了 作業 ⊨ 老師 在 改 作業
lǎoshī gǎi wán le zuòyè lǎoshī zài gǎi zuòyè
teacher correct finish ASP homework teacher PROG correct homework
'The teacher finished correcting homework.' 'The teacher was correcting homework.'

Point [-telic -composite]

We will now discuss atelic events, beginning with the semelfactives that Smith (1997) proposed, which Moens and Steedman (1988) and Steedman (2011) referred to as point events. We will refer to an event as a "point event" henceforth to maintain consistency with Figure 5.1. The main distinction between point and achievement, according to the authors, was that point did not result in an outcome or a relevant alteration to the state of the world. Although point and achievement are both classified as non-composite events, this does not imply that point must necessarily occur instantaneously, unlike achievement (Moens and Steedman, 1988). Instead, these verbs often only have a short duration that is not extended. For example, verbs such as *knock, sneeze* may involve a discernible time period (Smith, 1997).

The main difference between point and activity is that point does not break down into sub-events Steedman (2011); point involves a single-stage event that is perceived as an indivisible whole Moens and Steedman (1988). Therefore, a single event is sufficient to constitute a point. Since it is not composed of multiple sub-events, it does not typically associate with duration. It is important to note the observation by (Smith, 1997), namely that point can sometimes appear to combine with duration or the progressive aspect, as in *John coughed all night* or *John was knocking on the door.* However, in these sentences, we are constructing a continuous multiple-event activity by repeating the point (Smith, 1997). In other words, these English examples contain

multiple instances of the same point event. For example, in the case of action *walk*, taking one or two steps forward with one's feet cannot be considered to be *walking*, as walking is defined as moving forward at a steady pace using one's feet. Therefore, unlike point, *John was walking* only involves a single activity event.

We can summarize the characteristics of a point as criteria for determining whether a sentence can be classified as a point event as follows:

1. A point event involves a single-stage event.
2. It does not result in a change of state.
3. When it occurs repeatedly with duration or as a progressive, it must be interpreted as a multiple event.

Activity [-telic +composite]

We will now discuss the last situation within the four quadrants, as shown in Figure 5.1, namely activity, which is classified as an atelic composite event (Steedman, 2011). Activities, which are often known as processes, progress over time without arriving at a culmination. It is important to note the definitions of ±*telic* and ±*composite* by Steedman (2011). The term ±*telic* refers to whether an event culminates or relates to a particular change of state. ±*Composite* is not associated with extensiveness or durativity as it is usually understood; but with regard to whether an event can be decomposed into sub-events. We believe that this property is extremely important for our later discussion regarding differentiating activity from point and accomplishment.

(164) a. John was running. ⊨ John ran.

b. John was running a kilometer. ⊭ John ran a kilometer.

In the context of the imperfective paradox (Dowty, 1979) mentioned above, (Vendler, 1957, p. 146) suggested that *running* in (164a) "goes on in times in a homogeneous way; any part of the process is of the same nature as the whole." Based on this viewpoint, Smith (1997) claimed:

> If an Activity event A holds at interval I, then the process associated with that event holds at all intervals of I, down to intervals too small to count as A. Smith 1997:23

According to this definition, an activity event consists of multiple intervals, and each sub-event of each interval must be equivalent to event A. *Running* in (164a) is therefore an activity, as we can find the same sub-event *running* within each interval when we divide the process into a series of shorter time intervals. However, this does not hold for *running a kilometer*, which is an accomplishment event in (164b). Although we may encounter similar *running* sub-events when we divide an accomplishment into

several time intervals, these sub-events are not equivalent to the whole event; that is, *running a kilometer*. The sub-event *running a kilometer* is only valid in the last interval in which the runner completes one kilometer.

Accomplishment and activity have opposite syntactic behaviors in terms of the temporal relationship. First, as an atelic event, activity does not co-occur with RVCs to form a culmination. In the imperfective paradox example (164), we can see that the accomplishment event (164b) can associate with the progressive aspect because the accomplishment event itself is derived from the combination of the culmination and an activity. Thus, in the sentence (164b), the progressive aspect modifies the activity phase of the accomplishment event prior to culmination. However, the progressive 在 *zài* cannot serve as the head of the RVC construction in Chinese, as shown in the following example.[7] Therefore, RVCs are a reliable method for differentiating between activity and accomplishment.

(165) a. *老師 在 開 開 門
lǎoshī zài kāi kāi mén
teacher PROG open open door
For 'The teacher was opening the door open.'

b. *老師 在 改 完 作業
lǎoshī zài gǎi wán zuòyè
teacher PROG correct finish homework
For 'The teacher was finishing correcting homework.'

Second, accomplishment can occur with the frame adverbial *in*, but not with the duration adverbial *for*, whereas activity exhibits the opposite pattern in syntactic combinations with these two types of adverbials (Moens and Steedman, 1988; Steedman, 2011; Smith, 1997). In Chinese, verb-copying constructions must be used to convey duration for transitive verbs (Chang, 2001) and non-referential verbs, such as SVs (Li and Thompson, 1989; Tai, 1999; Tieu, 2008).

The durative characteristic of activity and accomplishment (Smith, 1997) may be due to the fact that both of these events, in part or as a whole, encompass sub-events that constitute a composite event. In fact, this is the key factor for differentiating between activity and point events from the perspective of semantics. A point event is a single-stage event that cannot be broken down into sub-events that are identical to the whole. Conversely, an activity event is an atelic event that is composed of a series of homogeneous sub-events that are equivalent to the whole event. As mentioned in the previous section, a point event can shift to an activity via iteration. Therefore, both of these events can combine with the progressive 在 *zài* and the verb-copying structure. However, it is important to note that the verb-copying structure is not exclusively associated with activity. According to the definition provided by Tai (1999), situations that can be repeated or continued must employ the verb-copying structure to express duration. Thus, in order to identify whether a progressive sentence stems from an activity or from an iterated activity that shifted from a point event, we need to consider the semantic property mentioned by Vendler (1967) and Smith (1997) when assessing activity. If a verb appears in a progressive sentence or a verb-copying structure,

[7] For a discussion of the progressive aspect 著 *zhe* in the imperfective paradox, refer to Wu (2011).

we need to conduct another semantic test. To identify whether the verb that passed the first diagnostic test is a single-stage atomic point or a genuine activity, we need to examine its semantic property by detaching 在 *zài* or the verb-copying structure to determine whether it meets the semantic criteria cited above. We only consider those conveying single-stage semantics as point.

