

THE UNIVERSITY OF CHICAGO

ON NON-CULMINATING ACCOMPLISHMENTS IN MANDARIN

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This dissertation is dedicated to God.

TABLE OF CONTENTS

LIST OF FIGURES	vii
LIST OF TABLES	viii
ACKNOWLEDGMENTS	ix
ABSTRACT	x
1 INTRODUCTION	1
1.1 Background	3
1.1.1 Accomplishment Predicate	3
1.1.2 Krifka	11
1.1.3 Comparing Dowty’s and Krifka’s Theories of Accomplishments	15
1.2 The Problem of Non-Culminating Accomplishment	16
1.3 General Structure of This Dissertation	20
2 PREVIOUS STUDIES AND GENERAL QUESTIONS	22
2.1 Introduction	22
2.2 Previous Studies	22
2.2.1 Referential Properties and Total Affectedness: Singh (1991, 1998)	23
2.2.2 Imperfectivity Built in the Stem: Koenig and Muansuwan (2000)	28
2.2.3 Bar-El et al. (2004)	32
2.2.4 Tatevosov and Ivanov (2009)	35
2.2.5 Problems with Previous Analyses	40
2.3 General Questions and Strategies	43
2.3.1 General Questions	43
2.3.2 Working Hypothesis	45
2.4 Conclusion	50
3 DIAGNOSTICS FOR ACCOMPLISHMENTS	52
3.1 Introduction	52
3.2 Defining Telicity	54
3.3 Developing Predicate Type Diagnostics Cross-Linguistically	56
3.4 Tests for Mandarin Predicate Types	61
3.4.1 Two Counterparts of the <i>For</i> -Test	62
3.4.2 The Equivalent of <i>In</i> Test	66
3.4.3 The Progressive Test with <i>Zai</i>	69
3.4.4 The Culmination Entailment	70
3.4.5 The <i>Almost</i> Test	71
3.4.6 the <i>Negation</i> test	73
3.4.7 Summarizing the Results	76
3.5 Conclusion	78

4	THE PERFECTIVE ASPECT IN MANDARIN	79
4.1	Previous Studies on the meaning of <i>le</i>	81
4.1.1	Two Component-Theory: Smith (1994, 1997)	84
4.1.2	Distinguished Phase: Klein et al. (2000)	86
4.1.3	Compositional Semantics: Lin (2000, 2003)	88
4.1.4	Summary of Previous Analyses	92
4.2	Arguments Against the Imperfective Uses of <i>Le</i>	93
4.2.1	Tham (2013)	93
4.2.2	No Inceptive Reading for Activity Verbs	95
4.2.3	No Non-Culminating Reading for Every Accomplishment	98
4.2.4	Summary of the Arguments	100
4.3	Semantics of the Perfective <i>Le</i>	101
4.4	The Semantics of the Stative Verbs in Mandarin	101
4.4.1	Analyzing Stative Verbs in Mandarin	104
4.4.2	Tests	105
4.4.3	Analysis	109
4.5	The Typology of the Perfective	110
4.6	Conclusion	113
5	THE SEMANTICS OF ‘BREAK’ AND ‘FIX’ IN MANDARIN	114
5.1	Background and Data	116
5.1.1	Morphology of Bare and Resultative Compound Transitive Verbs	117
5.1.2	Culminating Reading Patterns for Bare vs. Resultative Compound	119
5.1.3	Morpho-Syntax of Transitives and Intransitives	124
5.1.4	Culmination Entailment Patterns the Intransitive MMFPs	128
5.2	Motivation for Analysis	131
5.2.1	Agentivity, Causation and Non-Culmination	132
5.2.2	Affectedness	133
5.2.3	Manner/Result Complementarity	136
5.3	Analysis	138
5.3.1	Bare Transitives and Intransitives	138
5.3.2	Resultative Verbal Compounds and Accomplishment Structure	141
5.3.3	The Resultative Morpheme vs. the Completive Morpheme	144
5.4	Comparison with Previous Analyses	145
5.4.1	Comparison with Koenig and Muansuwan (2000)	147
5.4.2	Comparison with Tatevosov and Ivanov (2009)	148
5.5	Pragmatics Component	150
5.6	Conclusion	151
6	THE SEMANTICS OF DEGREE ACHIEVEMENTS IN MANDARIN	153
6.1	Introduction	153
6.2	Data	157
6.2.1	Culmination Readings and Transitive-Intransitive Alternations	161
6.2.2	Variable Telicity in the Intransitives	166
6.3	Previous Analyses	172

6.3.1	Lin (2004a)	173
6.3.2	Kennedy and Levin (2008)	178
6.4	Analysis	181
6.5	Conclusion	188
7	CONSUMPTION VERBS	190
7.1	Introduction	190
7.2	Background	191
7.2.1	Singh's Analysis of Hindi non-culminating Reading	193
7.2.2	Previous Analyses in Mandarin	195
7.2.3	Defining Referentiality	196
7.3	Data for Consumption Verbs in Mandarin	202
7.3.1	Indefinite NPs	202
7.3.2	Definite NPs	204
7.4	Analysis	208
7.4.1	Semantics of Noun Phrases in Mandarin	209
7.4.2	Semantic Composition with the Referential NP	216
7.4.3	Semantic Composition with the Non-Referential NP	220
7.4.4	Comparison with English Consumption Verbs	222
7.4.5	Summary of Analysis	223
7.5	Comparison with Previous Analyses	224
7.5.1	Comparison with Singh (1991, 1998)	224
7.5.2	Comparison with Soh and Kuo (2005)	225
7.5.3	Comparison with Koenig and Chief (2007)	228
7.6	Conclusion	229
8	CONCLUSION	231
8.1	The Overall Picture	231
8.1.1	Global Factors	233
8.1.2	Speculation of Cross-Linguistic Patterns	234
8.2	Looking Ahead	236
8.3	Conclusion	237
	REFERENCES	238

LIST OF FIGURES

1.1	A Complete Join Semi-Lattice without Bottom Elements	13
5.1	Schema for an Accomplishment with an Agent	142
5.2	MMFP Representation	149
7.1	The Lattice of <i>Ge Pingguo</i> ‘CL Apples’	209
7.2	The Lattice of <i>Wan Pingguo</i> ‘Bowl (of) Apples or Apple Stuff’	210
7.3	A Bottomless Lattice for <i>Shui</i> ‘Water’	213

LIST OF TABLES

1.1	Vendler’s Verbal Classes from Dowty (1979, 54)	4
2.1	Different Non-Culminating Accomplishment Patterns	49
3.1	Summary of the Test Results	77
4.1	The “Perfective” Cross-Linguistically	111
4.2	The “Perfective” Cross-Linguistically Revised	112
5.1	Mandarin Transitive and Intransitive MMFP	125
6.1	Chinese Degree Achievement Morphology	158
7.1	Summary of the Data for Consumption Verbs with Different DOs	207
8.1	Speculations about Cross-Linguistic Typologies	235

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ABSTRACT

My dissertation investigates the non-culminating accomplishments in Chinese. In Mandarin, the accomplishment predicates, such as *xiu-che* ‘fix the car’ and *chi san-ge pingguo* ‘eat three apples’, surprisingly do not necessarily entail the completion of the event in the perfective aspect as in English. This phenomenon is crucial for understanding how English and Chinese differ in their aspectual and verbal systems. The goal of my dissertation is to pinpoint the location where the culmination of event is encoded in the semantic composition. I argue that in Chinese the “non-culminating accomplishments” arise because of either how some verb meaning is packaged, or how the verb and the direct object interact. I propose that the non-culminating accomplishments arise from three major factors: transitivity, degree semantics, and the referentiality of the direct object for consumption verbs.

Unlike most previous analyses, my dissertation offers a more comprehensive study of all the relevant factors including the semantics of perfective markers, verbal classifications, and the composition of the meaning of the verb and the direct object. My dissertation contributes significantly to event semantics, by developing reliable ways to accurately locate the semantic source of the non-culminating accomplishment readings, and by identifying referentiality of the direct object as a new factor crucial to the problem.

CHAPTER 1

INTRODUCTION

When an accomplishment predicate appears in the perfective form, the sentence usually entails that the event has culminated. In English, accomplishment predicates in the simple past (perfective) form usually entail that the event has reached its culmination point and the theme has entered into the result state. For example, in (1), the accomplishment predicate ‘fix the refrigerator’ in the simple past tense form entails that the refrigerator is completely fixed and functioning, and therefore it is infelicitous to continue the sentence with a clause that denies that the culmination has been reached, i.e. the refrigerator is still broken. Likewise for (2), because the accomplishment predicate ‘eat three apples’ in the simple past tense form entails that all three apples have been completely consumed, it is infelicitous in a situation if parts of any of the three apples remain.

- (1) Mary fixed the refrigerator, (# but the refrigerator is still broken.)
- (2) Mary ate three apples, (# but she didn’t finish eating all of the three apples.)

This culmination entailment is seemingly straightforward, given the well-accepted semantics of the accomplishment predicates and the past tense form in English. According to Dowty (1979), because accomplishment predicates describe events that involve an activity part that brings about a change of state on the theme, they are telic and encode an end point in their semantics. The simple past tense form in English entails that some event described by the predicate took place in the past. Therefore, when combined together, an accomplishment predicate and the past tense marker describe a situation in which an telic event in its entirety took place in the past, and naturally it is entailed that the event has culminated.

However, as it has been long observed in the literature, cross-linguistically this culmination entailment does not always hold (Singh, 1991; Koenig and Muansuwan, 2000; Soh and

Kuo, 2005). And this phenomenon is called ‘non-culminating accomplishment’. For non-culminating accomplishments, the culmination reading is only an implicature which can be canceled within the same sentence. For example, in Hindi and in Mandarin, the culmination reading can be canceled. As shown in (3) in Hindi, it is possible that ‘I ate my cake’ does not entail that the cake is completely eaten. Similarly in (4) in Mandarin, ‘he drew a picture’ usually has the reading that the picture is completed, but the implicature that the drawing is completed can be directly canceled.

(3) Hindi

maĩne aaĵ apnaa kek khaayaa aur baakii kal khaũũgaa.
 I-ERG today mine cake eat-PERF and remaining tomorrow eat-FUT

‘I ate my cake today and I will eat the remaining tomorrow.’ Singh (1991, 469)

(4) Mandarin

Ta hua-le yi-fu hua, keshi mei hua-wan.
 he draw-PERF one-CL picture but not draw-finish

‘He drew a picture, but he didn’t finish drawing it.’ Soh and Kuo (2005, 201)

These non-culminating accomplishment phenomena are intriguing, because they directly challenge some well-accepted theories of accomplishment predicates, and open up many questions related to a broad range of topics in event semantics, including lexical semantics of accomplishments, semantics of the perfective, the role of nominal referential properties of the incremental theme, cross-linguistic morpho-semantic variations, and so on. To fully address these questions, we need both an in-depth study of these different components in one language to understand how each factor interacts with the others, and also some cross-linguistic comparisons for a broader picture. In my dissertation, I mainly investigate the non-culminating accomplishment phenomena in Mandarin and compare these non-culminating accomplishments with their English counterparts. The main goal of my dissertation is develop a comprehensive compositional account of the non-culminating accomplishment phenomena for

Mandarin that explains some of the cross-linguistic differences in the meaning of the perfective, the accomplishment predicate and the nominal properties of the direct object for consumption verbs.

My chapter is organized as follows: In §1.1, I briefly introduce Vendler’s four classes of verbs and explain two canonical theories of accomplishment predicates by Dowty (1979) and Krifka (1989). In §1.2, I discuss why non-culminating accomplishments present a problem for these analyses of accomplishment predicates. I conclude this chapter by laying out the general structure of this dissertation in §1.3.

1.1 Background

1.1.1 *Accomplishment Predicate*

In a seminal study of verbal classifications, Vendler (1957) distinguish four basic verb classes which become quite standard in the literature of event semantics: states, activities, achievements, and accomplishments. Intuitively speaking, state predicates describe static states which tend to last for a certain amount of time and do not change easily, and include examples such as *know* and *believe*. Activity predicates describe processes that do not have a defined endpoint, such as *run*, *walk*, and *swim*. Achievements happen instantaneously, including examples such as *recognize* and *spot*. Accomplishments usually involve some kind of process that brings about a change in the object or the subject, such as *paint a picture*, *make a chair*, and *deliver a sermon*.

According to Vendler (1957), these four classes ‘have different restrictions on time adverbials, tenses and logical entailments (Dowty, 1979, 54).’ For example, one famous restriction is whether a verb class is compatible with a *for* adverbial phrase or an *in* adverbial phrase in English. While activity and stative predicates are compatible with *for*-phrases but not with *in*-phrases, accomplishments and achievements are just the opposite as shown in (5) and in (6).

Table 1.1: Vendler's Verbal Classes from Dowty (1979, 54)

state	activity	accomplishment	achievement
know	run	paint a picture	recognize
believe	walk	make a chair	spot
have	swim	deliver a sermon	find
desire	push a cart	draw a circle	lose
love	drive a car	push a cart	reach
		recover from illness	die

(5) Compatibility with *for*-phrase.

- a. Mary swam for two hours. activity
- b. ? Mary made a chair for two hours. accomplishment
- c. * Mary knew the answer for two hours. stative
- d. Mary found the key for two hours. achievement

(6) Compatibility with *in*-phrase.

- a. * Mary swam in two hours. activity
- b. Mary made a chair in two hours. accomplishment
- c. * Mary knew the answer in two hours. stative
- d. Mary found the key in two hours. achievement

This difference in compatibility with the *for*-phrase/*in*-phrase can test for telicity in these four classes, i.e. whether a verbal class describes eventualities with an endpoint. According to this test, accomplishments and achievements are telic; whereas activities and statives are atelic. While activity predicates such as *run* and stative predicates such as *know the answer* describe eventualities without an endpoint unless arbitrarily stopped, accomplishments and achievements describe eventualities with a natural endpoint. For example, for an accomplishment predicate such as *write a novel*, the endpoint is when the novel is completed after some writing process. And for an achievement, the endpoint coincides with the starting point because achievements take place instantaneously. Accomplishments differ from achievements

in that the culmination of achievements happens instantaneous, while an accomplishment involves a activity stage before the culmination is reached.

However, as Dowty (1979) points out, this verbal classification is further complicated by the nominal properties of the direct object (Verkuyl, 1972; Krifka, 1989). When the direct object of an accomplishment or an achievement predicate is a bare plural instead of ‘Num + N’ phrase, the whole verb phrase acts like an activity instead and become compatible with durational time adverbials. As (7) shows, when an accomplishment verb *paint* takes a bare plural *pictures* instead of *a picture* as its direct object, the verb phrase becomes compatible with a durational phrase. Likewise, as (8) shows, when an achievement verb *discover* takes a bare plural *flees* as its direct object, the verb phrase again becomes compatible with a durational phrase.

- (7) a. ? He paint a picture for three months.
b. He paint pictures for three months.
- (8) a. * He discovered a flee for three hours.
b. He discovered flees for three hours.

Therefore, from the discussion above, it is clear that accomplishment predicates share some similarities with both activity predicates and achievement predicates. And it is sometimes not easy to determine whether a verb phrase is indeed an accomplishment, just based on our intuition of the verb meaning alone. It is necessary to have a certain set of diagnostics to determine whether a verb phrase is a true accomplishment or not, and especially tests to distinguish accomplishments from activities. Dowty (1979) has already developed quite a few solid tests for English.

Diagnostics

According to Dowty (1979), in English accomplishments and activities can be distinguished by the following tests. (9) gives a list of all the tests in Dowty (1979), and I explain each

test in turn below.

- (9) a. The *for*-phrases and *in*-phrases test
- b. *spend* and *take* test
- c. entailments with *for*-phrases
- d. entailments from the progressive to the non-progressive tenses
- e. entailments as complements of *stop*
- f. as complements of *finish*
- g. readings with adverb *almost*
- h. Scope ambiguity Dowty (1979)

As already mentioned earlier, the first test, the *for*-phrase/*in*-phrase test, is one way to differentiate an accomplishment and an activity, because accomplishments are telic and activity are atelic. Although both time adverbials describe a extended period of time, the *for*-phrases and *in*-phrases differ in that *for*-phrases describe a situation that is true throughout that period of time, and *in*-phrases describe a situation that starts and ends within that period. Activity predicates are totally compatible with durational *for*-phrases, because activity do not have a natural endpoint and theoretically can continue for an indefinite amount of time, but they are incompatible with *in*-phrases, because they do not have a natural endpoint and therefore do not culminate within a period of time. On the contrary, accomplishment predicates are marginally compatible with *for*-phrases, but fully compatible with *in*-phrases, because accomplishment can last for some amount of time before it culminates eventually in a normal course of development.

- (10) Activity
- a. He ran for three hours.
- b. * He ran in three hours.

(11) Accomplishment

- a. He painted a picture in three hours.
- b. ? He painted a picture for three hours.

Parallel to the first test, the second test can also differentiate accomplishments from activities. While both activity and accomplishment predicates can be used in the construction *spend some time X-ing*, only accomplishment predicates are felicitous in the construction *it took somebody some time to X*.

(12) Activity

- a. He spent three hours running.
- b. * It took him three hours to run.

(13) Accomplishment

- a. He spent three hours painting a picture.
- b. It took him three hours to paint a picture.

The third, fourth, and fifth tests in Dowty (1979) are concerned with entailment relationships. Because an accomplishment only culminates at the very end of the event, it would be false to assert that an accomplishment has taken place at any time prior to the culmination point. In contrast, an activity verb does not have a culmination point, and consequently it is felicitous to assert that an activity ‘has taken place’ or ‘is taking place’, as soon as the activity starts. Therefore, when an accomplishment or an activity occurs with a *for*-phrase, the entailment relationship in (14) holds.

- (14) ‘If ϕ is an activity verb, then $x \phi ed \text{ for } y \text{ time}$ entails that at any time during y , $x \phi ed$ was true. If ϕ is an accomplishment verb, then $x \phi ed \text{ for } y \text{ time}$ does not entail that $x \phi ed$ was true during any time within y at all.’

Dowty (1979, 57)

Likewise, when the two occur in the progressive, the entailment relationship in (15) also holds.

- (15) ‘If ϕ is an activity verb, then *x is (now) ϕ ing* entails that *x has ϕ ed*. If ϕ is an accomplishment verb, then *x is (now) ϕ ing* entails that *x has not (yet) ϕ ed*’

Dowty (1979, 57)

Similarly, when an accomplishment and an activity are used as the complement of *stop*, the entailments differ. ‘He stopped walking’ entails that ‘he walked’, but ‘he stopped painting a picture’ does not entail that ‘he painted a picture.’

- (16) a. He stopped walking.
b. He stopped painting a picture.

The sixth test, whether an accomplishment or an activity can occur as the complement of *finish*, is also straightforward. An accomplishment can easily be taken as the complement of *finish*, but an activity usually cannot without some specific context, for the very same reason that accomplishment predicates have a natural endpoint but activity predicates do not. It only make sense to finish something with an endpoint, but not something without a specified endpoint.

- (17) * He finished walking.
(18) He finished painting a picture.

As for the seventh test with the adverbial *almost*, accomplishments and activities again differ in their entailments. When a activity predicate is used with *almost*, the entailment is that the event did not take place completely. When an accomplishment predicate co-occurs with *almost*, either the event did not take place at all, or it started but did not finish.

- (19) He almost ran.
(20) He almost wrote a poem.

The last test is that an accomplishment with a *for*-phrase sometimes has a scopal ambiguity, whereas an activity does not. As shown in (21), for an accomplishment such as *jail Robinhood*, the *for*-phrase can either describe the duration of the jailing action with a repetitive reading that the sheriff took four years to jail Robinhood, or it can describe the result of that jailing order, the length of time for Robinhood to be in jail. In contrast, for activities, the *for*-phrase only describes the time of duration of the activity, not the time since the activity has taken place. This test actually supports the idea that the meaning of accomplishment predicates include the result state in English, or else there would not be ambiguous scopal readings.

- (21) The sheriff of Nottingham jailed Robinhood for four years. Accomplishment
- (22) The sheriff of Nottingham rode a white horse for four years. Activity
- Dowty (1979, 58)

Now that it is conceptually clear how accomplishments differ from the other verbal classes, how would a formal theory of verbal classifications capture these facts? In the following two subsections, I review two influential theories of situational aspectual composition, Dowty (1979) and Krifka (1989) in turn.

Aspectual Calculus

Dowty (1979) proposes an aspectual calculus that captures the differences in the four Vendler classes by decomposing the verbal classes into subcomponents that have certain characteristics. By virtue of having different subcomponents, the four predicate classes behave in the ways they do. In his model, states are the most primitive of all the four types, because a state can be judged to be true or false easily at any arbitrary point of time. The other types are derived from states and analyzed as changes of states and relationships of different states. The calculus consists of n-place state predicates $\pi_m(\alpha_1, \dots, \alpha_m)$ or $\rho_n(\beta_1, \dots, \beta_n)$ and three different sentential connectives: CAUSE, DO, and BECOME. CAUSE represents

a causal relationship between two sentences, BECOME ϕ represents a change of state, and DO signifies agentivity. Different verbal classes have different characteristic forms containing these different sentential connectives. For example, activities and most of the accomplishments have DO in their formulas so that they are compatible with volitional adverbials, such as ‘willingly’, indicating agentivity. But achievements and states do not contain DO, and therefore they are incompatible with such volitional adverbials. (23) gives an overview of the general formulas for all the four Vendler classes.

(23) a. Stative

- i. Simple statives: $\pi_n(\alpha_1, \dots, \alpha_n)$
- ii. Stative causatives: $\pi_m(\alpha_1, \dots, \alpha_m)$ CAUSE $\rho_n(\beta_1, \dots, \beta_n)$

b. Activity

- i. Simple activities: DO $(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_m)])$
- ii. Agentive Stative Causatives(?):
DO $(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_m)])$ CAUSE $\rho_n(\beta_1, \dots, \beta_n)$

c. Achievement

- i. BECOME $[\pi_n(\alpha_1, \dots, \alpha_m)]$
- ii. Inchoation of Activity: BECOME $[\text{DO}(\alpha_1, \dots, \alpha_n)]$
- iii. Inchoation of accomplishment: BECOME ϕ

d. Accomplishment

- i. Non-agentive Accomplishments [BECOME ϕ] CAUSE [BECOME ψ]
- ii. (Non-Intentional) Agentive Accomplishments:
[[DO $(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_n)])$]CAUSE [BECOME $[\rho_m(\beta_1, \dots, \beta_n)]$]]
- iii. Agentive Accomplishments with Secondary Agent:
[[DO $(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_n)])$]CAUSE [DO $[\beta_1, \rho_m(\beta_1, \dots, \beta_n)]$]]
- iv. Intentional Agentive Accomplishment (2):
DO $(\alpha_1, [\text{DO}(\alpha_1, \pi_n(\alpha_1, \dots, \alpha_n))$ CAUSE $\phi]$ Dowty (1979, 123-125)

According to this model, accomplishment predicates have the general shape of ‘ ϕ CAUSE [BECOME ψ]’. In other words, the semantics of the accomplishment predicates contains two components, a causing activity event and a change-of-state event. The change-of-state event component accounts for the telicity and the causing activity event explains why sometimes accomplishment predicates are marginally acceptable with durational *for*-phrase modifying the causing event.

Dowty’s (1979) account successfully handles most of the data described so far and straightforwardly captures that differences of the four verbal classes by breaking each down into subcomponents with certain characteristics. In this account, the semantics of accomplishment predicates contain a change-of-state event directly, which accounts for the telicity of accomplishments. However, as Krifka (1989) correctly points out, this account does not quite explain how nominal properties of the direct object influence aspectual composition in a perspicuous way.

1.1.2 *Krifka*

According to Dowty (1979), accomplishment predicates are telic mostly by virtue of the endpoint in the semantics of the verb, however, as Krifka (1989) correctly points out, nominal properties of the direct object can also influence the telicity of the verbal predicate. When an accomplishment predicate takes either a mass noun phrase or a bare plural noun phrase as its complement, the whole verb phrase turns into an activity instead (Verkuyl, 1972; Dowty, 1979; Krifka, 1989). As shown in (24), while ‘eat three apples’ is an accomplishment, ‘eat apples’ and ‘drink beer’ are activities.

- | | | | |
|------|----|--|----------------------------|
| (24) | a. | * He ate three apples for three hours. | count nouns with a numeral |
| | b. | He ate apples for three hours. | bare plural |
| | c. | He drank beer for three hours | mass noun |

Krifka (1989) proposes the first formalized account to explain how nominal properties of the direct object affect aspectual composition. The basic idea behind his theory is that because the atelicity/telicity distinction in the verbal domain closely resembles the mass/count distinction in the nominal domain, a parallel lattice-theoretic structure can be built for event semantics in the fashion of Link (1983). Krifka (1989) proposes that for certain verbs, because there is a one-to-one mapping relation between the parts of the incremental theme direct object and the event, the whole verb phrase inherits its atelicity or telicity from property of that the incremental theme direct object argument.

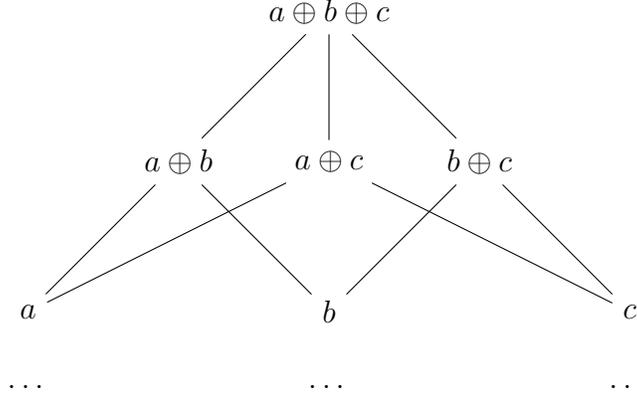
According to Krifka (1989), noun predicates, such as *books*, *three books*, *gold* and *three pounds of gold*, are either cumulative or quantized. Mass nouns such as ‘gold’ without measure phrases and bare plurals such as ‘books’ are cumulative, because if such a noun predicate applies to two separate entities, it also applies to the collection of the two. For example, if one entity is ‘gold’ and another entity is also ‘gold’, the collection of the two is still ‘gold’. In comparison, count nouns with a numeral ‘five books’ and mass noun with a measure word ‘five pounds of gold’ are not cumulative but quantized, because when such a noun predicate applies to two separate entities, it does not apply to their collection. For example, when ‘five books’ is true of an entity of books and also true of another entity of books, it does not apply to their collection, which is an entity of ten books rather than five books.

In his formal account, ‘the notions of structured individual domains and measure functions’ play very important roles. Following Link (1983), Krifka (1989) also adopts a lattice-theoretical account of the nominal predicates.

Then the extension of S should have the ‘structure of a complete join semi-lattice without bottom element. This structure can be defined with the help of some additional symbols in the representation language, which are indexed by S. Let \cup_s be a two-place operation (the join), and \subseteq_s , \subset_s , \circ_s two-place relations (part, proper part, and overlap).

Krifka (1989, 77)

Figure 1.1: A Complete Join Semi-Lattice without Bottom Elements



Within this model, the cumulative property and the quantized property can be formalized as follows in (25) and (26). According to (25), a predicate P is cumulative, if for any x and y that it applies to, it also applies to their union. According to (26), a predicate P is quantized, if for any x and any y it applies to, there is no y that is a part of x . So the cumulative property is true of mass nouns such as *gold* and bare plurals such as *apples*.

$$(25) \quad \forall P [CUM_S(P) \leftrightarrow \forall x \forall y [P(x) \wedge P(y) \rightarrow P(x \cup_s y)]]$$

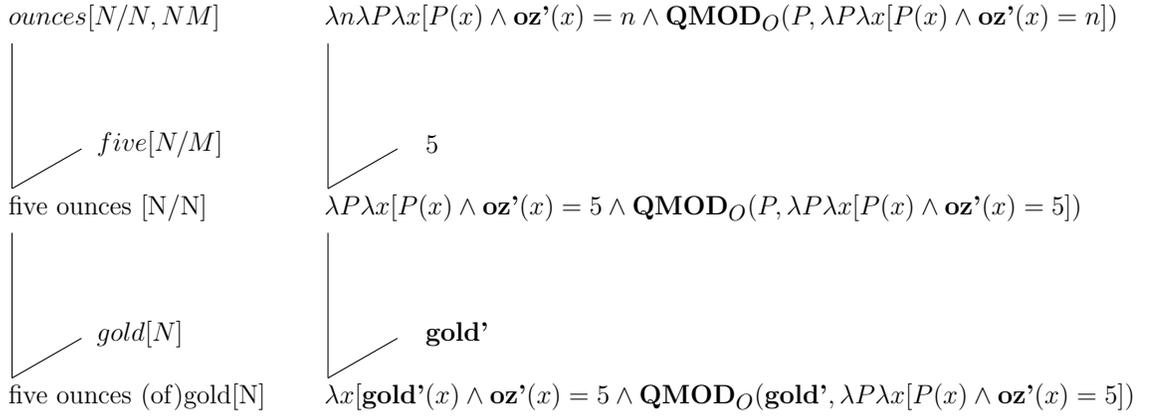
$$(26) \quad \forall P [QUA_S(P) \leftrightarrow \forall x \forall y [P(x) \wedge P(y) \rightarrow \neg y \subset_s x]]$$

Numerals and measure constructs such as ‘five ounces of’ are measure functions, which can turn a cumulative predicate into a quantized one. This is because when numerals are applied to count nouns and when measure phrases are applied to mass nouns or bare plurals, numerals and measure phrases cut out a bounded piece. This change of a cumulative predicate to a quantized one can be formalized as ‘quantized modification’ $P(P)$. This **QMOD** function also serves a well-formedness condition for measure phrases.

$$(27) \quad \forall P \forall P [QMOD_s(P, P) \leftrightarrow \neg QUA(P) \& QUA(P(P))](\text{quantizing modification})$$

Krifka (1989, 82)

(28) Composition of *five ounces of gold*



Krifka (1989, 83)

Back to the verbal domain, telic predicates such as *eat an apple* and atelic predicate *eat apples* are parallel to quantized NPs and cumulative NPs respectively, in that telic predicates are not cumulative and atelic predicates are cumulative. A part of ‘eat an apple’ event is not an ‘eat an apple’ event, but a part of ‘eat apples’ event is still an ‘eat apples’ event. To capture this intuition, Krifka (1989) proposes that for certain thematic relationships, the direct object is homomorphically mapped onto the event. Because the event is homomorphic with the parts of the incremental theme direct object, a predicate with a quantized direct object will also be quantized with an endpoint, and a predicate with a cumulative direct object will be cumulative without an endpoint. Therefore, ‘eat three apples’ is an accomplishment predicate, while ‘eat apples’ is an activity predicate, even though the verb is the same. The following are a few properties that a relationship R between a verb and its argument can have in order for the homomorphism to be established.

$$(29) \quad \forall R[\mathbf{SUM}(R) \leftrightarrow \forall e \forall e' \forall x \forall x' [R(e, x) \wedge R(e', x') \rightarrow R(e \cup_E e', x \cup_O x')]] \quad (\text{Summativity})$$

$$(30) \quad \forall R[\mathbf{UNI-O}(R) \leftrightarrow \forall e \forall x \forall x' [R(e, x) \wedge R(e, x') \rightarrow x = x']] \quad (\text{Uniqueness of Objects})$$

$$(31) \quad \forall R[\mathbf{UNI-E}(R) \leftrightarrow \forall e \forall e' \forall x [R(e, x) \wedge R(e', x) \rightarrow e = e']] \quad (\text{Uniqueness of Objects})$$

$$(32) \quad \forall R[\mathbf{MAP-O}(R) \leftrightarrow \forall e \forall e' \forall x [R(e, x) \wedge e' \subseteq_E e \rightarrow \exists x' [x' \subseteq_O x \wedge R(e', x')]]] \\ (\text{Mapping to Objects})$$

$$(33) \quad \forall R[\mathbf{MAP-E}(R) \leftrightarrow \forall e \forall x \forall x' [R(e, x) \wedge x' \subseteq_O x \rightarrow \exists e' [e' \subseteq_E e \wedge R(e', x')]]]$$

(Mapping to Events)

It is not the case that there is always a homomorphic mapping relation between the direct object and the event. Only verbs that satisfy certain conditions for graduality, i.e. uniqueness of object, mapping to object and mapping to event, have this argument-event homomorphism. For example, although *push a cart* has a quantized direct object, it is an atelic activity predicate, because the parts of the cart is not mapped to the parts of the event, i.e. it does not satisfy MAP-O and MAP-E. Intuitively speaking, because *push a cart* involves changing the location of the cart but not changing the parts of the cart, so the parts of the cart are not mapped to the event or vice versa. On the other hand, an *eat an apple* event is gradual, because there is one unique apple that is eaten, every bit of the apple corresponds to a subevent of ‘eat an apple’ and vice versa, so that a homomorphism is established.

$$(34) \quad \forall R[\mathbf{GRAD}(R) \leftrightarrow \mathbf{UNI-O}(R) \wedge \mathbf{MAP-O}(R) \wedge \mathbf{MAP-E}(R)]$$

1.1.3 Comparing Dowty’s and Krifka’s Theories of Accomplishments

Under both Dowty’s (1979) theory and Krifka’s (1989) theory of accomplishment predicates, an accomplishment verb phrase is telic, but the source of telicity is different for the two accounts. Whereas in Dowty’s account, telicity is directly encoded with a change-of-state subevent in the semantics of the verb stem; in Krifka’s account, it comes instead indirectly from the nominal properties of the incremental theme direct object for verbs with graduality. For example, ‘John ate three apples’ is telic in Dowty’s account, because the result state that the three apples are completely consumed and gone is directly encoded in the semantics of ‘eat three apples’; and telic in Krifka’s account because ‘three apples’ is quantized and the VP inherits its telicity from ‘three apples’.

In either account, the prediction is that an accomplishment VP in the perfective aspect should have a culminating completive reading, and indeed this is the case for most accomplishments in English. I have chosen to focus on these two accounts, because these two accounts are what most of the studies of non-culminating accomplishments assume and represent two major lines of thought of analyzing accomplishment predicates.

However, as we see in the next section, cross-linguistically accomplishment predicates in the perfective aspect sometimes fail to have the expected culminating reading. These non-culminating accomplishments indeed directly challenge our usual understanding of the accomplishment predicates and pose some intriguing questions about verbal and aspectual compositions in general cross-linguistically.

1.2 The Problem of Non-Culminating Accomplishment

As we have discussed above in the previous subsections, according to Dowty's (1979) theory of accomplishment predicates, an accomplishment predicate directly encodes a change-of-state subevent in its meaning. And according to Krifka's (1989) theory, an accomplishment inherits its telicity from the boundedness of its argument: a gradual verb with a quantized direct object is also quantized or bounded. Under either account, when an accomplishment predicate composes with the perfective marker, event culmination should be entailed. In English, as shown in (35) and (36), it is usually infelicitous to deny the culmination of the event as a sentence continuation to the main clause. 'Fixed the fence' entails that the fence is completely fixed and 'ate three apples' entails that all three apples are totally consumed.

(35) # I fixed the fence, but didn't finish fixing it.

(36) # I ate three apples, but didn't finish eating them.

Notice that what I mean by 'totally consumed' is not that literally every part of an apple is consumed, but that all the relevant parts are consumed. For example, leaving out the cores or the skin of the apples, which are normally not edible parts, does not count as not

‘totally consumed’. But if some parts of the edible flesh of the apples are not eaten, then it counts as non-culminating reading for *ate three apples*. Therefore, the culmination of an event allows for some pragmatic imprecision.

Although according to Dowty’s (1979) and Krifka’s (1989) accounts of English accomplishment predicates, it seems that in English an accomplishment predicate in the perfective should always entail the culmination of the event, actually it has well been observed that this does not need to be the case for some accomplishments (cf. Rothstein, 2004; Kennedy and Levin, 2008; Piñón, 2008; Kennedy, 2012). For example, as shown in (37), when the incremental theme has a definite article, such as ‘eat the apple’, the accomplishment VP can be atelic, being compatible with a *for*-adverbial.

- (37) I ate the apple for two minutes. Rothstein (cf. 2004)

Another example is the so-called degree achievements, famously analyzed in Kennedy and Levin’s (2008) study. These degree achievements involve verbs such as ‘lengthen’, ‘darken’ and ‘cool’, which can either be telic or atelic depending on whether we understand the verb as denoting an eventuality bringing about some degree of change or the maximal degree of change for the incremental theme argument as shown in (38). Kennedy and Levin (2008) propose that these degree achievements predicates are actually ambiguous between an accomplishment reading and an activity one.

- (38) a. The soup cooled in twenty minutes.
b. The soup cooled for twenty minutes. Kennedy and Levin (cf. 2008)

These two kinds of examples above cannot be accounted for easily by the existing theories of accomplishments by either Dowty’s (1979) or Krifka’s (1989) account so far. Although one may still argue that these data are not what Dowty’s and Krifka’s accounts mainly focus on and there are ways to modify the two accounts in order to accommodate these new data, these two types of examples bring up an important point that the classic theories of accomplishments are not perfect and need to be reconsidered in depth given these exceptions.

I leave the discussion of these cases for now and turn to some apparently more problematic cases in other languages.

What is more puzzling is that even for accomplishment VPs in (35) and (36), which are canonical examples of accomplishments in Dowty’s (1979) sense, they can easily fail to culminate in the perfective in many other languages, such as Thai, Hindi, Japanese and Mandarin (Bar-El et al., 2004; Ikegami, 1981; Koenig and Muansuwan, 2000; Singh, 1991; Soh and Kuo, 2005).

(39) Japanese

moyashita keredo, moenakatta.
burned though didn’t burn

[literally ‘I burned it, but it didn’t burn.’]

Ikegami (1981, 273)

(40) Thai

Surii tɛɛŋ klɔɔn k^hûn tɛɛ jaŋ mâj sèd
Surii composed poem ascend but still not finish

‘Surii composed a/the poem, but has not finished it yet.’

Koenig and Muansuwan (2000, 157)

The two examples (39) and (40) above also exemplify two types of non-culminating accomplishments, called ‘failed attempt’ and ‘partial success’ by Tatevosov and Ivanov (2009). The first type failed-attempt reading involves no change in the theme argument at all. As in (39), the object was not burned at all, although I tried to burn it. In Japanese, when used in the perfective, the lexical term for ‘burn’ can have a failed-attempt reading, by negating there is any change in the theme as a continuation to the sentence. The second type partial-success reading arises, when the theme is partially affected. As shown in (40), in Thai, ‘composed a poem’ can mean having written at least some part of a poem, not necessarily the whole poem.

These examples of non-culminating accomplishments are highly interesting, because they directly challenge our well-accepted theories of accomplishment predicates, and open up

a series of broader questions about event semantics, such as cross-linguistic variations of the semantics of accomplishments, the perfective aspectual marker and their composition. Given how accomplishment predicates and the perfective aspect are usually analyzed in English, that the accomplishments are telic with a culmination point and that the perfective describes an event having taken place in its entirety before a some contextually salient time, it should be impossible to have such readings where the culmination is not reached, once the accomplishment has taken place. To account for the difference between English and these languages that allow for non-culminating readings even for the canonical accomplishments, *a priori* one may hypothesize that either the semantics of the accomplishment VP or that of the perfective marker is different in those languages, possibly by having some sort of partitive meaning that makes the event stop before culmination is reached.

Many current proposals adopt the first line of thoughts that the semantics of accomplishment predicates in these languages are different from English (Singh, 1991; Bar-El et al., 2004; Koenig and Muansuwan, 2000). In one type of analyses, the non-culminating accomplishment predicates are different in their thematic relationship, by having a partial affected thematic relation for the incremental theme when the incremental theme has certain properties (Singh, 1991). In another type of analyses the non-culminating accomplishments VP have some kind of operator at some level that introduces the inertia worlds and removes the culmination requirement in the world of evaluation (Bar-El et al., 2004; Koenig and Muansuwan, 2000).

However, another possibility is that the accomplishment predicates have the same meaning cross-linguistically, but the perfective aspect particle has a different meaning. For example, according to Smith (1997) and Lin (2005), Mandarin accomplishment predicates in the perfective can have a non-culminating reading, because the perfective marker *le* only requires the event to have stopped at some point, and it does not need to stop at the culmination point.

In the current literature of non-culminating accomplishments, there seems to be surprisingly not many studies that discuss why they choose the one place or the other as the source of non-culmination in the first place. Therefore, even without going into details about other more specific problems, it is already clear that the non-culminating accomplishment phenomena are fairly complex problems that are influenced by a number of different factors. From the current literature, it is not entirely clear which component of the grammar contributes to the non-culminating accomplishment reading. Moreover, the detailed semantic composition at each level and their interactions have not been discussed extensively. Indeed, a study that carefully examines each factor in turn and their interaction is necessary.

1.3 General Structure of This Dissertation

My dissertation is mainly divided into three parts. In the first part, I establish the background by reviewing some previous studies of non-culminating accomplishments in other languages in Chapter 2, developing proper diagnostics for verb classes in Mandarin in Chapter 3 and analyzing the meaning of the perfective marker *le* in Chapter 4. I show that, contra previous claims, the ‘non-culminating accomplishment’ is actually a misleading umbrella term for similar patterns that have different origins and that the perfective marker *le* is not one of the sources for non-culminating accomplishments.

In the second part, I delve into my core analyses of three different types of non-culminating accomplishments: Dowty-style inherent accomplishments in Chapter 5, degree achievements in Chapter 6, and Krikfa-style derived incremental-theme accomplishments in Chapter 7.

In Chapter 5, I observe that for the equivalents of the Dowty-style inherent accomplishments in Mandarin, the bare transitive accomplishment verbs do not entail culmination and behave like activity verbs with respect to the diagnostics for predicate types, whereas the intransitive always entails culmination. I propose that Mandarin transitive accomplishment verbs are lexically packaged as manner verbs rather than result verbs, and the change-of-state subevent and the result state are encoded in the intransitive instead.

In Chapter 6, I observe that Mandarin degree achievements also show influences from transitivity, and exhibit patterns of variable telicity due to the degree semantics of the adjectival core. I propose that both transitivity and the degree semantics of the verb determine whether a non-culminating reading can arise in a Mandarin degree achievement predicate.

In Chapter 7 I observe that in Mandarin for incremental-theme accomplishments, non-culminating reading can arise when the direct object is referential. I propose that consumption verbs such as ‘eat’ and ‘drink’ in Mandarin mean ‘eat part of’ and ‘drink part of’ when composed with referential direct objects, and that the non-referential direct objects are interpreted with a non-referential measurement reading instead as an event measurement.

In the third part of my dissertation, I conclude by summarizing my dissertation, providing the general picture of non-culminating accomplishments in Mandarin, and discussing some remaining issues in Chapter 8.

CHAPTER 2

PREVIOUS STUDIES AND GENERAL QUESTIONS

2.1 Introduction

In this chapter, I review several influential previous studies on non-culminating accomplishments cross-linguistically. I point out that most of the previous studies lack substantial data and arguments to confidently locate the source of non-culminating accomplishments in a particular part of the semantics. To bridge this gap, I argue that it is necessary to conduct a step-by-step in-depth study of the semantics of the perfective marker and different types of non-culminating accomplishments in a single language.

This chapter is organized as follows: I first review some important studies and critique each one in turn in §2.2, and then I lay out some general questions for this dissertation and propose a working hypothesis in §2.3. I conclude this chapter by previewing the steps of my investigations in §2.4.

2.2 Previous Studies

Although the non-culminating accomplishment phenomena have been researched and discussed quite extensively, most of the analyses have only focused on one small aspect of the problem each time, and therefore the general picture of how different levels, i.e. lexical semantics of the verb, VP composition with the direct object, and the perfective aspectual marker, all come together as a whole is not entirely clear. For example, Singh (1991, 1998) mainly focuses on how the referential properties of the incremental theme affect the non-culminating accomplishment readings in Hindi, but does not fully discuss the semantics of the perfective aspectual marker. In contrast, Koenig and Muansuwan (2000) mainly discuss the semantics of the accomplishment verb stems and the perfective marker in Thai, but do not discuss the referential properties of the incremental theme. And as we shall see below,

the conclusions that Singh (1991, 1998) and Koenig and Muansuwan (2000) arrive at, at least on the surface, are quite different from each other. While these proposals account for their own data well and are not necessarily incompatible with each other, it remains unclear if there can be a general account that takes into account all three factors at once, and how this general account can handle the data at once.

In this section, I review several important analyses in turn. For each analysis, I first present the core data and then a synopsis of the analysis of the data. As we can see, each of the following analyses addresses a slightly different tiny aspect of the problem and somewhat misses the broader picture.

2.2.1 Referential Properties and Total Affectedness:

Singh (1991, 1998)

In Hindi, as Singh (1991, 1998) observes, unlike in English, an accomplishment predicate in the perfective form does not necessarily entail culmination. Whereas in English, ‘he read a letter’ entails that the letter was read entirely, in Hindi, ‘he read a letter’ can be true even if the letter was only partly read.

- (41) us ne ciTThii paRhii par puurii nahii kii
 he ERG letter read-PERF but complete NEG do-PERF
 ‘He read a letter but did not complete it.’ Singh (1998, 184)

However, it is not the case that accomplishment predicates in the perfective in Hindi never entails event culmination. If a compound verb is used instead of a simple verb, a culminating reading is required. As (42) shows, with *khaa liyaa* ‘eat take’ the compound verb instead of the simple verb ‘eat’, the reading is obligatorily culminating, as it is infelicitous to mention that some cake is left, which is contradictory to the culminating reading.

- (42) *mãē ne kek khaa liyaa, jo bacaa hae wo raam khaayegaa
 I ERG cake eat take-PERF what remain is that Ram eat-FUT
 ‘I ate the cake and Ram will eat the rest.’ Singh (1998, 173)

Having explained this difference between simple verb (SV) and compound verb (CV), Singh (1991, 1998) then focuses on accounting for how nominal properties of the incremental theme affect the culminating reading in Hindi. Crucially, the pattern in Hindi is different from the patterns described by Krifka (1989) for English. Recall that when the theme of a gradual verb is quantized, because of the homomorphism between the incremental theme and the event, the resulting VP is telic with the culmination point at the time when the theme is completely affected. However, in the SV construction in Hindi, this homomorphism only holds for the quantized theme with a mass (or material) reading, such as ‘two glasses of beer’ or ‘one and a half cakes’, but not for the quantized theme with a count (or referential) reading, such as ‘two cakes’.

(43) Count Nouns with a Count Reading

laRke ne do kek khaaye/ khaa liye.
 boy ERG two cake eat-PERF/ eat take-PERF

‘The boy ate two cakes (partly)/entirely.’ Singh (1998, 174)

(44) Mass Nouns

us ne do gilaas biiyar pii.
 he ERG two glasses beer drink-PERF

‘He drank two glasses of beer.’(culminating reading) Singh (1998, 185)

(45) Count Nouns with a Mass Reading

laRke ne deRh kek khaayaa/ khaa liyaa.
 boy ERG one and a half cake eat-PERF/ eat take-PERF

‘The boy ate one and a half cakes entirely.’ Singh (1998, 174)

As shown in (43), in Hindi, with a count noun as the head of the quantized incremental theme, the reading is partitive when the simple verb form is used, and culminating when the compound verb form is used. However, with a mass noun as the head of quantized incremental theme as shown in (44), even a simple verb form requires the culminating reading. In addition, as shown in (45) count nouns with non-integral numerals, such as ‘one and a half’,

have a mass reading because the non-integral numeral indicates a measurement reading of the numeral rather than a referential counting reading, and consequently the culminating reading is obligatory for both the simple verb form and the compound verb form in this case.

To account for this pattern in Hindi, Singh (1998) proposes that “a ‘partitive-patient’ relation yields a neutral perfective reading.” A neutral perfective is just a term that Singh (1998) has coined to distinguish the Hindi perfective from the English type of standard perfective where a ‘total-patient relation’ holds. Simply put, Hindi differs from English in having a neutral perfective reading for its simple verb form in the perfective, whereas English only has a standard perfective with an event culmination entailment. Her analysis is based on Krifka’s (1989) lattice-theoretic theory. To accommodate the Hindi data, she introduces some new features to the model.

Singh (1998) assumes that ‘the thematic relations are defined differently for individuals and for matter.’ For matter, it holds that every part of the matter would be involved in every part of the event, i.e. a total-affectedness relationship. She claims that for languages with only the ordinary perfective reading, this one version of theta relationship is enough.

$$(46) \quad \theta_m(e, x) \leftrightarrow \forall x'[x' \sqsubseteq x \rightarrow \exists e'[e' \sqsubseteq e \wedge \theta_m(e', x')]] \wedge \forall e'[e' \sqsubseteq e \rightarrow \exists x'[x' \sqsubseteq x \wedge \theta_m(e', x')]]$$

Singh (1998, 188)

Therefore, ‘drink three glasses of beer’ in Hindi is analyzed just like ‘drink three glasses of beer’ in English as in Krifka’s (1989) proposal. ‘Drink three glasses of beer’ has a culminating reading, because ‘three glasses of beer’ is in the material domain and the thematic relationship between the drinking event and the theme is a totally affected one, that every subpart of the theme is mapped to a subpart of the event and every subpart of the event is mapped to a subpart of the theme. Likewise in Hindi, ‘eat one and a half apples’ is also analyzed as having a total-affectedness relationship, because the numeral is not integral and therefore the reading is not referential but rather non-referential, denoting an amount of material that measures up to one and a half units of apples (or apple stuff) that is eaten in the event.

However, for languages such as Hindi with a neutral perfective, another version of the theta relation for individuals is also needed. This theta relationship for individuals only requires that some material part of each of the atomic parts is involved in the event, rather than that every material part is needed to participate. In other words, when this theta relation holds for the verb and the direct object in the individual domain, the individuals referred by the direct object does not need to be completely consumed, leading to a non-culminating reading.

$$(47) \quad \theta_i(e, x) \leftrightarrow \forall x'[x' \sqsubseteq_A x \rightarrow \exists x'', e'[x'' \sqsubseteq h(x') \wedge e' \sqsubseteq e \wedge \theta_m(e', x'')]] \wedge \forall e'[e' \sqsubseteq e \rightarrow \exists x'[x' \sqsubseteq h(x) \wedge \theta_m(e', x')]] \quad \text{Singh (1998, 189)}$$

So in Hindi, ‘eat three apples’ does not need to have a culminating reading that three apples are completely consumed, because ‘three apples’ stands in a partially affected relationship with the eating event, because ‘three apples’ is in the individual domain. According to the partial-affected thematic relationship in (47), ‘eat three apples’ in the perfective only requires that within each atomic unit, i.e. each of the three apples, a material part of that atomic unit (an apple) is eaten and that every subevent of the eating event is mapped to some part of the material part of the three apples. In other words, although the eating event is still totally mapped to some parts of the three apples, the material parts of the three apples are not fully mapped to the parts of the eating event.

Although a simple verb construction in Hindi may have either culminating readings or non-culminating readings depending on the mass/count distinction, a compound verb construction always gives rise to the culminating reading. Since a compound verb construction gives rise to a culminating reading even for the count nouns, Singh (1998) proposes that the compound verb construction changes a theta relation to a total relationship through a TOT function. When this TOT function applies to a theta relation for material, the theta relation is not changed, because the theta relation for material is total to begin with. But when this TOT function applies to a theta relation for individuals, it changes it to a from a partial relation to a total relation, where all the material parts of the individuals involved

will be affected in the event.

$$(48) \quad TOT(\theta)(e, x) \leftrightarrow \theta(e, x) \wedge \forall x'[x' \sqsubseteq h(x) \rightarrow \exists e'[e' \sqsubseteq e \wedge \theta(e', x')]] \wedge \forall e'[e' \sqsubseteq e \rightarrow \exists x'[x' \sqsubseteq h(x) \wedge \theta(e', x')]] \quad \text{Singh (1998, 189)}$$

Therefore, from this quick summary of the two studies in Singh (1991, 1998), we see that although she attributes the difference between Hindi and English to different perfectives, the analysis itself really is more about thematic relations rather than temporal semantics of the perfective aspectual markers, unlike Smith's (1997) analysis which relies on the semantics of perfective marker being imperfective in some sense to derive the non-culminating readings. Without substantial discussions of the source of non-culminating reading, Singh's (1991, 1998) analysis suffers from the general problem of not giving enough evidence to show that the non-culminating readings really do come from the semantics of the thematic relation between the verb and its argument instead of coming from the aspectual marker.

Furthermore, even though this analysis may be on the right track, there are reasons to believe it is still incomplete and cannot be generalized to other cases of non-culminating accomplishments. For one thing, how definiteness of the noun influences the culminating reading is not much discussed in the analysis. In Chapter 7 of my dissertation, I show that definiteness plays an important role in deciding what counts as an atom with a new and similar set of data from Mandarin. I present some Chinese data to show that when an NP is definite, group atoms other than the natural count atoms can be formed through the context. As shown in (49), in Chinese, 'drink those three liters of water' can have a non-culminating reading, although 'three liters of water' according to this analysis should be in the material domain and therefore have a total-affectedness thematic relationship.

$$(49) \quad \begin{array}{l} \text{wo na san-sheng shui he le, danshi mei he wan} \\ \text{I that three-liter water drink PFV, but not drink finish.} \\ \text{'I drank that three liters of water, but I did not finish it.'} \end{array}$$

For another, this analysis is specifically designed to account for consumption and creation types of accomplishments and cannot be extended to account for the failed-attempt non-

culminating readings, because even the partial-affectedness thematic relationship requires some change in the theme. Therefore, other analyses are needed for other types of non-culminating accomplishments.

Moreover, although this analysis handles this set of Hindi data well, it seems somewhat stipulative to propose two separate thematic relationships for the individual domain and the material domain. Singh's analysis does not explain satisfactorily the fundamental reason why two types of thematic relationship for the same argument slot for the same verb are needed.

2.2.2 Imperfectivity Built in the Stem:

Koenig and Muansuwan (2000)

For non-culminating accomplishments in Thai, Koenig and Muansuwan (2000) adopt a different approach from Singh (1991, 1998). In this analysis, Koenig and Muansuwan (2000) do indeed locate the source of non-culminating reading to the verb stem of the accomplishment predicate and also provide a spelled-out semantics for the Thai perfective marker. In short, Koenig and Muansuwan (2000) propose that for accomplishment verb stems in Thai, an imperfective operator is built in the semantics, so that accomplishment verbs in Thai are activity-like, and that perfective marker in Thai is a semi-perfective with a semantics of maximality operator rather than a traditional perfective meaning.

Koenig and Muansuwan (2000) do not factor in the referential properties of the direct object NP in their analysis, because they believe that for the Thai data, the referential properties are irrelevant. As the following examples show, they argue, a non-culminating reading arises, regardless of the nominal properties of incremental theme. As shown in the following examples in (50), a non-culminating reading can always arise, regardless of whether the direct object is a quantized NP, a definite NP or an pronoun. Therefore, they conclude definiteness or quantization of the direct object NP does not contribute to the non-culminating readings in Thai.

- (50) a. Surii tɛɛŋ klɔɔn sɔɔŋ bɔt k^hûm tɛɛ jaŋ mâj sɛd.
 Surii compose poem two CL ascend but still not finish
 ‘Surii composed two poems, but has not finished it yet.’
- b. Surii tɛɛŋ klɔɔn bɔt ní k^hûm tɛɛ jaŋ mâj sɛd.
 Surii compose poem CL this ascend but still not finish
 ‘Surii composed this poem, but has not finished it yet.’
- c. Surii tɛɛŋ man k^hûm tɛɛ jaŋ mâj sɛd.
 Surii compose it ascend but still not finish
 ‘Surii composed it, but has not finished it yet.’

Koenig and Muansuwan (2000, 157)

Instead, Koenig and Muansuwan (2000, 162) hypothesize that accomplishment verb stems in Thai “are fundamentally ‘imperfective’ in that they do not refer to complete eventualities, but to (non-necessarily proper) subparts of inherently bounded eventualities.” In other words, Thai accomplishment verb stems describe the activity part (possibly up to the culmination point) of the accomplishment, that would culminate in all ‘inertia worlds’(cf. Dowty, 1977).

- (51) a. $\alpha = \text{impfv}(ev, \phi)$
- b. An eventuality ev and an event description ϕ satisfy condition α if and only if there is an e' which (non-necessarily properly) includes ev and satisfies ϕ in all ‘inertia’ worlds — i.e. in all worlds compatible with what it would mean to complete ev without being interrupted.

Koenig and Muansuwan (2000, 163)

Now that the accomplishment verb stems in Thai are atelic and have an imperfective meaning, to make sure that the Thai accomplishment sentences in perfective still come out as bounded, i.e. the event did come to an arbitrary endpoint, the semantics of the Thai perfective marker needs to be adjusted accordingly. Koenig and Muansuwan (2000) accomplish this by the maximality operator, which picks out the largest eventuality that fits the description, but not any eventuality smaller. In this way, even though the accomplishment

verb stem carries an imperfective operator, the whole sentence would not wrongly come out to be imperfective, because the largest eventuality is picked out and so the eventuality did not continue beyond that point.

- (52) The referent of a discourse marker e satisfies the predicative condition $Max(e, \phi)$ if and only if e is the largest eventuality which satisfies ϕ , that is, if there is no eventuality e'' such that $e \sqsubset e''$ which satisfies the eventuality description ϕ

Koenig and Muansuwan (2000, 167)

Indeed, Koenig and Muansuwan's (2000) analysis has pinpointed the source of non-culminating accomplishment and shown how the semantics of the accomplishment verb stem interacts with that of the perfective marker. However, this analysis is also not completely satisfactory for several reasons.

First of all, If Koenig and Muansuwan's (2000) analysis of Thai accomplishment predicates as basically activity predicates is correct, then there are actually no non-culminating accomplishments in the real sense, since the predicates that would be accomplishment predicates in other languages are actually activities in Thai. If this really is the case, then Dowty's (1979) and Krifka's (1989) theories of accomplishment predicates are not directly challenged, except that what we take for granted to be accomplishments are actually activities in Thai. However, in the paper, they also show that these predicates are compatible with *in*-phrases, but not *for*-phrases. Although the *for*-phrase/*in*-phrase test usually tests for the difference between accomplishments and activities as we know from Dowty (1979), the authors take this piece of data as evidence that the actual event is bounded and ended prior the speech time somehow, not that the accomplishment VP is telic, because (54) can be true even if the three poems are not completed, despite its English translation. Despite their explanation, I think (53) may still be problematic for their claim that accomplishment predicates in Thai are activities, if Dowty's (1979) *for*-phrase test for activities actually works in Thai as well. Therefore, their assumption that Thai accomplishment predicates are activities is possibly not as valid as they claim.

- (53) *Suriî tɛ̀ɛŋ klɔ̀ɔn sǎam bòt kʰûm pen wee-laa nûŋ cʰûa-mɔ̀ɔŋ
 Suriî compose poem three CLASS ascend be time one hour
 ‘Suriî composed three poems for an hour.’
- (54) Suriî tɛ̀ɛŋ klɔ̀ɔn sǎam bòt kʰûm naj nûŋ cʰûa-mɔ̀ɔŋ
 Suriî compose poem three CLASS ascend in one hour
 ‘Suriî wrote three poems in an hour.’

Koenig and Muansuwan (2000, 158)

Second, even if it is indeed right to claim that Thai accomplishment predicates are activities, it is not entirely clear what counts as an accomplishment verb predicate in Thai for Koenig and Muansuwan (2000) in the first place. In the examples, verbs of creation such as ‘compose’ count, but what about verbs of consumption such as ‘eat’ and non-incremental ones such as ‘kill’? As we have previously discussed in Chapter 1, it is not entirely easy to determine what an accomplishment is. The authors lack examples of other types of accomplishments to support the claim that the accomplishment verb stems in Thai generally have an *Impfv* operator.

Third, although they claim that referential properties of the direct object are not relevant, Koenig and Muansuwan (2000) do not show the full data pattern for the count/mass distinction. From the examples, we can only conclude in Thai the definiteness of the direct object NP does not impose a culminating reading, but we do not know whether the count/mass distinction in the direct object in Thai would create the same patterns as in Hindi as in Singh (1991, 1998).

Fourth, the semantics of the Thai semi-perfective marker seems to have been designed to cater to the non-culminating accomplishment data. What kind of consequences would this Max operator analysis have for the entailment patterns for the other three types of predicates with the perfective marker in the language? How exactly does a semi-perfective marker differ from an ordinary perfective marker? To answer these questions, it is necessary to apply this theory to various sets of data of accomplishments in the perfective in a language to test out these questions. In short, as it stands now, Koenig and Muansuwan’s analysis needs much

more careful empirical evidence.

2.2.3 *Bar-El et al. (2004)*

Similar to Koenig and Muansuwan’s (2000) analysis, Bar-El et al. (2004) also analyze the non-culminating accomplishments in two Salish languages, St’át’imcets and Skwxwú7mesh, by employing a modal operator that introduces the inertia worlds, in which the accomplishment would culminate. Unlike Koenig and Muansuwan’s (2000) analysis, however, this modal operator is introduced by the ‘control transitive’ morpheme instead of directly by the verb stem in these two Salish languages. Unlike the Thai and the Hindi data, the Salish data exhibit an interesting pattern, where the sentences with the simple accomplishment verb roots require a culmination reading, whereas the sentences with a complex verb form with the ‘control transitive’ morpheme added to the simple verb root no longer have the required culminating reading. Bar-El et al. (2004), therefore, propose that the non-culminating accomplishment readings come from the control transitives, which ‘introduc[es] inertia worlds in the sense of Dowty’s (1977, 1979) analysis of the English progressive’, removing the culmination entailment (for the world of evaluation).

The verb roots, from which the accomplishment VP derive, are unaccusative and entail culmination in the perfective aspect. As the example below shows, the verb stem *mays* ‘get fixed’ is an unaccusative. Because sentences without an overt aspect marker are interpreted in the perfective aspect for telic predicates in Salish, this example has the perfective aspect. It is contradictory to negate the culmination for sentences with the unaccusative verb roots.

- (55) * mays ti q’laxan-a, t’u7 aoy t’u7 kw-s ka-máys-ts-a
 get.fixed DET fence-DET but NEG just DET-NOM OOC-fix-3POSS-OOC
 ‘The fence got fixed, but it couldn’t get fixed.’ (St’át’imcets)
Speaker’s comments: “Contradiction.” Bar-El et al. (2004)

However, when the control transitive morpheme is added to form an accomplishment verb, the requirement for event culmination is gone. When *en* the control transitive morpheme is

added to *mays* to form an accomplishment verb, the resulting sentence is not contradictory when the culmination reading is negated.

- (56) máys-en-lhkan ti q'láxan-a, t'u7 cw7ay t'u7 kw-s tsúkw-s-an
 fix-TR-1SG.SU DET fence-DET but NEG just DET-NOM finish-CAU-1SG.ERG
 'I fixed a fence, but I didn't finish.' (St'át'imcets)
 Bar-El et al. (2004)

From this contrast, Bar-El et al. (2004) show quite convincingly that instead of the verb root, the control transitive morpheme contributes to the meaning of non-culmination reading.

The composition for the simple verb form without the control transitive is as follows. As (57) and (58) show, the verb root itself is unaccusative and telic, and a sentence with the verb root in the bare form has a default past tense reading. When the verb root composes with the perfect tense form in (59), the reading is that there is an event of the fence getting fixed in the world of evaluation and the run time of the event is either before the utterance time or overlaps with the reference time, which is before the utterance time. This composition produces the expected culmination reading.

- (57) $\llbracket \text{mays} \rrbracket^w = \lambda e \lambda x [x \text{ gets fixed in } w(e)]$

- (58) mays ti q'láxan-a
 get.fixed DET fence-det
 'The fence got fixed.'

- (59) $\llbracket \text{TENSE}_i \text{ PERF mays ti q'láxana} \rrbracket^{w,g} = \exists e [\text{the fence gets fixed in } w(e) \& \tau(e) \subseteq g(i) < \text{Utterance Time or } g(i) \text{ overlaps Utterance Time}]$

'There is an event e of the fence getting fixed, and the running time of e is included within the contextually salient (past or present) reference time.'

However, when the unaccusative verb root combines with the control transitive morpheme, the culmination entailment is removed for the world of evaluation, because the

control transitive not only turns the predicate into a transitive one, but also introduces a set of inertia worlds, such that the culmination is only required to take place in the inertia worlds, but not necessarily in the world of evaluation.

- (60) $\llbracket \text{CONTROL.TRANS} \rrbracket^w = \lambda f \in D_{\langle l, st \rangle} [\lambda e [e \text{ is controlled by its agent in } w \& \forall w' [w' \text{ is an inertia world w.r.t. } w \text{ at the beginning of } e \rightarrow [\exists e' [f(e')(w') \& e \text{ causes } e' \text{ in } w']]]]]$
 (l= events; Intensional functional Application is used)

So Bar-El et al.'s (2004) analysis is similar to Koenig and Muansuwan's (2000) analysis in assuming that the accomplishment starts off with an endpoint that has been removed through some sort of modal operator that moves the culmination of the event into a set of inertia worlds. For the Salish data, they believe that it is the agentivity, lexicalized as the transitive morpheme, that removes this non-culmination requirement. However, different from Koenig and Muansuwan's study, Bar-El et al.'s analysis successfully provides some evidence as to why the authors choose a particular morpheme as the source of the non-culminating readings, and is explicit that the perfective marker in the two Salish languages have a standard perfective meaning. Therefore, this analysis does not suffer from the problem of arbitrarily locating the source of non-culmination.

However, this analysis also suffers from some problems similar to Koenig and Muansuwan's (2000). It is not clear what count as accomplishment verb roots in the Salish languages, and it is not clear if nominal properties of the incremental theme affect the culmination reading in a similar way as the Hindi data do. And furthermore, this type of analysis with an operator that moves the culmination into the inertia worlds may be too powerful and it may predict that languages with such kind of operators will have a wide range of non-culminating accomplishment phenomena, because all subtypes of accomplishments are treated the same in this analysis and all these subtypes only need to culminate in the inertia worlds. But as we know from some preliminary cross-linguistic survey in Tatevosov and Ivanov (2009), languages vary in which particular types of non-culmination accomplishments they allow in the language. Both Koenig and Muansuwan's (2000) and Bar-El et al.'s

(2004) analyses are not fine-grained enough to account for these cross-linguistic variations.

Unlike Singh (1991, 1998) and Koenig and Muansuwan (2000), Bar-El et al. (2004) actually mention briefly that the type of perfectivity in Salish is the standard type, different from semi-perfectivity in Thai and neutral perfectivity in Hindi. However, from this brief comment, it is unclear why and how the perfective in Salish is different from Thai and Hindi, and if Thai and Hindi are indeed different in the semantics of their perfective marker, except for the different names used. This shows that it is quite common for an analysis of non-culminating accomplishments not to be explicit enough about their analysis of the perfective marker in the first place.

2.2.4 Tatevosov and Ivanov (2009)

Unlike previous discussed studies (Singh, 1991, 1998; Koenig and Muansuwan, 2000; Bar-El et al., 2004), which do not distinguish subtypes of non-culminating accomplishments, Tatevosov and Ivanov (2009) crucially identify two types of non-culminating accomplishments, which they call partial success (PS) and failed attempt (FA). These two types of readings, as they argue, cannot be sufficiently accounted for by the partitive theories of non-culminating accomplishments, such as Koenig and Muansuwan's (2000) and Bar-El et al.'s (2004), because these studies do not have enough ingredients in the analysis to differentiate the two. The missing ingredients, they argue, lie in the predicate decompositions for these two different types of non-culminating accomplishments into subevents in Rothstein's (2004) fashion. Specifically, the two readings differ in how the activity subevent relates to the change-of-state subevent). Whereas for the partial success reading, the activity subevent is incrementally related to the change-of-state subevent; for the failed-attempt reading, the change-of-state subevent is mapped to the minimal final part of the activity subevent.

In this cross-linguistic study, Tatevosov and Ivanov (2009) point out that in many languages certain accomplishment predicates such as 'tear' can have a failed-attempt reading, where the theme argument does not undergo any change at all. This reading is different

from what we have seen so far in previous studies, where the theme has undergone at least some change. Consider the following example in (61).

(61) Karachay-Balkar (Altaic, Turkic)

- a. fatima eki sekunt-xa xalt-nṫ zirt-tṫ
 F. two second-DAT thread-ACC tear-PST.3SG
 ‘Fatima tore a thread in two seconds.’
- b. fatima eki minute xalt-nṫ zirt-tṫ
 F. two minute thread-ACC tear-PST.3SG
 ‘Fatima tried to tear a thread for two minutes.’

Tatevosov and Ivanov (2009, 84)

In Karachay-Balkar, besides its expected culmination reading when co-occurring with an *in*-phrase, when ‘tear’ appears with the durational adverbial ‘for two minutes’, it does not mean that the thread has been partly torn for two minutes, but rather means that the attempt to tear the thread has lasted for two minutes but has not succeeded yet. This reading is called ‘failed attempt’, because the theme argument ‘the thread’ has not undergone any change. This failed-attempt reading, however, is quite restricted and lexically determined.

In contrast, some other accomplishment predicates such as ‘plow’ are only compatible with the partial-success reading, where the theme has undergone some change.

(62) Karachay-Balkar (Altaic, Turkic)

- a. alim eki saʒat-xa baxca-nṫ sür-dü.
 A. two hour-DAT field-ACC plow-PST.3SG
 ‘Alim plowed a field in two hours.’
- b. alim eki saʒat baxca-nṫ sür-dü.
 A. two hour field-ACC plow-PST.3SG
 i. ‘Alim was involved in plowing the field for two hours.’
 ii. * ‘Alim tried to plow the field for two hours, (but have not made a single furrow).’

Tatevosov and Ivanov (2009, 85)

As (62) shows, in Karachay-Balkar when ‘plow’ appears in a sentence with a *for*-durational phrase, only the partial success reading, but not the failed-attempt reading is available, because it is somewhat hard to imagine that a person would fail to plow even a little bit of the field for two hours. In comparison with (62), what counts as success for ‘tear a thread’ in (61) happens instantaneously at the last moment rather than gradually, so that no partial success reading is available for ‘tear a thread’.

Previous analyses, as Tatevosov and Ivanov (2009) correctly point out, do not distinguish between failed attempt and partial success. Most the analyses only discuss the cases of partial success, without mentioning the failed attempt cases. Although the failed-attempt reading is not much discussed in previous studies, they argue that the failed-attempt reading certainly also belongs to the non-culminating accomplishments, because just like the partial-success cases, the failed-attempt accomplishment cases by default would also have culminating reading otherwise, if the culmination had not been denied.

Since both the partial-success and the failed-attempt readings share the same morphology in languages where both are available, Tatevosov and Ivanov (2009) argue that there is only one source from which non-culmination arises and the difference in culmination entailments between partial success and fail attempt should be analyzed by how the subevent structures of these two types of accomplishments are decomposed differently. These two types of accomplishment predicates differ in one important aspect: how the activity subevent relates to the change-of-state subevent.

Intuitively speaking, for accomplishment predicates that allow for the partial-success reading, the theme argument undergoes change gradually and simultaneously as the event progresses. For example, ‘plow a field’ culminates when a field is completely plowed, but as the plowing starts and continues, the field is constantly undergoing some change part by part, until the whole field is plowed. This property can be captured by Krifka’s (1989,1992) Mapping to Subobjects property.

$$(63) \quad \forall R[MSO(R) \leftrightarrow \forall x \forall e \forall e' [R(x)(e) \wedge e' < e \rightarrow \exists x' [x' < x \wedge R(x')(e')]]]$$

$$(64) \quad \forall y \forall x \forall e [plow(y)(x)(e) \rightarrow \forall e' [e' < e \rightarrow \exists x' [x' < x \wedge R(x')(e')]]]$$

On the other hand, accomplishment predicates such as ‘tear’ lacks the MSO property, because during the ‘tearing a thread’ event, the thread is not torn until the very end. In other words, the theme argument is not involved in every subevent of the ‘tearing a thread’ event. Tatevosov and Ivanov (2009) formalizes this property as ‘Anti-Mapping to (Sub)objects property (AMSO)’.

$$(65) \quad \forall y \forall x \forall e [tear(y)(x)(e) \rightarrow \forall e' [e' < e \rightarrow \neg \exists y' [y' \leq y \wedge tear(y')(x)(e')]]]$$

$$(66) \quad \text{Anti-Mapping to (Sub)objects property (AMSO)}$$

$$\forall R [AMSO(R) \leftrightarrow \forall x \forall e \forall e' [R(x)(e) \wedge e' < e \rightarrow \neg \exists x' [x' \leq x \wedge R(x')(e')]]]$$

Because failed attempt and partial success possess these different properties AMSO and MSO respectively, the relation between the activity subevent and the change-of-state subevent are also different for these two types of accomplishment predicates.

To fully capture the difference, Tatevosov and Ivanov (2009) argues that it is necessary to decompose the accomplishment predicates into its subcomponents, very much in the spirit of Dowty’s (1979) analysis. They assume Rothstein’s (2004) set up for accomplishment event predicates. The setup is given as follows.

$$(67) \quad \text{Rothstein (2004): basic definitions}$$

a. *Accomplishment event template*

$$\lambda y \lambda e \exists e_1 \exists e_2 [e = {}^S(e_1 \cup e_2) \wedge \text{ACTIVITY}(e_1) \wedge \text{agent}(e_1) = x \wedge \text{theme}(e_1) = y \wedge \text{BECOME}(e_2) \wedge \text{arg}(e_2) = \text{theme}(e_1) \wedge \text{INCR}(e_1, e_2, C(e_2))]$$

b. *Incremental relation between (sub)events*

$$\text{INCR}(e_1, e_2, C(e_2)) \text{ (} e_1 \text{ is incrementally related to } e_2 \text{ with respect to the incremental chain } C(e_2) \text{) iff there is a contextually available one-one function } \mu \text{ from } C(e_2) \text{ onto } \text{PART}(e_1) \text{ such that } \forall e \in C(e_2) \tau(e) = \tau(\mu(e))$$

c. *Incremental chain*

$C(e)$ is a set of parts of e such that

- i. the smallest event in $C(e)$ is the initial bound of e ,
- ii. for every e_1, e_2 in $C(e)$ $e_1 \leq e_2$ or $e_2 \leq e_1$, and
- iii. e is in $C(e)$

Tatevosov and Ivanov (2009, 105)

So an accomplishment predicate that allows for the partial success reading will have this type of representation, because their activity subevent and the change of state subevent is in an incremental relationship with each other. However, an accomplishment predicate that allows for the failed-attempt reading has a different relation between its activity subevent and its change-of-state subevent. They formulate this relationship as the mapping to minimal final part (MMFP) relationship as follows.

(68) $MMFP(e_2)(e_1)$

- a. e_1 stands in the Mapping to a minimal final part relation to e_2 iff there is a contextually available function μ from e_2 onto $Part(e_1)$ such that e_2 is mapped onto the minimal final part of e_1 ;
 - b. an event e' is a final part of e iff $e' \leq e \wedge \neg \exists e'' [e'' \leq e \wedge e' \ll e'']$ where \ll is a precedence relation on events (Krifka (1998, 207));
 - c. an event e' is a minimal final part of e iff e' is a final part of $e \wedge \neg \exists e'' [e''$ is a final part of $e \wedge e'' < e']$
- Tatevosov and Ivanov (2009, 107)

Therefore the semantics for ‘plow’ and ‘wake up’ are as follows. As can be seen in the formulas, the two differ only in how the activity subevent relates to the change-of-state subevent.

(69) $[[plow]] = \lambda y \lambda e \exists e_1 \exists e_2 [e = S(e_1 \cup e_2) \wedge ACTIVITY_{\langle plow \rangle}(e_1) \wedge agent(e_1) = x \wedge theme(e_1) = y \wedge BECOME_{\langle plowed \rangle}(e_2) \wedge arg(e_2) = theme(e_1) \wedge INCR(e_1, e_2, C(e_2))]$

$$(70) \quad \llbracket \text{wake up} \rrbracket = \lambda y \lambda e \exists e_1 \exists e_2 [e = S(e_1 \cup e_2) \wedge \text{ACTIVITY}_{\langle \text{wake.up} \rangle}(e_1) \wedge \text{agent}(e_1) = x \wedge \text{theme}(e_1) = y \wedge \text{BECOME}_{\langle \text{awake} \rangle}(e_2) \wedge \text{arg}(e_2) = \text{theme}(e_1) \wedge \text{MMFP}(e_1, e_2, C(e_2))]$$

The rest of their analysis pretty much follows Koenig and Muansuwan’s (2000) and Bar-El et al.’s (2004) analysis in assuming that a continuation modal operator then comes into play by moving the culmination point into the inertia worlds. And because the event can stop before the culmination point in the real world, for ‘plow’ the event is partially successful because the change of state subevent is incremental and simultaneous to the activity subevent, whereas for ‘wake up’ the event stops before the change of state takes place.

Different from previous analyses, Tatevosov and Ivanov’s (2009) analysis crucially shows that it is necessary to distinguish different sub-types of accomplishment predicates, because these different types have different non-culmination readings. And this can be achieved by decomposing an accomplishment predicate into different subevents and so their analysis is an improvement over the previous analyses by offering a more comprehensive picture that takes into account the lexical semantics of different sub-types of accomplishment predicates. However, Tatevosov and Ivanov’s (2009) analysis is not comprehensive enough, for the basically same reasons that Koenig and Muansuwan’s (2000) and Bar-El et al.’s (2004) analyses are not comprehensive enough. Especially, unlike Krifka’s (1989) and Singh’s (1991) accounts, how nominal reference of the incremental theme comes into play in these accounts is not addressed.

2.2.5 *Problems with Previous Analyses*

Apparently all these different accounts successfully explain the specific set of data presented in their papers, and yet each account has a different analysis for very similar patterns of data that overlap significantly, so that one may wonder at this point if any of these accounts is superior to the others, or if these accounts can be generalized into a single model. Many questions remain unanswered from these existing accounts.

The first problem, which I will call the problem of the source of non-culmination for the rest of the dissertation, is that it is not clear where the non-culmination really comes from. Does it come from the nominal properties of the direct object, or does it come from the accomplishment verbal stems, or does it come from the perfective aspect? This is an important question, because without knowing where the source is located, there is really no way to judge if one analysis is correct or not. All the previous analyses seem to have different answers: Singh (1991) focuses on the NP level within the accomplishment VP, Koenig and Muansuwan (2000) and Bar-El et al. (2004) attribute the source of non-culmination to the accomplishment verb stem or the verbal derivative level, and Tatevosov and Ivanov (2009) argues that it is necessary to delve into the level of accomplishment predicate decomposition in order to account for the differences between the partial-success and the failed-attempt non-culminating accomplishments. For Chinese, Smith (1997) and Lin (2000) instead attribute the non-culmination to the semantics of perfective marker *le*. Except for Bar-El et al.'s (2004) study, which presents convincing morpho-semantic evidence to locate the source at the transitiviser morpheme for the two Salish languages, it seems that none of the other studies have given much justification as to why they think the source comes from one part instead of another part of the grammar.

This question of the source of non-culmination actually has been explicitly raised in Koenig and Chief (2007), yet their answer is still not substantial enough. Based on the data from Mandarin, they decided that the source is located in the verb stems, but only a certain subset of accomplishment verb stems that describe ‘induced normative changes’ can have the non-culminating readings (Koenig and Chief, 2007, 256-257). Although they indeed provide some evidence for why the source of non-culmination does not come from the direct object NP or perfective marker, the evidence is unfortunately not substantial enough.¹ It is therefore necessary to develop a more sophisticated set of diagnostics, before we can arrive

1. I will return to the discussion of why Koenig and Chief's (2008) account for Mandarin is not substantial enough in §2.3.2.

at a unambiguous conclusion.

Related to the first problem, the second problem is that interestingly, the semantics of the perfective aspectual marker in each language is surprisingly not much discussed in the literature of non-culminating accomplishments, although some papers mention that the language has a different type of perfectivity. For example, Singh (1991) calls it ‘neutral perfectivity’ in Hindi, and Koenig and Muansuwan (2000) call it ‘semi-perfectivity’ in Thai, and Bar-El et al. (2004) claim that Salish has a standard perfective marker that is different from that in Hindi or Thai. Admittedly, Koenig and Muansuwan (2000) give a new maximality semantics to the perfective marker in Thai as the semantics of ‘semi-perfectivity’, and yet this semantics seems to have been proposed just to accommodate the composition with the new imperfective meaning of the accomplishment stems in Thai that they propose. Are there reasons to believe in these languages, the meaning of the perfective marker is different? How can we tell if the perfective marker indeed is standard or is unique in some ways? For each of the languages concerned, I hypothesize that there are some other language-internal ways of determining the semantics of the perfective marker besides just focusing on the non-culminating accomplishments, such as looking at the entailments of the composition of the perfective marker with other predicate types, or looking at compatibility patterns with different time adverbials. If one only focuses too narrowly on the data of the non-culminating accomplishments, there is really no reliable way to tease apart the effects of the semantics of the perfective and those from within the verbal predicates.

The third problem with these analyses is that, the accomplishment theories they adopt, either in Dowty’s (1979) style or Krifka’s (1989) style, end up having unwanted theoretical consequences for how they analyze the non-culminating accomplishments in their language. If an analysis assumes Dowty’s analysis, where the culmination directly encoded in the meaning of the accomplishment, then it is forced to include some sort of modal operator that moves the culmination point into the inertia worlds or some sort of partitive operator that cuts out the activity part of the accomplishment (cf. Koenig and Muansuwan, 2000;

Bar-El et al., 2004; Tatevosov and Ivanov, 2009). On the contrary, if an analysis assumes Krifka's analysis, then the theory does not need to invoke this kind of operator, and all that it has to do is to change the object-to-event mapping relationship into a partial one (cf. Singh, 1991). However, the data presented in these previous studies actually overlap for a good amount, so that having two different types of analyses for somewhat similar data seems somewhat unsatisfactory.

I believe most of these problems arise, because of the inherently complex nature of the non-culminating accomplishments and the limitation of space in their papers, so that many of the important questions are not given enough discussion. To overcome these problems, the solution lies in studying different aspects of these non-termination accomplishment phenomena in-depth in one language, not just a selected sub-set of non-culminating accomplishments, with discussion of other languages where relevant. In my dissertation, I give each sub-topic enough treatment, and then link each component together in order to bring out the whole picture, and discuss in some length how they all interact with each other in Chapter 8.

2.3 General Questions and Strategies

2.3.1 General Questions

In my dissertation, I mainly investigate the non-culminating accomplishments in Mandarin. The general questions and hypotheses I propose in this section to explore in my dissertation are made concrete as related sub-topics in different chapters in my dissertation. Through the investigation of the non-culminating accomplishment phenomena, my dissertation contributes significantly to our understanding of lexical semantics of the verbs, the perfective aspect, and composition of the incremental theme verbs with their direct objects cross-linguistically.

The overarching question in my dissertation is how to determine the source of non-culmination, and develop a general theory that satisfactorily explains the semantics compo-

sition in all three levels: lexical semantics of the accomplishment verb stem, composition of the accomplish VP with its direct object and the composition of the accomplishment predicates and the aspectual markers.

As already explained in the previous section, most current theories fall short of providing enough empirical evidence of why they decide that the non-culminating readings come from a certain place instead of another, and consequently often fail to explain the interactions between all three levels explicitly. When these theories assume that the source in a particular place such as the accomplishment verb stem, most of these theories also assume that the semantics of the other components, such as the perfective marker and the accomplishment VP composition, remain the same cross-linguistically. However, from the current literature of tense and aspect and lexical semantics of verbs, it is clear that such assumptions do not hold, because the semantics of the perfective marker varies wildly cross-linguistically, and especially for our purpose the line between the perfective and the imperfective is quite obscure (Comrie, 1976; Shirai, 1998; Nishiyama, 2006). And these theories probably neglect these problems, because there is not enough space to discuss all the possible factors comprehensively within one paper. To overcome these difficulties, it is necessary to examine the semantics of all these different levels thoroughly within a language to fully understand how each contributes to the non-culminating readings at the length of a dissertation.

Therefore, my dissertation encompasses three sub-areas as relevant to our discussion of non-culminating accomplishments: the semantics of perfective aspect, the lexical semantics of accomplishment verb stems, and the composition of accomplishment verb stems with its direct object. In order to separate these factors, I suggest that first we need to investigate each separately in the aforementioned order in different chapters.

- (71)
- a. perfectivity
 - b. lexical semantics of different types of accomplishments
 - c. incremental theme and the NP semantics

To determine how each component contributes in a particular language, I suggest the first step should be to fully understand the semantics of the perfective aspect in that language. This should be the first step, since even outside of the non-culminating accomplishments, cross-linguistic variations in the perfective system and the imperfective system are well investigated (cf. Comrie, 1976; Shirai, 1998; Nishiyama, 2006), and it is possible to determine the semantics of the perfective and imperfective morphemes with other data besides those of the non-culminating accomplishments.

Then, once it is determined that the perfective marker has a certain meaning in language, then we can confidently proceed to the central problem of how to develop a general and comprehensive theory of accomplishment predicates that can account for these different sets of data of non-culminating accomplishments. More specifically, how to reconcile Dowty's (1979) and Krifka's (1989) proposals: namely Dowty (1979) accounts for telicity by directly encoding the change of state subevent in the semantics and Krifka (1989) accounts for telicity by the homomorphism between quantized incremental theme and the event. I believe both theories are needed in order to account for different subtypes of non-culminating accomplishments and we need a heterogeneous analysis for different subtypes of non-culminating accomplishments as each type of non-culminating readings may arise from different semantic factors.