We believe that this approach simplifies the diagnostic testing process, and ensures that the selected events are primitive events rather than being derived through coercion from other events. As the arrows in Figure 5.1 indicate, it appears that there are no limitations to the time at which an event can shift from one event to another. It would be difficult to control our experiment if we calculate the shifted events as basic events, because an excessive number of variables will be produced when differentiating among events.

5.3 A Quantitative Study of Eventuality and Syntactic Flexibility

5.3.1 Data and Methods

Data

The data that were examined were taken from the Test Of Chinese as a Foreign Language 8000 Chinese vocabulary list (TOCFL 8000) Chang (2012), version 2018. The TOCFL 8000 comprises 7945 Chinese words that were manually collected and evaluated by the Steering Committee for the Test Of Proficiency-Huayu (SC-TOP) using numerous methods.[8]

Although the proportion of vocabulary per source is not given in Chang (2012) or Tseng (2014), most of the vocabularies were obtained from the Academia Sinica Balanced CorpusHuang et al. (1995). Words from the following sources were added to the TOCFL 8000 that was published in 2018: Chinese textbooks for Chinese learners, the TOCFL Chinese Learner Corpus, international curricula such as the International General Certificate of Secondary Education Chinese, and the International Baccalaureate (IB) Diploma Programme.[9]

The TOCFL 8000 contains seven sub-lists based on the language level with reference to the Common European Framework of Reference for Languages. The vocabulary size of the sub-list increases as language level increases, as follows: Novice 1 (146 words), Novice 2 (176 words), A1 (180 words), A2 (197 words), B1 (1483 words), B2 (2478 words), and C1 (2985 words). The words that are included in the lists are those that are considered to be used with high frequency, and are thus considered to be worthy of learning at each level.[10]

[8] SC-TOP is an organization directed by the Ministry of Education of Taiwan, which develops and administrates the standardized Chinese assessment test: The TOCFL aims to assess the Chinese proficiency level of non-native speakers of Chinese worldwide. This list is consistently reviewed and updated. The latest version of the TOCFL 8000 can be downloaded from https://tocfl.edu.tw/index.php/exam/download.

[9] The online service is available at http://tocfl.itc.ntnu.edu.tw:8080/.

[10] The occurrence of words were counted and reviewed by experts, but the exact procedures were not elaborated in Chang (2012) or in Tseng (2014)

The themes in Band A of the TOCFL 8000 range from personal information, jobs, education, environment, daily life, interpersonal relationship, travel, health and shopping, to diet. All the words in the Novice and Band A levels are classified according to the theme with which they are associated. This information is not annotated for Words from Band B to Band C because there are no reliable features to identify the themes for words at higher levels Tseng (2014).

Adopting the Chinese parts of speech proposed by Teng (2018), all the vocabularies in the list are tagged according to Table 5.1. There are eight major parts of speech at the highest level in this part of speech system, which are the first types that are shown in each row in Table 5.1.

Depending on the semantic and syntactic distributions, verbs are divided into the three main subclasses of action verb, Vs, and Vp. The "-" notation is used to delineate a particular feature that a group of verbs shares. For example, in addition to action verbs, Vs and Vps can associate with the *-sep* feature. The final data and the analyses in this study can be accessed via the following link: https://shorturl.at/eoEFT.

Table 5.1: Parts of speech in the TOCFL 8000 list

Abbreviation	**Parts of speech**	**Example**
Adv	Adverb	都 *dōu* 'all', 大概 *dàgài* 'probably'
Conj	Conjunction	跟 *gēn* 'and', 可是 *kěshì* 'but'
Det	Determiner	這 *zhè* 'this', 那 *nà* 'that'
M	Measure	個 *ge*, 條 *tiáo*, 次 *cì*
N	Noun	我 *wǒ* 'I', 勇氣 *yǒngqì* 'courage'
Ptc	Particle	嗎 *ma* 'question particle' 了 *le* 'completive verbal particle'
Prep	Preposition	從 *cóng* 'from', 對於 *duìyú* 'regarding'
V	Action Verb, transitive	買 *mǎi* 'buy', 吃 *chī* 'eat'
Vi	Action Verb, intransitive	哭 *kū* 'cry', 坐 *zuò* 'sit'
Vaux	Auxiliary Verb	能 *néng* 'can', 想 *xiǎng* 'would like to'
V-sep	Separable verb	結婚 *jiéhūn* 'get married', 生氣 *shēngqì* 'be angry'
Vs	State Verb, intransitive	好*hǎo* 'good', 貴 *guì* 'expensive'
Vst	State Verb, transitive	喜歡 *xǐhuān* 'like', 知道 *zhīdào* 'know'
Vs-attr	State Verb, attribute	主要 *zhǔyào* 'primary', 袖珍 *xiùzhēn* 'mini-'
Vs-pred	State Verb, predicate	夠 *gòu* 'enough', 多 *duō* 'plenty'
Vp	Process Verb, intransitive	死 *sǐ* 'die', 完 *wán* 'finish'
Vpt	Process Verb, transitive	破*(*洞*)* *pò(dòng)* 'lit. break (hole)', 裂*(*縫*)* *liè(fèng)* 'lit. crack (a crack)'

Participants

Due to the lack of previous studies discussing the interaction between SVs and syntactic separability from the perspective of eventualities, we conducted a small-scale experiment from an exploratory perspective. The author and one other person participated in the experiment took part in the experiment. Both annotators were native speakers of Taiwanese Mandarin and had received linguistic training. The judgements were independently based on the semantic and syntactic rules mentioned previously. Subsequently, differences were marked and independently checked for potential misjudgments. After narrowing down the discrepancies, we discussed the remaining divergences and reached a consensus, which was used for the statistical analysis.