Furthermore, once the semantics of the perfective marker and some set of accomplishment predicates are determined, then it becomes easier to add in another layer of referential properties of the incremental theme to our investigation as a final step before the conclusion.

2.3.2 Working Hypothesis

The source problem

As mentioned above, in Koenig and Chief (2007), the question of the source of non-culmination, which they call the Incompleteness Effects (IE), has been explicitly raised. According to

them, the source of non-culmination potentially comes from the aspectual marker, the accomplishment verb stem or one of the arguments of the verb. This is summarized into the following three hypotheses.

- (72) a. Hypothesis I: (The Quinian hypothesis, Soh and Kuo, 2005). *The source of the IE is the denotation of one or more of the stems' arguments.*
- b. Hypothesis II: (Aspectual Hypothesis, Smith, 1997). *The source of the IE lies in the meaning of aspect operators.*
- c. Hypothesis III: (ps-Quinian Hypothesis, Talmy 2000, Koenig and Muansuwan 2000, Lin 2004b). *The source of the IE is the meaning of the verb stems themselves.* Koenig and Chief (2007, 245-246)

Based on data from Mandarin, Koenig and Chief (2007) reject Hypothesis I and II. They reject Hypothesis I, by showing that contrary to Soh and Kuo (2005)'s claim that Mandarin DP with a numeral blocks non-culminating readings, direct object NP phrases with a numeral can have non-culminating readings. However, this piece of evidence itself actually does not prove that referential properties of the argument are not somehow relevant, except that Soh and Kuo's (2005) generalization is not correct.

- (73) wo (...) chi le liang chuan dakao, dan mei chi-wan^{Google}
 I (...) eat PERF two CL kabob, but not eat-finish
 'i ate two kabobs, but didn't finish eating them. (lit.)'

(Koenig and Chief, 2007, 247)

And they reject Hypothesis II, by showing that when composing with *le*, some accomplishment verb stems in Mandarin, such as 'vote' in (74), fail to have the non-culminating reading. And yet this does not exclude the possibility that 'vote' may have a particular semantics in Mandarin, something like an instantaneous achievement type of meaning, so that even if *le* has an imperfective meaning, the culmination still obtains. Despite Koenig and Chief's (2007) efforts, the question of the source of non-culmination is still largely not determined.

- (74) # ta tou le yi zhang piao, keshi mei tou-wan.
 he cast PERF one CL ballot, but not cast-finish
 ‘He cast a ballot, but didn’t finish voting. (lit.)’ Koenig and Chief (2007, 248)

Actually, there are other logical possibilities that Koenig and Chief (2007) have not yet considered: the source may be different depending on the language or different subtypes of non-culmination accomplishment in the same language. From §2.2, it is clear that nominal properties definitely play a role by virtue of their thematic relationships with the verb for the Hindi data in Singh (1991) that cannot be explained by Hypothesis III or Hypothesis II alone, and the semantics of some verbal morphemes also matter for the Salish data in Bar-El et al. (2004) that cannot be explained by Hypothesis I alone. So Hindi and Salish may just have two different sources of non-culmination in general. Or perhaps the difference is not between languages, but rather between different subtypes of non-culminating accomplishments. The Hindi data essentially concern creation and consumption verbs, and the Salish data involve non-incremental accomplishment verbs such as ‘fix’. Further evidence from each language is needed to decide which of the two possibilities is correct.

Furthermore, another possibility is that some accomplishment predicates are truly ambiguous between an activity reading and an accomplishment reading, such as degree achievements (cf. Kennedy and Levin, 2008). When used as an accomplishment, a degree achievement does have a culminating reading. However, when a degree achievement is used as an activity, naturally it should not have a culminating reading because it is atelic. It is possible that some other types of the non-culminating accomplishment predicates in a given language are also ambiguous between an activity reading and an accomplishment reading.

It is, therefore, probably not possible to attribute non-culminating accomplishments to one single source, because non-culminating accomplishments are most likely heterogeneous to begin with. The three hypotheses of Koenig and Chief (2007) should rather be generalized into one major hypothesis in (75). For a given language with non-culminating accomplishments, one of the options listed in (75) may be true, or several of the options may be simultaneously true. So this hypothesis admits that the source of non-culminating accom-

plishments may be different in different languages and any specific language may have any combinations of these different factors. However, I think that the nominal properties of any verbal argument cannot stand alone as a factor, because ultimately these nominal properties only come into play if the verb stem has certain properties, such as graduality and partial affectedness (cf. Krifka, 1989; Singh, 1991).

- (75) In a given language, the source of non-culmination accomplishment predicates in the perfective may come from
- a. the perfective aspectual marker, because the marker has a *Impv* operator or some kind of non-culminating semantics
 - b. the properties of accomplishment verb stems
 - i. Accomplishment verb stems in general may have a *Impv* operator
 - ii. Verbs of creation and consumption have partial-affected thematic relation: nominal properties of the incremental theme come into play.
 - iii. Some transitive accomplishment verbs only encode the activity subevent, and their morphologically distinct intransitive counterparts encode the change-of-state subevent.
 - iv. the accomplishment predicate may be ambiguous between an accomplishment and an activity
 - v. ...
 - c. a combination of different factors from both categories.

(Nominal properties of a verb argument do not form a separate category because they influence the non-culminating readings by virtue of composing with the gradual verbs and therefore should be subsumed under the accomplishment verb stem category.)

Although this new hypothesis in (75) seems to claim that anything is possible, actually it does not mean that we cannot pin-point the source or sources for a given language. To

locate the source or sources, it is necessary to see what different subtypes of non-culminating accomplishments a language has. Because by having different sources, languages differ in the types of non-culminating accomplishments they allow (cf. Tatevosov and Ivanov, 2009). For example, as claimed in the literature, Mandarin allows for non-culminating accomplishments for incremental verbs with a quantized direct object such as ‘eat three apples’, and non-incremental accomplishment predicates such as ‘kill’ (Soh and Kuo, 2005; Koenig and Chief, 2007). In comparison, Japanese allows for failed-attempt reading for ‘burn’, but does not seem to allow for non-culminating accomplishments for ‘eat three apples’. For Chinese, it is *a priori* theoretically possible that it has an *Impv* operator either at the accomplishment verb stem or the perfective marker that allows non-culminating readings across different subtypes of accomplishments, whereas for Japanese, the same account is not as likely, because otherwise we would expect that it should allow other non-culminating readings for accomplishments such as ‘eat three apples’ and ‘kill’ as well. For Japanese, therefore, it is more likely that a subset of the accomplishments have special lexical semantics that allow non-culminating accomplishments. Therefore, by examining what types of non-culminating accomplishments a language allows and how restricted they are, we can determine the set of possible sources of non-culmination for that language. This is exactly why I claim that examining a language in depth is necessary, because examining only a subset of data will lose the big picture.

Table 2.1: Different Non-Culminating Accomplishment Patterns

Non-Culmination?	Chinese	Japanese	Hindi
eat 3 apples	yes	no	yes
burn	yes(?)	yes	no(?)
kill	yes	no	no(?)
...

In summary, to determine the source of non-culmination in a specific language, it is necessary to examine how different subtypes of accomplishments allow for non-culminating

readings in the same language. If a language has a wide range of non-culminating accomplishments, then it is possible that that language has some type of non-culminating perfective marker or a general *Impv* operator at the verb stem, or possibly also other special properties of particular classes of accomplishments. If a language has a restricted set of non-culminating accomplishments, then the sources are probably located at the verb stems and these non-culminating accomplishments have certain semantic properties that allow for non-culminating readings.

2.4 Conclusion

To conclude, most previous studies have not convincingly located the source of non-culminating accomplishments. I have argued in this chapter that in order to accurately locate the source(s) of non-culminating accomplishments, it is necessary to adopt a step-by-step method that teases apart the semantics of the perfective marker and the different parts of the verbal predicate.

In the following chapters, I implement my investigation as follows: As a first step, I run predicate type diagnostics to determine the true cases of accomplishment predicates in Mandarin in Chapter 3. As a second step, I study the semantics of the perfective marker *le* with broader data in Mandarin in depth in Chapter 4 to see whether *le* indeed is responsible for the non-culminating accomplishment readings as some previous studies have claimed. Through these two preliminary steps, I determine that only resultative verbal compounds and consumption verbs with quantized direct objects are true cases of accomplishment predicates in Mandarin and rule out the possibility that the perfective marker *le* is the source of non-culminating accomplishments.

As a third step, I study three different subtypes of Mandarin equivalents to the English accomplishments in order to locate the sources of non-culminating accomplishments within the verbal predicate: Dowty-style accomplishments in Chapter 5, degree achievements in Chapter 6, and Krifka-style accomplishments in Chapter 7. Through studying the various

subtypes of the so-called non-culminating accomplishments in Mandarin, I establish that the non-culminating accomplishments are heterogeneous, arising from different sources: transitive verbs packaged as manner verbs, degree semantics of the degree achievements, and the referentiality of the direct object for consumption verbs.

The simple conclusion for my dissertation is that we can say that non-culminating accomplishments are somehow a misnomer because the seemingly accomplishment-like predicates that can have non-culminating readings are actually not strictly speaking accomplishment predicates semantically in the first place. These ‘non-culminating accomplishments’ are mistaken for accomplishments due to their translational equivalence to their English counterparts, and arise from how different languages package verb meaning in the lexical semantics differently. True accomplishment predicates do also culminate in Mandarin in the perfective.

CHAPTER 3

DIAGNOSTICS FOR ACCOMPLISHMENTS

3.1 Introduction

In order to fully understand the phenomena of non-culminating accomplishments, we need to first define what an accomplishment predicate is and identify the true cases of non-culminating accomplishments. In this chapter, I will explore these issues and develop some specific diagnostics for diagnosing accomplishments in Chinese.

What is an accomplishment predicate? Although it has been taken for granted, its definition has rarely been spelled out. Mostly an accomplishment predicate has been indirectly categorized by the tests that it passes, since that is how Vendler (1957) distinguishes his four verb classes in the first place. Originally, Vendler (1957) divides the verbal predicates in English into four categories, namely activities, accomplishments, states, and achievements, based on how these verbal predicates behave with respect to certain tenses, time adverbials and the entailment patterns of combinations of the two. He first distinguishes activities and accomplishments from states and achievements by pointing out that activities and accomplishments can appear in the progressive, while states and achievements cannot.

- (76) a. He is running.
b. He is writing an essay.
c. *He is knowing the answer.
d. *He is recognizing the fact. examples adapted from Vendler (1957)

Between accomplishments and activities, Vendler (1957) argues that accomplishments differ from activities by having a set terminal point, a ‘climax’. He claims that activities may continue for an indefinite amount of time, but accomplishments can only last until the set terminal point is reached. Thus it follows that it makes sense to ask ‘how long does it take to write an essay’, but not ‘how long does it take to run’.

Therefore, according to Vendler's (1957) original description, accomplishment predicates can appear in the progressive and have a climax. This idea is later expanded by Dowty's (1979) study. According to Dowty (1979), accomplishment predicates are characterized by certain properties, such as being telic, i.e. having an end point, and durative, i.e. being marginally compatible with temporal *for*-phrases, and lacking sub-interval properties (cf. Bennett and Partee, 1978).

So, conceptually speaking, an accomplishment predicate describes an event that involves an activity part and the culmination point. Usually an agent performs some kind of action to bring about a change in the agent or the theme. An accomplishment predicate is telic and therefore lacks homogeneity and sub-interval property, and can last for a certain period of time because of the durativity of the activity part. For example, *draw a circle* in English is an accomplishment. The predicate lacks homogeneity and sub-interval properties because any sub-event before the culmination point of drawing a picture cannot count as an event of drawing a picture. In addition, the event of drawing a picture is not instantaneous and lasts for some amount of time because the activity part of the predicate is durative.

However, defining accomplishment predicates as such gives rise to certain problems, especially when determining accomplishment predicates cross-linguistically. First of all, the tests developed for English to test telic and durative properties of accomplishments may not be easily transferable to other languages. The translational equivalents of the Dowty's tests, such as the temporal *for*-phrase or the progressive, may have a slightly different semantics, so that even if a verbal predicate in another language passes certain tests for a particular verb class, it is not guaranteed to belong to that verb class and vice versa. Second, what counts as a climax, or a culmination point, is also not entirely clear. In the previous studies, there seems to be two different ways to introduce a culmination point in the semantics: one way is through the inherent result state associated with the verb (cf. Dowty, 1979), and the other way is through specifying a certain amount of change in one of arguments (cf. Krifka, 1989). Although these two types behave quite similarly with respect to the tests in English,

it is reasonable to assume that they may behave differently in other languages.

In this chapter, I run some tests for predicate types in Mandarin to investigate whether the accomplishment predicates in the non-culminating accomplishments are true instances of accomplishments. With the test results, I argue that some of the so-called accomplishments such as ‘fix’ and ‘kill’ in Mandarin are actually activities, and that the true cases of accomplishments are the resultative verbal compounds and derived accomplishments with a quantized direct object because they do pattern differently from activities in Mandarin.

The rest of this chapter is organized as follows: In §3.2, I first discuss how to define telicity and propose my own definition of accomplishment predicates. In §3.3 I then discuss some ways to develop reliable tests and to interpret the reliability of these test results. And then, in §3.4, I present the tests and results for Mandarin predicate types. Finally, I conclude this chapter in §3.5.

3.2 Defining Telicity

According to all the previous studies, it is quite obvious there are two properties that are essential to define the accomplishment predicate class in any given language: durativity and telicity. For the former property, an accomplishment is durative because it is not instantaneous like an achievement, and can last for some time. Therefore an accomplishment predicate is compatible with the temporal *for*-phrase and the progressive in English. For the latter property, it is manifested in English that an accomplishment predicate entails culmination in the perfective and is compatible with the temporal *in*-phrases. However, in face of the non-culminating accomplishments, I argue that telicity should be better replaced by boundedness for accomplishments.

Telicity distinguishes an accomplishment from an activity. In Dowty (1979), telic predicates have the following properties: a culmination reading in the perfective, and compatibility with *in*-phrase but not with *for*-phrase (or marginal compatibility for the accomplishment predicates). There are reasons to believe that probably these two tests do not need to be both

passed for a verbal predicate to qualify as an accomplishment predicate cross-linguistically. Because in face of non-culminating accomplishments in other languages, some of the translational counterparts of the English accomplishments do not pass the test for culmination in the perfective.

This deviation can potentially be in two ways, either that accomplishment predicates cross-linguistically have different semantics and some of them do not entail culmination (Bar-el et al., 2004; Bar-el, 2005), or that these so-called accomplishments are actually activities in these languages instead (Koenig and Muansuwan, 2000). So the question boils down to how can we determine whether an accomplishment still counts as an accomplishment, when an accomplishment does not have culmination entailment in the perfective. Because if we follow strictly Dowty's (1979) definition of accomplishments, then the non-culminating accomplishments obviously cannot count as accomplishments to begin with for not passing the culmination entailment test in the perfective.

If the potential accomplishments with non-culminating readings are actually activities as claimed by some previous studies, then we would expect that they will behave identically with respect to the tests as other more canonical activities in that language. In other words, such so-called accomplishments will not only fail to have an entailed culmination reading, but will also be compatible with *for*-phrase equivalents in that language, and would not pass other tests for accomplishments. If after applying a sufficiently large number of tests, these potential accomplishments behave mostly identical with other activities, then we can quite confidently classify the so-called accomplishments in that language as activities.

However, if the potential accomplishment predicates pass most other tests for accomplishments except for the entailment test in the perfective, and if they behave differently from the activities in that language, then it is probably the case that these predicates still count as accomplishments (or some other type of predicates distinguished from activities, whatever we call them), but they may have different semantics from their English counterparts.

Therefore, as far as the tests are concerned, following Bar-el (2005), I suggest that Dowty's telicity criterion for accomplishments can be relaxed and replaced by boundedness. In other words, the accomplishment predicate only needs to be compatible with the *in*-phrase and does not need to entail culmination in the perfective. The crucial point is that different predicate types behave distinctively and can be differentiated in that language. Therefore, in any language, as long as a given predicate crucially behave differently from activities, and pass most tests for accomplishments, then it may potentially count as an accomplishment predicate.

Therefore, I propose the following for the definition of accomplishments.

- (77) Accomplishments are durative and bounded, and may potentially have a culmination point

In the following section, I discuss ways to develop tests for accomplishment predicate cross-linguistically.

3.3 Developing Predicate Type Diagnostics Cross-Linguistically

Once we decide that for an accomplishment predicate to qualify as a true accomplishment, it must behave differently from activities with respect to most tests and it does not need to fulfill the requirement for the culmination entailment in the perfective, then we can proceed to develop tests in a given language.

Most of the previous studies on accomplishments have just assumed that the translational equivalents of the commonly accepted accomplishment predicates in English are also accomplishments in that language, without running necessary tests in the first place. For the studies that do run certain tests, most of them assume that Dowty's tests in translation will work and that the test results are mostly reliable.

So the big questions are: do all the predicates that are more or less translational equivalents in different language describe the same type of eventualities? Are the tests developed

for English transferable to other languages? If not, how can we develop tests for a specific language other than English to test the categories?

As to the first question, it is definitely not the case that translational equivalents always fall into the same class as their English counterparts, since verbs can be lexicalized differently in different languages. Although given that eventualities have their own characteristics, it is easy to assume that translational equivalents that describe more or less the same eventuality are also semantically identical, nevertheless translational equivalents may be describing different parts of the eventuality and not be equivalent. For example, ‘to know’ in English is well established as a stative predicate, and yet its Japanese counterpart *shiru* ‘to come to know’ is lexicalized as a change-of-state verb (cf. Toratani, 2002). To express the state of knowing in Japanese, *shiru* must occur in the progressive with the *te-i-ru* auxiliary, *shit-te-i-ru*. If one is to simply take *shiru*, what appears to be the translational equivalent of English ‘to know’, to be a stative predicate and build a theory of Japanese statives based on data such as *shiru*, one would end up with a misinformed semantic theory of Japanese statives.

Precisely because languages lexicalize their verbs differently in subtle ways, it is necessary to first develop reliable tests to classify verbal predicates in a given language, before we can construct a sound semantic analysis of the non-culminating accomplishments. The common practice is to translate Dowty’s (1979) tests into the given language. This is usually a very effective way, but it runs into the similar translational problems that one must caution against. To begin with, it may not be as easy to find a translational equivalent for certain phrases used in the test in the first place. For example, in Mandarin, there is not a corresponding *for* preposition phrase for duration. To express the duration of time, there are various ways in Mandarin: through the verb reduplication construction, the preverbal duration phrase construction, the postverbal durational phrase construction, and using the verb *spend* with a duration phrase. As shown in (78), one way to express duration of an event is by reduplicating the verb and inserting the duration phrase after the second verb. Another way, as shown in (79), is to put the duration phrase at the internal topic position. As shown

and according to Toratani (2002), this type of predicates is nevertheless still a stative predicate. If Dowty’s progressive test is taken too literally, then one may wrongly conclude that those Japanese stative verbs that can occur in the progressive are not stative verbs after all. However, this is not the case according to Toratani (2002), he argues instead that the criterion for stative predicates in Japanese should be adjusted that any predicate that can express a state without being in the *te-i-ru* form is a true stative predicate.

(82) * He is being tall.

(83) a. Taroo wa hontoo wa mimi ga kikoeru
 Taro TOP in.reality P ear NOM be.audible
 ‘Taro can actually hear.’

b. Taroo wa hontoo wa mimi ga kikoe-te-i-ru
 Taro TOP in.reality P ear NOM be.audible-TE-exists-NPST
 ‘Taro can actually hear.’ (The utterance made in recollection)

Toratani (2002, 31)

For these reasons, when developing tests for the predicate types for another language, it is necessary to be aware of these pitfalls when it comes to applying and adapting Dowty’s tests to that language. Nevertheless, despite these pitfalls, Dowty’s tests are still a good starting point because these tests are designed to test certain properties of the predicates.

In her dissertation on predicate types in Skwxwú7mesh, Bar-el (2005) points out that some of Dowty’s tests are not adaptable crosslinguistically, because some of Dowty’s tests assume that accomplishments have endpoints. For example, one of Dowty’s tests requires an accomplishment to have a culmination entailment. In face of the non-culminating accomplishment data from other languages, such a test would fail to pick out an accomplishment predicate if it is still indeed accomplishment predicate. Bar-el (2005) believes that accomplishments do not necessarily have endpoints semantically and it suffices that they have endpoints pragmatically. Drawing from tests from Smith (1997) and Dowty (1979), she uses the following tests to detect final points in predicate types. According to these tests, neither activities or accomplishments have final points in Skwxwú7mesh.

(84) *Diagnostics for Final Points*

- a. Culmination cancellation: conjunction and questions
- b. Event continuation: conjunctions and questions
- c. The scope of [*kilh*] ‘almost’
- d. The scope of negation

However, accomplishments in Skwxwú7mesh do differ from activities in one test. When accomplishments occur with punctual adverbials, they can have inceptive, medial or culminated readings, whereas activities only have inceptive readings. According to Bar-el (2005), accomplishments have all three differently readings because accomplishments in Skwxwú7mesh do not have sub-interval properties, like activities do.

While it remains an open question whether Bar-el (2005) is right on that accomplishments do not have end-points in Skwxwú7mesh, she makes an important point that tests may not be transferable to other languages and that the class called ‘accomplishment’ in a particular language may have different semantic properties from the English accomplishment class. To establish an accomplishment category in a language, the predicates in the potential accomplishment category should behave differently from the rest of the predicate types in the language.

For the purpose of studying non-culminating accomplishments phenomena in Chinese, what are the appropriate tests that can test for a true accomplishment predicate, so that we know that we are dealing with a true case of non-culminating accomplishment rather than a case of an activity predicate that is usually translated as an accomplishment in English? I think the answer is whichever tests we apply to predicates in a language, we should be able to see consistent differences between an accomplishment predicate and an activity predicate. If a group of potential accomplishment predicates in that language consistently behave like activity predicates with regards to the tests, then this group should be classified as activities rather than accomplishments. On the contrary, if a group of potential accomplishment predicates behaves differently from activity predicates in a language with regard to most

tests, but fails some of the tests for accomplishments, then this group can be classified as accomplishments.

3.4 Tests for Mandarin Predicate Types

As relevant to the non-culminating accomplishments phenomena in Chinese, we are interested in seeing if these phenomena are caused by accomplishment predicates failing to culminate or by seemingly accomplishment predicates actually being activities in Chinese. In an early study of Chinese verbal predicate types, Tai (1984) claims that there is no accomplishment verbs in Mandarin and that the resultative verbal compounds are instead close equivalents to English accomplishment predicates. In this section, I show that Tai's claim is basically correct with the new set of tests I adapt and develop for Mandarin predicate types.

Because in English, accomplishments are either inherent accomplishments by virtue of the verbal meaning in Dowty's (1979) way or derived accomplishments by virtue of the verbal meaning and the quantized direct object in Krifka's (1989) way. In this section, I mainly focus on testing the equivalents to these two types of accomplishments in English. I show that some of the potential accomplishment predicates such as the *xiu* 'fix' type of predicates are actually activities, and the 'eat three apple' type accomplishment and resultative verbal compounds can be true accomplishment predicates. As for the degree achievements, because their telicity patterns are much more varied (cf. Kennedy and Levin, 2008), I show briefly that the bare transitive degree achievements are like activities and defer the detailed discussion of the telicity of the Mandarin degree achievements until Chapter 6.

In the rest of this dissertation, I call the potential Mandarin equivalents to the Dowty's style inherent accomplishments in English as inherent accomplishments, *fix*-type of predicates or MMFP verbs (Tatevosov and Ivanov, 2009); and I call the potential equivalents to Krifka's style of accomplishment predicates derived accomplishments. Note that although I may call these predicates 'accomplishments' because of their correspondences to their English counterparts, I am not committed to claiming that these predicates have actual accomplish-

ment semantics. Unless I explicitly propose that a predicate has an accomplishment semantics or that it is an accomplishment predicate, readers can assume that I am using the word ‘accomplishment’ loosely to mean ‘translational equivalent to an English accomplishment’.

Selecting from Dowty’s (1979) tests and Bar-el’s (2005) tests, I use the following tests for testing Chinese predicate types.

- (85) a. *for*-phrase test
- b. *in*-phrase test
- c. progressive test
- d. culmination entailment test
- e. *almost* test
- f. negation test

3.4.1 *Two Counterparts of the For-Test*

The *for*-phrase test in English can test primarily for the durativity and somewhat the atelicity of a predicate. According to Dowty (1979), activities are compatible with the *for*-phrase because they are both durative and atelic; whereas accomplishments are very marginally compatible with the *for*-phrase because accomplishments are durative and yet telic in English. In Chinese, there are several constructions that may qualify as a potential counterpart for the *for*-phrase test, because there is not a preposition in Chinese that can translate to the English temporal *for* preposition. The first two ways are putting the duration phrase in front or after the direct object (Cheng et al., 1997), as in (86) and (87), and as shown in (88) the third way is by reduplicating the verb and the object and putting the durational phrase at the direct object position. (88) is part of the often observed phenomenon of verb reduplication in the Mandarin syntax literature.

- (86) Ta du le san xiao-shi (de) shu.
 S/he read PERF three hour (MOD) book
 ‘S/he read books or a book for three hours’

- (87) Ta du le na-ben shu san xiao-shi.
 S/he read PERF that-CL book three hour
 ‘S/he read that book for three hours’
- (88) Ta du-shu du le san xiao-shi.
 S/he read-book read PERF three hour
 ‘S/he read books or a book for three hours’

Among these three ways, the pre-direct-object (Pre-DO) duration phrase and the reduplication constructions are closer equivalents to the English *for*-phrase, because the post-direct-object duration phrase construction has an additional requirement that the direct object be definite. Let’s look at these tests in turn.

As for the pre-DO duration test, as expected, activity-like predicates *chi fan* ‘eat rice’ are generally felicitous in this construction as shown in (89), and achievement-like predicates *dao* ‘reach’ are generally infelicitous as shown in (90).

- (89) Baiyun chi-le san-xiaoshi de fan.
 Baiyun eat-PERF three-hour MOD rice
 ‘Baiyun ate rice for three hours.’
- (90) # Baiyun dao-le san-xiaoshi de Beijing.
 Baiyun reach-PERF three-hour MOD Beijing
 Intended ‘Baiyun reached Beijing for three hours.’

When we apply this test to the potential accomplishment predicates in Chinese, it seems that different subtypes exhibit different patterns. Although derived accomplishments with a quantized object such as *chi san-wan fan* ‘eat three bowls of rice’ are not felicitous in this construction, *xiu* ‘fix’ kind of predicates are generally compatible. This suggests that *fix*-type predicates behave like activities in this test.

For example, as shown in (91) and (92), for verbs of consumption and creation that take a quantized direct object such as ‘three bowls of rice’ and ‘a paper’, these types of derived accomplishment predicates are not compatible with the pre-DO duration phrase test. This type of potential accomplishments in Mandarin behave a little differently from

their English accomplishments, which are marginally acceptable with *for*-phrases. However, one caveat is that there might be syntactic constraints on the pre-DO object position that the duration phrase and the numeral-classifier phrase cannot co-occur, see Zhang (2018) for further discussions on the syntax of the durational phrases in Mandarin.

(91) # Baiyun chi-le san-xiaoshi de san-wan fan.
 Baiyun eat-PERF three-hour MOD three-bowl rice.
 ‘Baiyun ate rice for three hours.’

(92) # Baiyun xie-le san-xiaoshi de yi-pian wenzhang.
 Baiyun write-PERF three-hour MOD article.
 Intended ‘Baiyun wrote an article for three hours.’

However, for the Chinese equivalents of ‘fix’ and ‘boil’, these Dowty’s style inherent types of accomplishments in Chinese are surprisingly compatible with the pre-DO duration phrase, unlike their English counterparts. In this test, ‘fix’ and ‘boil’ behave similarly to English activity predicates (cf. Tai, 1984).

(93) Baiyun shao-le san-xiaoshi de shui.
 Baiyun boil-PERF three-hour MOD water.
 ‘Baiyun boiled water for three hours.’

(94) Baiyun xiu-le san-xiaoshi de qiche.
 Baiyun fix-PERF three-hour MOD car.
 ‘Baiyun fixed a car/ cars for three hours.’

In contrast, when a resultative morpheme is added to the ‘fix’ and ‘boil’ type, the new predicates *xiu-hao* literally ‘fix-good’, and *shao-kai* literally ‘boil-open’ are no longer compatible with the pre-DO duration phrase. These new resultative verbal compound predicates behave more like English accomplishments (cf. Tai, 1984).

(95) # Baiyun xiu-hao-le san-xiaoshi (de) qiche.
 Baiyun fix-good-PERF three-hour (MOD) car.
 ‘Baiyun fixed the car for three hours.’

(96) # Baiyun shao-kai-le san-xiaoshi de shui.
 Baiyun boil-open-PERF three-hour MOD water.
 Intended ‘Baiyun boiled water for three hours.’

To summarize, in the pre-DO duration phrase test in Mandarin, as one possible equivalent of the English *for*-phrase, activities and *fix*-type of potential accomplishments are compatible with this type of Chinese equivalent of the *for*-phrase, whereas achievements, resultative verbal compounds, and potential accomplishment predicates derived from verbs of creation and consumption with a quantized object are not compatible with this type of the Chinese equivalent of the *for*-phrase.

Another potential equivalent of the *for*-test is the reduplication construction. And this test renders slightly different results from the pre-DO duration phrase test. In this construction, not only is the *fix*-type of potential accomplishments felicitous, but also is the derived type of potential accomplishments from consumption and creation verbs with a quantized object felicitous.

In the reduplication test, as expected, activity verbs such as *chi fan* ‘eat rice’ is felicitous, and the achievement *faxian xin dalu* ‘discover a new continent’ is infelicitous.

(97) Baiyun chi-fan chi-le san xiaoshi.
 Baiyun eat-rice eat-PERF three hour
 ‘Baiyun ate rice for three hours.’

(98) ?Baiyun faxian xin dalu faxian le san xiaoshi.
 Baiyun discover new continent discover PERF three hour.
 Intended ‘Baiyun continues to discover new continents for three hours.’

Or possibly It’s been three hours since Baiyun discovered the new continent.

All the potential accomplishments such as the derived accomplishments *xie yi-feng xin* ‘write a letter’, inherent accomplishments, and degree achievements are compatible in their bare verb forms with the reduplication test. Notice that unlike in the pre-DO duration phrase test, the derived accomplishments are indeed felicitous in the reduplication test. As previously discussed, it is very likely that some further syntactic constraint prevents the quantized direct object of the derived accomplishments from appearing in the pre-DO position (cf. Zhang, 2018).

- (99) Baiyun xie yi-feng xin xie-le san xiaoshi.
 Baiyun write one-CL letter write-PERF three hour.
 ‘Baiyun wrote a letter for three hours.’
- (100) Baiyun xiu-che xiu-le san-xiaoshi.
 Baiyun fix-car fix-PERF three-hour.
 ‘Baiyun fixed the car for three hours.’
- (101) Baiyun shao shui shao-le san xiaoshi.
 Baiyun boil water boil-PERF three hour.
 ‘Baiyun boiled water for three hours.’

However, the resultative verbal compounds are somewhat infelicitous in this environment.

- (102) # Baiyun xiu-hao-che xiu-hao-le san-xiaoshi.
 Baiyun fix-good-car fix-good-PERF three-hour.
 ‘Baiyun fixed the car for three hours.’
- (103) # Baiyun shao-kai shui shao-kai-le san xiaoshi.
 Baiyun boil-boiled water boil-boiled-PERF three hour.
 ‘Baiyun boiled water for three hours.’

3.4.2 *The Equivalent of In Test*

Often used together with the *for*-phrase test, the *in*-phrase test can test for the telicity of a predicate, if the predicate is compatible with the *in* time adverbial phrase because *in* specifies the time within which an event must be completed. If a predicate describes an eventuality with an end point, then it makes sense the eventuality can take place in its entirety within a period of time. In Chinese, there is a more or less identical *in*-phrase equivalent in English: duration + *nei* ‘in’. According to this *in* test in Chinese, the resultative verbal compound ‘fix-good’ type of predicates and Krifka-style ‘eat three apples’ type of potential accomplishments are good in this construction.

Let’s look at these two examples below in (104) and (105). As expected for the *in* test, activities predicates, such as *chi fan* ‘eat rice’, cannot take the *san-xiaoshi (nei)* ‘in three hours’ as shown in (104). In contrast, when the direct object is quantized, *chi san-wan fan*

‘eat three bowls of rice’ is compatible with the *in* phrase. These results suggest that verbs of consumption with a quantized direct object in Mandarin are telic.

- (104) # Yunzi san-xiaoshi (nei) chi-le fan.
Yunzi three-hour (in) eat-PERF rice
‘Within three hours, Yunzi ate rice.’
- (105) Yunzi san-xiaoshi (nei) chi-le san-wan fan.
Yunzi three-hour (in) eat-PERF three-bowl rice
‘Within three hours, Yunzi ate three bowls of rice.’

Likewise, predicates that consist of a verb of creation and a quantized direct object, such as *xie yi-feng xin* ‘write a letter’, are also felicitous in the *in*-phrase test. This suggests that these type of predicates are also telic.

- (106) Yunzi san-xiaoshi (nei) xie-le yi-feng xin.
Yunzi three-hour (in) write-PERF one-CL letter
‘Yunzi wrote a letter in three hours.’

So far, just as Krifka’s (1989,1992,1998) theory predicts, the Mandarin sentences with verbs of creation and consumption with a quantized object seem to be telic like their English counterparts.

However, for the *fix*-type of predicates in Mandarin, the type of predicates that may be inherent accomplishment by the virtue of the verb itself, the results are again not quite the same as their English counterparts. The bare verb *xiu* ‘fix’ without the resultative morpheme seems to be atelic, whereas with the resultative morpheme, the resultative verbal compound seems to be telic.

For example, compare the following two sentences in (107a) and (107b). Whereas the verb *xiu* ‘fix’ as a bare verb is incompatible with the *san-xiaoshi nei* ‘in three hours’ phrase; the compound form *xiu-hao* literally ‘fix-good’ is compatible with ‘in three hours’. It seems to indicate that *xiu* ‘fix’ by itself in Mandarin is atelic and that *xiu-good* ‘fix-good’ is telic.

- (107) a. # Yunzi san-xiaoshi (nei) xiu-le che.
 Yunzi three-hour (in) fix-PERF car
 ‘Yunzi fixed the car/cars in three hours.’
- b. Yunzi san-xiaoshi (nei) xiu-hao-le che.
 Yunzi three-hour (in) fix-good-PERF car.
 ‘Yunzi fixed the car/cars in three hours.’

As for the degree achievement types of predicates in Mandarin, the bare transitives seem to behave like an activity. As shown in (108a), *shao shui* ‘boil water’ certainly sounds odd with the time adverbial *san-xiaoshi nei* ‘in three hours’, so *shao shui* ‘boil water’ does not seem to be telic. However, as shown in (108b), when *shui* is quantized, *shao yi-hu shui* ‘boil a pot of water’ seems to be telic in this environment.

- (108) a. ? Yunzi san-fenzhong (nei) shao-le shui.
 Yunzi three-minute (in) boil-PERF water.
 Yunzi boiled water in three minutes.
- b. Yunzi san-fenzhong (nei) shao-le yi-hu shui.
 Yunzi three-minute (in) boil-PERF one-kettle water.
 Yunzi boiled a kettle of water in three minutes.

Somehow like the *fix*-type of predicates, when there is an explicit resultative morpheme, the compound predicates seem to be telic, as they are compatible with the temporal adverb *sao-xiaoshi nei* ‘in three hours’. Compare the examples below in (109a) and in (109b) with the ones above in (108a) and (108b). With the resultative morpheme *kai* ‘boiled’ (*lit.* open), the compound predicate *shao-kai* ‘boil-boiled’ can always be interpreted as telic. On the other hand, the bare transitive verb *shao* seem to form a telic predicate only by having a quantized direct object, but cannot be interpreted as telic by itself.

- (109) a. Yunzi san-fenzhong (nei) shao-kai-le shui.
 Yunzi three-minute (in) boil-boiled-PERF water
 ‘Yunzi boiled water in three minutes.’
- b. Yunzi san-fenzhong (nei) shao-kai-le yi-hu shui.
 Yunzi three-minute (in) boil-boiled-PERF one-kettle water.
 ‘Yunzi boiled a kettle of water in three minutes.’

3.4.3 The Progressive Test with Zai

The progressive test in English was originally designed to tease apart durative and non-durative predicates. Durative predicates such as activities and accomplishments are predicted to be good in a progressive sentence. Instantaneous predicates such as achievements should be incompatible in the progressive, unless it has an immediate future type of meaning. In Mandarin, this test confirms that activities, all types of potential accomplishments, resultative verbal compound constructions in Mandarin are durative.

First, let's compare the following four examples. As expected, the activity *tiaowu* 'dance' and the potential accomplishment *hua yi-fu hua* 'draw a picture' are both good with the *zai* progressive. However, the achievements such as *faxian xin dalu* 'discover a new continent' and *dao Beijing* 'reach Beijing' are not felicitous in the *zai* progressive. This shows that the progressive test in Mandarin does differentiate the durative and the non-durative predicates.

- (110) Gaogao zai tiaowu.
Gaogao PROG dance.
'Gaogao is dancing.'
- (111) Gaogao zai hua yi-fu hua
Gaogao PROG draw one-CL picture.
'Gaogao is painting a picture.'
- (112) # Gaogao zai faxian xin dalu.
Gaogao PROG discover new continent
Gaogao is discovering a new territory.
- (113) # Gaogao zai dao Beijing.
Gaogao PROG reach Beijing
'Gaogao is reaching Beijing.'

This test provides important results to classify the resultative verbal compound type of predicates in Mandarin. Although previously the *for*-phrase test does not support that the resultative verbal compound constructions are durative, this test however supports that the resultative verbal compounds are durative, because, unlike the achievements, these resultative verbal compounds are felicitous in the *zai* progressive.

- (114) Gaogao zai da-po huaping.
 Gaogao PROG hit-break vase
 ‘Gaogao is breaking a vase.’
- (115) Gaogao zai xiu-hao qiche.
 Gaogao PROG fix-good car
 ‘Gaogao is fixing the car.’
- (116) Gaogao zai ca-ganjing zuozi.
 Gaogao PROG wipe-clean desk
 ‘Gaogao is wiping the desk clean.’

As for the bare transitives of the degree achievements, they are compatible with the *zai* progressive and consequently are also durative themselves.

- (117) Gaogao zai shao (yi-hu) shui.
 Gaogao PROG boil (one-kettle) water.
 ‘Gaogao is boiling (a kettle of) water.’

3.4.4 *The Culmination Entailment*

The culmination entailment test may not be a good test for telicity in Mandarin, because as well documented in the literature, the intended accomplishment predicates in Mandarin do not necessarily have a culmination reading. As shown in (118) and in (119), both the derived potential accomplishments with quantized object such as *xie yi-feng xin* ‘write a letter’ and the inherent accomplishments such as ‘kill’ do not entail culmination, as the result state can be negated.

- (118) Baiyun xie-le yi-feng xin, mei xie-wan.
 Baiyun write-PERF CL letter, not.have write-finish.
 ‘Baiyun wrote (parts of) three letters, but did not finish writing (them).’
- (119) Jingke sha-le Qin wang, danshi Qin wang mei si.
 Jingke kill-PERF Qin king, but Qin king not.have die.
 ‘Jinke killed (or tried to kill) the king of Qin, but the king of Qin did not die.’

Interestingly, however, for the resultative verbal compounds such as *da-po*, literally ‘hit break’, the culmination reading cannot be canceled as shown in (120).

- (120) *Gaogao da-po le huaping, danshi huaping mei po.
 Gaogao hit-break PERF vase, but vase not.have break.
 Intended ‘Gaogao broke the vase, but the vase did not break.’

3.4.5 *The Almost Test*

The *almost* test can differentiate activities and accomplishments. With activities, using ‘almost’ gives a cancellation reading that the event did not actually occur. With accomplishments, there are two possible readings: either the cancellation reading that the event did not take place, or the non-culminating reading that the event happened in part but did not culminate. According to the *almost* test, the inherent *fix*-type potential accomplishments only have the event cancellation reading, but not the non-culminating reading. The resultative verbal compounds have both the event cancellation reading and the non-culminating reading.

As shown below in (121) and (122), whereas the activity predicate *pao* ‘run’ only has the event cancellation reading; the potential accomplishment predicate *pao yi-qian-me* has both the event cancellation reading and the non-culminating reading. Like their English counterparts, ‘I almost ran’ in Mandarin means that the speaker did not run, ‘I almost ran a thousand meters’ can either mean that the speaker intended to run a thousand meters but decided not to later, or that the speaker ran some distance close to a thousand meter but failed to accomplish the goal of one thousand meters.

- (121) wo jihu pao-le.
 I almost run-PERF
 ‘I almost ran.’

The only reading is the event cancellation reading.

- (122) wo jihu pao-le yi-qian-mi
 I almost run-PERF one-thousand-meter
 ‘I almost ran one thousand meters.’

Event cancellation or non-culminating reading.

Let’s compare the next pair in (123) and (124), while the predicate *xiu* ‘fix’ patterns again like an activity predicate by having only the event cancellation reading; the predicate *xiu-hao* ‘fix-good’, the resultative verbal compound form of *xiu*, has the non-culminating reading, but seems to lack the event cancellation reading. In other words, the counterpart of ‘I almost fixed the car’ in Mandarin means that the speaker did not start fixing the car at all, though the speaker had such an intention; and the resultative verbal compound version literally ‘I almost fixed-good the car’ in Mandarin means that the speaker had started working on the car, but was not able to fix it at the end. Interestingly, in contrast with the potential accomplishment predicate *pao yi-qian-mi* ‘run a thousand meter’, the resultative verbal compound *xiu-hao* ‘fix-good’ only has the non-culminating reading, but not the event cancellation reading.

- (123) wo jihu xiu-le che.
 I almost fix-PERF car.
 ‘I almost tried to fix the car.’

Event cancellation reading but not the non-culminating reading

- (124) wo jihu xiu-hao-le che.
 I almost fix-good-PERF car.
 ‘I almost fixed the car.’

Non-culmination reading, but not the cancellation reading

As for the degree achievements, the bare transitive verb with a non-quantized direct object behaves like an activity, whereas the bare verb with a quantized direct object behaves like an English accomplishment. As shown in (125), ‘I almost boiled water’ in Mandarin means that the speaker thought about boiling water but did not begin.

- (125) wo jihu shao-le shui.
I almost boil-PERF water.
'I almost boiled (some) water.'

Only the event cancellation reading

In contrast, as shown in (126), 'I almost boiled a kettle of water' in Mandarin can either mean that the speaker did not begin to boil a kettle of water, or that the speaker started boiling water but did not quite manage to boil a whole kettle of water.