Procedures

We extracted 208 words with the *-sep* feature from the TOCFL 8000. Of the 208 SVs, action verbs accounted for the majority. There were 182 action verbs, eight Vs, and 18 Vps. Two widely-recognized and discussed SVs, 幽默 *yōumò* 'tease' and *jiāngjūn* 'put someone on the spot,' were not initially included in the list, but were later added, resulting in a final list of 210 SVs for the analysis.

To address our questions, we evaluated each SV according to the two dimensions of event types and syntactic insertions. We included four event types and the 21 most common expressions that caused SVs to decompose at the syntax level, as summarized in the next section.

As the diagnostics for testing events require both semantic and syntactic judgments, we tested each SV within a specific event type in order to maintain consistency in our judgments. For SVs that met the criteria for the event type being tested, we recorded a value of 1; for those that did not meet the criteria, we recorded a value of 0. Once we had completed the testing of all 210 SVs within a particular event type, we applied the same method to test and record the 210 SVs for the next event type, and continued this process until all four event types were completed. After testing all four event types separately, we summed the values of each SV's compatibility with the four event types. Theoretically, the maximum sum for an SV would be four, indicating that it could be paired with all four event types, whereas a sum of 0 suggested that the SV could not be paired with any of the four event types that we explored.

We followed the same procedure for testing syntactic separation. We tested the first separation pattern on the 210 SVs, and recorded 0 or 1. We then continued to test the second separation pattern on the same 210 SVs. After completing the testing for all 21 separation patterns, we summed the values for each SV appearing in these 21 separation patterns. Theoretically, an SV could appear in up to 21 separation patterns, or may not appear in any of them. Therefore, the maximum possible value for an SV in the syntactic separation testing was 21, while the minimum was 0.

We included descriptive and inferential statistics in our research. There were two types of independent dependent variables. The first research question aimed to explore whether SVs that appeared in more events were more likely to exhibit syntactic

flexibility. The independent variable, referred to as "event variability," represents the total count of SV occurrences in four events (range 0 to 4). The dependent variable, termed "syntactic variability," denotes the total count of syntactic separations (range 0 to 21). The second research question examined the association between individual events and syntactic flexibility. The independent variable consisted of binary values (1 or 0) for each event. The dependent variable remained consistent with the first research question, "syntactic variability," ranging from 1 to 21.

Diagnostics of Eventualities

Each of the 210 SVs was tested in four event types based on the syntactic or semantic criteria mentioned in §5.2.1. As an event type is a property of a proposition conveyed by a predicate and its arguments and adjuncts; theoretically, an SV could occur in up to four distinct event types. Each of the four eventualities was tested independently for each SV. We summarized the tests for each event that was discussed in §5.2.1

Achievement [+telic -composite]: An achievement event can combine with a non-completive RVC in Chinese. When a perfective achievement event is constructed with a **non**-completive RVC, an associated imperfective sentence **cannot** be constructed.

Accomplishment [+telic +composite]: An accomplishment event can combine with an RVC in Chinese. When a perfective accomplishment event is constructed with an RVC, an associated imperfective sentence can be constructed.

Point [-telic -composite]: A point event involves a single-stage event that cannot be decomposed into sub-events. It does not lead to a change of state.

Activity [-telic +composite]: An activity can extend in time without reaching a climax. It can combine with a verb-copying structure to convey a process that continues over time as a single activity event, rather than as a multiple-event activity constructed via iterated point events.

The Examined Insertion Patterns

We discussed the relevant studies in Chapter 2, and compiled a list of the main 21 linguistic items that led most frequently to SV separation. Each SV was tested individually to determine whether it could readily appear in each of the 21 patterns. In total, there were 13 structures for verb satellites, six structures for nominal satellites, and two structures with inverse SV$_H$ and SV$_T$. We did not intentionally increase or decrease these, nor did we aim to balance the numbers of the syntactic patterns of verbal satellites, nominal satellites, or inversions because we did not assume that a particular syntactic function was particularly relevant to eventualities.

1. **Perfective aspect:** SV$_H$ + 了 *le* + SV$_T$

(166) 張三　　唱　　了　歌
Zhāngsān chàng le　gē
Zhangsan sing　ASP song
'Zhangsan sang.'

2. **Continuous aspect:** SVH + 著 *zhe* + SVT

(167) 張三　　唱　　著　歌
Zhāngsān chàng zhe　gē
Zhangsan sing　ASP song
'Zhangsan is (in the state of) singing.'

3. **Experiential aspect:** SVH + 過 *guò* + SVT

(168) 張三　　唱　　過　歌
Zhāngsān chàng guò　gē
Zhangsan sing　ASP song
'Zhangsan has sung.'

4. **Inchoative aspect:** SVH + 起 *qǐ* + SVT + 來 *lái*

(169) 張三　　唱　　起　歌　來
Zhāngsān chàng qǐ　gē　lái
Zhangsan sing　ASP song ASP
'Zhangsan began singing.'

5. **Verb-copying construction:** SVH + SVT + SVH + verbal complement

(170) 張三　　唱　　歌　唱了　　兩個小時
Zhāngsān chàng gē　changle liǎngge xiǎoshí
Zhangsan sing　song sang　two hours
'Zhangsan sang for two hours.'

6. **AAB form:** SVH + SVH + SVT

(171) 我們　唱　　唱　　歌　吧
wǒmen chàng chàng gē　ba
we　sing　sing　song PART
'Let's sing.'

7. **RV construction:** SVH + RV + SVT

(172) 張三　　唱　　完　　歌　了
Zhāngsān chàng wán　gē
Zhangsan sing　finish song
'Zhangsan has finished singing.'

8. **Verbal classifier:** SVH + verbal classifier phrase + SVT

(173) 張三　　唱了　兩　次　　歌
Zhāngsān changle liǎng cì　gē
Zhangsan sang　two　times song
'Zhangsan sang twice.'

9. **Potentials:** SV$_H$ + 得了 *déliǎo* / 不了 *bùliǎo* + SV$_T$

(174) 張三　　唱　　不了　歌
Zhāngsān chàng bùliǎo gē
Zhangsan sang unable song
'Zhangsan cannot sing.'