- (126) wo jihu shao-le yi-hu shui.
I almost boil-PERF one-kettle water
'I almost boiled a kettle of water.'

Both the event cancellation reading and the non-culminating reading

Not surprisingly, the resultative verbal compound form of a bare transitive degree achievement verb also patterns like the resultative verbal compound form of the *fix*-type by having only the non-culminating reading. As shown in (127), the resultative verbal compound *shao-kai* in the perfective means that the speaker started boiling some water and the water was heated up to close to the boiling point, but it did not boil.

- (127) wo jihu shao-kai-le shui.
I almost boil-boiled-PERF water.
'I almost boiled (some) water.'

Only the non-culminating reading.

3.4.6 the Negation test

Very much like the *almost* test, the negation test can also differentiate between activities and accomplishments. In English, while the activities only have the event cancellation reading, the accomplishments have both the event cancellation reading and the non-culminating reading. The results of the negation test are parallel to those of the *almost* test. According to this test, activities, and the inherent accomplishment equivalent *fix*-type of predicates in Mandarin only has the event cancellation reading. The resultative verbal compounds seem

to mostly have only the non-culminating reading, although the event cancellation reading might be possible. The derived accomplishments with a quantized direct object have both the event cancellation reading and the non-culminating reading.

As shown in (128), when being negated, an activity predicate *paobu* in the perfective only has the event cancellation reading. Like its English counterpart, ‘Baiyun did not run’ in Mandarin means that Baiyun did not run at all.

- (128) Baiyun mei paobu.
 Baiyun not.have run.
 ‘Baiyun did not run.’
 Event cancellation reading

In contrast, as shown in (129), when the amount of distance is specified for the activity verb, the derived accomplishment *pao yi-bai mi* ‘ran a hundred meter’ can have either an event cancellation or a non-culminating reading. Just like its English translation, in (129a), ‘Baiyun did not run a hundred meters’ in Mandarin can be either continued with (129b) ‘she did not run at all’, or (129c) ‘she only ran about eighty meters’. In the former, the reading is an event cancellation reading, and in the latter, the reading is a non-culminating reading.

- (129) a. Baiyun mei pao yi-bai mi.
 Baiyun not.have run one-hundred meter.
 ‘Baiyun did not run one hundred meters.’
 Event cancellation or non-culminating reading.
- b. ...
 Ta genben jiu mei pao.
 3.SG at.all EMPH. not.have run.
 ‘She did not run at all.’
- c. ...
 Ta cai pao le ba-shi mi zuoyou.
 3.SG only run PERF eight-ten meter about.
 ‘She only ran about eighty meters.’

As for the equivalents to the inherent accomplishments, the *fix*-type of predicates in Mandarin, the bare transitive verbs without the resultative suffix pattern like activities in having only the event cancellation reading; whereas the corresponding resultative verbal compounds with the resultative morpheme added have predominantly the non-culminating reading. The event cancellation reading might be possible for the resultative verbal compound, but it is not very likely, partly because the bare transitive verbs would have been used instead for the event cancellation reading.

For example, as shown in (130) and (131), the verb *xiu* ‘fix’ only has the event cancellation reading when negated in the perfective, whereas the resultative verbal compound *xiu-hao* ‘fix-good’ has the non-culminating reading. Literally, ‘Baiyun did not fix the car’ in Mandarin means that Baiyun did not start fixing the car, but not that she tried but did not succeed in fixing the car. To express the latter, the resultative verbal compound form *xiu-hao* would be used instead. Perhaps because Mandarin differentiates *xiu* ‘fix’ and *xiu-hao* ‘fix-good’, the resultative verbal compound version only has the non-culminating reading, and the event cancellation reading might only be marginally possible, but is quite hard to get.

- (130) Baiyun mei xiu zhe-liang che.
 Baiyun not.have fix this-CL car
 ‘Baiyun did not fix this car.’

Only the event cancellation reading.

- (131) Baiyun mei xiu-hao zhe-liang che.
 Baiyun not.have fix-good this-CL car
 ‘Baiyun did not fix this car.’

Non-culmination reading. Possibly also the event cancellation reading.

The negation test also gives strong evidence for arguing that *sha* ‘kill’ in Mandarin also patterns like an activity verb. In previous studies, there were some debates about whether *sha* ‘kill’ in Mandarin always entails culmination (cf. Koenig and Chief, 2007). If *sha* ‘kill’ is like an English accomplishment, then it should be possible to have both the event cancellation reading or the non-culminating reading. But in this test, as shown in (132), ‘Jingke did not

kill the king of Qin’ in Mandarin can only mean that Jingke did not carry out the plan of killing, but not that Jingke carried out the plan but did not succeed. In order to express the failed attempt, the resultative verbal compound *sha-si* ‘kill dead’ is used instead. For example, imagine a scenario that Jingke made a plan to assassinate the king of Qin by killing him with a dagger hidden in a map. If Jingke somehow lost the map and the dagger beforehand and did not carry the plan at all, then (132) is felicitous and (133) is not felicitous. However, if Jingke did carry out the plan and successfully landed the dagger at a fatal part, but the king of Qin was later saved by some doctors despite of the fatal blow, then (132) is not felicitous and (133) is.

- (132) Jingke mei sha Qin wang.
 Jingke NOT kill Qin king.
 ‘Jinke did not kill the king of Qin.’

Only event cancellation reading.

- (133) Jingke mei sha-si Qin wang.
 Jingke not kill-dead Qing king.
 ‘Jinke did not kill the king of Qin.’

Non-culminating reading. Possibly also the event cancellation reading.

3.4.7 Summarizing the Results

So as shown in Table 3.1, according to the six tests that we have run above, the results are as follows: unlike their English counterparts, the inherent accomplishment equivalent *fix*-type of predicates and the bare transitive degree achievements such as *shao* ‘boil’ pattern exactly like activities such as *paobu* ‘run’; the derived accomplishments with a quantized direct object pattern the most like accomplishments in English; the resultative verbal compounds fall somewhat between an accomplishment and an achievement according to the test results. Like an accomplishment, the resultative verbal compounds are compatible with the progressive in Mandarin, which shows that the resultative verbal compounds can be durative, although somehow strangely the resultative verbal compounds are not compatible with either of the

two *for*-phrase test equivalents in Mandarin. Like an achievement, a resultative in the perfective does entail culmination and seems to predominantly favor a non-culminating reading only in both the *almost* and negation test.

Table 3.1: Summary of the Test Results

Tests:	Pro-DO Dur	Redup	In-test	Prog Test	Entail	almost	neg
paobu 'run'	✓	✓	*	✓	N/A	cancellation	cancellation
chi san-ge pingguo 'eat three apples'	*	✓	✓	✓	*	cancl or non-culm	cancl or non-culm
faxian xin-dalu discover a new continent	*	*	✓	*	✓	non-culm or cancl?	non-culm or cancl?
xiu fix	✓	✓	*	✓	*	cancellation	cancellation
xiu-hao fix(resultative)	*	*	✓	✓	✓	non-culm	non-culm or cancl?
shao 'boil or burn'	✓	✓	*	✓	*	cancellation	cancellation
shao-kai boil(resultative)	*	*	✓	✓	✓	non-culm	non-culm or cancl?

Therefore according to these test results, what really can count as true accomplishments are the derived accomplishments with a quantized direct object and the resultative verbal compounds. The *fix*-type of bare transitive predicates and the bare transitive degree achievements in Mandarin are actually activities.

So already from the tests for predicate types, we see that so called the non-culminating accomplishments in Mandarin are not a homogeneous phenomenon. Some of them arise because the predicates themselves are activities to begin with in the case of the *fix*-type of bare transitive predicates. Others such as the derived accomplishments according to the test results are true accomplishments, and the reason for the non-culminating reading must be investigated separately.

Interestingly, not every type of accomplishments can have a non-culminating reading in Mandarin. For example, the resultative verbal compounds always entail culmination in the perfective. This seems to suggest that the non-culminating phenomena in Mandarin cannot be attributed to the perfective marker, but rather must be considered on the basis of the different subtypes of accomplishments.

3.5 Conclusion

In this chapter, I have discussed how to adapt Dowty's (1979) predicate tests for Mandarin, in order to investigate what predicates are true accomplishments in Mandarin. I bring up some of the caveats when applying tests to another language such as differences in lexical semantics between equivalents in languages, and differences in test results between languages. Obviously, one major difference we could expect is that not all accomplishments in Mandarin entail culmination in the perfective, because non-culminating accomplishments exist in Mandarin. I propose that in order to distinguish between activities and accomplishments in a given language, as long as the two categories pattern distinctively and form their own respective classes, then the accomplishments still count as accomplishments, even if the accomplishments do not pass some of the tests for accomplishments like their English counterparts.

I have so far established that the so-called non-culminating accomplishments in Mandarin have various origins. Some of them such as the Dowty's style *fix*-type of predicates and the bare transitive degree achievements are activities to begin with. Others such as Krifka's style derived accomplishments with a quantized direct object are true instances of accomplishments that unexpectedly fail to have a culminating reading in the perfective. So these results show that non-culminating accomplishments in any given language may not be accounted by one single account, but should rather be examined carefully case by case.

In the next chapter, I discuss the semantics of the perfective marker in Mandarin and argue that the perfective marker in Mandarin has a standard English-like perfective semantics minus the tense part and that the perfective marker is not the source of the non-culminating accomplishments in Mandarin.

CHAPTER 4

THE PERFECTIVE ASPECT IN MANDARIN

In this chapter, we discuss the semantics of the perfective *le* in Mandarin. I show that non-culminating readings for accomplishments do not result from the meaning of the perfective marker *le*, but actually come from the semantics of predicates themselves. I claim that despite of the non-culminated readings for accomplishments and the so-called inchoative uses of the perfective, the Mandarin perfective marker *le* has a standard perfective meaning.

In Chapter 2, I have argued that *a priori* it is equally possible that the so-called ‘non-culminating accomplishments’ can arise either from the meaning of the accomplishment predicate or the meaning of the perfective marker, and I have shown that most previous studies have assumed one position without considering other alternatives. Whereas the literature on non-culminating accomplishments in languages other than Chinese has generally attributed the cause of the non-culminating accomplishments to the meaning of the verb and its internal argument (cf. Bar-El et al., 2004; Koenig and Muansuwan, 2000; Singh, 1998), interestingly in the Chinese aspectual literature the cause has been attributed to the perfective marker *le* instead (cf. Smith, 1997; Klein et al., 2000; Lin, 2003). Does this difference reflect a true linguistic difference between Mandarin and other languages? Do non-culminating accomplishments arise from different sources in different languages? Maybe in some languages, they arise from the semantics of the perfective marker and in other languages they arise from the semantics of the verb and its internal argument. What are some criteria we can use to choose between these two alternatives for a given language? In this chapter, I explore these issues through the discussion of the semantics of the perfective *le* and stative verbs in Mandarin.

One of the major arguments for the view that the Mandarin perfective *le* has a special meaning actually comes from the facts about non-culminating accomplishments themselves. This view has been long around in Chinese philology (Chao, 1968; Li and Thompson, 1989, among others), but probably was made explicit first in Smith’s (1994; 1997) works. In her

influential book on aspect, Smith (1997) suggests that accomplishments in the perfective sentences such as ‘I wrote a letter but did not finish it’ in Mandarin is felicitous because the perfective *le* only requires an event to stop at an arbitrary point after it starts. Given that Smith’s (1994; 1997) seminal works are quite comprehensive and intuitive, most subsequent researchers adopt her theory and take for granted her explanation of the non-culminating accomplishments in Mandarin.

Another major argument espoused by many Chinese linguists is that the perfective marker *le* has apparent imperfective uses. When certain predicates such as *yang* ‘foster’ and *zuo* ‘sit’ are used together with *le* in the sentence, the sentence seemingly has an on-going imperfective kind of meaning to it. For example, in (134), although *yang* ‘foster’ is used with a perfective marker, the sentence in the most natural reading means that the person is still keeping the fish as a pet, not that the person kept the fish as a pet in the past. The same goes for the ‘sit’ example in (135).

- (134) ta yang-le yi-tiao yu.
 he/she foster-LE one-CL fish.
 ‘S/he keeps(is keeping) a fish as a pet.’
 Or ‘S/he kept a fish as pet.’

- (135) menkou zuo-le yi-ge ren.
 door sit-LE one-CL person.
 ‘A person is sitting at the door.’ cf. Lin (2000)

If indeed, these imperfective uses do come from the particular meaning that *le* contributes to the sentence, then we would simply attribute the non-culminating readings of the accomplishment to the imperfective uses of *le*, and it would be the end of the story. However, upon closer examination, neither of these two arguments holds particularly well. In the first argument, Smith (1994, 1997) does not consider too carefully the alternative analysis that the incompletive reading can come from the special properties of the predicate instead. In the second argument, because the so-called ‘imperfective’ uses of the perfective particle *le* is only restricted to some very narrow sub-classes of verbs, for example verbs of location or

potential inchoative verbs, it is more likely that the semantics of these verbs rather than that of *le* gives rise to the on-going ‘imperfective’ meaning.

In fact, this predominant view that *le* contributes to the imperfective and the inchoative readings has been questioned. For example, in her paper on change-of-state verbs in Mandarin, Tham (2013) argues that the predicates themselves can have an inchoative reading in certain contexts, by showing quite convincingly that these verbs can have an inchoative reading on their own, without any aspectual markers.

In addition to Tham’s (2013) argument, I show new evidence that *le* does not have the inchoative meaning. My main arguments are as follows: First, if *le* really is a special perfective marker that signifies that an event stops arbitrarily, then any accomplishment predicate in Mandarin should be able to easily have a non-culminating reading, however, this is not the case as I show in §4.2. Second, if *le* indeed contributes to the inchoative reading by having a semantics that accesses the target state of a verb as proposed by Lin (2000), then activities should also potentially have inchoative reading. However, I show that this the inchoative reading for activities is very hard to get in Mandarin in §4.2.

This chapter is organized as follows: In §4.1, I discuss a few influential studies of the semantics of *le*. Then, in §4.2, I proceed to argue that the perfective *le* has just a plain perfective meaning and the so-called ‘imperfective reading’ and the ‘inchoative reading’ actually should be attributed to the properties of the predicates themselves. Following these arguments, I define the meaning of the perfective marker in §4.3, and propose my own version of the meaning of these stative predicates in §4.4 in light of inchoativity phenomena discussed in other languages. In §4.5, I have some general and tentative discussions of what the typology of perfectivity might look like.

4.1 Previous Studies on the meaning of *le*

The perfective marker *le* has always been of huge interest to Chinese philologists and linguists and it is probably impossible to give credit to all these works within the given space (Chao,

1968; Li and Thompson, 1989; Smith, 1997; Klein et al., 2000; Lin, 2003, 2005). I therefore limit my discussion to a few classical papers in the modern linguistics framework.

The perfective aspect in Mandarin is different from that in English in several ways, as Mandarin is a tenseless language with a rich aspectual system. There are two perfective particles in Mandarin: the perfective *le* and the experiential *guo*. *Le* and *guo* are generally used to describe the past, and sometimes they seem to be able to be used interchangeably (Li and Thompson, 1989). Though Li and Thompson (1989) distinguish between the two as perfective and experiential, many studies (Klein et al., 2000; Smith, 1994; Lin, 2003, among others) agree that both have a perfective viewpoint aspect, which makes it hard to differentiate the two sometimes. The main difference is generally ascribed to the so called ‘discontinuity’ effect of *guo* (cf. Li and Thompson, 1989), which requires the result state of the verbal predicate to no longer be valid at the time of speech as illustrated in (136a). This difference is considered to be a semantic one by most studies, as the ‘discontinuity’ effect is not defeasible. As shown in (136), when *guo* is used, the result state that the person is still in Hong Kong cannot be true; whereas if *le* is used, the person can potentially still be in Hong Kong. But as most discussions of non-culminating accomplishments in Mandarin are concerned with sentences with *le*, our discussion will focus on *le* hereafter.

- (136) a. % Ta qunian qu-guo Xiang Gang, hai zai nar.
 3SG last-year go-EXP Hong Kong, still stay there.
 ‘S/He went to Hong Kong last year, and I am still there.’
- b. Ta qunian qu-le Xiang Gang, hai zai nar.
 3SG last-year go-PERF Hong Kong, still stay there.
 ‘S/He went to Hong Kong last year. and I am still there ’

[e.g. after] Smith (1994)

Besides that apparent differences that Mandarin distinguishes between two perfective aspectual markers and that both of these two perfective particles can appear in future or present sentences, the perfective markers *le* has three particularities: the non-culminating reading when co-occurring with some accomplishment predicates, its so-called ‘imperfective’

uses, and its two syntactic positions, post-verbal and sentence-final positions.

The first particularity of the perfective marker *le* that accomplishments can have non-culminating reading in the perfective in Mandarin is exactly what we are most interested in investigating in this dissertation. It has long been observed that when co-occurring with an accomplishment predicate, *le* does not necessarily have a culminating reading (Smith, 1994; Lin, 2003). As briefly discussed above, this lack of culmination is often attributed to the semantics of the perfective marker *le* itself by Chinese linguists, especially those following Smith (1994, 1997).

The second and third particularities both have been used to support the idea that *le* has a special inchoative semantics that brings about the non-culminating readings. It has been argued that because *le* seems to have an imperfective use to describe a present and on-going situation in some sentences such as in (137), it must be the case that whatever this semantic property might be should also be responsible for the non-culminating readings for the accomplishments (Klein et al., 2000; Lin, 2003). This semantic property has been more or less been suggested as inchoativity or the change-of-state use, because most sentences with the ‘imperfective’ use seem to involve a change of state, or stative verb coerced into a change-of-state verb as in (137). For example, in (137), the on-going situation described is the result state brought about by the change-of-state ‘hanging’ event.

(137) qiang-shang gua-le yi-fu hua
wall-top hang-PERF one-CL picture
‘A picture has been hung on the wall and is still hanging there.’

(138) wo chi-le fan le
I eat-PERF rice LE
‘I ate (or have eaten).’

As for the third particularity, *le* can be attached to the end of the sentence to indicate that what was not true before has become true now. For example, in (138), the sentential final *le* emphasizes that the state ‘I have not eaten or I did not eat’ changed into ‘I have eaten or I ate’ at some point at a time previous to the topic time. This seems also to lend

some support to the inchoative semantics of *le*, because this kind of update of the common ground information can also be considered some sort of change of state. In other words, the post-verbal *le* and the sentence-final *le* are actually one and have the same meaning with the change-of-state property as the semantic core of *le* (cf. Lin, 2003, 2005).

In this section, I review a few works representative of these ideas above. I will start with the two-component theory in Smith (1994, 1997), and then briefly discuss the notion of distinguished phase (DP) by Klein et al. (2000), and Lin’s (2003, 2005) formal semantics works.

4.1.1 *Two Component-Theory: Smith (1994, 1997)*

Smith (1994) offers many valuable insights and seminal ideas about the interactions of situation types and Chinese aspectual particles. Central to her analysis is what she calls the two-component theory, which claims that the viewpoint aspect and the situation aspect are different and separate from each other, and the viewpoint aspect “focuses and makes semantically visible all or part of a situation (1994, 108)”. The viewpoint aspect is provided by the particles, and the situation aspect by the verb type and its argument.

The two-component theory works roughly as follows: a set of schemata for the situation types are defined in terms of initial point and endpoints to reflect their characteristics, and the view point aspects work like lenses that are added onto to situation aspects, and modify which part of the schema can be visible in the sentence.

Smith’s (1994) schemata for situation types are shown in (139). Unlike Vendler (1957) and Dowty (1979), Smith (1994) proposes that atelic predicates, activities and states, can have arbitrary endpoints. Therefore, in this framework activities differ from accomplishments by having an arbitrary endpoint. For achievements and accomplishment, they have a natural endpoint, i.e. the culmination point. As shown in (139), the schemata works as follows: I stand for the initial point, F stands for the final point, the brackets indicate that the points are optional, the *Nat* and *Arb* subscripts stand for natural and arbitrary respectively, and E

standards for an instantaneous event.

(139) Stative Schema: (I) (F)

Activity Schema: I..... F_{Arb}

Accomplishment Schema: I F_{Nat}

Achievement Schema: E_{Nat}

So in a given sentence, a view point aspect takes in a situation type schema, and imposes certain modifications to this schema. The perfective and imperfective viewpoints are defined as follows:

Perfective viewpoints include both endpoints of a situation and are closed informationally. Imperfective viewpoints focus on intervals that are neither initial nor final, thus excluding endpoints (Smith, 1994, 110).

So within this two-component framework, Smith (1994) analyzes the non-culminating accomplishments in the following way: because in Mandarin, the endpoints of a viewpoint aspect do not need to coincide with that of a situation aspect, the perfective viewpoint can end before the natural endpoint of an accomplishment. In other words, the perfective marker *le* can either impose an arbitrary endpoint to the accomplishment predicate, or include the arbitrary endpoint of the accomplishment predicate. Therefore, in Mandarin, given a perfective viewpoint, a sentence with a telic predicate may either be terminated or closed. For example, accomplishment predicate such as ‘write a letter’ is obligatorily culminated in the perfective in English but not in Chinese, as shown below in the famous example (140). The perfective in Chinese can thus target the activity phase of the accomplishment verb and use it as if it were an activity verb.

(140) Wo zuotian xie-le yi-fen xin, keshi mei xie-wan.
1SG yesterday write-PERF one-CL letter, but not.have write-complete.
‘I wrote a letter yesterday, but didn’t finish writing it.’

(adapted from Soh and Kuo, 2005)

To summarize, Smith’s (1994, 1997) two-component theory has spelled out very explicitly the interactions between situation types and viewpoint aspects in an straightforward and visual way. Because the two-component theory framework is user-friendly and yet has a lot of explanatory power, it has been used widely in the literature of Chinese aspect and also applied broadly in studies of aspect on other languages. Perhaps as a result of the popularity of her works, many also accept her analysis of the non-culminating accomplishments in Mandarin as a result of the semantics of the perfective marker *le* imposing an arbitrary endpoint to the accomplishment predicate.

However, despite its immense popularity, the two-component theory is not formal enough so that precise truth-conditional predictions are still obscure. More specifically, it is not entirely clear how the viewpoint aspects can be modeled in compositional semantics. In the following two sub-sections, we look at some more formal approaches that build on her work.

4.1.2 *Distinguished Phase: Klein et al. (2000)*

In Klein et al.’s (2000) study of Mandarin aspectual particles, they formalize the notions of viewpoint aspect and tense as the relation between time of utterance (TU), time of situation (T-SIT) and time of topic (TT). The time of utterance is the time of speech. The time of situation is the “time span at which the situation obtains” and the time of topic is “the time span about which something is said” (Klein et al., 2000, 742). Topic time can either be introduced via an adverbial phrase or by the context. Crucially, they claim that tense is a relation between TT and TU, not T-SIT and TU, and that aspect is concerned with how TT relates to T-SIT. TT may contain it, be a subinterval of T-SIT, or after it. These time spans can be related to each other by having one of the following three relations.

- (141) a. S AFTER T: last interval of T precedes first interval of S
 b. S IN T: S is a proper subset of T
 c. S OVL T: S and T have a subinterval in common (i.e., they ‘overlap’)

Klein et al. (2000, 744)

To account for the inchoative uses of *le*, Klein et al. (2000) proposes the notion of the distinguished phase (T-DP), which is defined as the phase that a TT must relate to in a language. “The distinguished phase (DP) is (a) the only phase in the case of 1-phase contents, and (b) either the source phase or the target phase in the case of 2-phase contents. (Klein et al., 2000, 751).” While English chooses the source phase, Chinese chooses the target phase as its distinguished phase.

So the semantics of the perfective marker *le* is formulated as follows: *le* describes a relationship between the topic time and the distinguished phase of the situation time such that the topic time overlaps both with the pre-time of the distinguished phase and with the distinguished phase. Because *le* specifies that the topic time overlaps with the pre-time of the distinguished phase, it has an inchoative flavor with certain verb classes.

(142) a. *le* TT OVL PRETIME T-DP AND T-DP Klein et al. (2000, 754)

Let’s have a look at some original examples from Klein et al.’s (2000) paper to see how their semantics of *le* accounts for non-culminating accomplishments and inchoative uses. Non-culminating accomplishments can be explained by precisely that *le* only requires some time of the pre-time and the T-DP to be included, but does not specify whether the endpoint of the accomplishment needs to be included in the topic time interval or not. According to the paper, for a one-phase predicate *xie xin* ‘write a letter or (letters)’, only part of the letter-writing needs to be true in the topic time. In this case, as shown (143), even if the accomplishment ‘write a letter’ did not culminate, i.e. the letter has not been written out in full, the sentence is still felicitous because *le* only require part of the letter-writing in the topic time.

(143) Ta xie-le xin, keshi mei xie-wan.
 she write-LE letter but not write-finish
 She wrote a letter, but did not finish writing it.

[+++++]+++++ Klein et al. (2000, 755)

Similarly, the inchoative readings of statives can be explained by the fact that *le* requires the pre-time of the distinguished phase to be true in the topic time. For example, as shown in (144), because of the semantics of *le*, the stative adjective *pang* ‘fat’ is true for some part of the topic time and the pre-time of ‘fat’, the state of ‘not fat’ preceding the ‘fat’ state also needs to be true for some part of the topic time. Therefore, *pang* in Mandarin get a inchoative change-of-state reading in the perfective.

- (144) Ta pang-le.
 She fat-LE
 She became fat.

[+++++]

Klein et al. (2000, 755)

In Klein et al.’s (2000) analysis, there are two implicit assumptions that are relevant to our discussion of non-culminating accomplishments. First, just like Smith (1994), Klein et al. (2000) claim that the semantics of *le* is what contributes to the non-culminating readings in Mandarin. Second, they also claim that inchoativity is the semantic core of *le* and the post-verbal and sentential-final *le* need not be distinguished.

4.1.3 *Compositional Semantics: Lin (2000, 2003)*

Building on these previous works, especially on Klein et al.’s (2000) analysis, Lin (2000, 2003, 2005) work on formalizing these intuitions into compositional semantics in a series of his studies.

As a first pass, Lin (2000) starts out formalizing the compositional semantics of *le* as basically a standard perfective marker. The semantics of *le* is just like the simple past tense marker *-ed* in English minus the tense part. The semantic formula in (145) basically specifies that the run time t of a situation P must precede another time t' , i.e. the situation must be completed before some given t' ; and the run time of the situation time must be contained in a reference time t_R . As shown in (146), an adverbial phrase such as ‘yesterday’ serves to restrict time of the event time.

(145) The Preliminary Semantics of *le*.

$$le \Rightarrow \lambda P_{\langle i, t \rangle} \lambda t' \lambda t [t < t' \& P(t) \& t \subseteq t_R] \quad (\text{Lin, 2000, 115})$$

(146) *zuotian* $\Rightarrow \lambda P_{\langle i, t \rangle} \lambda t [t \subseteq \textit{yesterday}' \& P(t)] \quad (\text{Lin, 2000, 114})$

For example, with these definitions, the truth condition for ‘Zhangsan wrote a letter yesterday’ is shown in (147). In this example, the third argument of *le* function is existentially closed at the end of the derivation in the example above. The truth condition says that there is a time *t* before speech time and this time is within yesterday and within the reference time, and the time *t* is the event time of ‘write a letter’. So by uttering this sentence, the speech time *s** and the adverbial time ‘yesterday’ become salient in the context. The time by which the event need to have taken place *t'* is replaced by speech time because otherwise a contradiction will arise between $t < \textit{yesterday}'$ and $t \subseteq \textit{yesterday}'$.

(147) LF:[*le* [Zhangsan *zuotian* *xie* *yi-feng* *xin*]]

$$\exists t [t < s^* \& t \subseteq \textit{yesterday}' \& \exists x [\textit{letter}'(x) \& \textit{write}'(x)(\textit{Zhangsan}')(t)] \& t \subseteq t_R] \quad (\text{Lin, 2000, 116})$$

Besides this kind of most common perfective reading, Lin (2000) observes that *le* sometimes has an imperfective, ongoing kind of reading with certain verbs, such as *zu fangzi* ‘to rent a house’ and *yang jinyu* ‘breed goldfish’.

(148) Zhangsan yang-le yi-tiao yu.
 Zhangsan breed-PERF one-PERF fish.
 ‘Zhangsan is breeding/has been breeding a fish.’ (modified from Lin, 2000, 123)

His explanation for this kind of sentence is that the subcategorization of verbal constellation ‘breed goldfish’ has the property that the target phase comes into existence as soon as the event starts and then *le* targets the initial subinterval of the target phase. This view agrees with Klein et al.’s (2000) claim that the distinguished phase in Chinese is the target phase, unlike English whose distinguished phase is the source phase. As the breeding event is likely to last for a while, and there is nothing in the semantics of *le* to indicate an endpoint

of the event, the above example is compatible with a reading that the breeding event is still going on now.

In order to account for the fact that in some sentences *le* has imperfective reading, Lin (2000) revises his formula as follows:

(149) The Final Version of *le*.

$$le \Rightarrow \lambda P_{\langle i, t \rangle} \lambda t' \lambda t \exists t'' \exists t''' [t < t' \& t = f_{initial}(t'') \& t'' = \tau(f_{target}(P)) \& P(t''') \& t''' \subseteq t_R]$$

(Lin, 2000, 126)

In this new version of the semantics of *le*, only the initial subinterval t of the target phase time t'' is required to precede t' , a contextually salient time. The τ function from Krifka (1989) traces the time of target phase of P , which gives the value for t'' . The event time t''' is only required to be within the reference time.

This is one of Lin's first attempts to formalize the meaning of the Chinese aspect *le*.

Lin (2003) revises his analysis of *le* and expands his formal analysis to *guo*, by accepting and recasting Klein et al.'s proposal into the model-theoretic framework. He proposes "to analyze *le* as an event realization operator and *guo* as an anteriority operator. (Lin, 2003, 259)"

First, he recasts Klein et al.'s (2000) proposal of tense and aspect as follows:

(150) a. Perfective aspect =: $\lambda P_{\langle s, t \rangle} \lambda t_2 \lambda e [\tau(e) \subseteq t_2 \wedge P(e)]$

b. Imperfective Aspect =: $\lambda P_{\langle s, t \rangle} \lambda t_2 \lambda e [t_2 \subseteq \tau(e) \wedge P(e)]$

(151) a. [+present] =: $\lambda P_{\langle i, \langle s, t \rangle \rangle} \lambda t_2 \lambda e [P(t_2)(e) \wedge s^* \subseteq t_2]$

b. [+past] =: $\lambda P_{\langle i, \langle s, t \rangle \rangle} \lambda t_2 \lambda e [P(t_2)(e) \wedge t_2 < s^*]$

So as the formulas show above, crucially a perfective aspect has its situation time $\tau(e)$ contained by t_2 and an imperfective aspect has its situation time containing t_2 . t_2 is the topic time in Klein et al.'s (2000) system. Crucially, the present tense has the topic time containing the speech time s^* and the past tense has the topic time preceding s^* .

Lin (2003) also brings up an important point about the neutral viewpoint aspect. Consider the following example in (152). Both sentences are unmarked for aspect, yet one is interpreted as present, and the other is interpreted as past. Lin claims that it is due to the difference in verb constellation type, that the former sentence has an atelic verbal predicate and the latter sentence has a telic verbal predicate.

- (152) a. wo xiangxin ni
 I believe you
 ‘I believe you.’
- b. ta dapuo yi-ge hua ping
 3SG break one-CL flower vase
 ‘S/he broke a flower vase.’

To account for why aspectually unmarked sentences may receive past or present meaning depending on the verbal constellation type. Lin stipulates the following syntactic rules. Together with Bohnemeyer and Swift’s (2004) idea that “crosslinguistically the default aspectual viewpoint of telic descriptions is perfective, whereas the default aspectual viewpoint of atelic descriptions is imperfective (Lin, 2003, 264)”, he is able to explain that a telic verbal predicate, when unmarked for aspect, receives a default perfective aspect and this perfective AspP syntactically co-occurs with covert past tense, and therefore receives the past tense reading.

- (153) a. Covert present tense must select imperfective AspP as its complement.
 b. Covert past tense must select perfective AspP as its complement.

Lin (2003, 264)

Based on Bohnemeyer and Swift’s (2004) idea, Lin (2003) revises his semantics for *le* as an event realization operator in the following way.

- (154) $\llbracket le \rrbracket =: \lambda P \lambda t_2 \lambda e \exists e' [P(e) \wedge P(e') \wedge e' \leq_E e \wedge \tau(e') \subseteq t_2 \wedge t_2 \leq \tau(e_{pro})]$

Lin (2003, 273)

The variable e_{pro} is a pronoun-like free event variable, it can refer to the speech event, in which case $\tau(e_{pro})$ will yield the speech time, or be co-indexed to other events, such as another event in the subsequent clause in a complex sentence. Lin (2003) introduces e_{pro} in order to model *le*'s usage in a complex sentence, where *le* denotes an anterior event. In this new version of the semantics of *le*, only a subevent e' of e is required to be in the topic time t_2 . Note that the time of e is not guaranteed to proceed the $\tau(e_{pro})$, so *le* can be either perfective or imperfective.

In comparison, in the following semantics of *guo*, the event time $\tau(e)$ precedes $\tau(e_{pro})$, and indeed this semantics does model the discontinuity effect reported in the literature.

$$(155) \quad \llbracket guo \rrbracket =: \lambda P_{\langle s, t \rangle} \lambda t_2 \lambda e [P(e) \wedge \tau(e) \subseteq t_2 \wedge t_2 < \tau(e_{pro})] \quad \text{Lin (2003, 277)}$$

In addition, Lin (2003) provides the semantics of sentence final *le*. He claims that sentential final *le* involves the notion of result state. The definition below is exactly the same with the definition of verbal *le* except that it requires the result state of event e overlap with the speech time.

(156) sentential *le*

$$\llbracket le \rrbracket =: \lambda P \lambda t_2 \exists e' [P(e) \wedge P(e') \leq_E e \wedge \tau(e') \subseteq t_2 \wedge t_2 \subseteq \tau(e_{pro}) \wedge RESULT(e) O s^*] \quad \text{Lin (2003, 281)}$$

Lin (2003) is an improvement and expansion of Lin (2000), because it has succeeded in implementing Klein et al.'s (2000) theory in the model theoretic framework. This study has also investigated further how tense and aspect interact in the syntax/semantics interface in Mandarin Chinese.

4.1.4 Summary of Previous Analyses

From this brief survey of some canonical papers on Chinese aspectual markers, we can see the general consensus is that it is the Mandarin perfective marker *le* that directly gives rise to the non-culminating readings for accomplishments. The semantics of *le* is either analyzed

as only requiring part of the telic predicates to hold in the sentence (Smith, 1997), or a combination of the non-completive property of *le* and the inchoative semantic core of *le* that requires the initial part of the target phase to hold (Klein et al., 2000; Lin, 2000).

At first glance, it seems that analyzing *le* as a special kind of perfective marker is more economical and has more explanatory power. This kind of analysis at least does not rely on doubling the lexicon to account for the inchoative meaning and the non-culminating accomplishments. However, if we look at the broader literature on aspect in other languages, non-culminating accomplishments (Singh, 1998; Koenig and Muansuwan, 2000; Bar-El et al., 2004; Tatevosov and Ivanov, 2009), and inchoative readings in the perfective (Bybee, 1995) are actually not unique to Chinese. And in most these studies, very few have proposed that the semantics of the perfective contributes to these special readings. Therefore, it is quite possible that *le* actually is not all that special, and the non-culminating accomplishments and inchoativity readings can be similarly explained somewhere else in the grammar.

In the following section, I argue against the predominant view of *le* that it can have a quasi-imperfective meaning, and claim that non-culminating accomplishments should be instead attributed to the predicate themselves. I first present arguments from Tham's (2013) paper, then I present my own arguments.

4.2 Arguments Against the Imperfective Uses of *Le*

4.2.1 *Tham (2013)*

Despite the predominant view in the Chinese aspectual literature, Tham (2013) argues that the change-of-state meaning for stative verbs or adjectives is not induced by the perfective marker *le*, but rather that some stative adjectives are inherently ambiguous between a stative meaning and a change-of-state meaning, and that stative verbs do not consistently show a change-of-state meaning.

Tham (2013) first argues that *le* does not induce the change-of-state meaning because stative adjectives can have the change-of-state meaning even without the presence of *le*. Tham (2013) cites Sybesma’s (1997) examples to show that even without *le* some adjectives can have the change-of-state meaning in the modal contexts. As shown in (157a), the stative adjective ‘tall’ can have a change-of-state meaning in a modal environment, even without the presence of *le*. If the perfective marker *le* is indeed what derives that change-of-state meaning of *gao* ‘tall’, then we would not expect to see the change-of-state meaning of *gao* without *le*. Likewise for *pang* ‘fat’ and *hao* ‘good’, as shown in (157b) and (157c), these stative adjectives also have a change-of-state meaning in the modal environment, without the presence of *le*.

- (157) a. ta neng gao
 3SG can tall
 ‘He can become tall’
- b. ta hui pang
 3SG can fat
 ‘He may become fat.’
- c. ta yao hao.
 3SG will good
 ‘He will get better.’

Then, Tham (2013) argues that stative verbs such as *xihuan* ‘like’ and *xiangxin* ‘believe’ do not consistently have the change-of-state meaning even when combining with the perfective marker *le*. If it is indeed *le* that causes the change-of-state meaning of the stative verbs, then the change-of-state meaning should always be present with *le*, regardless of environment or the predicate type. For example, according to Tham (2013), the following example about *xiangxin* ‘believe’ from the PKU corpus can either mean that people started to believe the myth, or that people did believe in the myth even from sometime before the reference time of the sentence. The example does not only have the inceptive reading, but also has a regular stative reading, which is unexplainable if *le* does indeed an inceptive semantics.

- (158) jinrong jianguan dangju he Riben zhengfu guo duo baohu jinrong
 finance oversee authority and Japan government over many protect finance
 jigou, renmen xiangxin-le Riben jigou bu hui daobi de shenhua.
 institution people believe-PERF Japan institution will not collapse [MOD] myth
 ‘The financial oversight authority and the Japanese government overly protect fi-
 nancial institutions, people believed the myth that Japanese institutions will not
 collapse.’ (PKU) slightly re-glossed from Tham (2013, 670)

These two arguments directly contradict the predominant view of *le* as the source of non-culminating readings for accomplishments and inchoative readings for statives. In the next subsection, I provide more evidence against the inchoative meaning of the perfective *le*.

4.2.2 *No Inceptive Reading for Activity Verbs*

Adding to Tham’s (2013) arguments, I argue that if *le* indeed had an inchoative semantics like what is proposed in Klein et al. (2000), then one would expect that all types of predicates can have an inceptive reading when combining with *le*. However, this is not the case, because the inchoative readings claimed for Chinese are only available to certain types of stative verbs in Chinese. There are no inceptive readings for activities or accomplishments in Chinese when they co-occur with *le*.

Perfectivity and inchoativity seem to go hand-in-hand in many languages. It is not uncommon for a verb phrase in the perfective to give rise to an inchoative meaning (Bybee, 1995; Smith, 1997; Rothstein, 2004; Bar-el, 2005), especially when used with a punctual clause or phrase. There are two types of readings: the inchoative meaning for statives and the inceptive reading for activities and accomplishment predicates when these predicates are used in the perfective.

The first inchoative type of readings arise when the stative predicates appear in the perfective. This first type does not require the presence of any punctual temporal adverbial. According to Bybee (1995), in many languages, stative predicates have the change-of-state meaning in the perfective. It is attested in a wide range of unrelated languages, such as

Spanish, Mandarin, and some African and Oceanic languages. For example, the following two examples from Trukese, an Oceanic language cited in Bybee (1995), are parallel to what we have observed in Mandarin. Therefore, the inchoative uses of the Chinese perfective *le* is by no means an isolate phenomenon. Beyond Chinese linguistics, the inchoative uses of the stative predicates in the perfective have been mostly analyzed in two ways: inchoative states and coercion. Neither of these two analyses attribute the inchoativity to the semantics of the perfective marker.

(159) Inchoative

aa semmwēn atewe
3S-PERF sick fellow

‘That fellow has become sick.’

Goodenough and Sugita (1990, xlix)

(160) Perfective

ja a tēēti nee qqyn
3S PERF descend to ground

‘She descended to the ground.’

Dyen (1965, 27)

The second type is when the punctual clause induces inceptive readings for activities and accomplishments. For example, in (161), with a punctual clause ‘when she saw the wolf’, the meaning of the perfective ‘ran’ is interpreted as the rabbit ‘started to run’ upon seeing the wolf. Likewise in (162), with a punctual adverbial ‘at three o’clock’, the perfective ‘ran’ has an inchoative meaning as well.

(161) The rabbit ran when she saw the wolf.

(162) The rabbit ran at three o’clock yesterday.

Let’s take a moment to think what would really happen if *le* indeed has a so-called ‘inchoative’ meaning. It is probably more likely that *le* would render inceptive readings for all the predicate types across the board. However, the perfective marker *le* in Mandarin does not render inceptive readings with activity verbal predicates, despite the predominant belief

that the core meaning of *le* is inchoativity, which unites the post-verbal *le* and sentential *le* into one single aspectual marker. As the following examples show, for most predicates regardless of its type, the reading of the verb with a perfective particle *le* has either a terminal reading or punctual reading, never an inceptive reading.

- (163) zuotian xiawu san-dian, Xiaoming dao-le Beijing
 yesterday afternoon three-o'clock, Xiaoming reach-PERF Beijing.
 'Yesterday afternoon at three-o'clock, Xiaoming reached Beijing.'

achievement

He reached Beijing at three o'clock yesterday.

- (164) zuotian xiawu san-dian, Xiaoming xiu-le che
 yesterday afternoon three-o'clock, Xiaoming fixed-PERF car
 'Yesterday afternoon at three-o'clock, Xiaoming fixed (or tried to fix) the car'

fix-type activity

Either he finished fixing the car at three or tried to fix it at around three. Not that he started fixing the car at three.

- (165) zuotian xiawu san-dian, Xiaoming xiu-hao-le che
 yesterday afternoon three-o'clock, Xiaoming fixed-good-PERF car
 'Yesterday afternoon at three-o'clock, Xiaoming fixed the car'

fix-good-type accomplishment/achievement

He finished fixing the car at three o'clock.

- (166) zuotian xiawu san-dian, Xiaoming chi-le san-wan fan.
 yesterday afternoon three-o'clock, Xiaoming eat-PERF three-bowl rice.
 'Yesterday afternoon at three-o'clock, Xiaoming ate (part of each of the) three bowls of rice.'

accomplishment

Xiaoming finished eating three bowls of rice at three o'clock. Not that he started to eat at three.

The only place where we see the similar inchoative types of reading for the perfective *le* is restricted to the stative predicates. And among the stative predicates, it seems that only the stage-level statives can be felicitous with a punctual phrase. For example, in (168), a stage-

level stative *gaoxing* ‘happy’ with the perfective particle produces a change-of-state meaning ‘became happy’ and it is felicitous with the punctual adverbial phrase. In contrast, in (169), an individual-level stative *gao* ‘tall’ with the particle *le* is infelicitous with the punctual adverbial phrase, although the combination can also have a change-of-state meaning in other environments. The pattern is rather restricted, and quite unlike what has been reported for the more productive inchoative uses of the perfective in other languages.

(167) # *zuotian xiawu san-dian, Xiaoming yang-le yi-tiao yu.*
 yesterday afternoon three-o’clock, Xiaoming feed-PERF one-CL fish
 Intended ‘Yesterday afternoon at three-o’clock, Xiaoming (started to keep) kept a fish.’
 stage-level(?) stative

(168) *zuotian xiawu san-dian, Xiaoming gaoxing-le.*
 yesterday afternoon three-o’clock, Xiaoming happy-PERF
 ‘Yesterday afternoon at three-o’clock, Xiaoming became happy.’
 stage-level stative

(169) # *zuotian xiawu san-dian, Xiaoming gao-le.*
 yesterday afternoon three-o’clock, Xiaoming tall-PERF.
 ‘Yesterday afternoon at three-o’clock, Xiaoming became tall.’
 individual-level stative

4.2.3 *No Non-Culminating Reading for Every Accomplishment*

Next, I argue that a non-completive semantics of *le* is also not tenable. As proposed by Smith (1994) and Klein et al. (2000), the non-completive semantics of *le* only requires part of the eventuality to hold in the topic time. If *le* has such a meaning that only requires the eventuality to stop at an arbitrary endpoint, then we would expect that for every accomplishment predicate, it is possible to have a non-culminating reading regardless of its specific meaning, because *le* would be the only source of non-culmination, and the actual semantics of the predicate should not be relevant. However, contrary to this expectation, there are actually accomplishment predicates that do not have possible non-culminating readings. Since the semantics of the accomplishment predicate does influence whether the non-culminating

reading is possible, it is evident that the non-culminating reading comes from the predicates themselves, rather than from the perfective marker *le*.

For example, just like in the Hindi data reported in Singh (1991, 1998), derived accomplishment predicates formed by a consumption verb and an abstract measure phrase always have a culminating reading in Mandarin (cf. Soh and Kuo, 2005). For example, in (170), *he-le san-sheng shi* ‘drank three liters of water’ does not have the reading that the person started drinking some three-liter amount of water but stopped arbitrarily before finishing the whole three liters. Likewise, in (171), *chi-le san-bang yintao* ‘ate three pounds of cherries’ does not have a non-completive reading either. Otherwise, both (170) and (171) should be felicitous.

(170) # ta he-le san-sheng shui, mei he wan.
3SG drink-PERF three-liter water, not drink finish
Intended ‘He drank three liters of water, but did not finish’

(171) # ta chi-le san-bang yingtao, mei chi wan.
3SG eat-PERF three-pound cherry, not eat finish.
Intended ‘He ate three pounds of cherries, but did not finish’

If indeed, *le* had a non-completive semantics that only requires part of the accomplishment to have taken place, then we would expect to see non-culminating readings for these accomplishment predicates too. Precisely because not all accomplishment predicates have the non-culminating readings, we know that the perfective marker *le* itself does not give rise to the non-culminating readings and the source of non-culmination should be located at the level of verbal predicates instead.

Another type of accomplishment predicates that systematically lacks the potential non-culminating reading is the resultative verbal compound construction of the form ‘V + Resultative Adjective/Verb’ in Mandarin. Accomplishment predicates such as *zhu-shu* ‘fully cook’, literally ‘cook-done’, and *xi-ganjing* ‘wash-clean’ cannot mean something like the agent has the intention of fulfilling the accomplishment, but stops at an arbitrary point, i.e. the food is half cooked or the clothes are washed not completely clean. If indeed, the analysis of *le* along

the lines of Smith (1994) and Klein et al. (2000) is true, then the non-culminating readings for these accomplishment predicates should also be possible. The semantics or the syntax of the resultative verbal compound construction in Mandarin should not provide another exception to the analysis.

(172) mama zhu-shu-le ji-tui.
mom cook-well.done-PERF chicken-leg.
'Mom cooked the chicken legs fully.'

(173) baba xi-ganjing-le yifu.
dad wash-clean-PERF clothes.
'Dad washed the clothes clean'

4.2.4 *Summary of the Arguments*

In this section, I have argued against the predominant view in Chinese aspect literature that the non-culminating accomplishments are caused by the special semantics the perfective *le*. Following Tham (2013), I claim that the so-called imperfective uses of the perfective *le* are actually derived from the meanings of the stative verbs in Mandarin. In addition to Tham's (2013) arguments, I have provided two pieces of evidence to further support my claim: activity predicates in the perfective do not have inceptive reading when used with the punctual clauses or punctual adverbials, unlike what is claimed for other languages that have perfectives with inchoative uses, and that not all accomplishments have a potential non-culminating reading.

If this is the right picture, then the semantics of *le* should be quite standard, close to that of a perfective marker in English minus the tense part. To really account for the so-called 'imperfective' uses of *le*, we need to explain what is happening exactly with the semantics of the statives in Mandarin. In the following sections, I first give the semantics of *le* that I adopt for the rest of the dissertation, and then I sketch a tentative analysis of some stative verbs in Mandarin that explains the so-called imperfective uses of *le*. Finally before concluding, I discuss what the Mandarin perfective means for the broader picture of perfective typology.

4.3 Semantics of the Perfective *le*

The conclusion to draw from the data considered so far in this chapter is that the semantics of the verbal *le* is just a standard perfective marker, despite the so-called imperfective uses. I have shown in the previous sections, that the inchoative uses and non-culminating accomplishments are best described as the properties of the predicates themselves in Mandarin, rather than semantics of *le*. So actually, *le* has the semantics for a standard perfective marker, very much like the English simple past tense *-ed* minus the tense part. Following Lin (2000, 2003, 2005), I formulate the semantics of *le* as follows:

$$(174) \quad le: \lambda P_{\langle s,t \rangle} \lambda t_{TOP} \lambda t' \lambda e [P(e) \wedge \tau(e) < t' \wedge t' \subset t_{TOP} \wedge \tau(e) \subset t_{TOP}]$$

So basically this semantics says that *le* takes in a event description type of argument first and then situates it before some contextually salient point t' , which is contained within the topic time. Both the run time of the eventuality $\tau(e)$ and the contextually salient time t' are contained within the topic time. This version of the semantics of *le* is basically the same as the general semantics of *le* given by Lin (2000).

This semantics of *le* is standard in the sense that it does not have the same non-completive or partial-realization type of semantics, nor does it have the inchoative kind of meaning that requires the pre-time of the predicate to be true. The run time of the predicate is completely contained within the topic time.

4.4 The Semantics of the Stative Verbs in Mandarin

In Tham (2013), the stative adjectives in Mandarin are argued to be able to zero-derive into change-of-state verbs. Yet it is left open as to why some stative verbs have an occasional change-of-state meaning and others do not. Especially, why locational verbs such as *zuo* ‘sit’ and *zhan* ‘stand’, and predicates such as *yang yi-tiao yu* ‘keep a fish’ and *zu-fangzi* ‘rent a house’ can have seemingly imperfective meaning with the perfective *le*, that the situation still holds at present. Although some of these stative verbs are clearly not change-of-state verbs,

they somehow acquire the change-of-state meaning some of the times. Following Marín and McNally (2005), I sketch a tentative analysis of some of these verbs below. I claim that the semantics of these stative verbs are inchoative statives just like the Spanish reflexive psychological verbs (cf. Marín and McNally, 2005), which are not change-of-state verbs and are rather classified as stative verbs with an inchoative meaning.

In Marín and McNally’s (2005) study on Spanish reflexive psychological verbs (SRPV) such as ‘get angry’ and ‘get bored’, the SRPVs describe the onset of the state without referring to the change-of-state happening. The change-of-state reading is only pragmatically deduced, because of the boundary happening in the semantics of the inchoative stative. Crucially, they propose that that inchoativity and telicity are separate from each other. The SRPV verbs are inchoative yet atelic. They argue that there are two sub-classes of SRPV: the first *aburrirse* class includes reference to the state and is non-punctual as in (175a), and the latter *enfadarse* class does not make reference to the associated state and is punctual as in (175b).

- (175) a. Marta se ha aburrido
 Marta SE has bored
 ‘Marta has gotten bored.’
- b. Josep se ha enfadado.
 Josep SE has angered.
 ‘Josep has gotten angry.’ (Marín and McNally, 2005, 469)

These two classes are both atelic because they are not compatible with the *in*-phrase, but compatible with the *for*-phrase in Spanish. Like the rest of the atelic predicates, as shown in (176), SRPVs cannot be modified by *en* ‘in’ adverbials, but can be instead modified by *durante* ‘during’ adverbials.

- (176) a. Se aburrió/divirtió durante/*en toda la tarde.
 SE [bored/amused] during/in all the afternoon
 ‘He was bored/amused (continuously) the whole afternoon.’

- b. Se asustó/ enfadó durante/*en toda la tarde.
 SE frightened/angered during/ in all the afternoon.
 ‘She got frightened/angry (repeatedly) the whole afternoon.’

Marín and McNally (2005, 476)

However, these two classes differ from each other in a few ways. For example, they differ in whether the reading is the stative reading or the about-to-happen reading, when combining with the progressive in Spanish. While the non-punctual *aburrirse* class has the stative reading as shown in (177), and the punctual *enfadarse* class as shown in (178) have the about-to-happen reading.

- (177) Juan se está aburriendo.
 Juan SE is boring.
 ‘Juan is (already) bored.’

Marín and McNally (2005, 475)

- (178) El perro se está asustando.
 the dog SE is frightening
 ‘The dog is getting (but is not yet) frightened.’

Marín and McNally (2005, 475)

Marín and McNally (2005) account for the fact that these predicates in Spanish are atelic but have a seemingly change-of-state meaning by proposing that these predicates denote the initial state of the states. By means of inference, the initial interval of state also implicates the change-of-state happening, yet this is not part of the meaning of the predicate.

They implement their analysis by adopting Piñón’s (1997) framework, which distinguishes between boundary happenings and happenings. In Piñón’s analysis, boundary happenings such as the beginning and the ending of a happening are truly instantaneous happenings that do not have duration; whereas happenings take up time. The formalisms are as follows: The beginning function **Beg** and the ending function **End** describe respectively the left boundary and the right boundary of a happening.

- (179) **Beg** := $\lambda e \lambda e' \lambda P [\mathbf{Boundary-Happening}(e) \wedge \mathbf{Eventuality}(e') \wedge \mathbf{Left-Boundary}(e, e') \wedge P(e') \wedge \neg \exists e'' [e'' \ll e' \wedge e' \wedge P(e'' \oplus e')]]$

Marín and McNally (2005, 491)

$$(180) \quad \mathbf{End} := \lambda e \lambda e' \lambda P [\mathbf{Boundary-Happening}(e) \wedge \mathbf{Eventuality}(e') \wedge \mathbf{Right-Boundary}(e, e') \wedge P(e') \wedge \neg \exists e'' [e' << e'' \wedge P(e' \oplus e'')]]$$

Marín and McNally (2005, 491)

And telic endings can be defined as a subtype of ending

$$(181) \quad \mathbf{TelicEnd} := \lambda e \lambda e' \lambda P [\mathbf{Boundary-Happening}(e) \wedge \mathbf{Eventuality}(e') \wedge \mathbf{Right-Boundary}(e, e') \wedge P(e') \wedge \neg \diamond \exists e'' [e' << e'' \wedge P(e' \oplus e'')]]$$

Marín and McNally (2005, 492)

Marín and McNally (2005) analyze the SRPV verbs as follows: the *enfadarse* verbs describe the beginning of its corresponding psychological state, whereas the *aburrirse* verbs include both the beginning and the psychological state that follows. Although the *aburrirse* class appears to describe compound eventualities, the class still counts as just a state, because according to Piñón's (1997) ontology, the right boundary (the beginning) plus the happening proper (the psychological state) counts as a happening, not as a complex eventuality.

$$(182) \quad \text{enfadarse: } \lambda x \lambda e \exists e' [\mathbf{Beg}(e, e', \lambda e'' [\mathbf{angry}(e'', x)])]$$

$$(183) \quad \text{aburrirse: } \lambda x \lambda e \exists e', e'' [\mathbf{Beg}(e, e'', \lambda e''' [\mathbf{bored}(e''', x)])] \wedge e = (e' \oplus e'')$$

4.4.1 Analyzing Stative Verbs in Mandarin

Following Marín and McNally (2005), I propose that the stative verbs in Chinese that have both a so-called change-of-state meaning and a stative meaning on the surface actually have the semantics of the inchoative states just like the Spanish SRPV verbs, the *aburrirse* class. Because the inchoative states contain the left boundary, the beginning of the state, the change-of-state meaning is deduced through pragmatics. These inchoative stative verbs can be shown through the tests below to be different from a regular change-of-state verb, because inchoative stative verbs are atelic unlike the telic change-of-state verbs. In addition, as another piece of important evidence that the change-of-state meaning is not caused by

the semantics of the perfective marker, it is worthy to note that not all stative verbs can be “coerced” to have a change-of-state meaning.

4.4.2 Tests

In this subsection, I adopt four of the tests from Marín and McNally that can be easily transferred to Chinese. In the following tests, I will show that the inchoative stative verbs are atelic and do have an inchoative reading in the right contexts.

In the first test, the classic *in/for*-phrase test, the stative verbs in Chinese can be shown to be atelic: locational verbs such as *zuo* ‘sit’ and *zhan* ‘stand’, and stative verbs such as *yang yi-tiao yu* ‘keep a fish’ and *zu fangzi* ‘rent a house’ in Mandarin are atelic, as shown in the examples below, they are compatible with *for*-phrase equivalent adverbials in Mandarin, but not with *in*-phrase equivalent adverbials. Despite that sometimes these verbs have been analyzed as having the change-of-state meaning as an alternative to the stative meaning, these verbs are not telic.

- (184) a. ta zuo le san-ge xiaoshi.
 3SG sit PERF three-CL hour
 ‘S/He sat (has sit) for three hours.’
- b. # ta san-miao nei zuo-le.
 3SG three-second in sit-PERF
 Intended ‘S/He sat down in three seconds.’
- (185) a. ta yang le san-nian yu.
 3SG foster PERF three-year fish
 ‘S/He has kept a fish for three years’
- b. # ta san-nian-nei yang le yu.
 3SG three-year-in keep PERF fish
 Intended ‘S/He started to keep a fish in three years.’
- (186) a. ta gaoping le san-xiaoshi.
 3SG happy PERF three-hour
 ‘S/He is happy for three hours.’

- b. # ta san-xiaoshi nei gaoxing le.
 3SG three-hour in happy PERF
 Intended ‘S/He got happy in three hours.’
- (187) a. ta wuliao le san-xiaoshi.
 3SG be.bored PERF three-hour
 ‘He was bored for three hours’
- b. # ta san-xiaoshi nei wuliao le.
 3SG three-hour in be.bored PERF
 ‘He got bored in three hours.’

Compare the patterns of the stative verbs above with the following example with a change-of-state verb *yanjuan* ‘get tired/fed up’. This change-of-state verb is telic, because it is compatible with the *san-xiaoshi nei* ‘in three hours’, but not with the Chinese equivalent of *for three hours*. This means that the stative verbs above that occasionally have the so-called change-of-state meaning are fundamentally different from regular change-of-state verbs, because these two types of predicates are different in their telicity.

- (188) a. # ta yanjuan le san-xiaoshi.
 3SG get.tired PERF three-hour.
 Intended ‘He got tired for three hours.’
- b. ta san-xiaoshi nei yanjuan le.
 3SG three-hour in get.tired perf.
 ‘He got tired in three hours’

The second test with *tingzhi* ‘stop’ can test for dynamicity. If a predicate is non-dynamic, it is compatible with *buzai* ‘no longer’ but not *tingzhi* ‘stop’. The data show that except for *yang-yu* ‘foster fish’, psychological states and locational verbs are non-dynamic.

- (189) a. # ta tingzhi gaoxing.
 3SG stop happy
 Intended ‘S/He stopped being happy’
- b. ta buzai gaoxing.
 3SG no.longer happy
 ‘S/He is no longer happy.’

- (190) a. # ta tingzhi zuo.
 3SG stop sit
 Intended ‘S/He stopped sitting.’
- b. ? ta buzai zuo.
 3SG no.longer sit
 ‘S/He is no longer sitting.’
- (191) a. ta tingzhi yang-yu.
 3SG stop foster-fish.
 ‘S/He stopped keeping fish as pets’
- b. ta buzai yang-yu.
 3SG no.longer foster-fish
 ‘S/He no longer keeps fish as pets’
- (192) a. # ta tingzhi wuliao le.
 3SG stop be.bored PERF
 Intended ‘S/He stopped being bored.’
- b. ta buzai wuliao le.
 3SG no.longer get.bored PERF
 Intended ‘S/He is no longer bored.’

Again, unlike the stative verbs, a regular change-of-state verb like *yanjuan* ‘get bored/fed up’ is not compatible with either *tingzhi* ‘stop’ or *buzai* ‘no longer’. This is not surprising because change-of-state verbs are achievements rather than stative predicates.

- (193) a. # ta tingzhi yanjuan le.
 3SG stop get.tired PERF
 Intended ‘S/He stopped being tired.’
- b. # ta buzai yanjuan le.
 3SG no.longer get.tired PERF
 Intended ‘S/He is no longer tired.’

The punctual temporal clause test can test for inchoativity, i.e. the left boundary of the predicate. If the predicate has a left boundary, then it will have an inchoative interpretation with a punctual temporal clause. The psychological verbs, such as *gaoxing* ‘happy’ and *wuliao* ‘bored’, and *keep fish as pets* ‘yang-yu’ both have an inchoative meaning, but the

bare locational verb *zuo* ‘sit’ and the change-of-state verb *yanjuan* ‘get tired’ are quite awkward with the inchoative reading. While in all the good sentences, the meaning is that whenever something happens, the person begins to do something or begins to feel a certain emotion as a result; in the bad sentences, the inchoative reading seems to be absent.

- (194) meidang kaoshi, ta dou gaoxing
 whenever test, 3SG EXHAUST happy.
 ‘Whenever there is a test, s/he is happy.’
- (195) meidang kaoshi, ta dou yang-yu
 whenever test, 3SG EXHAUST foster-fish.
 ‘Whenever there is a test, s/he always starts keeping fish as pet.’
- (196) ? meidang kaoshi, ta dou zuo
 whenever test, 3SG EXHAUST sit
 ‘Whenever there is a test, s/he always sits’
- (197) ? meidang kaoshi, ta dou yanjuan.
 whenever test, 3SG EXHAUST get.tired
 ‘Whenever there is a test, s/he always gets tired’
- (198) meidang kaoshi, ta dou wuliao.
 whenever test, 3SG EXHAUST get.bored
 ‘Whenever there is a test, s/he always gets bored’

Interestingly, in Mandarin, psychological verbs seem to be not split into the punctual/non-punctual classes like the Spanish SRPVs. For example, in Marín and McNally (2005), one way that they distinguish between punctual versus non-punctual SRPVs is through their interpretation in the simple present tense: whereas the punctual class does not have the non-habitual reading, the non-punctual class has the non-habitual reading. In Mandarin, actually the translational equivalents to both classes of psychological verbs behave the same in allowing the non-habitual reading in their bare forms, the closest tense-aspect form to the simple present in Spanish. This piece of evidence according to Marín and McNally (2005) shows that the predicate is associated with some sort of state. So both classes behave like the non-punctual *aburrirse* class in Mandarin.

- (199) ta hen gaoxing
 3SG very happy
 ‘He is very happy (now)’
- (200) ta hen wuliao
 3SG very bored
 ‘He is very bored (now)’

From these tests above, we can see that the Mandarin stative verbs are different from the change-of-state verbs, and can be further divided into two types: pure stative verbs and inchoative stative verbs. The first type such as *sit* and *stand* are simply stative verbs without the left boundary or the right boundary. The second type with the inchoative meaning can be divided into two subtypes: the psychological verbs which are not dynamic, and the dynamic extended state such as *keep fish as pet* ‘yang-yu’. Unlike Spanish SRPVs, according to the tests in Chinese, inchoative psychological statives are not distinguished by punctuality or non-punctuality in Mandarin. All the Mandarin inchoative stative verbs are atelic and non-punctual. The change-of-state meaning can be derived from the pragmatics reasoning because these inchoative states describe the initial state of the state.

From these tests, it is confirmed again that the Chinese stative verbs can have inchoative readings, neither because they are change-of-state verbs themselves, nor because they are caused by the inchoative semantics of the perfective marker *le*.

4.4.3 Analysis

I analyze psychological stative verbs in Mandarin as inchoative statives, and verbs such as *yang-yu* as inchoative activities because of their dynamicity, and I propose that verbs such as *zuo* ‘sit’ without the directional adverb as a pure stative predicate.

- (201) *zuo*: $\lambda x \lambda s [\mathbf{sit}(s, x)]$

In my analysis, I distinguish two types of event variables, dynamic event *e* and stative state *s*. Following Marín and McNally (2005), I propose the following representations for the semantics of *gaoxing* ‘happy’ and *yangyu* ‘foster a fish’:

(202) *gaoxing*: $\lambda x \lambda e \exists e', e'' [\mathbf{Beg}(e, e'', \lambda s [\mathbf{happy}(s, x)]) \wedge e = (e'' \oplus e')]$

(203) *yangyu*: $\lambda x \lambda e \exists e', e'' [\mathbf{Beg}(e, e'', \lambda e''' [\mathbf{keep-fish-as-pets}(e''', x)]) \wedge e = (e'' \oplus e')]$

So based on these semantics, we can explain that all these predicates are atelic, because they are associated with an activity or a state, and that the inchoative states and activities can have an inchoative reading in the right contexts, whereas the pure statives such as *zuo* can never have an inchoative reading because of the lack of the left boundary happening, which is responsible for the inchoative reading.

I have shown so far that the seemingly ‘imperfective’ use of the perfective marker *le* is not caused by *le* itself, by showing that the ‘imperfective’ use stems from the semantics of the particular verbal predicates themselves. The perfective marker *le* has just a standard perfective meaning.

4.5 The Typology of the Perfective

From this in-depth study of the semantics of the perfective marker in Mandarin, we see that the perfective marker *le* still has a standard perfective meaning, although sometimes accomplishments seem not to culminate in the perfective in Mandarin and that statives have change-of-state uses in the perfective. This finding answers one of the big questions I set out in the Chapter 2: can the source of non-culminating accomplishments actually come from the semantics of the perfective marker? And the answer for Mandarin is no. This leads us to a more general question, can the semantics of the perfective actually cause the non-culminating accomplishments in some other language? And if so, what would it possibly look like?

Let’s first have a look at typology of the perfective from Bar-el’s (2005) dissertation. Bar-el (2005) classifies the perfective systems by the termination and culmination entailment patterns for activities and accomplishments when co-occurring in the perfective. Borrowing the notion of semi-perfective and neutral perfective from Singh (1998) and Koenig and

Muansuwan (2000), she classifies the perfective systems as follows: according to the chart, the standard perfective, such as in English, gives rise to culmination and termination entailments in the accomplishments; the completive perfective requires the activities to have terminated in addition; the semi-perfective has no culmination entailment, but a termination entailment for accomplishments; the neutral perfective does not have culmination entailment with some exceptions. There are not enough data to know whether activities have termination entailment for semi-perfective and neutral perfective, and not enough data to know whether termination entailments exist for neutral perfective.

Table 4.1: The “Perfective” Cross-Linguistically

Type of Perfective	Activities	Accomplishments	
	Termination entailment	Culmination entailment	Termination entailment
Standard Perfective (<i>e.g. English</i>)	x	✓	✓
Completive Perfective (<i>e.g. Dëne Sũliné</i>)	✓ (completion)	✓	✓
Semi-perfective (<i>e.g. Thai</i>)	-	x	✓
Neutral Perfective (<i>e.g. Hindi</i>)	-	x (with some exception)	-

- = data is not available from source

Bar-el (2005)

While Bar-el (2005) seems to be on the right track to classify the perfective systems according to the termination and culmination entailment patterns across different predicate types, the results reported actually need to be interpreted with some caution. As it stands now, Bar-el’s actual classification has several problems. For one thing, she distinguishes between the semi-perfective and the neutral perfective in her typology, but in the original papers these two terms do not strictly describe the meaning of perfective markers themselves, but rather are used to describe the interactions between the perfective marker and the accomplishment predicates in their respective languages because from Singh’s (1998) and Koenig and Muansuwan’s (2000) papers, it is evident that the non-culminating readings are

not analyzed as being derived from the semantics of the perfective marker itself. For another, from our discussion of the semantics of *le*, we see clearly that even if a language have non-culminating accomplishments and inchoative uses with the perfective, the perfective marker may still just have a standard semantics very similar to that in English.

For the dissertation, what really interests us is whether a language can have a perfective marker with a somewhat incomplete semantics as claimed in Smith (1994) and Klein et al. (2000). If so, for those languages with this type of perfective marker, the non-culminating accomplishments phenomena may be attributed to the perfective marker itself instead. In such a language, it can be predicated that all predicate types can have a non-culminating reading when possible, because a non-completive perfective marker only specifies that part of the eventuality described by the predicate is realized, but does not say anything about the rest of the eventuality. This means that observably all the accomplishments predicates would have non-culminating readings regardless of their meaning, and all the activities would always be able to have non-terminated readings as well. As for statives and achievements, the difference is potentially much less obvious. The statives do not need to have been terminated by the speech time, and achievements may have culminated anyways because they are instantaneous. Hypothetically, however, if the achievement predicates are understood not as instantaneous by default, they too may have a non-culminating reading.

The revised typology probably would look like the following:

Table 4.2: The “Perfective” Cross-Linguistically Revised

Type of Perfective	Activities	Accomplishments	
	Termination entailment	Culmination entailment	Termination entailment
Standard Perfective	x	✓	✓
Completive Perfective	✓ (completion)	✓	✓
Incomplete-perfective (Hypothetical)	x	x	x

4.6 Conclusion

In this chapter, I have discussed the semantics of the perfective marker *le* in Mandarin and shown that *le* has a standard perfective semantics, just like its English counterpart minus its tense part. Although some influential studies on Chinese aspectual markers have claimed that *le* is responsible for the non-culminating readings and the inchoative readings, I have shown that actually those readings are more likely to be derived from the predicates themselves. I have also tentatively discussed the meaning of the inchoative statives in Chinese, and explored what an incomplete perfective may look like.

Therefore, for the dissertation in general, the fact that *le* has a standard perfective meaning means that the non-culminating readings in Mandarin indeed come from the level of the verbal predicate. Yet, whether it is from the level of the verb itself or the internal argument remains another issue that we explore in the following chapters.

CHAPTER 5

THE SEMANTICS OF ‘BREAK’ AND ‘FIX’ IN MANDARIN

In this chapter, I discuss the semantics of the Mandarin translational equivalents to the Dowty-style English inherent accomplishments, such as *break* and *fix*. As discussed in Chapter 1, according to Dowty (1979), an accomplishment predicate consists of an activity part and a change-of-state part, where the result state is directly encoded as part of the semantics of the verb. As shown in (204), a standard Dowty-style way to represent the semantic structure of the transitive and the intransitive version of these accomplishment verbs is to analyze the transitive accomplishment as a causation event where the agent causes the theme to undergo a change of state, and the intransitive as the theme’s change of state. In this chapter, I focus on the Mandarin translational equivalents to these English inherent accomplishments, whose change of state is instantaneous rather than gradual. These transitive accomplishment verbs are called MMFP (mapping to minimal final part) verbs by Tatevosov and Ivanov (2009) because the change-of-state subevent of the direct object takes place at the very end of event according to the authors, instead of changing gradually.

- (204) a. transitive (lexical causative): [x CAUSE [y BECOME state]]
b. intransitive (inchoative): [y BECOME state] Tsujimura (2003)

In Chapter 3, through the diagnostics for verb classes, we establish that some of the bare transitive verbs such as *sha* ‘kill’ and *xiu* ‘fix’ behave like activities in Mandarin, because they are atelic (Tai, 1984), whereas the corresponding resultative verbal compounds such as *sha-si* ‘kill-dead’ and *xiu-hao* ‘fix-good’ are accomplishments. Why would ‘kill’ and ‘fix’ behave like activities in Mandarin? Especially, why do we observe this cross-linguistic difference between English and Chinese?

Actually, Chinese is just one of many languages, such as Burmese, Thai and Japanese, where some accomplishment predicates behave like activities (Koenig and Muansuwan, 2000; Tsujimura, 2003; Kato, 2014). For example, in Koenig and Muansuwan (2000), Thai accom-

plishments predicates are analyzed to be also like activities. The central claim is that the accomplishment stem's activity-like semantics derives from the corresponding accomplishment, by canceling the end result through a semantic operator. However, this proposal seems to be not the optimal solution, based on the Monotonicity Hypothesis that morphologically complex forms have more complex semantics that are built on the semantics of the morphologically simpler forms (Koontz-Garboden, 2007, 2008, 2009, 2011). In that sense, Koenig and Muansuwan's (2000) proposal is somewhat against this Monotonicity Hypothesis, because the bare form of the verb has a more complex semantics than the derived form.

Another major question is what the relationship is between the morphological derivations of transitive change-of-state, intransitive change-of-state, and the resultative construction, and how these specific morphological derivations influence the semantics of the verbal predicates in a language. For Mandarin, a general pattern for these non-culminating accomplishments emerges that usually the transitive sentences can have a non-culminating reading, whereas the intransitive sentences cannot, and that a resultative compound verb with the resultative adjective/adverb does not allow a non-culminating reading.

I propose that the bare verb equivalents of the MMFP verbs are manner verbs in Mandarin that describe the agent's activity without any information regarding the theme's change (cf. Hovav and Levin, 2010). Because the equivalents of the English *fix* and *kill* in Mandarin are manner verbs rather than result verbs, naturally they can describe events in which the theme fails to enter into the result state. Unlike English which lexicalizes both manner verbs and result verbs in the transitive, Mandarin seems to preponderantly lexicalize manner verbs in the transitive and result verbs in the intransitive. Therefore, to express the same meaning as an English accomplishment eventuality, this class of Mandarin verbs need to have a resultative adjective or verb attached to the end of the manner verb to form a resultative verbal compound. The resultative adjective or verb compositionally adds the change of state of the direct object onto the activity expressed by the bare transitive. In other words, unlike in English, Mandarin does not have bare accomplishment verbs and all the accomplishment

predicates in Mandarin are compositionally derived.

This chapter is organized as follows: In §5.1, I present the background and the data on Mandarin inherent accomplishment verbal predicates (which I call MMFP verbs using Tatevosov and Ivanov’s terminology) and show that bare transitive verbs are manner verbs and bare intransitive verbs are change-of-state result verbs. In §5.2, I present some motivations for analyzing bare transitive verbs as manner verbs based on the discussion of transitivity, affectedness and manner/result complementarity in previous studies. Then, in §5.3, I present my own analysis and compare my analysis to some previous studies in §5.4. Finally, in §5.5, I suggest a tentative pragmatic analysis for the default culminating reading and conclude this chapter in §5.6.

5.1 Background and Data

In English, accomplishment predicates can be roughly categorized into three categories: Dowty-style inherent accomplishments, degree achievements, and Krifka-style derived accomplishments. The inherent accomplishments are telic by virtue of the meaning the verb stem, such as *break* and *kill*, whose meaning seems to be inherently associated with the some result state of the direct object (cf. Dowty, 1979). These verbs contrast with the derived accomplishments such as ‘eat three apples’, which are telic by virtue of the homomorphism between the event and the parts of a bounded direct object noun phrase (cf. Krifka, 1989). In this chapter, we are concerned the translational equivalents to the inherent accomplishments in Mandarin.

More precisely speaking, in Tatevosov and Ivanov (2009), these inherent accomplishments are called the MMFP accomplishments (mapping to minimal final part), because the change-of-state subevent seems to happen instantaneously at the very end of the accomplishment event, which contrasts with the derived accomplishments (called INCR accomplishments by the authors), whose direct objects change simultaneously and gradually with the unfolding of the accomplishment event. In the rest of the chapter, I call these equivalents to the

inherent accomplishments MMFP verbs so as to distinguish them from the gradual-change accomplishment predicates.

In this section, I show that bare transitive MMFP verbs do not entail culmination, whereas ‘V + Resultative Adjective/Verb’ transitive RVC verbs and the intransitive MMFP verbs do. In the first two subsections, I discuss the morphology of bare and compound transitive MMFP verbs, and their associated culminating or non-culminating reading patterns. In the second two subsections, I discuss the morphological relations of transitive and intransitive MMFP verbs in Mandarin and their culminating or non-culminating reading patterns.

5.1.1 Morphology of Bare and Resultative Compound Transitive Verbs

In modern Chinese verbal morphology, most bare verbs are monosyllabic or bisyllabic. The bisyllabic bare verbs consist of two characters, some of them are of the form ‘Manner+V’ such as 刺杀 *cisha* ‘assassinate’, literally ‘stab-kill’, and others consist of characters that are near synonyms to each other, such as 修理 *xiuli* ‘fix’, literally ‘fix and order’. As shown in (205), some of the counterparts to the English MMFP verbs such as ‘cut’ and ‘kill’ in Mandarin are primarily translated as bare verbs as in (205). As illustrated in (205a), some of these MMFP verbs in Mandarin specify the manner in the lexical semantics, as the ‘cut’ verbs in Mandarin specify the tool used in the lexical semantics of the verb. In (205b), the manner can also be specified by a morpheme in front, as shown in *ci-sha* literally ‘stab-kill’ and *du-sha* ‘poison-kill’.

- (205) a. Cut in Mandarin: 切 *qie*, ‘cut (with a knife)’ 剪 *jian* ‘cut with a scissor’, 锯 *ju* ‘cut with a saw’, ...
- b. Kill in Mandarin: 杀 *sha* ‘kill’, 刺杀 *cisha* ‘assassinate’ literally ‘stab-kill’, 毒杀 *dusha* ‘kill by poisoning’ literally ‘poison-kill’ ...

Although one may argue that these bisyllabic verbs are verbal compounds (cf. Li and Thompson, 1989), I consider these bisyllabic verbs as bare verbs, because these derivations are either highly fossilized or semi-productive, and I distinguish them from the resultative verbal compounds below, which I consider to be true verbal compounds in Mandarin. For the rest of the chapter, I may also refer to the monosyllabic or bisyllabic verbs described above as ‘bare verbs’ and use ‘compound verbs’ to refer to the RVCs in Mandarin.

As shown in (206a-c), any of these bare monosyllabic or bisyllabic transitive verbs can take a resultative adjective or verb at the end to form a ‘V + Resultative Adjective/Verb’ result verb compound (RVC) (cf. Li and Thompson, 1989). As in (206d), some English transitive MMFP verbs such as *break* can only be translated as an RVC without a bare transitive verb translation.

- (206) a. 修理-好 *xiuli-hao* ‘fix’, literally ‘fix-good’
 b. 切-断 *qie-duan* ‘cut’, literally ‘cut-break’
 c. 杀-死 *sha-si* ‘kill’, literally ‘kill-die/dead’
 d. 打-破 *da-po* ‘break’, literally ‘hit-break/broken’

Besides the RVC compounds above, I also include another type of verbal compound ‘V+完 *wan*’, i.e. the ‘V + finish’ construction with the completive morpheme in our discussion, as these constructions have also shown to be relevant in previous studies in other languages (Koenig and Muansuwan, 2000; Singh, 1991, 1998). Instead of a resultative or an adjective, the morpheme *wan* ‘finish’ can attach to the end of a bare verb as in (207a-c) to form a verbal compound. However, as shown in (207d), the morpheme *wan* ‘finish’ seems to be unable to attach to an RVC construction with the resultative adjective/verb already attached.

- (207) a. 修理-完 *xiuli-wan* ‘fix’, literally ‘fix-good’
 b. 切-完 *qie-wan* ‘cut’, literally ‘cut-break’
 c. 杀-完 *sha-wan* ‘kill’, literally ‘kill-die/dead’
 d. *打-破-完 *da-po-wan* ‘break’, literally ‘hit-break/broken’

Although some of these English MMFP accomplishment verbs such as ‘kill’ or ‘fix’ can be translated as either a bare verb or an RVC, when Mandarin is cited as an example of languages that allow non-culminating accomplishments, it is the bare transitive examples that are used. In the next subsection, I discuss in more details the culmination entailment patterns of the bare and the RVC transitive accomplishment predicates in turn.

5.1.2 *Culminating Reading Patterns for Bare vs. Resultative Compound*

In some previous studies of non-culminating accomplishments in Thai and Hindi (Koenig and Muansuwan, 2000; Singh, 1991, 1998), it is observed that while bare accomplishment verbs do not entail culmination, compound verbs with some kind of completive or resultative morpheme do. Just like in Thai and Hindi, in Mandarin the bare transitive accomplishment verbs also do not entail culmination, whereas the RVCs with the resultative adjective/verb do. However, different from what has been reported for Hindi and Thai, the verbal compounds with the completive morpheme in Mandarin do not seem to entail culmination for the transitive MMFP predicates in Mandarin.

First, let’s look at the bare transitive MMFP verbs. The bare transitive verbs do not entail culmination and can have a non-culminating reading, when the result is canceled. As shown in the following examples, none of the bare transitive verbs *sha* ‘kill’, *xiu* ‘fix’, *jian* ‘cut with scissors’ in the perfective entail that the event has culminated for sure, because it is totally fine to deny the result state is obtained. For example in (208), in Mandarin it is felicitous to assert that Jingke killed the king of Qin but the king of Qin did not die from the killing. Although the English translation sounds contradictory, the Mandarin is fine as long as Jingke did perform some kind of killing action on the king of Qin, for example by stabbing a sword in. However, whether the king of Qin died as a result is an open question.

- (208) Jingke sha le Qin-wang, keshi Qin-wang mei si.
 Jingke kill PERF Qin-king, but Qin-king not die.
 Literally ‘Jingke killed the king of Qin, but the king of Qin did not die.’

Although it has been reported multiple times in the literature that *sha* ‘kill’ does not entail event culmination in the perfective (cf. Tai, 1984; Koenig and Chief, 2007), the example in (208) still sounds odd for some native speakers. Despite the variations in native speakers’ judgments, I believe it is still valid to claim that *sha* ‘kill’ does not semantically encode the death result, because the judgment improves when a manner verb is added in front. For example, as shown in (209), when *ci* ‘stab’ is added in front to form the word *ci-sha* ‘assassinate’ literally ‘stab-kill’, the sentence becomes acceptable even to the Mandarin speakers who reject (208). Notice the crucial difference between English and Mandarin that *assassinate* in the simple past in English entails that the person assassinated is definitely dead, but not so in Mandarin. If *sha* ‘kill’ in Mandarin indeed has the same semantics as the English ‘kill’, then we would not expect the improved judgment for *ci-sha* ‘assassinate’, which is morphologically built on *sha* ‘kill’ in Mandarin.

- (209) Jingke ci-sha le Qin-wang, keshi Qin-wang mei si.
 Jingke stab-kill PERF Qin-king, but Qin-king not die
 Literally ‘Jingke assassinated the king of Qin, but the king of Qin did not die.’

Even if the readers may still not be as convinced, the following bare transitive examples are definitely much more unanimously accepted. Similarly, for *xiu* ‘fix’ and *jian* ‘cut with scissors’ in (210) and (211), as long as the agent perform some kind of fixing action or cutting action on the object, then it is fine to assert that the worker fixed the car and the guest cut the ribbon, even if the car has not been fixed and the ribbon was not cut into two as a result. For example, (210) can be true in a scenario where the worker started fixing the car but stopped in the middle because he needed to get some extra parts. (211) can be true in a scenario where the guest did a cutting action on the ribbon, but because the scissors were too blunt, the ribbon was not even cut a little bit.

- (210) Gongren xiu le che, keshi che mei xiu-hao.
 worker fix PERF car, but car not fix-good
 Literally ‘The worker fixed the car, but the car is not fixed.’

- (211) Jiabin jian le caidai, keshi caidai mei you duan.
 Guest cut.with.scissors PERF ribbon, but ribbon not have break
 Literally ‘The guest cut the ribbon, but the ribbon was not cut into two.’

As discussed in Chapter 3, these bare transitive accomplishment verbs are actually atelic because like the activity verbs in Mandarin, these transitive accomplishment verbs can co-occur with *for*-phrase equivalent and yet incompatible with the *in*-phrase equivalent in Mandarin (cf. Tai, 1984). For example as shown in (212), *xiu* ‘fix’ is compatible with the *for*-phrase equivalent in Mandarin but not the *in*-phrase equivalent. As discussed in Chapter 3, because these bare transitive accomplishment verbs pattern identically with the activities in all the diagnostic tests for predicate types in Mandarin, these bare transitive MMFP accomplishment verbs should rather be classified as activity verbs instead.

- (212) a. gongren xiu zhe-bu che xiu le san xiaoshi.
 worker fix this-CL car fix PERF three hour.
 Literally ‘The worker fixed this car for three hours.’ *for*-phrase test
- b. # gongren san xiaoshi nei xiu le zhe-bu che.
 worker three hour in fix PERF this-CL car.
 Literally ‘The worker fixed this car in three hours.’ *in*-phrase test

In contrast with the bare transitive accomplishment verbs, the result verbal compounds (RVC) composed of the ‘V + Resultative Adjective/Verb’ do entail culmination. Examples in (213), (214) and (215) illustrate that if the RVC is used instead of the bare transitive, it is no longer felicitous to assert that direct object it did not reach the result state.

- (213) # Xiaohai da-po le huaping, keshi huaping mei you po.
 Child hit-broken PERF vase, but vase not have break
 Literally ‘The child broke the vase, but the vase did not break.’
- (214) # Jingke cisha-si le Qin-wang, keshi Qin-wang mei si.
 Jingke assassinate-dead PERF Qin-king, but Qin-king not die
 Literally ‘Jingke assassinated the king of Qin, but the king of Qin did not die.’
- (215) # Gongren xiu-hao le che, keshi che mei xiu-hao.
 worker fix-good PERF car, but car not fix-good
 Literally ‘The worker fixed the car, but the car is not fixed.’

When the RVC is used in the perfective, the event must have culminated. Morphologically speaking, it makes intuitive sense that the RVC entails event culmination, as the resultative adjective/verb literally specifies the state the direct object is in after the event. For example, in (213), *da-po* ‘break’ literally means ‘hit-break/broken’, the *po* ‘break/broken’ part as the resultative asserts that the vase is broken and therefore it is contradictory to negate that vase is broken later in the sentence.