10. **Trivialness 個 *ge*:** SV$_H$ + Trivialness 個 *ge* + SV$_T$

(175) 請　　唱　　個 歌　吧
qǐng n chàng ge gē ba
please sing GE song PART
'Please sing a song.'

11. **QW$_{\text{-adv}}$:** SV$_H$ + QW as an adverbial + SV$_T$

(176) 你 唱　　什麼　　歌　啊
nǐ chàng shénme gē a
you sing what the heck song PART
'What the heck are you singing?'

12. **Time$_{\text{-adv}}$:** SV$_H$ + temporal phrase as an adverbial + SV$_T$

(177) 張三　　唱了　三小時　　的　歌
Zhāngsān chàngle sānxiǎoshí de gē
Zhangsan sang three hours NOM song
'Zhangsan sang for three hours.'

13. **Object:** SV$_H$ + object + SV$_T$

(178) 張三　　幽　　了　李四 一　默
Zhāngsān yōu le Lǐsì yí mò
Zhangsan serene ASP Lisi one silent
'Zhangsan teased Lisi.'

14. **Nominal quantification:** SV$_H$ + nominal classifier phrase + SV$_T$

(179) 張三　　唱了　一　首　歌
Zhāngsān chàngle yì shǒu gē
Zhangsan sang one CL song
'Zhangsan sang a song.'

15. **QW$_{\text{-attr}}$:** SV$_H$ + QW as an attribute + SV$_T$

(180) 張三　　唱　　哪　　國　　歌
Zhāngsān chàng nǎ guó gē
Zhangsan sing which country song
'Which country's song is Zhangsan singing?'

16. **Time$_{\text{-attr}}$:** SV$_H$ + temporal phrase as an attribute + SV$_T$

(181) 張三　　唱了　一首　三分鐘　　的　歌
Zhāngsān chàngle yìshǒu sānfēnzhōng de gē
Zhangsan sang one CL three minute NOM song
'Zhangsan sang a three-minute-long song.'

17. **Adjective:** SV_H + adjective phrase + SV_T

    (182) 張三　　唱　　好　　歌
    Zhāngsān chàng hǎo　gē
    Zhangsan sing　good song
    'Zhangsan sings good songs.'

18. **Genitive:** SV_H + Genitive 的 *de* + SV_T

    (183) 張三　　唱　　我 的　歌
    Zhāngsān chàng wǒ de　gē
    Zhangsan sing　I　GEN song
    'Zhangsan sings my song.'

19. **Relative clause construction:** SV_H + Relative 的 *de* + SV_T

    (184) 張三　　唱　　的　歌　　很好
    Zhāngsān chàng de　gē　　hěnhǎo
    Zhangsan sing　REL good very good
    'The song that Zhangsan sang was good.'

20. **Topicalization:** SV_T as a topic + SV_H

    (185) 歌　　張三　　唱了
    gē　Zhāngsān chàngle
    song Zhangsan sang
    'A song, Zhangsan sang.'

21. 把 ***bǎ*** **construction:** 把 *bǎ* + SV_T + SV_H

    (186) 張三　　把 歌　　唱了
    Zhāngsān bǎ　gē　　chàngle
    Zhangsan BA song sang
    'Zhangsan sang the song.'

5.3.2 Results

Results for Research Question 1

The first research question in this study focused on examining the relationship between the number of event types in which an SV could occur and their syntactic flexibility.

Based on the descriptive statistical results in Table 5.2, of the 210 SVs, 23 could only occur in a single event type (labelled as (1)), with an average syntactic variability score of 11.48. The majority, 153 SVs, could occur in any two event types (labelled as (2)), with an average syntactic variability score of 17.86. SVs that were capable of occurring in any of the three event types (briefed as (3)), had slightly higher scores than (1), with an average of 16.38. These findings indicate that SVs with a broader range of event types had higher syntactic variability scores. To confirm whether these differences were statistically significant, a one-way analysis of variance (ANOVA)

Table 5.2: Descriptive statistical results

Event counts	**N**	**Mean**	**SD**
(1) SVs occurring in 1 event type	23	11.48	4.640
(2) SVs occurring in 2 event types	153	17.86	2.365
(3) SVs occurring in 3 event types	34	16.38	2.785
Sum	210	16.92	3.393

was conducted using the event variability scores as the independent variable and the syntactic variability scores as the dependent variables.

We assessed the homogeneity of variance before conducting an ANOVA. As the Levene's test yielded a significant result ($p < .05$), we utilized the robust tests by Welch and Brown-Forsythe for the variance analysis. The outcomes in Table 5.3 indicated that both tests produced significant F-test at the .05 level, indicating that SVs with different event variability exhibited significant differences in the syntactic variability scores. Subsequent Dunnett T3 post hoc tests revealed that (2) > (3) > (1). In other words, SVs appearing in two event types had the highest syntactic variability scores, followed by those that appeared in three event types and, finally, those that appeared in only one event type.

The observed results differed from our initial expectations. We initially hypothesized that SVs appearing in more event types would have the highest average scores. However, the analysis revealed that SVs occurring in any two event types had the highest average scores. To understand the potential reasons for this disparity, we conducted additional analyses focusing specifically on the SVs that occurred in two and three event types to explore their relationships with event type variability.

Table 5.3: Robust Tests for Equality of Means

	***F*-stat**	**df 1**	**df 2**	**Sig.**
Welch	23.488	2	40.730	.000
Brown-Forsythe	30.406	2	41.067	.000

We summarized the distribution of the occurrences of SVs across different event types in Table 5.4. Two inferences can be drawn based on this table. First, the majority of SVs had the characteristic of +*composite*. Based on this table, of the 210 SVs, 194 SVs (92.4%) appeared in at least one type of +*composite* event. Of the 176 SVs that appeared in one or two events, 142 SVs occurred exclusively in +*composite* events, accounting for 80.7%. Of the 34 SVs that appeared in three events, 33 SVs were observed in two types of +*composite* events, accounting for 97.1%. Second, it appears that the score for the syntactic variability of SVs was not determined solely by the number of event types in which they could appear, but rather according to the specific types of events. Of the 153 SVs that could occur in any two event types, an impressive

135 of them were present in both the accomplishment and activity +*composite* event types. Only 18 SVs appeared in the combination of +*composite* and -*composite* events. With regard to the SVs that occurred in three event types, while 33 SVs could appear in both of the two composite events, a substantial 30 of them could also occur in the achievement category. This aligned well with our second research question. We conducted a multiple regression analysis to explore this relationship further.