With respect to the predicate type diagnostics, the resultative verbal compounds are telic predicates. When a bare transitive MMFP verbs take a resultative adjective/verb to form an RVC construction, the predicate becomes telic, as it is now compatible with the *in*-phrase in Mandarin. Examples in (216) illustrate that when the bare verb *xiu(li)* ‘fix’ has the adjective *hao* ‘good’ attached to form an RVC *xiu-hao* ‘fix’, literally ‘fix-good’, the predicate is compatible with the *in*-phrase equivalent in Mandarin, and only marginally acceptable with the *for*-phrase equivalent.

- (216) a. ? gongren xiu-hao zhe-bu che xiu le san xiaoshi.
 worker fix-good this-CL car fix PERF three hour.
 Literally ‘The worker fixed this car for three hours.’ *for*-phrase test
- b. gongren san xiaoshi nei xiu-hao le zhe-bu che.
 worker three hour in fix-good PERF this-CL car.
 Literally ‘The worker fixed this car in three hours.’ *in*-phrase test

So far, the Mandarin data conform to the patterns described for Thai and Hindi in Koenig and Muansuwan (2000) and Singh (1991, 1998) respectively: the bare transitive accomplishment verbs can have a non-culminating reading, whereas the compound verbs must entail culmination. However, for the MMFP verbs in Mandarin, one important difference is that the verbal compounds with the completive morpheme in Mandarin do not necessarily entail the culmination of the event. Although by default the reading is usually that the event has culminated, it could also be the case that the event reached an reasonable completion point from the agent’s perspective. For example, both of the sentences in (217) and (218) sound somewhat odd without further contexts because usually the assassination and the

fixing are not considered completed unless the target died or the object is restored to a working condition. However, in some particular contexts where there is no other possible action that the agent can take, then the agent's work can also be considered completed in a sense. (217) can be felicitous in a scenario where Jingke finished his assassination of the king of Qin by stabbing a sword into the king, but Jingke did not take more subsequent actions either because he believed the king had died or there was nothing else he could possibly do. Similarly, (218) can be felicitous in a scenario where the repair worker has already done his best at attempting to fix the car and has no other possible repairing work he could try on the car. In other words, the completive morpheme for MMFP verbs in Mandarin signals the completion of the event from the agent's perspective rather than the patient's perspective.

(217) ? Jingke cisha-wan le Qin-wang, keshi Qin-wang mei si.
 Jingke assassinate-finish PERF Qin-king, but Qin-king not die
 Literally 'Jingke finished assassinating the king of Qin, but the king of Qin did not die.'

(218) ? Gongren xiu-wan le che, keshi che mei xiu-hao.
 worker fix-finish PERF car, but car not fix-good
 Literally 'The worker finished fixing the car, but the car is not fixed.'

In summary, in Mandarin, the bare transitive accomplishment verbs are tested as activity predicates and do not entail event culmination, while the result verbal compounds with the resultative adjective/verb are tested as telic accomplishment predicates and do entail event culmination. This pattern suggests that the bare transitive accomplishment verbs are pure activity predicates that do not encode the change-of-state subevent of the direct object, and that the change-of-state subevent is encoded in the resultative adjective/adverb, because the presence of the resultative adjective/adverb always entails the culmination of the event. Further evidence that the bare transitive MMFP verbs do not encode the patient's change-of-state process comes from the completive verbal compounds that they only signal the completion of the event from the agent's perspective, not necessarily from the patient's change-of-state perspective.

5.1.3 *Morpho-Syntax of Transitives and Intransitives*

In the previous two subsections, we have discussed the bare and compound transitive MMFP verbs. We have come to an interim conclusion that bare transitive MMFP verbs are activity predicates that do not encode the patient's change-of-state process, and that the change-of-state process is encoded instead in the resultative adjective/verb. In these two subsections, we take a further look at the intransitive MMFP verbs and how they relate to their transitive counterparts. I first present some morpho-syntactic alternations of the transitive and intransitive MMFP verbs and then discuss the patterns of the culminating and non-culminating readings for the intransitives. I show in these two subsections that most of the Mandarin intransitives tend to share the same form with the resultative adjective and entail event culmination.

As Fillmore (1970) observes, in English the verbs can be roughly classified into two groups with respect to the transitive-intransitive alternations, what he called the *break* group and the *hit* group. The *break* group represents the the pattern where the transitive and the intransitive share the same form, whereas the *hit* group represents the pattern where the transitive and the intransitive do not share the same form. As illustrated in (219), English *break* can be used both transitively and intransitively. For the transitive use, the boy as the agent performs some action on the window that causes the window, the theme, to undergo a certain change-of-state process from being intact to being broken. For the intransitive use, the window as the theme is promoted in the subject position and undergoes a change either on its own due to internal cause (e.g. temperature change) or due to some external cause by an implicit agent.

- (219) a. The boy broke the window.
b. The window broke.

In contrast, as shown in (220), for the *hit* group, there is no similar intransitive use of *hit* like in (219b) so that 'the tree hit' is ungrammatical. To express a similar idea, the passive

‘the tree is hit’ needs to be used instead.

- (220) a. The boy hit the tree
 b. *The tree hit.
 c. The tree was hit.

It is actually not totally random whether a verb would pattern like *break* or like *hit*. As a general tendency, Fillmore (1970) observes that verbs of the *break* group are mostly result verbs that describe some sort of change-of-state eventualities and verbs of the *hit* group are mostly manner verbs that describe agent’s action without specifying the change on the object.

In Mandarin Chinese, the pattern is somehow different from English. More so than English, the Mandarin MMFP verbs usually have different transitive and intransitive forms. The transitive and intransitive verb pairs actually pattern quite like the verb pair *kill* and *die* in English, in which the transitive causative change-of-state and the intransitive change-of-state are lexicalized as separate lexical items. The intransitive form usually share the same form with the resultative adjective we mention above in the previous two sections.

Table 5.1: Mandarin Transitive and Intransitive MMFP

Verb	Transitive	Intransitive
break	<i>da-po</i> literally ‘hit-break’	<i>po</i> ‘break/broken’
cut	<i>qie</i> ‘cut’	<i>duan</i> ‘broken/cut into two’
fix	<i>xiuli</i> ‘fix’	<i>hao</i> ‘good’
kill	<i>sha</i> ‘kill’	<i>si</i> ‘die’
open	<i>kai</i> ‘open’	<i>kai</i> ‘open’
close	<i>guan</i> ‘close’	<i>guan</i> ‘close’

As shown in Table 5.1, unlike English *break* which share the same form for the transitive and the intransitive, in Mandarin the transitive *da-po* ‘break’ is distinguished from the intransitive *po* ‘break/broken’ and this intransitive *po* ‘break/broken’ can be used as the resultative adjective/verb as the second part of an RVC. Similarly for *cut* and *fix*, whereas

in English *cut* and *fix* does not have an intransitive use and the passive needs to be used, in Mandarin the transitive *qie* ‘cut’ and *xiuli* ‘fix’ are morphologically distinguished from their intransitive counterparts *duan* ‘broken or cut into two pieces’ and *hao* ‘good’. As expected, the pair for *kill* in Mandarin are also lexicalized as two separate lexical items *sha* ‘kill’ for the transitive and *si* ‘die’ for the intransitive.

Although the vast majority of the MMFP verbs in Mandarin have different transitive and intransitive forms, there are actually a few that do share the same transitive and intransitive forms such as *kai* ‘open’ and *guan* ‘close’ as illustrated in (222) and (221).

- (221) a. fuwuyuan kai le men.
waiter open PERF door
‘The waiter opened the door.’
- b. men kai le.
door open PERF
‘The door opened.’

- (222) a. fuwuyuan guan le men.
waiter close PERF door
‘The waiter closed the door.’
- b. men guan le
door close PERF
‘The door closed.’

There is a slight complication to the generalization about the transitive-intransitive alternations above. Actually, besides the intransitive forms above, all of these Mandarin transitive MMFP verbs can be used directly intransitively in the middle constructions (Cheng and Huang, 1994; Ting, 2006). As illustrated by the examples (223) through (226), the theme can directly occupy the subject position with the bare transitive MMFP verb as the main verb without any passive morphology. These sentences are structurally analogous to ‘the window breaks’ in English.

- (223) huaping da-sui le
vase hit-break PERF
‘The vase is broken.’

- (224) caidai jian le
 ribbon cut PERF
 ‘The ribbon is cut.’
- (225) Qin-wang sha le.
 Qin-king kill PERF.
 ‘The king of Qin was killed.’
- (226) qiche xiu le.
 car fix PERF.
 ‘The car is fixed.’

However, there are reasons to believe that these intransitives in the middle constructions are not true intransitives like the ones in Table 5.1, as for these intransitives in the middle constructions, an implicit external agent is always implied. According to Cheng and Huang (1994), the intransitives that are zero-derived from transitives and used in the middle constructions are surface ergatives whose agent argument is suppressed, whereas the true intransitives in Table 5.1 are deep ergatives that are ergative both in the deep and surface structure (cf. Keyser and Roeper, 1984; Ting, 2006). Consider the examples (227) through (229), the surface ergative in (227) is incompatible with the word ‘self’ to indicate that there is no external agent involved, whereas the deep ergatives in (228) and (229) are compatible with the word ‘self’. It is intuitive that the verb *xiu* ‘fix’ in (227) cannot occur with *ziji* ‘self’, because usually cars cannot miraculously fix themselves, while the verbs like *kai* ‘open’ and *sui* ‘break’ can because things could open or break on their own without an external agent (probably due to natural forces such as the wind or the drastic change in temperature).

- (227) # qiche ziji xiu le.
 car self fix PERF
 Intended ‘The car is fixed on its own.’ Surface Ergative
- (228) men ziji kai le.
 door ziji open PERF
 ‘The door opened on its own’ Deep Ergative
- (229) chuānghu ziji sui le.
 window self break PERF
 ‘The window breaks on its own.’ Deep Ergative

In summary, perhaps much more so than English, Mandarin generally tends to lexicalize its transitive and intransitive MMFP verbs as separate lexical items, where the intransitive shares the same form with a resultative adjective/verb. These intransitives are deep ergatives that do not require external agents. Also unlike English, Mandarin bare transitive MMFP verbs can be freely used intransitively in middle constructions, but these intransitives in the middle constructions are surface ergatives that always imply an external agent.

In the next subsection, I present the culmination entailment patterns for the intransitive MMFPs in Mandarin. As it turns out, the deep ergatives always entail event culmination, whereas the surface ergatives pattern like the bare transitives and do not necessarily entail culmination.

5.1.4 *Culmination Entailment Patterns the Intransitive MMFPs*

The deep ergative intransitive MMFP verbs always entail event culmination in Mandarin. This makes intuitive sense as the deep ergative intransitive share the same form as the resultative adjective/verb so that it is contradictory to assert that a result is obtained and then deny that the result is obtained as illustrated in (230) and (231) .

(230) # boli sui le, danshi mei sui.
 glass break PERF, but not break
 Intended: ‘The glass broke but it did not break.’

(231) # Qin-wang si le, danshi mei si.
 king-qin die PERF, but not die
 Intended: ‘The king of Qin died but did not die.’

On the other hand, the surface ergative intransitives, i.e. the bare transitives used as in the middle construction, do not necessarily entail event culmination. These surface ergative intransitives just behave like their corresponding transitives in not entailing event culmination. As shown in (232) and (233), when the bare transitives *sha* ‘kill’ and *jian* ‘cut’ are used in the middle construction, it is felicitous to deny that the subject entered into the result state of being dead or being cut into two halves.

- (232) Qin-wang sha le, danshi mei si.
king-qin kill PERF, but not die
'The king of Qin was killed but did not die.'
- (233) caidai jian le, danshi mei duan.
ribbon cut PERF, but not cut.into.two
'The ribbon was cut, but was not cut (into two).'

Not all surface ergative intransitives can allow these non-culminating readings, and it ultimately depends on whether the corresponding transitive entails culmination in the first place. If the surface ergative are originally derived from a transitive RVC instead of a bare verb, then like its transitive RVC counterpart, it also entails culmination. As shown in (234), the Mandarin translation of the English transitive *break* is an RVC *da-sui* 'hit break'. As discussed in §5.1.2, result verbal compounds do entail event culmination in the perfective, and therefore when used intransitive in the middle construction, the event culmination entailment remains unchanged.

- (234) # boli da-sui le, danshi mei sui.
glass hit-break PERF, but not break.
Intended: 'The glass was broken but it did not break.'

Summing up the patterns of the deep and surface ergatives so far, it appears that event culmination is entailed whenever the resultative adjective/verb is present: in the transitive RVC, in the deep ergative intransitive, and in the surface ergative derived from a transitive RVC. Therefore, it further supports the idea that the bare transitive MMFP verbs in Mandarin are activity predicates that do not encode the change-of-state process of the theme or the patient, and this change-of-state process is instead encoded in the resultative adjective/verb.

The verbs *kai* 'open' and *guan* 'close' in Mandarin present some interesting questions for the generalization above. Because the transitive form and the intransitive form share the same lexical form, one may wonder if the transitives would then entail event culmination by virtue of sharing the same form as the resultative adjective. As it turns out, even though

the transitive and the intransitive share the same form, the transitive in the bare form still does not entail that the result state is necessarily obtained. As shown in (235a), only the compound forms *kai-kai* and *guan-shang* signify that the door has been successfully opened or closed. This shows that none of the bare transitives in Mandarin entail event culmination, regardless of whether the transitive happens to share the same form with the intransitive.

- (235) a. dianyuan kai-le/guan-le men, keshi men mei
 store.worker open-PERF/close-PERF door, but door not
 kai-kai/guan-shang.
 open-open/close-up
 Literally ‘The store worker opened/closed the door, but the door did not
 open/close’
- b. Men kai-le/guan-le, keshi mei you kai-kai/guan-shang.
 door open-PERF/close-PERF, but not have open-open/close-up
 Literally ‘The door has been opened/closed, but it is not open/close.’
- c. # Men ziji kai-le/guan-le, keshi mei you kai/guan.
 door self open-PERF/close-PERF, but not have open/close
 Intended: ‘The door opened/closed, but it did not open/close.’

In the intransitive form, if the sentence is interpreted as the door was opened or closed by someone as a surface ergative, then it is felicitous to add that the door was not successfully opened or closed as in (235b). However, if there is no agent implied as a deep ergative, for example when the door is an automatic door, then it seems a little odd that the door does not open or close successfully as in (235c).

To conclude this section, the most important generalization is that bare transitive MMFP verbs do not entail culmination, whereas the deep ergative intransitive MMFP verbs always do. These deep ergative intransitive MMFP verbs share the same form as the resultative adjectives or verbs, and are for the most part lexically distinguished from the bare transitives. Because event culmination is entailed only when the resultative adjective/verb is present, whether as the deep ergative intransitive or the second element of a resultative verbal compound, these patterns strongly suggest that the bare transitive MMFP verbs do not encode the change-of-state process of the theme or the patient, and this change-of-state process is

instead lexically encoded in the resultative adjective/verb, which is also the deep ergative intransitive.

Further support for this idea comes from the data of the resultative verbal compounds and the verbal compounds with the completive morpheme. Because the resultative verbal compound contains the resultative adjective/verb as the second element of the compound, it entails event culmination. On the other hand, the transitive verbal compound with the completion morpheme *wan* does not entail event culmination necessarily, but only indicates that the event has finished from the agent’s perspective.

Given all these data, I would like to propose informally for now that the bare transitive MMFP verbs in Mandarin are activity predicates that only encode the agent’s action on the patient without encoding the actual changing process of the patient, and instead this changing process is lexically encoded in the intransitive resultative verb. More generally speaking, the ultimate reason why non-culminating readings are possible for Mandarin MMFP verbs lies in the particular way Mandarin lexicalizes verbal meaning differently from English: Mandarin tends to lexicalize all transitive verbs as manner verbs and reserve the result verbs for the intransitives (cf. Hovav and Levin, 2010). In other words, whereas English lexicalizes both the agent’s activity and the theme’s change of state together in the result verbs in the transitives as in *kill*, *break*, and *fix*, Mandarin instead lexicalizes the agent’s activity and the theme’s change separately into the transitives and the intransitives respectively. In the next section, I present some motivations for my analysis based on some previous studies that discuss transitivity, affectedness and manner/result verb complementarity (Martin and Schäfer, 2015; Beavers, 2011; Hovav and Levin, 2010).

5.2 Motivation for Analysis

My analysis is both motivated by language-internal patterns of Chinese, and the cross-linguistic patterns that agentivity and the transitive form are often linked to the possibility of a non-culminating reading (Ikegami, 1981; Martin, 2015). Based on the affectedness

theory by Beavers (2011), I argue that the transitive verbs of MMFP type verbs in Mandarin merely encode that the agent affects the object in some way, without specifying the degree of affectedness. It focuses on the agent’s action, rather than the change of the direct object. In a sense, in Mandarin *xiuli* ‘fix’ and *sha* ‘kill’ actually have the same degree of affectedness on its object as *da* ‘hit’. And consequently, the lack of the event culmination entailment follows naturally in Mandarin and should not be a surprise. From a lexical semantics perspective, we can say that Mandarin tends to lexicalize all the transitive verbs as manner verbs rather than result verbs, and the result verbs are largely lexicalized as intransitives (Hovav and Levin, 2010).

5.2.1 *Agentivity, Causation and Non-Culmination*

My analysis is motivated by the fact that whereas the bare transitive MMFP verbs in Mandarin can have non-culminating reading, the intransitive result stative verbs always entail that the result state is obtained. This pattern in Mandarin also supports the observation that cross-linguistically, agentivity is strongly linked with non-culminating accomplishments (cf. Martin, 2015; Martin and Schäfer, 2015). For example, as shown in (236), in Japanese ‘open’ when used in the transitive form in Japanese does not entail culmination, but in the intransitive form it does entail the event is culminated (Ikegami, 1981; Tsujimura, 2003, among others). This pattern is quite consistent among other Japanese transitive-intransitive pairs.

- (236) *doa wo ake-ta* *kedo,* *ak-anak-atta.*
 door OBJ open.TR-PERF although, open.INTR.-not-PERF.
 Literally ‘I opened the door, but the door didn’t open’

I argue that in Mandarin transitivity or agentivity often predicts that a non-culminating reading is possible because the transitive sentence is focused on the agent, whereas the intransitive sentence is focused on the direct object. In other words, the transitive verbs may only semantically encode the agent’s action without encoding the direct object’s change,

whereas the intransitive verbs semantically encode the changing process of the direct object. But how can Mandarin verbs such as *sha* ‘kill’ and *xiuli* ‘fix’ merely describe the agent’s activity? I believe we can answer this question by invoking Beavers’s (2011) discussion of affectedness and Levin and Hovav’s (2004) discussion of the manner/result complementarity. The answer in short is that *sha* ‘kill’ and *xiuli* ‘fix’ are manner verbs that describe the surface contact or impact of the agent on the patient, rather than result verbs like their English counterparts. The Mandarin bare transitive MMFP verbs show lower affectedness than their English counterparts. The change-of-state result verbs in Mandarin are almost exclusively lexicalized in the deep ergative intransitives.

5.2.2 *Affectedness*

According to Beavers (2011, 335), affectedness is ‘usually construed as a persistent change in or impingement of an event participant’. Different verbs exhibit different degrees of affectedness. Consider the following examples from his paper.

- (237) a. John ate the apple up. (Apple is completely gone)
 b. John cut the apple. (Apple cut, not necessarily to a particular degree)
 c. John kicked the apple. (Apple impinged, not necessarily affected)
 d. John touched the apple. (Apple manipulated, not necessarily impinged)

Beavers (2011, 336)

In (237), we see that these four different verbs in English have different degrees of affectedness. *Eat up* has the maximal degree of affectedness as the apple is completely gone, whereas *kick* has mostly a very minimal degree of affectedness, as the apple may not have undergone any change necessarily. According to this way of classifying affectedness, verbs such as *fix*, *break* and *kill* in English can all be put into the same category as *eat up*. More formally speaking, Beavers (2011) establishes the following four categories of affectedness based on the direct object *x*’s change with respect to a predicate ϕ .

- (238) a. x undergoes a quantized change iff $\phi \rightarrow \exists e \exists s [\text{result}'(x, s, g_\phi, e)]$
 (e.g. accomplishments/achievements: break, shatter, destroy, devour x)
- b. x undergoes a non-quantized change iff $\phi \rightarrow \exists e \exists s \exists g [\text{result}'(x, s, g, e)]$
 (e.g. degree achievements/cutting: widen, cool, lengthen, cut, slice x)
- c. x has potential for change iff $\phi \rightarrow \exists e \exists s \exists \theta [\theta(x, s, e)]$
 (e.g. surface contact/impact: wipe, scrub, rub, punch, hit, kick, slap x)
- d. x is unspecified for change iff $\phi \rightarrow \exists e \exists \theta' [\theta'(x, e)]$
 (e.g. other activities/states: see, laugh at, smell, follow, ponder, ogle x)

Beavers (2011, 385)

Basically, the formalisms in (238) classify the verbs according to whether and how the event participant x changes as related to ϕ . Beavers (2011) assumes that all these verbs have some kind of verbal scales, among which certain verbal scales have goals associated with the scale. For the first category, x undergoes a quantized change, if x enters into the goal g_ϕ specified by predicate ϕ . For the second category, the degree achievements, x enter into a unspecific state g that is not directly specified by ϕ . For the third and fourth categories, there are no change-of-state goals associated, but rather the ‘potential for change is an existential generalization over the θ -relation between the theme, scale, and event, and being unspecified for a change is an existential generalization over the thematic role of the theme (Beavers, 2011, 385).’

Thinking back to the Chinese data, the very fact that the culmination reading can be canceled for the bare transitive MMFP verbs in Mandarin strongly suggests that *sha* ‘kill’, *xiuli* ‘fix’, *kai* ‘open’ are not categorized in the same category as in (238a), because x does not necessarily undergo any quantized change. Rather the patterns of these verbs are very similar to (238c), that x is impinged and has a potential for change, because in the perfective these verbs definitely entails that the agent performed some activity on x , but x may or may not have undergone any visible change.

Among the various diagnostics tests that Beavers (2011) uses to test for affectedness, the entailment test can be used to test for surface contact or impact verbs such as *hit* in English. The entailment test works as follows: in English, for all the other verb classes that show affectedness, it is infelicitous to deny that the change of state happened, but for the surface contact or impact verbs, they are marginally felicitous with the change-of-state negated as in (239d), where the *is hit* is understood to mean ‘is damaged’ and *is wiped* to mean ‘is clean’.

- (239) a. John just cleaned/painted the bedroom, #but it is not cleaned/painted.
 b. John just turned/carved the wood into a toy, #but it is not turned/carved into a toy.
 c. John just moved the pot into the room, #but it is not moved into the room.
 d. John just hit/wiped the car, ?but it is not hit/wiped.
 e. John just destroyed/ate the cake, #but it is not destroyed/eaten.
 f. John just built/constructed the house, #but it is not built/constructed.

Beavers (2011, 341)

The behavior of (239d) is exactly what all these bare transitive MMFP verbs in Mandarin are capable of doing. Therefore, the bare transitive MMFP verbs such as *xiuli* ‘fix’ and *jian* ‘cut with scissors’ should be classified as surface contact or impact verbs. The examples repeated below show that the change-of-state can be negated.

- (210) Gongren xiu le che, keshi che mei xiu-hao.
 worker fix PERF car, but car not fix-good
 Literally ‘The worker fixed the car, but the car is not fixed.’

- (211) Jiabin jian le caidai, keshi caidai mei you duan.
 Guest cut.with.scissors PERF ribbon, but ribbon not have break
 Literally ‘The guest cut the ribbon, but the ribbon was not cut into two.’

5.2.3 Manner/Result Complementarity

The transitive and intransitive contrast can be further explained in light of the discussion of manner verbs and result verbs by Hovav and Levin (2010). Unlike English, which lexicalizes manner verbs and result verbs both in the transitive and the intransitives, Mandarin seems to preponderantly lexicalize manner verbs in the transitives and result verbs in the intransitives exclusively. There are reasons to believe that the transitive verbs of *kill*, *fix* etc. in Mandarin are packaged as manner verbs rather than result verbs like their English counterparts.

First, as we know from Chapter 3, these predicates are atelic rather than telic. This fits the description of manner verbs, as manner verbs describe agent's activity and are atelic.

- (240) gongren xiu zhe-liang che xiu le shi xiaoshi.
 gongren fix this-CL car fix PERF ten hour
 'The worker fixed this car for ten hours.'

Second, according Hovav and Levin (2010), whereas result verbs cannot take a resultative adjective, manner verbs can as in (241). This is exactly what most of this 'kill' and 'fix' type of verbs in Mandarin can do morphologically, as they actually need these resultative adjectives as a suffix to the bare verb stem to entail the culmination reading.

- (241) a. He wiped the table clean.
 b. # He broke the table shattered.

- (242) gongchengshi xiuli-hao le diannao
 engineer fix-good PERF computer
 'The computer engineer fixed the computer.'

Third, perhaps more convincingly, the resultative adjective can be quite flexible in expressing any result, even the opposite result from what we usually expect. This shows that the transitive verb such as 'kill' and 'fix' in Mandarin do not encode the result, because otherwise a different result or the opposite result would be a clear contradiction to the pre-existing result in the semantics the verb. For example, the fish could just faint rather than die as a result of the chef's killing action as in (243), or the bag was damaged rather than

being restored to a better condition from the repairing action as in (244). If the state of the fish being dead or the bag being fixed is part of the meaning of the transitive verb, then it is plain-out infelicitous to claim otherwise or the opposite.

(243) chushi sha-yun le na tiao yu.
chef kill-faint PERF that CL fish
'The chef made the fish faint from killing it'

(244) shifu xiu-huai le wo de bao.
master fix-bad PERF I POSS. bag
'The repairman damaged my bag from fixing it.'

These examples provides direct evidence against those analyses modified from Dowty (1979) that use inertia worlds or the imperfectivity operator to remove the result end point into some potential world (Koenig and Muansuwan, 2000; Bar-El et al., 2004). If indeed the semantics of the verb encodes the result state of the theme being dead or being restored to working condition, and the non-culminating reading arises because the culmination point is removed into an inertia world, then we cannot explain why the actual result obtained can be unexpected in the case of the fish fainting or opposite to what would have been the inertial result in the case of the bag being broken. Because according to these accounts, if the event has continued and obtained a result, then the result should be the same as what is specified in the semantics of the verbs. Precisely because Mandarin RVCs allow very flexible combinations with the result adjectives or verbs, it shows that the result state is not encoded in the verb but rather compositionally added on through verb compounding in Mandarin.

Furthermore, the usual result may not even need to be intended by the agent. Consider the following example (245) in the scenario of two spies having a conversation. One of the spies can felicitously say the sentence in (245) to indicate that he wants to be selected to be the person to perform some repairing on the computer, but he does not intend to fix the computer so as to interfere with the enemies' work. If the semantics of *xiu* 'fix' in Mandarin does include the result of the object being fixed as the agent's intention, then (245) should not be felicitous.

- (245) wo xiang xiu na-bu diannaoh, danshi wo bu xiang xiu-hao ta
 I want fix that-CL computer, but I not want fix-good it
 ‘I want to do the repair work for the computer, but I don’t want to fix it.’

5.3 Analysis

Given the generalization that bare transitive MMFP verbs in the perfective are activity predicates that can have non-culminating readings and that the bare deep ergative intransitives in the perfective always entail event culmination, I analyze the bare transitive MMFP verbs as surface contact or impact manner verbs, and the deep ergative intransitives as change-of-state result verbs.

5.3.1 Bare Transitives and Intransitives

To illustrate my analysis, let’s first consider the case of the Mandarin equivalent of the English *break*, *da-sui* literally ‘hit-break’, which is an resultative verbal compound that consists of the bare transitive verb *da* ‘hit’ and the deep ergative intransitive verb *sui* ‘break, shatter’. Let’s analyze the bare transitive *da* ‘hit’ and the bare deep ergative *sui* ‘break’.

(246) $\llbracket da \rrbracket = \lambda x \lambda y \lambda e [agent'(y)(e) \wedge patient'(x)(e) \wedge hit'(e)]$ Transitive

(247) $\llbracket sui \rrbracket = \lambda x \lambda e [theme'(x)(e) \wedge BECOME(broken)(x)(e)]$ Intransitive

As shown in (246) and (247), the transitive *da* ‘hit’ denotes an activity event description of agent’s hitting action on the patient, and the intransitive *sui* ‘breaks’ denotes an achievement event description that the theme undergoes an change-of-state event so that the theme becomes broken as a result. Because the bare transitive does not encode the change-of-state event while the bare deep ergative intransitive does, naturally only the deep ergative intransitive in the perfective denotes event culmination.

- (248) a. Xiaoming da-le chuanghu.
 Xiaoming hit-PERF window.

‘Xiaoming hit the window.’

$\iota y \exists e [agent'(Xiaoming)(e) \wedge patient'(y)(e) \wedge window'(y) \wedge hit'(e)]$

- b. Xiaoming da-le chuanguhu, chuanguhu mei sui.
 Xiaoming hit-PERF window, window not.have broken.
 ‘Xiaoming hit the window, the window was not broken.’

- (249) a. Chuanguhu sui-le
 Window break-PERF
 ‘The window broke.’

$\iota x \lambda e [window'(x) \wedge theme'(x)(e) \wedge BECOME(broken)(x)(e)]$

- b. # Chuanguhu sui-le, mei sui
 Window break-PERF, not break
 Intended ‘The window broke, but was not broken.’

So far, it is not surprising that the Mandarin transitive *da* ‘hit’ and intransitive *sui* ‘break’ have the semantics described above, since their English counterparts have more or less the same semantics. The real difference between English and Mandarin is that I propose that Mandarin lexicalizes its bare transitive MMFP verbs such as *sha* ‘kill’, *xiuli* ‘fix’, *jian* ‘cut with scissors’ as surface contact or impact verbs like *hit*, rather than result verbs. As shown in (250), I use the notation such as ‘*fixing – act'*’, ‘*killling – act'*’ and ‘*cutting – act'*’ to express the agent’s action on the patient and to differentiate them from the ‘fixing’ and ‘killling’ that entails result in English.

- (250) a. $\llbracket xiuli \rrbracket = \lambda x \lambda y \lambda e [agent'(y)(e) \wedge patient'(x)(e) \wedge fixing - act'(e)]$

- b. $\llbracket sha \rrbracket = \lambda x \lambda y \lambda e [agent'(y)(e) \wedge patient'(x)(e) \wedge killing - act'(e)]$

- c. $\llbracket jian \rrbracket = \lambda x \lambda y \lambda e \exists z [agent'(y)(e) \wedge patient'(x)(e) \wedge cutting - act'(e) \wedge tool'(e)(z) \wedge scissors'(z)]$

The truth conditions for these ‘*fixing – act'*’, ‘*killling – act'*’ and ‘*cutting – act'*’ event descriptions only require the agent to have a surface contact or impact on the patient, which can be categorized as ‘*fixing – act'*’, ‘*killling – act'*’ and ‘*cutting – act'*’, and do not specify whether the patient undergoes any change. For example, Mandarin *jian* ‘cut

with scissors’ describes an action in which the agent uses a pair of scissors to make surface contact with the patient by doing a ‘cutting’ action, i.e. closing the the blades of the scissors together. However, it is not part of the semantics of the verb *jian* whether the patient actually remains intact or is damaged in the desired way. Therefore, the example (211) repeated below is felicitous, because it is not contradictory assert that the ribbon remains intact after receiving a surface contact action as shown by the semantics of the sentence in (251).

- (211) Jiabin jian le caidai, keshi caidai mei you duan.
 Guest cut.with.scissors PERF ribbon, but ribbon not have break.
 Literally ‘The guest cut the ribbon, but the ribbon was not cut into two.’

- (251) $\lambda xiy\exists e\exists z[guest'(y) \wedge ribbon'(x) \wedge agent'(y)(e) \wedge patient'(x)(e) \wedge cutting - act'(e) \wedge tool'(e)(z) \wedge scissors'(z) \wedge \neg[\exists e'[BECOME(broken)(x)(e') \wedge theme'(x)]]]$

The meaning of ‘*fixing - act'*’ and ‘*killing - act'*’ are also similar to ‘*hitting*’ and ‘*cutting - act'*’, but the actions that ‘*fixing - act'*’ and ‘*killing - act'*’ describe are less straightforward to characterize than these simple surface contact verbs. For example, for ‘*fixing - act'*’ for a car, perhaps if the agent performs a sequence of actions such as running some tests, cleaning out, replacing the parts, then the ‘*fixing - act'*’ is truth-conditionally fulfilled. The crucial difference between the ‘*fixing - act'*’ in Mandarin and *fixing* in English is that Mandarin ‘*fixing - act'*’ is not committed to whether the patient has any visible change or actual change at all, even though the object is certainly impacted somehow just like in the case of ‘*hitting*’.

If Mandarin bare transitive verbs all describe surface contact or impact activity eventualities, then how can Mandarin express the same event-culminating readings as the English transitive *fix* and *kill* do? Mandarin can form resultative verbal compounds that compositionally bring together the manner of action part packaged in the transitive and the change-of-state part packaged in the intransitive into one verbal compound.

5.3.2 Resultative Verbal Compounds and Accomplishment Structure

So far in the analysis, I have proposed that Mandarin extensively lexicalizes manner verbs in the bare transitives and result verbs in the deep ergative intransitives. I also claim that Mandarin uses the resultative verbal compounds to express the same event-culminating readings as their English accomplishment counterparts, as an RVC combines the manner part of the meaning and the result part of the meaning together into one. Adopting Rothstein's (2008, chapter 3) analysis of the secondary predication as an event summation operation, I propose that the verbal compounding of the RVC construction is also a kind of event summation operation that sums of agent's action and the theme's change into one complex eventuality.

In Rothstein (2008), an event summation operation takes two verbal predicates to form a new verbal predicate that describes a summed event formed from two subevents described by these two verbal predicates. This summing operation is quite flexible about the temporal or the causal relation between the two sub-events, so that the two subevents do not necessarily follow each other sequentially in time nor does one subevent necessarily cause the other. The summing operation is a very general operation that can fuse two subevents into one complex summed event.

$$(252) \quad \text{SUM}[\alpha(e_1), \beta(e_2)] = \lambda e. \exists e_1 \exists e_2 {}^s(e_1 \sqcup e_2) \wedge \alpha(e_1) \wedge \beta(e_2) \quad \text{Rothstein (2008, 67)}$$

Let's consider the case of *da-sui* 'break' literally 'hit-break' in Mandarin again to see how I adapt Rothstein's analysis to the Chinese RVC. As repeated below in (246) and (247), the transitive denotes an activity event description and the intransitive denotes an achievement event description.

$$(246) \quad \llbracket da \rrbracket = \lambda x \lambda y \lambda e [agent'(y)(e) \wedge patient'(x)(e) \wedge hit'(e)] \quad \text{Transitive}$$

$$(247) \quad \llbracket sui \rrbracket = \lambda x \lambda e [theme'(x)(e) \wedge \text{BECOME}(broken)(x)(e)] \quad \text{Intransitive}$$

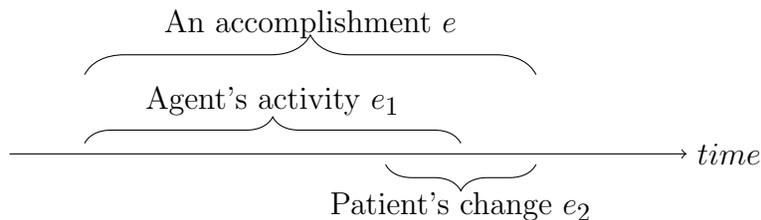
The Mandarin RVC *da-sui* denotes an accomplishment eventuality summed from the two subevents described by *da* 'hit' and the intransitive *sui* 'break' as shown in (253). It is

crucial for this summing operation for the Mandarin RVC that the two subevents need to share one event participant (cf. Rothstein, 2008, 75-77). The patient in e_1 of *da* is also the theme in e_2 of *sui*. In other words, the direct object is identified both as the patient of the agent’s action and also the theme of the change-of-state event.

$$(253) \quad \llbracket da - sui \rrbracket = \lambda x \lambda y \lambda e \exists e_1 \exists e_2 [e = {}^s(e_1 \sqcup e_2) \wedge agent'(y)(e_1) \wedge patient'(x)(e_1) \wedge hit'(e_1) \wedge theme'(x)(e_2) \wedge BECOME(broken)(x)(e_2) \wedge \tau(e_1) \preceq \tau(e_2) \wedge CAUSE(e_1)(e_2)]$$

As shown in Figure 5.1, the complex event e that is formed from two subevents: the agent-action subevent e_1 and the patient-change-of-state subevent e_2 and these two subevents are not necessarily in a strict temporal-sequential order. Slightly different from Rothstein’s analysis, which also imposes that the culmination of e_1 leads to e_2 , I assume that e_1 causes e_2 , but the two have a more relaxed temporal relation that e_1 just needs to end sometime before e_2 ends. It is possible that e_1 can end some time before e_1 starts to take place, and also possible that e_1 can continue for sometime after e_2 starts.

Figure 5.1: Schema for an Accomplishment with an Agent



Now given this analysis, it is easy to understand why the resultative verbal compound turns the atelic bare transitive activity predicate into a telic predicate that does not allow non-culminating readings. Basically the resultative morpheme adds in the change-of-state subevent (cf. Rothstein, 2008). As shown in (254), *da-sui* in the perfective describes a complex event in which the agent’s hitting action caused the patient to undergo the change-of-state process to the result of being broken. It is therefore infelicitous to deny that the result state of being broken has obtained, unlike for the bare transitive MMFP verbs.

- (254) Xiaoming da-sui le huaping.
 Xiaoming hit-break PERF vase.
 ‘Xiaoming broken the vase’

$$\iota x \exists e \exists e_1 \exists e_2 [vase'(x) \wedge e = {}^s(e_1 \sqcup e_2) \wedge agent'(Xiaoming)(e_1) \wedge patient'(x)(e_1) \wedge hit'(e_1) \wedge theme'(x)(e_2) \wedge BECOME(broken)(x)(e_2) \wedge \tau(e_1) \preceq \tau(e_2) \wedge CAUSE(e_1)(e_2)]$$

Similarly, *sha-si* ‘kill-dead’ and *xiu-hao* ‘fix-good’ are also formed through the same event summation operation. Along the same line of reasoning, the bare transitive *sha* ‘kill’ and *xiu(li)* ‘fix’ do not entail event culmination because they do not encode the change-of-state subevent in their semantics, but their RVCs do entail event culmination because the event summation operation adds the change-of-state subevent into the semantics of the RVCs.

$$(255) \quad \llbracket sha - si \rrbracket = \lambda x \lambda y \lambda e \exists e_1 \exists e_2 [e = {}^s(e_1 \sqcup e_2) \wedge agent'(y)(e_1) \wedge patient'(x)(e_1) \wedge killing - act'(e_1) \wedge theme'(x)(e_2) \wedge BECOME(dead)(x)(e_2) \wedge \tau(e_1) \preceq \tau(e_2) \wedge CAUS(e_1)(e_2)]$$

$$(256) \quad \llbracket xiu - hao \rrbracket = \lambda x \lambda y \lambda e \exists e_1 \exists e_2 [e = {}^s(e_1 \sqcup e_2) \wedge agent'(y)(e_1) \wedge patient'(x)(e_1) \wedge fixing - act'(e_1) \wedge theme'(x)(e_2) \wedge BECOME(good)(x)(e_2) \wedge \tau(e_1) \preceq \tau(e_2) \wedge CAUS(e_1)(e_2)]$$

We see that through compounding *da* with *sui*, the generated meaning is quite close to its English counterpart ‘break’. And therefore, whenever a resultative verbal compound accomplishment predicate is used in the perfective in Chinese, no non-culminated reading is present. The RVC constructions in Mandarin are semantically true accomplishment predicates that entail event culmination.

Therefore, ultimately one of the reasons why Mandarin seems to allow non-culminating accomplishments is that for the MMFP predicates, Mandarin almost exclusively lexicalizes manner verbs as the bare transitives and result verbs as the bare intransitives. The bare transitives such as *sha* ‘kill’ and *xiu(li)* ‘fix’ are actually manner verbs that do not semantically encode the change-of-state process of the patient or the theme. In contrast, English lexicalizes its MMFP transitive predicates as accomplishment event descriptions that package both the agent/causer-activity subevent and the change-of-state subevent of the theme as a single complex event, so that whenever the English transitive result verb is used in the

perfective, it entails that the event has culminated. Many previous studies of the English accomplishments analyze the transitive subject as the causer of the change-of-state event rather than an agent. For the ease of comparison, one way to represent Dowty’s (1979) style of analyses of the English transitive accomplishment is shown in (257).

- (257) a. $[[kill]] = \lambda x \lambda y \lambda e [causer'(y)(e) \wedge theme'(y)(e) \wedge BECOME(dead)(x)(e)]$
 b. $[[fix]] = \lambda x \lambda y \lambda e [causer'(y)(e) \wedge theme'(y)(e) \wedge BECOME(fixed)(x)(e)]$

The contrast in (258) further illustrates that the transitive MMFP verb subject in Mandarin is confined to an agent and the English transitive MMFP verb subject can be the causer. An impersonal subject for *sha* ‘kill’ is very odd in Mandarin, while it is perfectly fine in English. The reading of (258a) is that pollution causes a lot of fish to die. However, a similar causative use in (258b) is very odd, unless we understand pollution as a personified subject.

- (258) a. Pollution killed a lot of fish.
 b. # wuran sha le henduo yu.
 pollution kill PERF a.lot.of fish.
 Intended ‘Pollution killed a lot of fish.’

5.3.3 *The Resultative Morpheme vs. the Completive Morpheme*

Given my new analysis that the bare transitive MMFP verbs are actually activities that focus on the agent’s action without encoding anything about the change-of-state of the direct object in Chinese, it also predicts that when a completive morpheme is added to this bare transitive verb, the reading only entails that the agent’s activity is ended, but the direct object has not necessarily undergone any visible change.

As shown in (259), it is fine to assert that the agent finished the action and that the result state is not obtained. Because the completive morpheme *wan* ‘finish’ only puts an end to the agent’s activity described by the semantics of the transitive verb. This completion

point on the agent’s action that may or may not coincide with the culmination point when the car’s status of being fixed ensues.

- (259) gongren xiu-wan qiche, danshi mei xiu-hao.
 worker fix-finish car, but not.have fix-good.
 Literally ‘The worker finished fixing the car, but the car is not fixed.’