Table 5.4: Event counts versus composite events

Event counts	**Composite Events**			**Sum**
	0	1	2	
(1)	16	7	0	23
(2)	0	18	135	153
(3)	0	1	33	34
Sum	16	26	168	210

Results for Research Question 2

The aim of the second research question was to identify the events that were more predictive of SV syntactic separations. To achieve this, we employed a multiple regression analysis to examine which event types had greater predictive power for the syntactic variability. The independent variables included each of the four event types mentioned above, while the dependent variable was the syntactic variability scores.

The results displayed in Table 5.5 revealed that the stepwise regression method identified two predictor variables, accomplishment and achievement, as having higher predictive power for syntactic variability scores among the four initial variables. The standardized regression equation for predicting syntactic variability scores was as follows. Combined, these two variables explained 40.1% of the variance.

$$\text{Syntactic variability} = .505X_{Accomplishment} + (-.233)X_{Achievement}$$

The absolute values of the standardized coefficients β represent the predictive strength of the dependent variable (syntactic variability). According to the table, accomplishment had the highest predictive power (β = .505), followed by achievement (β = -.233). Both variables had a Variance Inflation Factor below 10 (1.208), indicating no existence of multicollinearity.

The Contrasting Syntactic Structures between Accomplishment and Achievement

We will now compare the syntactic differences between accomplishments and achievements. we divided SVs into three intervals based on their scores for syntactic variabil-

Table 5.5: Stepwise regression analysis for each event type's syntactic flexibility

Order	Variable	R	R^2	Adjusted R^2	F	Standardized Coefficients β	T
1	Accomplishment	.602	.362	.359	118.123**	.505	8.586**
2	Achievement	.638	.407	.401	15.666**	-.233	-3.958**

**$p < .01$

ity. SVs with a total score of 15 to 21 points were the most separable; those with a score of eight to 14 points had medium separability, and those with a score of one to seven points were the least separable. According to the results in §5.3.2, we concluded that SVs that were compatible with accomplishments may score higher for syntactic variability, while those compatible with achievements may fall into the lower score range. Given that SVs can feature in various event types, we filtered out and compared the syntactic differences in the two types of SVs to provide a clearer understanding of their relationships, as outlined below. All the SVs that met these two criteria and their syntactic variability scores are described below.

1. Highly flexible accomplishment-only SVs: Those that only appeared in accomplishments and had a total syntactic variability score of 15 to 21.
   - score 18: 生氣 *shēngqì* 'be angry'; 過節 *guòjié* 'celebrate a holiday'
   - score 16: 拜年 *bàinián* 'greet someone for the New Year'
   - score 15: 抬頭 *táitóu* 'lift one's head'
2. Least flexible achievement-only SVs: Those that only appeared in achievements and had a total syntactic variability core of one to seven.
   - score 7: 幽默 *yōumò* 'tease'; 獻身 *xiànshēn* 'devote oneself to'
   - score 6: 將軍 *jiāngjūn* 'put somebody on the spot'; 下班 *xiàbān* 'get off work'
   - score 5: 放學 *fàngxué* 'get off school'; 下課 *xiàkè* 'class dismiss'
   - score 4: 畢業 *bìyè* 'graduate'

The seven completely mutually exclusive patterns across 21 splitting patterns of the 11 SVs are listed below. Most of the patterns fell into two main categories: verbal satellites and SV$_T$ fronting. The two types of SVs showed no differences in nominal satellites.

1. Patterns exclusive to highly flexible accomplishment-only SVs were:
   Verbal satellites: Continuous aspect 著 *zhe*, AAB form, verb-copying construction, RV, Time$_{\text{-adv}}$
   SV$_T$ fronting: Topicalization, 把 *bǎ* construction
2. patterns exclusive to the least flexible achievement-only SVs were: N/A

5.3.3 Discussions

Discussion of Research Question 1

In the first hypothesis, we posited that the higher the occurrence of SV pairs across various event types, the more likely they were to be found in diverse syntactic environments. A higher score for event variability was expected to correspond to a higher score for syntactic variability within the overall assessment. However, the study's results refuted this hypothesis. Coordinating conjunctions occurring in a broader range of events did not necessarily manifest in a greater diversity of syntactic environments. These types of events demonstrated a higher predictive capacity rather than quantity.

Due to the constraints in the existing literature, our experimental setup did not allow for a direct correlation between the types of interventions and the types of events. Consequently, we were unable to sort or balance the varieties or amounts of splitting patterns. We regarded event types and splitting patterns as independent variables, and presumed that there was no interaction between them. This approach had the following consequences:

First, the relationship between intervening structures and event types was not one to one. As a result, certain splitting structures may be found in various event types, such as the perfective aspect 了 *le* and topic sentences. Given that the perfective aspect considers a predicate in its entirety, it does not differentiate between event structures, thus making it compatible with any SV. Second, the structural separation of SVs is not solely attributable to the event type of the predicate. The semantics of verbs and pragmatic considerations also play significant roles in the occurrence of certain splitting patterns, such as potential complements 得了 *déliǎo*, which can project a predicate into a hypothetical realm, thus indicating the feasibility of the action in the predicate taking place. Similarly, as examined in §2.1.1, the QW$_{\text{-adv}}$ extends its modification to the entire predicate to convey the speaker's dissatisfaction or interrogative attitude.

Based on Table 5.4, it can be observed that +*composite* events predominate among SVs. Of the 153 SVs distributed across two event types, 135 (about 88%) participated in +*composite* events. Of the 34 SVs associated with three event types, 33 (nearly 97%) were involved in both types of +*composite* events and one type of a -*composite* event. This indicates that the majority of SVs can occur within +*composite* events.

Discussion of Research Question 2

The findings for the second research question revealed that composite events accounted for 40.1% of syntactic variability. Considering that accomplishments and achievements predict syntactic variability in contrasting ways, and in view of the results for the first research question, the distinction between these events—±*composite*—is pivotal for assessing SVs' syntactic flexibility.

Moens and Steedman (1988) and Steedman (2011) adopted compositionality, as opposed to the traditional notion of durativity, to determine whether an event could be decomposed into smaller sub-events. In section §5.1.1, we explored how various aspects

responded sensitively to the event types that they modified. According to Moens and Steedman (1988) and Steedman (2011), imperfective aspects selectively paired with verbs that denoted events and sub-events, as seen in 在 *zài,* 著 *zhe* in Chinese. Similarly, other languages present aspects that modify sub-events, such as the Japanese *tei* form, which aligns with verbs consisting of sub-events (Kiyota, 2008). The presence or absence of sub-events may explain the divergent predictions for accomplishment and achievement in terms of syntactic variability. Sub-events provide an event with internal intervals, which can be decomposed into various temporal references. Events lacking an internal structure are unable to pair with linguistic expressions describing an event's duration, intermediate processes, and start and end points. Consequently, events with sub-events, +*composite*, can tolerate more splitting structures than can those without sub-events -*composite*.

5.4 A Monostratal Solution for Event Structures and Temporal Relationships

Based on previous findings, we inferred that the sub-events corresponding to +*composite* might be the key to some SVs' tolerance of more instances of insertion patterns. At this point in the discussion, we have observed that the syntactic separation phenomena of Chinese SVs are inextricably linked to their semantic properties. We will now integrate the results of the quantitative research and the CCG categories presented in Chapter 4 based on the theories proposed by Klein (1994); Klein et al. (2000), whose theories assisted in modeling the two properties in the eventualities, ±*telic* and ±*composite*, and their relationship with aspect.

5.4.1 Klein's Theory of Time

Similar to Reichenbach (1947), Klein defined three types of time: time of utterance (TU), time of situation (TSIT), and topic time (TT). TU and TSIT correspond to Reichenbach's Speech Time and Event Time, respectively. Klein (1994) contended that Reichenbach's definition of Reference Time was ambiguous, and revised it in his theoretical framework as TT, defined as "the time span to which the speaker's claim on this occasion is confined" (Klein 1994:6). Following this, Klein generalized that "aspects concerns the relation between TT and TSIT—the way, or sometimes ways, in which some situation is hooked up to some TT" (Klein 1994:6).

While the majority of linguistic research follows Vendler's event classification, the criteria for these classifications are not always easily distinguishable. For example, Klein (1994) criticized "telicity" because, if we extend the time frame to be sufficiently long, even verbs that are classified as activity will reach a natural endpoint. Therefore, he advocated for moving beyond previous classification standards to adopt a logical semantic criterion, —"behaviour with respect to the time span at which it can be true (or not true)" (Klein et al. 2000:747), and categorized verbs and all linguistic expressions according to three types.[11]

[11] The type names used here are taken from Klein et al. (2000), with definitions integrated from both Klein (1994) and Klein et al. (2000)

1. 0-phase contents: These are true for any time span, and are the only boundless type among the three categories; for example, *cats are animals*.
2. 1-phase contents: These are true for a specific time span and false for others; for example, *the cat was in the kitchen*. This sentence is valid for a certain period in the past. However, it is not possible for the cat to be in the kitchen forever; thus, there are instances in which this statement does not hold true in other time spans. Klein (1994) referred to this phenomenon of opposition between different time spans as "outside contrast."
3. 2-phase contents: These change from true to false, or from false to true, within a specific time span; for example, *the cat **left** the kitchen*. This sentence describes a dynamic change within a particular time span; that is, from *the cat was in the kitchen* to *the cat was not in the kitchen*. The former is the source state, and the latter is the target state. Klein (1994) referred to this type of dynamic contrast within a single time span as "inner contrast."

For 2-phase contents, the language selects one state, or part of both states, to connect to TT and considers it to be 1-phase content, which is defined as the distinguished phase (DP). DP is the only phase in 1-state contents. For 2-state contents, English selects the source state as DP, while Chinese opts for the target state. Following the diagrams presented by Klein et al. (2000), in the figure below, we use +++ to represent DP, −−− to signify the source phase, and [ ] to denote the assertion time TT.

5.4.2 Event Specifications in LF

We will now integrate the theory proposed by Klein et al. and the results of the quantitative research on the SVs' CCG types that were presented in the previous chapter. By incorporating the known factors affecting the syntactic manifestations of SVs into the logical forms of SVs, aspects, and relative linguistic contents, these specifications will either permit or reject the combination of certain linguistic elements, and will ultimately account for the syntactic behavior of SVs.

In Section §5.3.2, we categorized two types of SVs based on our data analysis: highly flexible accomplishment-only SVs and least flexible achievement-only SVs, together with seven sentence patterns that were mutually exclusive in these two types of SVs. In our dataset, the highest scoring SV in the former category, 生氣 *shēngqì* 'be angry,' was identified as the most syntactically flexible SV, while the lowest scoring SV in the latter category, 畢業 *bìyè* 'graduate,' was recognized as the most syntactically rigid SV. We will analyze these two SVs according to these seven splitting patterns. By employing CCG types, we aim to explain the fundamental reasons underlying the syntactic differences between these two groups of SVs.

Categorical Differences between Accomplishment and Achievement

As indicated in the literature (see §5.2.1), Chinese telic events are mainly constructed via RVCs, which are the combination of a verb followed by an RV. The categories for the two verbs in an RVC are (187a) and (187b), respectively.

We have incorporated consistent event constraints into both syntax and LFs to model their syntactic behavior and semantics. An RV is analyzed as a phase converter in (187b). It lexically (due to \\) applies to $VP\$_i$ *++* to its left and yields a 2-phase RVC: $VP\$_i$ *−+*. Following the definition provided by Klein et al., a 1-phase verb is marked by the phase "++". Hence, we employed the "¬" notation to neutralize the DP in a 1-phase content as a source phase in 2-phase content. The 1-phase verb on the left becomes the source phase, while the RV becomes the target DP of the 2-phase RVC.