I suggest that the completive morpheme can be semantically understood to be a MAX operator as proposed in Koenig and Muansuwan (2000) that picks out the largest event beyond which there is no other larger event. This models well the meaning that the agent has finished doing something because from the agent’s perspective there is nothing more that can be done. In other words, the *wan* ‘finish’ morpheme picks out the largest possible event of the agent’s action.

$$(260) \quad \text{Max}(e, \phi) \leftrightarrow (\phi(e) \wedge (\neg \exists e'' \in U_E[e \sqsubset e'' \wedge \phi(e'')]))$$

Koenig and Muansuwan (2000, 169)

So the sentence in Mandarin ‘the worker finished fixing the car’ with *fix-good* ‘xiu-hao’ means something like in (261) that describes the maximal eventuality of the agent’s fixing action without any information about whether patient is changed at all during the process.

$$(261) \quad \lambda e \iota x \iota y [car'(y) \wedge worker'(x) \wedge fixing-act'(e) \wedge patient'(y)(e) \wedge agent'(x)(e) \wedge (\neg \exists e'' \in U_E[e \sqsubset e'' \wedge \iota x \iota y [car'(y) \wedge worker'(x) \wedge fixing-act'(e'')]])]$$

5.4 Comparison with Previous Analyses

Compared with some previous analyses for non-culminating accomplishments (Koenig and Muansuwan, 2000; Tatevosov and Ivanov, 2009), I argue that my analysis is more fitting for the Mandarin data according to some version of the Monotonicity Hypothesis (MH) that prefers that the complexity of the semantics of an expression be in tandem with the complexity of the morphological expressions. My current analysis builds the meaning of an RVC accomplishment predicate from the meaning of the bare transitive verb and the

meaning of the resultative morpheme, so that the semantics of the RVC accomplishment predicate is more complex than the semantics of the bare transitive. However, for many previous analyses of non-culminating accomplishments in other languages, the analysis is the other way round because they assume Dowty's semantics for accomplishment verbs as the starting point.

According to the Monotonicity Hypothesis (Koontz-Garboden, 2007, 2008, 2009, 2011), in semantic composition, no semantic information previously composed together can be deleted later in the derivation. Some version of the Monotonicity Hypothesis also prefers that semantic derivations mirror morphological derivations in a sense.

(262) **The Monotonicity Hypothesis (MH)**

Word formation operations do not remove operators from lexical semantic representations (= conceptual structures).

(Koontz-Garboden, 2008, 3)

For many previous studies, the Monotonicity Hypothesis is probably the biggest challenge, while these previous analyses try to formulate the semantics for the accomplishment verb stem without the expected culminating reading by assuming Dowty's semantics as the basis (cf. Koontz-Garboden, 2009, 2011). In other words, coming from the canonical verbal aspectual theory by Dowty (1979) that claims that accomplishment verbs encode the culmination point within the semantics of the verb itself, how can one remove this culmination point so that a non-culminating reading is possible?

Many previous analyses run into problems when they assume Dowty's (1979) semantics as the basis and try to remove the culmination point in the actual world of evaluation from the accomplishment semantics through a somewhat modal analysis, such as in Koenig and Muansuwan (2000). Although such analyses do not explicitly violate this Monotonicity Hypothesis, it still seems somewhat stipulative to build the semantics of an activity verb from the semantics of an accomplishment verb, because the semantics of the activity should be

simpler than the accomplishment for a language whose bare transitive verbs are the activity verbs upon which the compound accomplishment predicates are built.

In the next two subsections, I briefly compare my current analysis with two previous analyses: Koenig and Muansuwan (2000) representative of a kind of partitive modal analysis and Tatevosov and Ivanov (2009).

5.4.1 *Comparison with Koenig and Muansuwan (2000)*

For similar non-culminating accomplishment phenomena in Thai, Koenig and Muansuwan (2000) claim that the verbal stem of Thai accomplishment verbs are actually activities that all carry an *Impfv* operator. As shown in (263), they propose that a verb stem α in Thai has a imperfective operator that derives the activity meaning from the corresponding accomplishment by projecting the the culmination into the inertia worlds.

- (263) a. $\alpha = \text{impfv}(ev, \phi)$
- b. An eventuality ev and an event description ϕ satisfy condition α if and only if there is an e' which (non-necessarily properly) includes ev and satisfies ϕ in all ‘inertia’ worlds — i.e. in all worlds compatible with what it would mean to complete ev without being interrupted.

Koenig and Muansuwan (2000, 163)

Unfortunately, this analysis is not sufficient for several reasons: First, morphologically, the corresponding accomplishment predicate is a more complex form with the verb stem plus a suffix, and it has a simpler semantics than the morphologically-simpler activity verb stem, which is not ideal according to the Monotonicity Principle (cf. Koontz-Garboden, 2009). If we apply Koenig and Muansuwan’s analysis to Chinese directly, these semantics would look something like the following in (264), where the bare transitive ends up being semantically more complex than its RVC counterpart.

- (264) a. $[[xiu - hao]] = \lambda x \lambda y \lambda e [causer'(y)(e) \wedge \text{BECOME}(fixed)(x)(e)]$

- b. $\llbracket xiu \rrbracket = Impfv(\llbracket xiu - hao \rrbracket)$

Second, even placing the culmination point in the inertia world, the culmination point is not truly deleted in the semantics, but only delayed into the inertia world. But as we have discussed previously in the chapter, the resultative morpheme can express a totally opposite result to what is expected. For example, we can use *xiu-huai* ‘fix-bad’ to express that an agent performed a fixing activity on an object that ultimately leads to the object being damaged. If Koenig and Muansuwan’s (2000) analysis is applied to Chinese, it would have a hard time explaining why the object was damaged although in the inertia world it is supposedly fixed. My analysis, in comparison, does not commit the semantics of the bare transitive to any particular result, so that the resultative morpheme can actually be quite flexible.

Furthermore, Koenig and Muansuwan’s analysis does not explain satisfyingly why languages like Thai and Chinese would package the semantics of an inherently accomplishment-type event with an intended culmination point as an activity with an imperfective operator. In comparison, my analysis explains the activity meaning of the bare transitives in Mandarin as a general lexical-semantic pattern that Mandarin tends to lexicalize manner verbs in the transitives and result verbs in the intransitives, because the transitive verbs in Mandarin focus on agent’s action rather than the patient or the theme’s change.

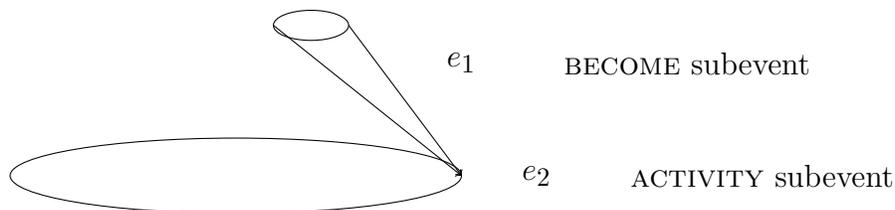
5.4.2 *Comparison with Tatevosov and Ivanov (2009)*

Unlike Koenig and Muansuwan (2000), Tatevosov and Ivanov (2009) do not encode a modal operator on the semantics of the accomplishment verb stem, but nevertheless Tatevosov and Ivanov (2009) still analyze accomplishment verbs as necessarily having a culmination point and the non-culminating reading comes from the quasi-imperfective meaning of the perfective operator. For Tatevosov and Ivanov (2009), predicates such as ‘break’ and ‘fix’ that allow for failed-attempt readings are “mapping to minimal final part” (MMFP) predicates, because the change-of-state sub-event maps to the minimal final part of the activity subevent as

illustrated in Figure 5.2. And the failed-attempt reading can arise for MMFP verbs, because the event can stop before the final point is reached.

For example, according to Tatevosov and Ivanov (2009), *wake up* is an MMFP verb whose change-of-state subevent is mapped to the final part of the agent’s activity as in (265). As it composes with the perfective as in (266), a failed-attempt can be obtained because the event can stop before it reaches the change-of-state subevent given the semantics of the perfective marker in (266) that the topic time is a subpart of the run time of the event.

Figure 5.2: MMFP Representation



Tatevosov and Ivanov (2009, 107)

$$(265) \quad \llbracket \text{wake up} \rrbracket = \lambda y \lambda e \exists e_1 \exists e_2 [e = S(e_1 \cup e_2) \wedge \text{ACTIVITY}_{\langle \text{wake.up} \rangle}(e_1) \wedge \text{agent}(e_1) = x \wedge \text{theme}(e_1) = y \wedge \text{BECOME}_{\langle \text{awake} \rangle}(e_2) \wedge \text{arg}(e_2) = \text{theme}(e_1) \wedge \text{MMFP}(e_1, e_2, C(e_2))]$$

Tatevosov and Ivanov (2009, 107)

$$(266) \quad \llbracket \text{PFV} \rrbracket = \lambda P \lambda t \exists e [t \supset \tau(e) \wedge P(e)]$$

Tatevosov and Ivanov (2009, 110)

The non-culminating reading arises essentially by the somewhat incomplete meaning of the perfective in (266). However, this analysis does not explain the patterns we observe for the Chinese data either. For one thing, not all the Mandarin MMFP counterparts can have non-culminated reading, because the non-culminated reading is only available for the bare transitive verbs but not for the resultative compound verbs. If we assume that the MMFP verbs cross-linguistically share more or less the same accomplishment event structure and the perfective marker accounts for the non-culminated reading, then it does not explain why the bare versus compound morphological distinctions should make a difference in their

culmination entailments. Second, Tatevosov and Ivanov’s analysis of the semantics of the accomplishment verbs also includes the final culmination point and has to rely on the quasi-imperfective semantics of the perfective marker they propose to derive the non-culminating readings. In Chapter 4, I have argued exactly against this type of analysis that the perfective cannot be the source of non-culminating readings in Mandarin.

5.5 Pragmatics Component

Now if we are convinced that verbs such as ‘fix’ and ‘kill’ are lexicalized as manner verbs in Mandarin, we are left to explain why out of the blue the sentences with these bare verbs in the perfective sound like they assert that the event has culminated. Most hearers upon hearing these sentences would automatically assume that the events have culminated. If the semantics of these bare transitive verbs do not encode the result, then why would the hearers almost always assume there to be one?

Although most previous studies have mainly focused on the semantics and seldom discussed at the length the pragmatics of how the default culminated readings are derived, some of these studies have offered valuable insights on how to pragmatically derive this default culminating reading, such as the study by Bar-El et al. (2004). In Bar-El et al. (2004), based on their account that the result point is removed by the transitive control morpheme to the inertia world, they explain that listeners derive the default culminating reading by assuming that the event has continued the way the inertia world predicts. However, the same explanation cannot be directly applied to my analysis, since crucially different from these previous accounts, I claim that the culmination is not part of the meaning of the transitive verb at all in Mandarin.

I would like to suggest that the end result is part of the conventional meaning of these transitive verbs. In English, as discussed in Hovav and Levin (2010), certain manner verbs such as different manners of cleaning ‘wash’ and ‘sweep’ are strongly associated with the state of ‘clean’, therefore when uttered on their own in the perfective as in (267), hearers

usually assume that the floor is clean or the dishes are clean. The ‘clean’ state is part of the conventional meaning for these verbs. Analogously, *sha* ‘kill’ and *xiu* ‘fix’ are also strongly associated with the state of ‘dead’ and the state of ‘functional’, and therefore similarly upon hearing the perfective sentences with the bare transitive verbs of ‘kill’ and ‘fix’, hearers assume the direct object has also reached these states.

- (267) a. I swept the floor.
b. I washed the dishes.

Hearers assume that the conventionally associated result states are obtained because the bare transitive forms in Mandarin are the morphologically unmarked forms. Upon hearing these unmarked forms, given the hearers’ world knowledge about how these activities are often associated with certain result states, they will assume that the result states are obtained unless they are explicitly negated.

5.6 Conclusion

In this chapter, I have discussed the Chinese equivalents of the Dowty-style English inherent accomplishments that have an instantaneous change-of-state endpoint by virtue of the semantics of the verb stem. These verbs include examples such as ‘kill’, ‘fix’ and ‘break’ and largely correspond to the Mapping to Minimal Final Part (MMFP) verbs in the study by Tatevosov and Ivanov (2009). For this class of verbs in Mandarin, they are either translated as bare verbs such as *sha* ‘kill’ and *xiu* ‘fix’, or resultative verbal compounds such as *da-sui* literally ‘hit-break/broken’. When used in the perfective, the bare transitive verbs do not entail culmination but the resultative verbal compounds do.

I have proposed that these Mandarin MMFP bare verbs give rise to non-culminating reading because Mandarin lexicalizes these verbs as manner verbs in the transitives and leaves to the intransitives the task of encoding change-of-state subevent. While the agent’s action is encoded in the transitive, the theme’s change is encoded in the intransitive. In contrast, the

corresponding English transitive verbs are lexicalized as result verbs instead, which encode both the agent's action and the theme's change. Therefore, simply put, unlike English, Mandarin does not have accomplishment verb stem but rather has to compositionally derive its Dowty-style accomplishment predicate by compounding a transitive activity verb with an intransitive change-of-state achievement verb. Naturally, the bare transitive verbs in Mandarin can give rise to the non-culminating reading simply because the culmination point is not part of the semantics of the bare transitive verb in Mandarin.

Although previous analyses preponderantly assume the semantics of the accomplishments to include the result state by default and add additional modal operators to remove the culmination point in the actual world so as to derive the non-culminating readings, I argue that we could instead simply assume the basic semantics of the bare transitive as agent's action packaged as a manner verb as the starting point for certain languages, if morphologically the bare verb form is shown to be an activity predicate upon which a verbal compound accomplishment predicate can be built.

Building on the discussion of transitivity and lexical semantics of verbs, in the following chapters, I investigate some other factors that also may contribute to the non-culminating readings. In Chapter 6, I discuss the semantics of degree achievements in Mandarin, another class of potential accomplishment verbs that may have non-culminating readings by virtue of the lexical semantics of the verb stem. The degree achievements correspond largely to the class of INCR (Incremental Change) verbs in Tatevosov and Ivanov (2009). In the next chapter, we see that transitivity and manner/result complementarity also play a role like in this chapter, but in addition the degree semantics of adjectival cores of the degree achievements also influence whether a non-culminating reading may arise.

CHAPTER 6

THE SEMANTICS OF DEGREE ACHIEVEMENTS IN MANDARIN

6.1 Introduction

In the previous chapter, I have discussed the Mandarin equivalents to the Dowty-style inherent accomplishment predicates whose change-of-state subevent happens instantaneously and is encoded in the semantics in the verb stem. In this chapter, I discuss the Chinese counterparts of degree achievements and their related transitives, where the change-of-state process is gradual. Degree achievements (DA), such as ‘lengthen’, ‘cool’, ‘warm’, ‘sink’ in English, are an interesting kind of predicates that does not seem to fit well into Vendler’s (1957) four classes, because they show variable telicity (Dowty, 1979; Kennedy and Levin, 2008). Consider the following examples of the English verb ‘cool’ in (293). This verb ‘cool’ is compatible with both the *for*-phrase and the *in*-phrase, showing that it is ambiguous in telicity. In (293a), the verb ‘cool’ has an atelic reading in the sense that for ten minutes the soup has cooled gradually but has not reached a desired degree of coolness. In (293b), ‘cool’ has a telic reading where the soup reaches a contextually-dependent desired degree of coolness, namely that the soup can be considered cool at the end in ten minutes.

- (268) a. The soup cooled for ten minutes. TELIC
b. The soup cooled in ten minutes. ATELIC

Kennedy and Levin (2008, 156)

Degree achievements are relevant for our discussion of the non-culminating accomplishments, because sometimes it seems that the state expressed by the adjectival root is not reached. Although as shown in (269), for some of these degree achievement predicates such as ‘darken’, ‘dry’ and ‘empty’, the default reading is telic and culminating, there are also examples such as in (270), where the state described by the adjective root is not obtained.

According to Kennedy and Levin (2008), whether the degree achievement predicate has a telic or atelic reading, or a culminating or non-culminating reading, depends both on the properties of the scale associated with the adjectival core of the degree achievement and pragmatic principles (cf. Kennedy and Levin, 2008).

- (269) a. The sky darkened (?but it didn't become dark).
 b. The shirt dried (??but it didn't become dry).
 c. The sink emptied (??but it didn't become empty).

Kennedy and Levin (2008, 159)

- (270) a. The gap between the boats widened, but it didn't become wide.
 b. The recession deepened, but it didn't become deep.

Kennedy and Levin (2008, 160)

Just like in English, Mandarin intransitive degree achievements also show a similar pattern of variable telicity. For example, as shown in (271), the de-verbal degree achievement *chen* 'sink' can be used both telically with an *in*-phrase equivalent and atelically with a *for*-phrase equivalent.

- (271) a. chuan san xiaoshi nei chen le.
 ship three hour in sink PERF.
 'The ship sank in three hours.'
 b. chuan chen le san xiaoshi, mei you wanquan chen xia-qu.
 ship sink PERF three hour, not have complete sink down-go.
 'The ship sank for three hours, but has not completely sunk'.

However, different from English, the de-adjectival degree achievements in Mandarin are generally not compatible with the *for*-phrase equivalent with the dynamic change reading as in (272). The de-adjectival degree achievements only have a stative reading with the *for*-phrase equivalent duration phrases. This fact has led some previous studies of Mandarin to conclude that all Mandarin degree achievements are telic (cf. Lin, 2004a). In this chapter, I argue against this telic analysis by showing that the de-adjectival degree achievements

also exhibit almost identical patterns of variable telicity to their English counterparts with respect to the *in*-phrase test as illustrated by the contrast in (273).

- (272) yifu gan le san xiaoshi.
 clothes dry PERF three hour.
 ‘The clothes has been dry/was dry for three hours’
 Not ‘the clothes dried/ has been drying for three hours’.

- (273) a. yifu san xiaoshi nei gan le.
 clothes three hour in dry PERF
 ‘The clothes dried in three hours’
 b. # he-dao san nian nei kuan le.
 river-course three year in wide PERF.
 ‘The river course widened in three years’

Another interesting difference between English and Mandarin is that the bare transitive degree achievements in Mandarin can have both the failed-attempt and the partial-success reading (cf. Tatevosov and Ivanov, 2009). As shown in (274), in Mandarin it is perfectly fine to assert that I heated the water but the water did not change in temperature at all or that it was not hot. This behavior of the bare transitives is the same as described in the previous chapter. In English, however, at least the failed-attempt reading seems a little harder to get than in Mandarin out of the blue without proper contexts.

- (274) a. wo jia-re le shui, dan shui-wen wanquan mei sheng-gao.
 I add-hot PERF water, but water-temperature complete not rise-high.
 ‘I heated the water, but the water temperature did not rise at all.’
 Failed Attempt
 b. wo jia-re le shui, dan shui hai shi wen-wen de bu zenme re.
 I add-hot PERF water, but water still be warm-warm MOD not quite hot.
 ‘I heated the water, but the water is still (just) warm and not quite hot.’
 Partial Success

Therefore, in this chapter, I investigate the factors that influence the telicity patterns of Mandarin degree achievements and the various possible non-culminating readings. I find

that both transitivity and the degree semantics of the Mandarin degree achievements play an important role in determining whether a non-culminating reading is possible. More specifically, bare transitive degree achievements do not entail event culmination or any minimal change of the object at all, while intransitive degree achievements entail at least some minimal change in the object. For the intransitives, the structure of the associated scale of the adjectival core of the de-adjectival degree achievements or the inherent path scale of the de-verbal achievements influences whether it has a telic culminating reading by default (cf. Kennedy and Levin, 2008). Following Kennedy and Levin (2008), I propose that the de-verbal degree achievements are just like their English counterparts that denote measure of change functions. But for the de-adjectival degree achievements, I propose that they are inchoative statives that denotes a state that has some difference in value in some property from a previous state.

This chapter is organized as follows: in §6.2, I first describe how the stative adjective, the intransitive and transitive are derived morphologically in Mandarin. Based on these patterns I distinguish the de-adjectival degree achievements and the de-verbal degree achievements in Mandarin. Then for the rest of §6.2, I first show that bare transitive verbs do not entail culmination and can have either a failed-attempt or a partial-success reading, and then I show that Mandarin degree achievement exhibit same type of variable telicity with respect to the Mandarin version of the *in*-phrase test, even though the de-adjectival degree achievements are generally incompatible with the *for*-phrase equivalent in Mandarin. Then in §6.3, I review a previous analysis of Mandarin degree achievements by Lin (2004a), where I argue against a telic achievement analysis of Mandarin degree achievements, and then present Kennedy and Levin's (2008) analysis on English degree achievements to show how the variable telicity may be accounted for. Then in §6.4, I adapt and modify Kennedy and Levin's (2008) analysis to account for the Mandarin degree achievements. I conclude this chapter in §6.5.

6.2 Data

Degree achievements are first observed in Dowty (1979) and are loosely defined as ‘some cases of verbs which would seem to be achievements on some semantic and syntactic grounds but which nevertheless allow durational adverbs (Dowty, 1979, 88).’ Dowty (1979) gives three examples with the verbs *cool*, *sink* and *age*, which can be divided into two groups: de-adjectival as in *cool* and non-de-adjectival such as *sink* and *age*. Although most of the later studies of degree achievements focus on the de-adjectival group (Hay et al., 1999; Kennedy and Levin, 2008, among others) and probably by far the de-adjectival degree achievements consist the majority of the degree achievements, and yet there are still some cases of non-de-adjectival degree achievements. It also happens that most of the studies focus on the intransitive degree achievements, but in this chapter I also include the discussion of the relevant transitive predicates of the intransitive degree achievements, as transitivity is relevant to our discussion of culmination. In this section, I consider both the de-adjectival and the de-verbal¹ degree achievements in Mandarin. More specifically, I investigate how the state, the transitive and the intransitive are related morphologically, and what telicity and non-culminating reading patterns each type possesses.

Before we move onto the discussion of the different morphological types, it is important to note that the Chinese counterparts to the de-adjectival degree achievement verbs in English are actually morphologically not distinguishable from the positive or the comparative form of the stative adjective. In English, most of these degree achievement verbs are morphologically derived from their adjectival counterpart by adding the suffix *-en*. In Chinese, however, no similar morphological derivation is used. As the following examples show, the same basic form of *gao* ‘tall’ is used in the stative adjective use in (275), the change-of-state use in (276), and the comparative use in (277). As a result of this syncretism, there are cases in the discussions below, where instead of the degree achievement reading, we find the stative

1. I used *de-verbal* to mean the basic meaning of the predicate is a verb, to keep the terminology analogous with *de-adjectival*.

reading of the positive form of the adjective instead.

- (275) Baiyun hen gao.
 Baiyun very tall
 ‘Baiyun is (very) tall.’
- (276) Baiyun gao le.
 Baiyun tall PERF
 ‘Baiyun has become (became) tall.’
- (277) Baiyun bi Yunzi gao.
 Baiyun than Yunzi tall
 ‘Baiyun is taller than Yunzi.’

As mentioned earlier, I distinguish two major types of degree achievements: de-adjectival and de-verbal. For the de-adjectival degree achievement predicates such as *kuan* ‘wide’, *re* ‘hot’, and *gan* ‘dry’, the stative adjective and the intransitive verb share the same form, and the transitive verb is formed by zero-derivation or more naturally by adding a manner verb in front. For the de-verbal degree achievements such as *chen* ‘sink’ and *shao* ‘burn, boil’, the basic form seems to be the verb rather than the stative adjective itself.

Table 6.1: Chinese Degree Achievement Morphology

	State	Intransitive	Transitive
<i>kuan</i> ‘wide’	<i>kuan</i>	<i>kuan</i>	<i>jia-kuan</i> ‘add-wide’
<i>re</i> ‘hot’	<i>re</i>	<i>re</i>	<i>(jia)-re</i> ‘add-hot’
<i>gan</i> ‘dry’	<i>gan</i>	<i>gan</i>	<i>(hong)-gan</i> ‘tumble-dry’
<i>chen</i> ‘sink’	<i>chen-le</i>	<i>chen</i>	<i>chen</i>
<i>shao</i> ‘burn, boil’	<i>(shao)-kai-le</i>	<i>shao/kai</i>	<i>shao</i>

To distinguish the adjectival ones and the verbal ones, one can use the compatibility test with the Mandarin modifier-morpheme *de* (cf. Paul, 2005). To distinguish the intransitive and the transitive de-verbal degree achievements, one can look at the verb’s possible position in an RVC. In the case of ‘sink’, the basic form seems to be the intransitive, and in the case of ‘burn’ the basic form seems to be the transitive, because only *chen* ‘sink’ can occur as the second element in an RVC construction, the position of which is restricted to the intransitive.

In the rest of this section, we examine these different patterns more closely case by case, and run some tests to differentiate the different types.

The de-adjectival degree achievements are probably by far the most common in Mandarin. As shown in (278a), the stative adjective is directly compatible with the modifier morpheme *de* without the perfective marker in (278a) to modify a noun (cf. Paul, 2005), so it is clear that it is not a kind of de-verbal adjective like the past participle in English such as ‘sunk’. The intransitive is of the same form as the stative adjective as shown in (278b), but the transitive as shown in (278c), unlike in English, usually requires a manner verb in front of the stative adjective.

- (278) a. gan de yifu
dry MOD clothes
‘dry clothes’
- b. yifu gan le.
clothes dry PERF
‘Clothes are dried.’
- c. mama (shai)?-gan le yifu
mother (bask)-dry PERF clothes
‘Mom dried the clothes by exposing them to the sunlight.’

Compared with the de-adjectival type, the de-verbal type is probably less common. The first subtype of the de-verbal type includes intransitive verbs such as *chen* ‘sink’ in (279).

- (279) a. chen *(le) de chuan
sink PERF MOD boat
‘a sunk boat’
- b. chuan chen le.
ship sink PERF
‘The ships sank.’
- c. jundui nong-chen le chuan.
army make-sink PERF ship
‘The army made the ship sink.’

Different from the patterns above for *gan* ‘dry’, the predicate *chen* ‘sink’ cannot modify a noun attributively without the perfective marker *le*, suggesting *chen* is verbal instead of

adjectival. Because *chen* ‘sink’ can appear in the second position in an RVC as in (279), it is intransitive in its base form because only intransitive occur in that position. Although slightly different from the de-adjectival pattern, nevertheless as shown in (279) the transitive predicate is derived similarly by adding a manner verb in front of the change-of-state verb.

The third type of equivalents to degree achievements is the transitive de-verbal degree achievements, the equivalents of transitive verbs such as ‘boil’ or ‘cook’ in English. Crucially, different from the previous type, where the transitive is derived from the intransitive. In this type, one possible intransitive variant, i.e. the surface ergative, is derived from the transitive (cf. Cheng and Huang, 1994; Ting, 2006). As shown in (280b) and (280c), the transitive and the intransitive can share the same form *shao*, literally meaning to burn or to boil.

- (280) a. (shao)-kai le de shui
 boil-boiled PERF MOD water
 ‘boiled water’
- b. chushi shao le shui
 chef heat PERF water
 ‘The chef heated some water.’
- c. shui shao le
 water heat PERF
 ‘The water was heated.’
- d. shui kai le
 water boiled PERF
 ‘The water was boiled.’

But the surface-ergative intransitive in (280c) seems to be more accurately considered a middle voice, because it is understood that there is an implicit agent omitted, as the water cannot burn itself (Cheng and Huang, 1994). Different from the pattern in *chen* ‘sink’, as shown in (280a), *shao* cannot be the second word in a resultative verbal compound. In order to express the state of ‘boiled’, the resultative adjective *kai* ‘open, boiled’ must be attached to the end of *shao* ‘burn’. The other intransitive variant is the deep ergative derived from the adjective as in (280d). This pattern is identical to what was presented in the previous chapter.

In summary, in Mandarin most of the equivalents of degree achievements share the same form with the degree adjectives in the intransitive form, and the transitive form are mostly derived by adding a manner verb in front of the adjective.

Having discussed the morphological relations between the stative adjectives, non-causative and causative, in the next subsection, we discuss the relation between transitivity and non-culminating readings for degree achievements.

6.2.1 *Culmination Readings and Transitive-Intransitive Alternations*

Just like in the previous chapter, for the degree achievements equivalents in Mandarin, transitivity also plays an important role in determining whether a non-culminating reading is possible. The bare transitives do not entail culmination, but when the resultative adjective or verb is added, the transitive resultative verbal compounds do entail culmination. For the intransitives, except for the surface-ergative intransitives derived from the transitives, the de-adjectival and the deep ergative intransitives both entail culmination.

Let's first examine non-culminating reading patterns for the transitives and their corresponding RVC compounds. The general pattern is that the bare transitive does not entail culmination, while the resultative verbal compound does entail culmination. This pattern is most obvious for the predicates with a manner verb in the transitive, which does not share the same form as the resultative stative adjective. For example, as shown in (281), unlike the equivalent of the English 'dry', in Mandarin the stative adjective *gan* 'dry' cannot be used as a transitive verb, but instead a manner verb such as *shai* 'bask, expose to the sun' must be used instead in the transitive. And the manner verb *shai* 'bask, expose to the sun' is clearly atelic as it is compatible with the Mandarin *for*-phrase equivalent.

- (281) wo *gan/shai le (san xiaoshi) yifu
 I *dry/bask PERF (three hour) clothes
 'I put the clothes out in the sun (for drying) (for three hours).'

Now compare the contrast in (282), whereas in (282a) the bare transitive *shai* in the perfective does not entail that the clothes has been dried, the verbal compound *shai-gan* in the perfective does indeed entail that the clothes has been dried, when the resultative adjective *gan* is added.

- (282) a. mama shai le yifu, buguo yifu mei gan.
 mom bask PERF clothes, but clothes not dry
 ‘Mom put the clothes out in the sun for drying, but the clothes has not dried.’
- b. # mama shai-gan le yifu, buguo yifu mei gan.
 mom bask-dry PERF clothes, but clothes not dry
 Intended ‘Mom dried the clothes by putting it out in the sun , but the clothes has not dried.’

These patterns suggest that the transitive manner verb *shai* ‘bask, expose in the sun for drying’ that is somewhat equivalent to ‘dry’ does not encode the change of state in its semantics, but rather the resultative adjective or verb subsumes the task of encoding the change of state in the semantics just like in Chapter 5.

While for most of the equivalents of the degree achievements in Mandarin, the transitive is a manner verb that is distinguished from the stative adjective, there are a few cases where the the stative adjective can be directly used transitively as well. One may wonder whether in these cases, the bare transitive would actually entail the culmination of the event, since the stative adjective is used directly transitively instead of a regular related manner verb. Interestingly, it seems that even in these cases, the bare transitive does not entail culmination. Consider the predicate *re* ‘hot’ as one such example in (283).

- (283) a. wo yong weibolu (jia-)re le sheng-fan, danshi wanquan bu re
 I use microwave (add-)hot PERF leftover-rice, but completely not hot.
 ‘I heated the leftover rice, but (it) totally is not hot.’
- b. # wo yong weibolu nong/chao-re le sheng-fan, danshi wanquan
 I use microwave make/stir.fry-hot PERF leftover-rice, but completely
 bu re
 not hot.
 Intended ‘I made/stir-fried the leftover rice hot, but (it) totally is not hot.’

As shown in (283a), *re* ‘hot’ by itself can be directly used transitively, but the perfective sentence does not entail that the leftover rice is completely heated or hot at all. Alternatively, the verb *jia* ‘add’ can be added to the front of *re* derivationally to produce a predicate ‘heat’ and this predicate in the perfective also does not entail culmination, despite that the predicate superficially looks like a resultative verbal compound. Therefore, even though sharing the same form as the stative adjective, these bare transitives (monosyllabic or bisyllabic) still do not entail culmination. This suggests that the transitive *re* ‘hot’ may be re-interpreted as a manner verb rather than morpho-semantically directly derived from the change-of-state intransitive.

Furthermore, the real resultative verbal compound as shown in (283b) does entail culmination, because by adding a generic action verb *nong* ‘make, act’ or a more concrete manner verb *cha* ‘stir-fry’ in front of *re* ‘hot’, the resultative verbal compound in the perfective entails that the leftover rice has become hot. Therefore, regardless of whether it shares the same form as the stative adjective or not, the bare transitive predicate does not entail the culmination of an event, whereas the resultative verbal compound does.

This pattern also holds for the de-verbal degree achievement *chen* ‘sink’. As shown in (284a), *chen* can be used directly transitively as well, but it does not necessarily entail that the boat is completely sunk. On the contrary, the resultative verbal compound with *chen* ‘sink’ as the resultative morpheme does entail that the ship is totally sunk.

- (284) a. shibing-men chen le chuan, danshi mei wanquan chen-xiaqu.
 soldier-PL sink PERF ship, but not completely sink-down
 ‘The soldiers sank the ship, but the ship is not completely sunk’
- b. # shibing-men nong/ji-chen le chuan, danshi mei wanquan
 soldier-PL make/shoot-sink PERF ship, but not completely
 chen-xiaqu.
 sink-down
 Intended: ‘The soldiers made the ship sink (by shooting), but the ship is not completely sunk.’

It is hopefully clear by now that just like the patterns in Chapter 5, for the degree achievements the bare transitive does not entail the event culmination, but the resultative verbal compound does. The non-culminating reading for the bare transitive can be either a failed-attempt reading or a partial-success reading (cf. Tatevosov and Ivanov, 2009), although the partial-success reading seems to be more accessible.

- (285) Mama zhu le mi, dan mi yi-dian dou mei shu.
 mother cook PERF raw.rice, but raw.rice one-bit *exhaust.* not cooked.
 ‘Mom cooked the (raw) rice but the (raw) rice did not become cooked a bit.’

Failed Attempt

- (286) Mama zhu le mi, dan mi mei wanquan zhu-shu.
 mother cook PERF raw.rice, but raw.rice not complete cook-cooked
 ‘Mom cooked the (raw) rice, but the raw.rice did no become completely cooked.’

Partial Success

Let’s then turn to our discussions of the intransitives. In Mandarin, all the intransitive degree achievements entail that at least some change has taken place. But not all these degree achievements entail that the state denoted by the adjective has been obtained, the pattern of which closely resembles what is described in Kennedy and Levin (2008) for English degree achievements. For the predicates that are associated with an open-scale relative gradable adjectives such as ‘tall’ and ‘wide’, it is not entailed that the state of ‘being tall’ or ‘being wide’ is obtained as in (287) and (288).

- (287) he-dao kuan le, danshi he-dao yiran bu kuan.
 river-course wide PERF, but river-course still not wide
 ‘The river course widened, but the river course is still not wide’

- (288) Xiaoming gao le, danshi yiran ting ai.
 Xiaoming tall PERF, but still quite short
 ‘Xiaoming has grown taller, but he is still quite short.’

In contrast, for the absolute gradable adjectives such as *gan* ‘dry’ and *ganjing* ‘clean’ as in (289) and (290), it is definitely intuitively quite odd to deny that the state of being ‘dry’ or ‘clean’ has been obtained when these predicates are used in the perfective intransitively.

- (289) # yifu gan le, danshi yifu yiran bu gan.
 clothes dry PERF, but clothes still not dry
 Intended ‘The clothes dried but is still not dry’
- (290) # diban ganjing le, danshi hai shi hen zang.
 floor clean PERF, but still be very dirty
 Intended ‘The floor has become clean, but is still very dirty.’

Translating these patterns in terms of non-culminating accomplishments, one could say that the intransitives derived from a relative gradable adjectives allow a partial-success kind of non-culminating reading (cf. Tatevosov and Ivanov, 2009), if we define the culmination for degree achievements as reaching the state denoted by the adjective core. In contrast, the absolute gradable adjectives do not allow non-culminating reading out of the blue.

According to Kennedy and Levin (2008), absolute gradable adjectives usually do not have the non-culminating reading because of a pragmatic principle called Interpretive Economy principle. Because the absolute gradable adjectives are conventionally associated with a fixed standard, i.e. the minimal point or the maximal point of the scale, due to the Interpretive Economy principle, the contextually-determined non-maximal/minimal standard is only available as a last resort and therefore the default reading for these degree achievements is a culminating reading where the fixed standard associated with the maximal or the minimal point of the scale for the relevant absolute gradable adjective is reached.

(291) *Interpretive Economy*

Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions.

Kennedy (2007, 36)

Different from the transitive degree achievements that can have either a partial-success reading or a failed-attempt reading, the intransitives derived from relative gradable adjectives can only have a partial-success reading. In other words, the intransitive degree achievements must entail that at least some degree of change has taken place. For example, as shown in (292a), it is contradictory to deny that any change has taken place when the intransitive

degree achievement is used in the perfective, but it is fine if the state denoted by the adjective is not reached.

- (292) a. # he-dao kuan le, dan yi dian dou mei bian kuan.
 river-course wide PERF, but one bit EXHAUST. not become wide.
 Intended ‘The river course widened but did not become wider even for a bit’
 Failed Attempt
- b. he-dao kuan le, dan yiran bu kuan.
 river-course wide PERF, but still not wide
 ‘The river course widened but is still not wide.’ Partial Success

To summarize, Mandarin degree achievements also can have the so-called non-culminating readings, and these readings either result from the transitivity or the degree semantics. Just like the bare transitive verbs such as ‘fix’ and ‘kill’ in the previous chapters, the bare transitive degree achievements are also basically manner verbs that do not encode the change of the direct object in its semantics, and therefore can have both failed-attempt and partial-success readings. In contrast with the transitives, the intransitive degree achievements only allow partial-success non-culminating reading but not failed-attempt non-culminating reading. Therefore, while the failed-attempt reading can only arise with the transitive degree achievements, the partial-success reading can result from the transitivity factor or the lack of an end point for degree achievements with a relative adjective semantic core.

6.2.2 Variable Telicity in the Intransitives

In Kennedy and Levin (2008), English degree achievements are observed to have variable telicity. As shown in (293), the English verb ‘cool’ can describe both telic and atelic events because it is compatible with both an *in*-phrase and a *for*-phrase, although there are degree achievements such as ‘widen’ in (294) that only have atelic interpretations.

- (293) a. The soup cooled in 10 minutes (Telic)
 b. The soup cooled for 10 minutes (Atelic)

(294) The gap between the boats widened for/??in a few minutes

Kennedy and Levin (2008, 160)

However, unlike their English counterparts, the de-adjectival degree achievements in Chinese are generally not compatible with the *for*-phrase equivalent in Mandarin with the intended degree achievement meaning. Instead, the predicate has a stative reading and the *for*-phrase equivalent measures the duration of the state rather than the change-of-state process preceding the state. For example, although as shown earlier in this chapter, stative adjectives such as *kuan* ‘wide’ and *gan* ‘dry’ in the perfective can have a change-of-state reading otherwise, in (295) with the duration phrase sentence-finally they are interpreted as a stative predicates instead.

(295) he-dao kuan le san nian.
river-course wide PERF three year.
Intended: ‘The river course widened for three years.’

Actual Reading: ‘The river course was wide for three years.’

(296) yifu gan le yi xiaoshi
clothe dry PERF one hour
Intended ‘The clothes was drying for one hour.’

Actual Reading ‘The clothes has been/was dry for one hour.’

There are some apparent exceptions where superficially it seems that the degree achievement reading can co-occur with the duration phrase. Consider the example of *re* ‘hot’ below in (297), both the reading that the water was hot or the reading that the water was heated for five minutes are acceptable.

(297) shui re le wu fenzhong.
water hot PERF five minute
‘The water was hot for five minutes’ or

‘The water was heated for five minutes.’

Given that most other stative predicates only have the stative reading with the post-sentential duration phrase, it is a little surprising that *re* ‘hot’ can be interpreted somewhat

as a degree achievement with the *for*-phrase equivalent. However, I believe this example does not prove the observation above wrong, because as previously discussed *re* ‘hot’ can be directly used transitively. In other words, this degree achievement reading is actually derived from the middle-voice use of *re* and should be better interpreted as an implicit agent’s action of heating the water rather than the theme’s change, hence the translation ‘was heated’ rather than ‘becoming hotter’. As a piece of evidence, in (298), the word ‘self’ cannot be added to the sentence in (297), indicating that the heating cannot be internally caused but must be externally caused by an agent.

- (298) # shui ziji re le wu fenzhong.
 water self hot PERF five minute
 ‘The water is heating up on its own for five minutes.’

Because the degree achievement readings are not compatible with the *for*-phrase equivalent in Mandarin, some previous studies have taken this as a piece of evidence that degree achievements are all telic in Mandarin (cf. Lin, 2004a). However, I argue that this is not a sufficient piece of evidence for the following reasons: First, unlike in English, as discussed in Chapter 3, most accomplishment types of predicates in Mandarin are only marginally acceptable with the post-verbal *for*-phrase equivalent in Mandarin and slightly more acceptable in verb reduplication *for*-phrase equivalent in Mandarin.

- (299) a. * wo hua le ban xiaoshi yi fu hua.
 I draw PERF half hour one CL picture
 Intended ‘I drew a picture for an hour.’
 b. wo hua yi fu hua hua le ban xiaoshi.
 I draw one CL picture draw PERF half hour
 ‘I drew a picture for an hour.’
- (300) a. * wo ca-ganjing le yi xiaoshi zhuozi.
 I wipe-clean PERF one hour table
 Intended: ‘I wiped the table clean for an hour.’
 b. ? wo ca-ganjing zhuozi ca le yi xiaoshi
 I wipe-clean table wipe PERF one hour
 ‘I wiped the table clean for an hour.’

Second, although the degree achievement reading is not compatible with the *for*-phrase equivalent, the stative reading is still available and felicitous with the *for*-phrase equivalent. In other words, the generalization that Mandarin degree achievements are telic and incompatible with the *for*-phrase is not a very accurate generalization. There might be other reasons why the dynamic degree achievement type of reading is not compatible with the *for*-phrase in Mandarin and the incompatibility may perhaps not be due to the telicity of the predicate. If we believe that the stative use and the change-of-state use can be both derived from the same semantic representation, then the predicate itself can be atelic but just not with the intended dynamic degree-achievement reading. This is exactly the position I take in my analysis in §6.4: I basically propose that the de-adjectival degree achievements in Mandarin have an inchoative stative semantics (cf. Marín and McNally, 2005), that describes an inchoative state that has some difference from a previous state in a property.

Third, without the measure phrase for difference, not all of the degree achievements in Mandarin can be used together with the the *in*-phrase equivalent in Mandarin. Just like its English counterpart (cf. Kennedy and Levin, 2008), *kuan* ‘wide’ cannot be used felicitously with the *in*-phrase on its own, but predicates such as *re* ‘hot’ and *gan* ‘dry’ can. It is much harder for predicates without a conventional standard to be felicitously used in the *in*-phrase equivalent in Mandarin.

- (301) ?? he-dao san-nian nei kuan le.
 river-course three-year in wide PERF
 ‘The river course widened in three years.’
- (302) shui wu fenzhong nei re le.
 water five minute in hot PERF
 ‘The water became hot in five minutes.’
- (303) yifu liang xiaoshi nei gan le.
 clothes two hour in dry PERF
 ‘The clothes dried up in two hours.’

Although it is very hard to get the telic reading for *kuan* ‘wide’ on its own, it becomes felicitous once a differential measure phrase is supplemented to specify the degree change.

With the differential measure phrase, all of these degree achievements are telic. This pattern closely resembles the English pattern reported by Kennedy and Levin (2008).

- (304) he-dao san-nian nei kuan le shi mi
river-course three-year in wide PERF ten meter
'The river course widened 10 meters in three years.'