The syntactic type and LF in (187b) preserve the characteristics that Chinese accomplishments are derived through structure rather than being inherent in the lexicon. Chinese also has primitive 2-phase verbs (187c). It is clear that these atomic 2-phase verbs are indeed achievements, since their LF does not include a 1-phase verb, thus being -*composite*. This intrinsic 2-phase nature does not align with the RV's requirements for leftward verbs. Therefore, for a single organism in the real world, (b) and (c) cannot produce 死完 *sǐwán* 'finish dying'.

(187) a. 1-phase verb 跑 pǎo := $VP\ {+}{+}$: $\lambda x.run\ {+}{+}'x$

b. RV 完 wán := $VP\$_i\ {-}{+} \backslash\backslash VP\$_i\ {+}{+}$: $\lambda p.finish{+}{+}'\neg p$

c. 2-phase verb 死 sǐ:= $VP\ {-}{+}$: $\lambda x.die{-}{+}'x$

We added event constraints to the two SVs to be compared as follows:

(188) a. Highly flexible accomplishment-only SVs
1-phase SVH 生 shēng := $VP\ {+}{+}/NP_{\text{qì}}$: $\lambda x\lambda y.be\ angry{+}{+}'_{\circ x}y$
SVT 氣 qì:= $N_{\text{qì}}$: $anger'$

b. Least flexible achievement-only SVs
2-phase SVH 畢 bì:= $VP{-}{+}/NP_{\text{yè}}$: $\lambda x\lambda y.graduate{-}{+}'_{\circ x}y$
SVT 業 yè:= $N_{\text{yè}}$: $school\ studies'$

Categories for the Insertion Patterns

We identified the seven most distinct structures in §5.3.2, with RVC in (187b) being one of them. The other four are listed in (189). The absence of these five types of inserted structures in achievement has been confirmed in numerous studies. Categorically speaking, these five functional categories expect 1-phase verbs as their arguments. This reflects the conclusion deduced from our experiments, indicating that SVs with sub-events semantics could combine with a wider variety of syntactic structures.

According to the definition of 著 *zhe* as "TT IN T-DP" by Klein et al. (2000), our hypothesis regarding this aspect is as outlined in (a). We utilized the directionality of a slash to represent the syntactic differences between the two Chinese imperfective aspects, 在 *zài* and 著 *zhe*, with the argument of 著 *zhe* being required to appear on the left-hand side, and the opposite for 在 *zài*. However, the semantic differences between the two exceeded the scope of this study, and are therefore only indicated by zhe' for simplicity.

Following Li and Thompson (1989), we viewed verb duplication as a delimitative aspect, which added tentativeness to action, but not to achievement (Chen et al., 1992). Since the AAB form does not assert the truth value of a proposition, we did not incorporate Klein et al.'s [ ] notation in its LF, but simply presented its aspectual finiteness as *S\NP*.

(189) a. Continuous aspect 著 zhe := $(S\backslash NP)\$_i \; ++ \backslash\backslash VP\$_i ++ \; : \; \lambda p.zhe'p + [\,++\,] +$

b. The copied verb root in AAB form α := $(S\backslash NP)\$_i \; ++ \backslash\backslash VP\$_i \; ++ \; : \; \lambda p.tentative'p ++$

c. The copied verb root in the verb-copying construction $\alpha := VP ++ \backslash_\star VP_{\text{inf}} ++ : \; \lambda p.p ++$

d. Numeral in Time-adv $\nu := (VP\$_i ++ \backslash_\star VP\$_i ++)/\; CL_{\text{span}} : \; \lambda m \lambda p.sk^{m}_{\nu;span} p$

Building on the categories of the verb-copying construction and Time-adv in §4.3.3, we added event constraints that restricted their arguments to 1-phase verbs, which avoided derivations involving 2-phase verbs, such as (187c) and (188b).

(190)

Zhāngsān	shēng-qì	shēng	liǎng	xiǎoshí
Zhangsan	be angry	get	two	hour
S/VP	$VP\ ++$	$VP ++ \backslash_\star VP_{\text{inf}} ++$	$(VP\$ ++ \backslash_\star VP\$ ++)/\; CL_{\text{span}}$	CL_{span}
$: \lambda p.p\, Zh'$	$: \lambda y.be\ angry ++'_{\circ\, anger} y$	$: \lambda p.p ++$	$: \lambda m \lambda p.sk^{m}_{2;span} p$	$: hour$
	$VP ++$: $\lambda y.be\ angry ++'_{\circ\, anger} y$		$VP\$ ++ \backslash_\star VP\$ ++$: $\lambda p.sk^{hour}_{2;span} p$	
	$VP ++ : \; sk^{hour}_{2;span}(\lambda y.be\ angry ++'_{\circ\, anger} y)$			
$S : \; sk^{hour}_{2;span}(be\ angry ++'_{\circ\, anger} Zh')$				

With regard to the two remaining distinct structures, topicalization and the 把 *bǎ* construction, we speculated that their exclusive appearance in highly flexible accomplishment-only SVs may be attributed to these structures' requirement for indefinite NPs (Li and Thompson, 1989).

The connection between these two structures and eventualities remains unresolved. For example, Sybesma (1992) posited that the 把 *bǎ* construction necessitated an accomplishment. Nevertheless, there are common counterexamples of the 把 *bǎ* construction combined with the continuous aspect and the tentative aspect (AAB), as illustrated in (191). Consequently, Liu (1997) advocated for considering aspects beyond eventualities, and suggested a broader definition for examining the 把 *bǎ* construction, such as boundedness. We recognize that these structures are influenced by numerous factors, thus necessitating further comprehensive research. Our experimental findings may only represent one aspect of this complex interaction. Without a clear consensus on these factors, imposing event constraints may be too hasty.

(191) a. 把 書 拿 著
bǎ shū ná zhe
BA book hold ASP
'Hold the book.'

b. 把 這件事 想想
bǎ zhèjiànshì xiǎngxiǎng
BA this issue think think
'Think about this (issue).'

Nonetheless, there is general agreement regarding topicalized NPs and the complement of the 把 *bǎ* construction. These NPs cannot be indefinite nominals that are unknown to the listener; instead, they must be definite or generic (Li and Thompson, 1989; Teng, 1972; Li and Cheng, 1998). In light of the categories delineated for these structures in §4.3.4, we propose the following modifications. Due to the feature of *−indef*, only combinations with the same features, (a) and (b), are allowed.

(192) a. 把 bǎ:= $(VP/TV\$)/NP_{-\text{indef}}$: $\lambda x \lambda p \lambda y.cause' init'(pxy)xy$

b. Highly flexible Accomplishment-only SVs
SVT 氣 qì:= $N_{\text{qì, }-\text{indef}}$: $anger'$

c. Least flexible Achievement-only SVs
SVT 業 yè:= $N_{\text{yè,+indef}}$: $school\ studies'$

d. topicalized 氣 *qì*:= $S_{\text{top}}/(S/NP_{\text{qì, }-\text{indef}})$: $\lambda p.p\ anger' \wedge topic'\ anger'$

It is semantically unmotivated to assume a specific category for verbs in topic sentences. Thus, the method outlined previously for fine-tuning the category's features to restrict combinations with adjacent components is not applicable. Given that the topicalized object and the complement of the 把 *bǎ* construction, marked as *−indef*, are applicable to all nouns in Chinese, and that nouns in these positions are derived through the $>\mathbf{T}_{\times}$ combinator (refer to §4.3.4), we exclusively limit access to $>\mathbf{T}_{\times}$ to $NP_{-\text{indef}}$, as demonstrated in (193). This restriction implies that an *+indef* SVT 業 *yè* cannot be transformed into a topicalized object through (193).

(193) $NP_{\text{i, }-\text{indef}} \rightarrow S_{\text{top}}/(S/NP_{\text{i, }-\text{indef}})$

Consequently, the lexical entry $S_{\text{top}}/(S/NP_{\text{yè, }+\text{indef}})$ is absent from our lexicon, thereby preventing its projection into a topic sentence.

5.5 Conclusion

In this chapter, we investigated the relationship between eventualities and SVs, and concluded that sub-events played a critical role in influencing the syntactic flexibility of SVs. In our analysis, we identified two representative categories of SVs, and delineated seven mutually exclusive splitting patterns within these categories. Finally, we integrated the constraints imposed by eventualities and inserted structures on SVs into the hypotheses that were previously formulated for SVs, in line with with the theoretical frameworks proposed by Klein (1994) and Klein et al. (2000).

CHAPTER 6

CONCLUDING REMARKS

Unlike previous studies that employed a top-down grammatical framework for analysis, we adopted a bottom-up lexical grammar framework to analyze Chinese separable verbs. We analyzed SVs as MWEs, in which the verbal part SV$_H$ and the nominal part SV$_T$ have independent categories, allowing them to operate syntactically independently while keeping their meaning specific, which has been a previously unmet challenge in SV research. Compared to V-O phrases, the significance of the head-dependent type lies in its limited combination freedom in terms of syntax, and a narrower range of reference in terms of semantics. Syntactically, the SV$_H$ must find a specific phonological word to derive; that is, the SV$_T$ specified in the category of the SV$_H$. Semantically, the overall semantics of the SV are not entirely synthetic. The SV$_H$ already encodes the main idiosyncratic meaning, with the SV$_T$ assisting the SV$_H$ to refer to a specific event modality. Using such a model, we captured the most important characteristic of SVs—syntactic decomposability but semantic non-decomposability. Of course, the common properties discussed in Chapter 1 were also addressed in this study.

In addition to analyzing SVs from various theoretical perspectives, we also attempted to explore the relationship between SVs and their degree of separability from a perspective that had not yet been explored, namely event structure. According to the principles of CCG, each syntactic argument within a syntactic type corresponds to a semantic argument in the LF. There is no need to examine how the interface between semantics and syntax is generated, as these aspects are inherently interlinked and mutually constraining within the CCG model. We hope that this study will serve as an example of analyzing Chinese via CCG. Tse (2013) pioneered the study of Chinese using CCG and established many syntactic types that are worth referencing, which was of tremendous benefit to our research. Beyond simply applying CCG to the empirical analysis of linguistic phenomena, we also modeled the logical form underlying language components, as well as the relationship between semantics and syntax as far as possible at this stage.

In this study, we adopted an approach that posited assumptions about the lexicon rather than manipulating rules for processing language. When an SV maintains the same LF across different intervening structures, there is no need to introduce a new category for it. We therefore maintained consistent analyses across various splitting patterns. Unlike some studies that adjusted their analyses of SVs for each type of splitting structure encountered, our method can predict whether an inserted structure can be derived

with SVs. For example, grammatical markers with \\, // cannot intervene in inseparable disyllabic verbs, which have only one category. Our analysis also allows for the verification or prediction of the grammaticality and semantic validity when an SV combines with certain syntactic components. Our research demonstrates that language processing is similar to other human cognitive abilities because the rules and principles that are applied in CCG's derivations, like many human cognitive abilities, are based on the same core logical algorithms (cf. Steedman (2002)).

In this study, we explored various aspects, including semantics, syntax, and event structure. The quantitative investigation into event structure revealed ample opportunities for enhancement in domains such as SV samples, annotators, and experimental designs. In this investigation, we only conducted a tentative, small-scale experiment. Moreover, in this research, we established categories for numerous constructions and grammatical units. Compared to morphologically rich languages, Chinese has relatively limited phonological forms for grammatical mechanisms. This scarcity of grammatical devices contributes to the opacity of complex semantics in Chinese. From a typological perspective, Chinese is characterized as a language with rigid word order. Consequently, alterations in word order are often not arbitrary, but may imply changes in semantics or event structures. While our work touched on various syntactic constituents and structures, as they were not the main focus of this study, we could only analyze them very briefly. However, they all deserve a deeper examination of their syntactic and semantic relationships using CCG.

Due to personal knowledge limitations and limited research experience, this dissertation inevitably contains many flaws and imperfections. As demonstrated in Chapter 5, the categorization of SVs could be refined through further explorations of semantic and syntactic constraints. We believe there are many other factors that contribute to the variability among SVs. However, given the limitations of time and resources, we must conclude our inquiry at this juncture. We hope that this research will serve as a resource for the Chinese linguistics community, and will encourage continued investigation by fellow linguists who share our interest in this issue.

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