In summary, although the Mandarin de-adjectival degree achievements are not compatible with the *for*-phrase equivalent with the degree achievement reading, they nevertheless show a very similar pattern of variable telicity to their English counterparts. When the *for*-phrase equivalent is used with the degree achievement predicate, a stative reading arises. Therefore, there are good reasons to believe that degree achievements in Mandarin are not inherently telic as some previous studies have claimed (cf. Lin, 2004a).

Rather, the de-adjectival degree achievements closely resemble the inchoative statives we have discussed in Chapter 4, because the default reading for the predicate is stative and atelic, but under certain conditions they can have a change-of-state reading. The only difference is that some of these degree achievements are telic under certain interpretations. In other words, the change-of-state degree achievement reading seems to be secondary to the primary stative reading and the predicate itself seems to be non-dynamic and unable to function as a full-blown activity or accomplishment type of verb.

The examples with the progressive test and the punctual time adverbial tests below further support my idea that these de-adjectival degree achievements counterparts in Mandarin are non-dynamic stative predicates. In Mandarin, both the non-dynamic stative predicates and the instantaneous achievement predicates are incompatible with the progressive aspect. But all achievement predicates are compatible with the punctual time adverbials. Because none of the de-adjectival degree achievements are compatible with the progressive, the de-adjectival degree achievements are either stative or achievement predicates. Also because the de-adjectival open-scale degree achievements are incompatible with the punctual time adverbials, de-adjectival degree achievements cannot possibly be achievement predicates and

therefore de-adjectival degree achievements should be some kind of stative predicates.

As shown in (305), even though the stative predicate *kuan* ‘wide’ can have a degree achievement reading, it nevertheless cannot be used in the progressive to express that a degree change is in progress, unless the verb *bian* ‘change’ is attached in front.

- (305) he-dao zai *(bian) kuan
river-course PROG *(change) wide
‘The river course is widening’

In the rare cases where a de-adjectival degree achievement predicate can be directly used dynamically as in (306), the verb must be interpreted as the middle voice instead of the intransitive active voice. For example, (306) means that the water is being heated up by an implied agent, not that the temperature of the water is rising on its own.

- (306) shui zai (bian) re
water PROG (become) hot
‘The water is being heated up.’

And as shown in (307), the open-scale degree achievements such as *pang* ‘fat’ is not compatible with a punctual time adverbial as *san dian* ‘three o’clock’ in Mandarin. If indeed all the degree achievements are telic instantaneous achievement predicates as some previous studies have claimed (cf. Lin, 2004a), then we would expect all degree achievements in Mandarin to be able to co-occur with a punctual time adverbial. Together with the progressive test above, we can determine that the de-adjectival degree achievements in Mandarin are stative predicates in Mandarin.

- (307) # Xiaoming san dian pang le.
Xiaoming three o’clock fat PERF.
intended ‘Xiaoming became fat/grew fat at 3 o’clock.’

To conclude, for the Mandarin degree achievements and the related transitive predicates, transitivity and the degree semantics contribute to the non-culminating readings. This suggests that non-culminating readings indeed arise from heterogeneous origins and different sub-accounts are necessary in order to tailor to different sub-classes of verbs.

Like the English degree achievements, the Chinese counterparts of the de-adjectival degree achievements also show variable telicity with regards to the *in*-phrase test, although most of these de-adjectival predicates are not felicitous with the *for*-phrase equivalent construction in Mandarin with the degree achievement reading. With the *for*-phrase equivalent, only the stative reading is possible for the de-adjectival degree achievements. I have argued that the de-adjectival degree achievement reading's infelicity with the *for*-phrase equivalent construction does not prove the degree achievements to be all telic, but rather shows that the degree achievement reading is a secondary reading derived from the primary stative reading for the de-adjectival degree achievements. These patterns closely resemble the behavior of inchoative statives (cf. Marín and McNally, 2005), that the primary reading is stative with the possibility of a change-of-state reading occasionally.

6.3 Previous Analyses

Having discussed the telicity and non-culminating reading patterns in the previous section, I move on to discuss some previous analyses of degree achievements to see how these previous analyses attempt to handle the data mentioned above.

It is well documented in the literature that the meaning of de-adjectival degree achievements is closely related to the meaning of gradable adjectives (Dowty, 1979; Hay et al., 1999; Kennedy and Levin, 2008, among others). According to Kennedy and Levin (2008), English degree achievements denote measurement of change functions that are related to the measure functions of their adjectival core. To the best of my knowledge, although there is more substantial work on Chinese gradable adjectives (Grano, 2012; Grano and Kennedy, 2012, among others), not that much has been researched for Chinese degree achievements except for Lin (2004a). In this section, I first review Lin (2004a) for some previous discussions on Chinese degree achievements, and then I present Kennedy and Levin (2008) for English degree achievements, upon which I build my own proposal in §6.4.

6.3.1 Lin (2004a)

Lin (2004a) analyzes Mandarin degree achievements as telic achievement predicates for the following reasons: First, Lin (2004a) claims that Mandarin degree achievements without the differential measure phrase is not compatible with either the *in*-phrase or *for*-phrase equivalent in Mandarin as in (308).

(308) a. ?? ta zai yi nian nei gao le
he at one year in tall PERF
'He grew in a year.'

b. * ta gao le yi nian.
he tall PERF one year.
'He grew for a year.'

adapted from Lin (2004a, 3)

However, as I have discussed in the previous section, this generalization is not accurate enough because degree achievements derived from absolute adjectives such as *gan* 'dry' are actually compatible with the *in*-phrase equivalent, and that the de-adjective degree achievements have a stative reading with the *for*-phrase equivalent duration phrase. As shown in (309), some degree achievements such as *gan* 'dry' is compatible with an *in*-phrase equivalent in Mandarin. And if we replace the predicate *gao* 'tall' with *pang* 'fat' as in (310), the sentence becomes felicitous with the *for*-phrase and can have a stative reading that the person was fat for a year.

(309) yifu zai yi xiaoshi nei gan le.
clothes in one hour in dry PERF
'The clothes dried in an hour.'

(310) ta pang le yi nian.
he fat PERF one year
'He was fat for a year.'

Second, he claims that all the Chinese degree achievements are telic because degree achievements with differential measure phrases are not felicitous in the progressive aspect or as a complement for *tingzhi* 'stop' as illustrated in (311) and (312). In English originally,

the progressive test can distinguish stative predicates from non-stative predicates and the complement of stop test can test for durativity. In Mandarin, as Lin (2004a) claims, these two tests can also distinguish an achievement predicate from the rest, if the predicate fails both tests.

- (311) a. *Lisi zhengzai pang le liang gongjing.
 Lisi in.process.of fat PERF two kilograms.
 intended: ‘Lisi is gaining two kilograms.’
- b. *boli zhengzai sui le man di
 glass in.process.of shatter PERF whole floor
 intended: ‘The glass is shattering all over the floor.’

adapted from Lin (2004a, 5)

- (312) a. *Lisi tingzhi pang le liang gongjing
 Lisi stop fat PERF two kilograms
 intended: ‘Lisi stopped gaining two kilograms’
- b. *boli tingzhi sui le man di
 glass stop shatter PERF whole floor
 intended ‘The glass stopped shattering all over the floor.’

adapted from Lin (2004a, 5)

However, upon closer examinations, these examples also prove to be somewhat problematic. First of all, if the tests are valid for Mandarin, these examples only show that degree achievements with the differential measure phrase are telic, without proving whether degree achievements without the differential measurement phrases are telic or not. Second, the test sentences actually are not that well constructed and may be infelicitous for other reasons. The sentences in (311) sound odd already because both the progressive aspect and the perfective aspect are used simultaneously in the same sentence. If we take out the perfective marker *le* as in (313), then at least *sui man di* ‘shatter (over the) whole floor’² can occur in the progressive, even though *pang liang gongjin* may not be as good probably because

2. Lin (2004a) treats ‘shatter (over the) whole floor’ as a degree achievement rather than a regular achievement, probably because he considers that *shatter* have different degrees of ‘shatteredness’ depending on how spread-out the broken pieces are.

pang ‘fat’ is stative and not dynamic. (313b) definitely shows that at least some degree achievements such as *sui man di* ‘shatter’ are not achievement predicates.

- (313) a. ?? Lisi zhengzai pang liang gongjin
 Lisi in.process.of fat two kilogram
 intended ‘Lisi is gaining two kilograms’
- b. boli zhengzai sui man di.
 glass in.process.of shatter whole floor
 intended ‘The glass is shattering all over the floor.’

Similarly, sentences in (314) with the ‘stop’-test are also not so great for other reasons. Even the intended English translations sound odd because it is not predictable how much weight will be gained or how spread-out the glass pieces will be before the events end. The verb *tingzhi* ‘stop’ sort of implies that the subject has the intention or the tendency to obtain the final result. Therefore, naturally it is somewhat strange to utter sentences in (314) as if the speaker could predict what final change could have been obtained but was stopped in the middle. As illustrated by the contrast in (314), although it is felicitous for *stop* ‘tingzhi’ to occur with *bian pang* ‘become fat’ without any differential measure phrase in Mandarin to mean that Lisi no longer has the tendency to become any fatter, with the differential measure phrase the sentence becomes infelicitous because the speaker is not an omniscient being who can predict what result would otherwise be obtained if the tendency of growing fatter had not been stopped.

- (314) a. Lisi tingzhi bian pang.
 Lisi stop become fat
 ‘Lisi stopped becoming fatter.’
- b. ?? Lisi tingzhi bian pang shi-bang.
 Lisi stop become fat ten-pound
 Intended ‘Lisi stopped gaining ten pounds.’

Most importantly, his analysis wrongly predicts that all Mandarin degree achievements to be compatible with punctual time adverbials, because as a hallmark instantaneous achievement predicates can co-occur with punctual time adverbials such as ‘at one o’clock’. As

shown in (315), this prediction is simply not borne out.

- (315) # he-dao si dian kuan le
 river-course four o'clock wide PERF
 intended 'The river course widened at four o'clock.'

Even without going into the details of the proposal, it is already obvious that Lin (2004a) does not sufficiently prove that degree achievements in Mandarin are all telic achievement predicates, given that some of his examples and arguments are problematic as discussed above. In other words, even though most of the de-adjectival degree achievements are not compatible with the Mandarin *for*-phrase equivalent, they are nevertheless not all telic, but rather show a pattern of variable telicity similar to English regarding the *in*-phrase test. In the rest of this section, I briefly describe how Lin's (2004) proposal attempts to describe the difference between Mandarin and English degree achievements.

Lin's proposal basically follows and adapts Hay et al.'s (1999) analysis, and the only difference is that Lin (2004a) claims that the degree argument in Mandarin is a variable δ that represents the minimum difference and is not existentially closed. In Hay et al. (1999), degree achievements are analyzed as describing events in which an individual undergoes some increase in a property. Hay et al. (1999) assume gradable adjectives to be measure functions from individual and time to degree as in (316), upon which semantics of degree achievements is built as in (317). The formula in (317) basically says that the degree achievement represented as the INCREASE function is true of an event iff an individual x 's property ϕ measured at the starting point of an event e plus the difference d equals that individual x 's property ϕ measured at the end point of the event e . As shown in (318), the difference argument d can be either existentially closed or explicitly saturated by a difference measure phrase.

- (316) $\llbracket \text{long}(x)(t) \rrbracket =$ the degree to which x is long at time t

- (317) $\llbracket \text{INCREASE}(\phi)(x)(d)(e) \rrbracket = 1$ iff $\phi(x)(\text{SPO}(e)) + d = \phi(x)(\text{EPO}(e))$

- (318) a. The road widened.
 $\exists e, d[\text{INCREASE}(\text{wide}(\text{road}))(d)(e)]$
- b. The road widened 5m.
 $\exists e[\text{INCREASE}(\text{wide}(\text{road}))(5\text{cm})(e)]$

To explain why degree achievements in Mandarin are instantaneous achievement predicates, Lin (2004a) argues that the difference argument is a variable δ that ‘represents the minimum difference in degree such that a comparative judgment can be made (Lin, 2004a, 7).’ As shown in (319), the sentence is true as soon as Lisi gained the minimum noticeable weight. Because a minimum change occurs instantaneously, the predicate is an achievement rather than an accomplishment.

- (319) Lisi pang le.
 Lisi fat PERF
 ‘Lisi gained weight’
- $\exists e[\text{INCREASE}(\text{weight}(\text{Lisi})(\delta)(e))]$ adapted from Lin (2004a, 7)

As Lin (2004a) admits, adapting the analysis in this fashion runs into the problem of not being able to explain why degree achievements can co-occur with durative phrases such as in (320). To fix this problem, Lin (2004a) resorts to a coercion analysis that the achievement predicate is coerced into an accomplishment predicate either by adding the preparatory phrase or adding an implicit iteration operator, when the predicate type and the time adverbial clash in their durative properties.

- (320) The soup cooled in an hour.

However, this coercion analysis seems somewhat *ad hoc* at best. For one thing, it does not explain when such a coercion is allowed and cannot explain why we see a difference between *gan* ‘dry’ and *kuan* ‘wide’ with respect to their compatibility with an *in*-phrase equivalent in Mandarin. For another, the primary meaning for sentences such as ‘the clothes dried’ and ‘the soup cooled’ in Mandarin is not that some minimal change has taken place, but rather that enough of a change has taken place so that the state of being dry or cool is reached.

- (321) yifu yi xiaoshi nei gan le.
 clothes one hour in dry PERF
 ‘The clothes dried in an hour.’
- (322) *malu san nian nei kuan le.
 road three year in wide PERF
 intended ‘The road widened in three years.’

To conclude, Lin (2004a) argues that degree achievements in Mandarin are instantaneous achievement predicates that describe events where the minimum change in some property of an individual has taken place. However, as discussed above, because some of his examples are somewhat problematic, there is no conclusive evidence to prove Mandarin degree achievements to be instantaneous telic achievements. His analysis also fails to explain the variable telicity pattern for Mandarin degree achievements.

In the following sub-section, I describe the basics of Kennedy and Levin’s (2008) analysis to show how they explain the variable telicity patterns for English degree achievements.

6.3.2 *Kennedy and Levin (2008)*

In order to account for the variable telicity patterns in English degree achievements, Kennedy and Levin (2008) argue that a simple achievement type of analysis or a comparative type of analysis along the lines of Hay et al. (1999) is not enough. Instead, Kennedy and Levin (2008) propose for English degree achievements that ‘the adjectival core of a DA is a special kind of derived measure function that measure the degree to which an object change along a scalar dimension as the result of participating in an event.’ Because the scale structures of the adjectival cores are different for different gradable adjectives, and that through Interpretive Economy that the conventional meaning of a standard end point is used whenever available, certain degree achievements with the absolute gradable adjectives or more conventional standard point are interpreted as telic by default. The derived scales that Kennedy and Levin (2008) propose allow the semantics to access these different scale structures of the adjectival cores, so that the derived scales of the English degree achievements inherit the

maximal points from the adjectival scales if there is any.

As their theoretical background, Kennedy and Levin (2008) also assume that gradable adjectives are measure functions of type $\langle e, d \rangle$ and that the positive form of a gradable adjective composes with a **pos** operator that turns the measure function into a property of an individual at a given time.

$$(323) \quad \mathbf{pos} = \lambda g \in D_{\langle e, d \rangle} \lambda t \lambda x. g(x)(t) \succeq \mathbf{stnd}(g) \quad \text{Kennedy and Levin (2008, 168)}$$

$$(324) \quad \mathbf{pos}(\mathbf{wide}) = \lambda t \lambda x. \mathbf{wide}(x)(t) \succeq \mathbf{stnd}(\mathbf{wide}) \quad \text{Kennedy and Levin (2008, 168)}$$

Then, Kennedy and Levin (2008) define that a difference function is a derived function from the measure function. Basically, as shown in (325), the derived difference function m_d^\uparrow is just like its corresponding regular measure function m except that m_d^\uparrow maps an arbitrary point d as the zero point and measures the difference from this arbitrary point d .

$$(325) \quad \textit{Difference functions}$$

For any measure function \mathbf{m} from objects and times to degrees on a scale S , and for any $d \in S$, \mathbf{m}_d^\uparrow is a function just like \mathbf{m} except that:

- i. its range is $\{d' \in S \mid d \preceq d'\}$, and
- ii. for any x, t in the domain of \mathbf{m} , if $\mathbf{m}(x)(t) \preceq d$ then $\mathbf{m}_d^\uparrow(x)(t) = d$

Kennedy and Levin (2008, 172)

The semantics of the English degree achievements has in its core the measure of change function that is built on the difference function. As shown in (326), a measure of change function m_Δ measures the difference that an individual undergoes in some property m from the initial point of the event e to the end of e . Just like a regular measure function, the measure of change function also need to compose with a modified **pos** operator suitable for the event domain \mathbf{pos}_v as in (327), before it can be applied to events. In other words, the change must be equal or greater than a standard determined by that measure of change function.

(326) *Measure of change*

For any measure function \mathbf{m} , $\mathbf{m}_\Delta = \lambda x \lambda e. \mathbf{m}^\uparrow_{\mathbf{m}(x)(init(e))}(x)(fin(e))$

Kennedy and Levin (2008, 173)

(327) $\mathbf{pos}_v = \lambda g \in D_{m_\Delta} \lambda x \lambda e. g(x)(e) \succeq \mathbf{stnd}(g)$

Kennedy and Levin (2008, 174)

(328) $\mathbf{pos}_v(\mathbf{m}_\Delta) = \lambda x \lambda e. \mathbf{m}_\Delta(x)(e) \succeq \mathbf{stnd}(\mathbf{m}_\Delta)$

Kennedy and Levin (2008, 174)

Kennedy and Levin (2008) account for the variable telicity in English by the different scale structures and a pragmatic principle called Interpretive Economy. Because measure of difference functions are based off the measure functions of the gradable adjectives, these measure of difference functions inherit the maximum points conventionally associated with the scale of the adjectives. For degree achievements derived from closed-scale gradable adjectives such as *dry*, the measure of change function \mathbf{dry}_Δ inherits the maximum point from the scale of \mathbf{dry} . In contrast, degree achievements derived from open-scaled gradable adjectives such as *widen* has not maximal point to inherit. Therefore, without the differential measure phrase, *dry* can have a telic reading when the maximum point is reached, but *widen* cannot. Furthermore, for *dry*, although the atelic reading is also available, the default reading is telic due to the Interpretive Economy that the conventional meanings should be maximized. Although both minimum and maximum meanings are compatible with Interpretive Economy, the maximum results in a stronger meaning and therefore is preferred. In my analysis, I follow all the theoretical setup of Kennedy and Levin (2008).

(329) *Interpretive Economy*

Maximize the contribution of the conventional meanings of the elements of a sentence to the computation of its truth conditions.

Kennedy (2007, 36)

Before we move on to discuss how to adapt this analysis accounts for the variable telicity patterns in Mandarin, let's quickly discuss how it handles the differential measure phrase. Due to type mismatch, to properly compose with the differential measure phrase, the degree achievement predicate needs to first compose with an μ_v operator in (331), modeled after

the special degree morpheme μ operator in (330) as proposed in Svenonius and Kennedy (2006), that introduces the external argument for the differential measure phrase. So for the sentence ‘the soup cooled 17 degrees’, the semantic representation after all the composition would be something like in (332).

$$(330) \quad \llbracket \mu \rrbracket = \lambda g_{\langle e, d \rangle} \lambda d \lambda x. g(x) \succeq d \quad \text{Kennedy and Levin (2008, 179)}$$

$$(331) \quad \llbracket \mu_v \rrbracket = \lambda g \in D_{\mu_{\Delta}} \lambda d \lambda x. g(x) \succeq d \quad \text{Kennedy and Levin (2008, 180)}$$

$$(332) \quad \lambda e. \mathbf{cool}_{\Delta}(\mathbf{the\ soup})(e) \succeq \mathbf{17\ degrees} \quad \text{Kennedy and Levin (2008, 180)}$$

Kennedy and Levin’s analysis successfully explains the variable telicity patterns of the degree achievement in English in a natural and intuitive way. This analysis can be almost directly applied to the de-verbal degree achievements in Mandarin, but needs to be adapted to account for the de-adjectival degree achievements in Mandarin because de-adjectival degree achievements as I have discussed above are inchoative stative predicates rather than dynamic activity or accomplishment predicates. In the following section, I present my analysis based on Kennedy and Levin (2008).

6.4 Analysis

Recall the patterns we want to account for Mandarin degree achievements. We see that the transitive versions of the degree achievements do not entail any change necessarily, where the intransitive versions necessarily entail some kind of difference in some property of an individual. For the intransitive degree achievements, we see that some de-verbal degree achievements are compatible with the *for*-phrase equivalent in Mandarin, but the de-adjectival ones are generally incompatible with the *for*-phrase equivalent.

To explain the contrast between the transitives and the intransitives, I follow what I have already proposed in the previous chapter that transitive verbs in Mandarin denote agent’s action without encoding any information about the change in the direct object. The change is encoded in the intransitive in Mandarin. Therefore, the transitive versions of the degree

achievement verbs either can have a fail-attempt reading when there is no change in the object at all but the agent has performed certain action on the object, or can have a partial-success reading if the object has undergone some change but did not reach the point where the state expressed by the gradable adjective ensues.

Now onto the difference between intransitive de-verbal and de-adjectival degree achievements. I argue that the de-verbal degree achievements in Mandarin describe dynamic events just like their English counterparts and have at their core the same measure of change function as their English counterparts, whereas de-adjectival degree achievements are inchoative statives that are non-dynamic and denote states that have an increase in some property for an individual compared to a prior state.

For a de-verbal degree achievement such as *chen* ‘sink’ in Mandarin, although it is not associated with a gradable adjective, it is nevertheless associated with a measure function that measures the distance between the vertically tallest point of an object above water and the water surface level. Let’s call measure function the ‘sunk’ measure function. This ‘sunk’ measure function measures to zero when the object is completely afloat, and measures how much the object has gone down vertically compared to the afloat state. The scale does have a maximal point when the object is fully submerged.

$$(333) \quad \llbracket chen \rrbracket = \mathbf{sunk}_{\Delta} = \lambda x \lambda e. \mathbf{sunk}_{\mathbf{sunk}(x)(init(e))}^{\uparrow}(x)(fin(e))$$

Therefore, *chen* ‘sink’ behaves just like the English degree achievement ‘dry’ with respect to its telicity. By default, *chen* ‘sink’ in the the perfective has a telic culminating reading as in (334a) that the ship was fully submerged into the water due to the Interpretive Economy. However, *chen* ‘sink’ is also compatible with an the *for*-phrase equivalent in Mandarin with an atelic degree achievement reading, given that the ship was not completely sunk as in (334b). This reading can be considered a non-culminating partial-success reading. The de-verbal degree achievements in Mandarin behave just as predicted by Kennedy and Levin’s (2008) analysis.

- (334) a. chuan chen le
 ship sink PERF
 ‘The ship sank.’
- b. chuan chen le san-ge xiaoshi, hai mei you wanquan chen-mo.
 ship sink PERF three-CL hour, still not have completely sink-sunk.
 ‘The ship has been sinking for three hours, but it still hasn’t completely sunk.’

For the de-adjectival degree achievements, the major difference we need to account for is why the de-adjectival degree achievements are incompatible with the *for*-phrase equivalent in Mandarin, even though they still show similar variable telicity patterns with respect to the compatibility with the *in*-phrase equivalent in Mandarin. In the previous sections, I have argued against the analysis of Chinese degree achievements as telic achievement predicates and remarked that the de-adjectival degree achievements closely resemble the inchoative statives as analyzed in Marín and McNally (2005) and discussed in Chapter 4. Therefore, I formulate an analysis compatible with the inchoative stative analysis in Chapter 4.

The main idea of my analysis of the de-adjectival degree achievements in Mandarin works as follows: Rather than denoting a dynamic eventuality that describes the changing process of the object, the de-adjectival degree achievements in Mandarin are actually inchoative statives that denote states that are different in some degree in a property compared to a previous state. In other words, these states could also be considered as the result states of the gradual changing process of the object. Although they are not dynamic *per se*, by virtue of the comparison with some previous state, these inchoative statives imply that a dynamic event has taken place, in which some property of an object has changed, so that they have some sort of dynamic kind of sense and may be mistaken as a regular dynamic change-of-state event. The de-adjectival degree achievements lack the dynamic change reading with the *for*-phrase precisely because they describe the result states to begin with and the *for*-phrase can only access the result state.

To implement this idea, following Katz (2000), first I assume that eventualities can be subdivided into dynamic eventualities represented by the variable *e* and static eventualities

represented by the variable s . For any state s , I assume that a property of an individual remains constant throughout the run time of s . Following Grano (2012) and Grano and Kennedy (2012), I also assume the basic meaning of the gradable adjectives in Mandarin denotes measure functions of type $\langle e, d \rangle$ that can be relativized to time. With these assumptions, and assuming the set up of the difference functions in Kennedy and Levin (2008), I propose a derived measure function called ‘Measure of Difference from a Prior State’ as in (335). This measure function measures the difference between a state s and some salient relevant s' in an individual x . The CH function chooses a relevant point from the runtime $\tau(s)$ of the state s so that a value of the degree can be calculated. To apply this measure function to states, similarly we also need a version of the **pos** operator as in (336) and existentially close s' or explicitly supply s' in the context.

(335) Measure of Difference from a Prior State

For any measure function \mathbf{m} , $\mathbf{m}_{s' < s} = \lambda x \lambda s' \lambda s. \mathbf{m}_{\mathbf{m}(x)(\text{CH}(\tau(s')))}^{\uparrow}(x)(\text{CH}(\tau(s)))$ where $s' \preceq s$, and s' is a salient relevant state prior to s .

(336) $\mathbf{pos}_{m_{s' < s}} = \lambda g \in D_{\mathbf{m}_{s' < s}} \lambda x \lambda s' \lambda s. \mathbf{m}_{\mathbf{m}(x)(\text{CH}(\tau(s')))}^{\uparrow}(x)(\text{CH}(\tau(s))) \succeq \mathbf{stnd}(g)$

So according to my analysis, a sentence such as *Xiaoming pang le* ‘Xiaoming has grown fatter’ in Mandarin is asserting that Xiaoming has obtained a state where he is fatter than some previous state. Out of the blue, the sentence is not informative about when the change in weight actually happened and which previous state the current state is being compared to. All we know is that the speaker is asserting that Xiaoming is fatter than sometime before.

(337) $\lambda s \exists s'. \mathbf{fat}_{\mathbf{fat}(Xiaoming)(\text{CH}(\tau(s')))}^{\uparrow}(Xiaoming)(\text{CH}(\tau(s))) \succeq \mathbf{stnd}(g)$

First, let me explain how this new analysis account for the fact that dynamic change reading is absent for de-adjectival degree achievements in Mandarin with the *for*-phrase equivalent, and that the only reading available is the stative reading. It follows naturally from my analysis that the dynamic change reading is not available, because the semantics of the de-adjectival degree achievements in Mandarin describe the state after the dynamic

degree change process rather than the change process itself. So a sentence with an open-scale adjectival core in (338), besides the regular stative reading that Xiaoming was fat for a month, could also have the meaning that Xiaoming was fatter (than sometime before) for a month.

- (338) Xiaoming pang le yi-ge yue.
 Xiaoming fat PERF one-CL month.
 ‘Xiaoming was fat/was fatter (than before) for a month.’
 $\lambda s \exists s' . \mathbf{fat}_{\mathbf{fat}(Xiaoming)(\text{CH}(\tau(s')))}^{\uparrow}(Xiaoming)(\text{CH}(\tau(s))) \succeq \mathbf{stnd}(g) \wedge \tau(s) = 3 - \text{month}$

In contrast, as shown in (339), for de-adjectival degree achievement with a closed-scale *gan* ‘dry’, besides the regular stative reading, the most salient reading is that the clothes has been completely dry for three hours, not that it was dryer than before for three hours. I believe that the Interpretive Economy principle is again at play here that selects for the maximal point on the scale that is available for absolute adjectives. Therefore, we get an absolute reading rather than a comparative reading.

- (339) yifu gan le san xiaoshi.
 clothes dry PERF three hour.
 ‘The clothes was/has been dry for three hours’
 $\lambda s \iota x \exists s' . \text{clothes}'(x) \wedge \mathbf{dry}(x)_{\mathbf{dry}(x)(\text{CH}(\tau(s')))}^{\uparrow}(x)(\text{CH}(\tau(s))) \succeq \mathbf{stnd}(g) \wedge \tau(s) = 3 - \text{hour}$

But given that I analyze these de-adjectival degree achievements as atelic inchoative statives, how does this analysis account for the telicity for the closed-scale predicates such as *gan* ‘dry’ in Mandarin? Still building on the idea of the Interpretive Economy and the difference of the scale structures, I argue that the de-adjectival achievements with a closed-scale adjectival core have a more accessible left-boundary of inchoative stative than the the open-scale adjectival core. Given my current semantics, the exact degree of difference and the previous state are both quite vague so that the starting point of the current state is not easy to pinpoint for the open-scale degree achievements. In contrast, for the closed-scale

degree achievements, it is easier to determine the starting point of the maximal difference, i.e. the state of being completely dry, because we do not need to know what the exact difference is or what the previous state actually was, and we only need to know that the object is completely dry. The sentence with the *in*-phrase asserts that this state starts within a given amount of time from the last time we are concerned about the dryness of an object. I suggest that the inchoative stative predicate with the closed scale may have been coerced into an instantaneous achievement type of predicate with the *in*-phrase, as it is also compatible with a punctual time adverbial as in (340).

- (340) yifu san dian gan le.
 clothes three o'clock dry PERF
 ‘Clothes dried (up) at three o'clock.’

My analysis is further supported by examples such as in (341). The prior state as represented by a prior time can be explicitly introduced in the syntax as the standard for comparison. If the de-adjectival degree achievements in Mandarin denote dynamic measure of change functions instead, we would expect the sentence to be infelicitous just like their English counterpart in (342).

- (341) He-dao bi yi nian qian kuan le.
 River-course compare one year ago wide PERF
 ‘The river course has become wider than (it was) one year ago.’

- (342) * The river course widened than one year ago.

The sentence in (341) means that compared to how wide it was a year ago, the river course has become wider than that. In English, however, even though there can be a comparative use as in (343), the sort of stative comparative reading in (341) cannot be grammatically expressed by the degree achievement in English, presumably because the main clause is eventive but the comparative clause is stative³.

- (343) a. The river widened more than it did a year ago.

3. Thanks to Chris Kennedy for pointing this out to me.

- b. * The river widened more than it was a year ago.

Given that I propose that the de-adjectival degree achievements are non-dynamic inchoative stative predicates, one may have a remaining question about how Mandarin expresses the dynamic process of changing of a property denoted by a given adjective? I believe that in Mandarin, there is a morphological mechanism that the adjectives can choose to combine with the suitable verbs in front to derive the dynamic degree achievement meaning. For example, the predicate *gao* ‘tall’ can attach to the end of the verb *zhang* ‘grow’ to meaning ‘grow taller’. I suggest a meaning for *zhang* ‘to grow’ as in (344) and the composition of *zhang-gao* as in (345). With this process, the predicate can have the same meaning as a dynamic English degree achievement.

$$(344) \quad \llbracket zhang \rrbracket = \lambda g \langle \langle e, t \rangle, d \rangle \lambda x \lambda e. \mathbf{g}_{\mathbf{g}(x)(init(e))}^{\uparrow}(x)(fin(e))$$

$$(345) \quad \begin{array}{c} zhang \ gao \\ \lambda x \lambda e. \mathbf{height}_{\mathbf{height}(x)(init(e))}^{\uparrow}(x)(fin(e)) \\ \swarrow \quad \searrow \\ zhang \quad \quad \quad gao \\ \lambda g \langle \langle e, t \rangle, d \rangle \lambda x \lambda e. \mathbf{g}_{\mathbf{g}(x)(init(e))}^{\uparrow}(x)(fin(e)) \quad \mathbf{height} \end{array}$$

As expected, now with the verb in front of the adjective, this predicate is compatible with a *for*-phrase in Mandarin. As shown in (346), the verbal compound *zhang-gao* is compatible with a *for*-phrase equivalent in Mandarin with dynamic degree achievement reading that the tree sapling was continuously growing for three months, but stopped afterwards.

- (346) xiao shu-miao zhang-gao le san-ge yue, jiu bu zai zhang
 little tree-sapling grow-tall PERF three-CL month, already not any.more grow
 le.
 PERF.
 ‘The tree sapling grew taller for three months, but did not grow any more (afterwards).’

This shows that Mandarin is capable of expressing the same atelic type of degree achievement reading for the de-adjectival degree achievement with the proper morphology.

6.5 Conclusion

To conclude, in this chapter, we have discussed the semantics of the Mandarin degree achievements, which more or less correspond to the INCR predicates in Tatevosov and Ivanov (2009). We see that the bare transitives of the degree achievements can either have partial-success or failed-attempt reading, whereas the intransitive degree achievements can only have partial-success readings. Just as proposed in the previous chapter, the reason why the bare transitive can have either the failed-attempt or partial-success reading is precisely because the bare transitive only denotes the agent's action on the object, without encoding the change of the object. The intransitive, on the other hand, encodes the change of the direct object and therefore must have at least some minimal change so that the intransitive degree achievements lack the failed-attempt non-culminating reading.

Just like their English counterparts, the Mandarin degree achievements also show a very similar pattern of variable telicity with respect to the *in*-phrase test. One particularity of the Chinese degree achievements is that all the de-adjectival degree achievements are incompatible with the *for*-phrase equivalent in Mandarin, although the de-verbal degree achievements can felicitously co-occur with a *for*-phrase equivalent duration phrase construction. To account for this particular fact, I have proposed that while the de-verbal degree achievements describe dynamic changing process of the object through the measure of change function as their semantics core, the de-adjectival degree achievements in Mandarin actually are semantically inchoative statives. It is because of the difficulty in pinpointing when the inchoative stative starts and ends and the predicate's non-dynamicity that makes the predicate incompatible with a *for*-phrase test in Mandarin.

Because these Mandarin degree achievements have within themselves or inherit the maximum points of the scale of related gradable adjectives, some of these degree achievements are

associated with scales with maximum points. Through the Interpretive Economy, the default readings are telic culminating reading for degree achievements with a closed scale. However, without the differential measure phrase, the semantics for all these degree achievements is atelic and can have atelic non-culminating reading under given the proper contexts.

In Chapter 5 and this chapter, we have focused on the semantics of the verb itself and examine how the meaning differences of the verb itself in English and Mandarin influence whether a non-culminating reading is possible. I have proposed that unlike their English accomplishment counterparts, Mandarin equivalents of the transitive accomplishment verbs are activity verbs that do not encode the changing process of the object but only the agent's action, so that failed-attempt readings and partial-success readings are both possible. Like their English counterparts, Mandarin degree achievements also exhibit variable telicity patterns due to the variations of the scale structures of their adjectival cores. Already from these two chapters, we can see that non-culminating accomplishments are of heterogeneous origins, so that no one account can fit all sub-types of non-culminating accomplishments in a given language. In the next chapter, I move onto the discussion of how the nominal properties of the direct object contribute to the non-culminating reading in Mandarin by examining the Krifka-style accomplishment predicates in Mandarin.

CHAPTER 7

CONSUMPTION VERBS

In the previous two chapters, we have discussed how the meaning of the Mandarin verbs can contribute to the non-culminated reading. For the previous two types of ‘non-culminating accomplishments’, it is actually a misnomer to call such predicates accomplishments, because actually they are semantically packaged as activities in Mandarin and consequently do not entail completion of events inherently.

While these previous two types we have seen in Chapter 5 and Chapter 6 are not true accomplishments, the third type, the verbs of consumption with a quantized direct object in Mandarin, actually do pass tests for accomplishment predicates in Mandarin. We can no longer explain the non-culminating reading in these cases by proposing an activity meaning for the predicate. For the verbs of consumptions in Mandarin, there are actually different factors at play: the nominal properties of the direct object and the interaction between the verb meaning and the direct object.

7.1 Introduction

Based on a corpus analysis of Mandarin, Koenig and Chief (2007) show that accomplishment predicates with a quantized incremental theme with the form [Num + CL + N] can have a non-culminating reading (contra Soh and Kuo, 2005). However, if we replace [Num+ Cl] with [Num+ Measure], the non-culminating reading disappears as in (347). This looks similar to Singh’s (1991; 1998) description of Hindi (though her examples involve a contrast between mass and count nouns), which she analyzes in terms of two gradual patient thematic relationships that differ in completion entailment in a mereological analysis of telicity (cf. Krifka, 1989, 1998).

- (347) wo chi le san ge/*bang pingguo, mei chi wan.
I eat PFV three CL/*pound apple, not eat finish.
‘I ate three apples/*pounds of apples, but did not finish.’

In this chapter, I argue instead that the crucial factor is the referentiality of the incremental theme. My arguments are based on data like (348) and (349), which show that when [Num+ Measure] NP is marked with a demonstrative or occupies the preverbal topic position which is reserved for referential NPs (cf. Paul, 2002), the non-culminating reading comes back.

(348) wo chi le na san-bang pingguo, mei chi wan.
 I eat PFV that three-pound apple, not eat finish.

(349) wo san-bang pingguo dique chi le, mei chi wan.
 I three-pound apple indeed eat PFV, not eat finish.

In my new analysis, I argue that non-culminating readings can arise whenever the object NP can have a referential reading, because in Mandarin verbs of consumption and their object are in a partial thematic relationship. However, when the NP is non-referential, it serves as an event measurement function that measures out the event homomorphically against the amount of the NP consumed in the event, and consequently in this scenario only the culminating reading is possible.

This rest of chapter is organized as follows: In §7.3, I present some background on the non-culminating readings for the consumption verbs and informally define my understanding of referentiality. In §7.3, I present the culmination patterns for different combinations of indefinite and definite numeral-classifier phrases as the direct object of the consumption verbs. Then, in §7.4 I present my own analysis and compare my analysis to some previous studies in §7.5. Finally, I conclude this chapter in §7.6.

7.2 Background

In event semantics, it is well known that telicity of a predicate can vary depending on whether the direct object NP is quantized or not (Dowty, 1979; Bach, 1986; Krifka, 1989, 1998, among others). As shown in (350a), when the direct object ‘apples’ is not quantized as a bare plural noun, the predicate ‘eat apples’ is an activity, as the predicate can co-occur

with a *for*-phrase rather than an *in*-phrase. In contrast, as shown in (350b), when the direct object is quantized with the numeral *three* in front, the predicate ‘eat three apples’ becomes an accomplishment and is now compatible with the *in*-phrase rather than the *for*-phrase.

- (350) a. I ate apples for two hours/*in two hours.
 b. I ate three apples *for two hours/in two hours.

Based on this pattern, Krifka (1989) proposes that for a certain class of predicates called the gradual predicates, parts of the event are homomorphically mapped to parts of the individual denoted by the direct object. When the event is quantized, according to the definitions of the four basic verb classes (Vendler, 1957), the predicate is an accomplishment. Likewise, when the event is not quantized, the predicate is an activity. Because of this homomorphic mapping relationship, the event is measured out by the parts of the direct object. For example, in the case of ‘eat three apples’, the event progresses at the same rate as the three apples are being consumed and ends at the moment when the last bit of apple is eaten. In other words, the endpoint of the event is marked by the last bit of apple consumed. For a more detailed description of Krifka’s (1989) analysis, refer back to Chapter 1, §1.1.2.

From Krifka’s influential mereological account, it follows naturally that all such types of accomplishments with a quantized direct object should have a culminating reading in the perfective, because the standard meaning of a perfective marker situates the entire event before a reference time and an accomplishment has an endpoint by default. Therefore, ‘I ate three apples’ should entail that the three apples have been entirely eaten. In English, it does indeed entail that three apples were completely eaten. However, for many other languages, it has been observed that this is not the case all the time, as such sentences can have non-culminating reading. For example, Singh (1991; 1998) observes for Hindi, predicates such as ‘eat my cake’ can have a non-culminating reading that the cake was only partially eaten as in (351).

- (351) māẽ ne aaj apnaa kek khaayaa aur baakii kal khaaũgaa
 I ERG today mine cake eat-PERF tomorrow remaining tomorrow eat-FUT
 ‘I ate my cake today and I will eat the remaining part tomorrow.’

Singh (1991, 172)

Singh (1991; 1998) accounts for the Hindi data by proposing that there are two thematic relationships, total and partial, between the verb and the direct object depending on whether the direct object is a countable noun or a mass noun. Although the Chinese data that I discuss in this paper are very similar to the Hindi data, there are differences such as those Mandarin examples in (348) and (349), where clearly referentiality rather than the mass/count distinction is responsible for the non-culminating reading. In the remaining of the background section, I first discuss in some details Singh’s analysis and why it cannot be fully extended to the Chinese data, and then I discuss some of the previous studies on non-culminating accomplishments in Mandarin and explain why these accounts also cannot fully capture the whole picture.

7.2.1 *Singh’s Analysis of Hindi non-culminating Reading*

Singh (1991; 1998) bases her analysis of the non-culminating readings of the consumption and the creation verbs on the crucial observation that the non-culminating reading can only arise when the direct object is a count noun, but never when it is a mass noun. Compare the following example (352) with (351). When the direct object is a mass noun ‘beer’ instead in (352), the non-culminating reading is not allowed, as the continuation ‘but did not drink all of it’ is considered infelicitous.

- (352) us ne do gilaas biiyar pii (*par puurii nahĩĩ pii)
 he ERG two glasses beer drink-PERF (but entire NEG drink-PERF)
 ‘He drank two glasses of beer (* but did not drink all of it).’

Singh argues that this contrast can be explained if there are actually two separate thematic relations in the material domain for the mass nouns, and in the individual domain

for the count nouns: whereas in the material domain the thematic relation is total, in the individual domain the relation is partial. As shown in (353a), the thematic relation for the material domain denotes a total relation in the sense that every subpart of the object NP participates in a subevent and that each subevent has a subpart of the object NP involved. In contrast, the thematic relation for the individual domain as in (353b) only requires that for each of the atomic parts of the object NP, there is a material subpart of that atomic part that participates in the event and that each subevent has a material subpart involved. Therefore, unlike Krifka’s analysis, where each part of the individual must be mapped to some part of the event, for Singh (1991) some parts do not need to participate in the event within each atomic part of an individual in the individual domain. In other words, given the partial thematic relation, for ‘I ate three apples’ in Hindi, some part of each apple can be uneaten so that a non-culminating reading can arise.

- (353) a. $\theta_m(e, x) \leftrightarrow \forall x'[x' \sqsubseteq x \rightarrow \exists e'[e' \sqsubseteq e \wedge \theta_m(e', x')]] \wedge \forall e'[e' \sqsubseteq e \rightarrow \exists x'[x' \sqsubseteq x \wedge \theta_m(e', x')]]$
- b. $\theta_i(e, x) \leftrightarrow \forall x'[x' \sqsubseteq_A x \rightarrow \exists x'', e'[x'' \sqsubseteq h(x') \wedge e' \sqsubseteq e \wedge \theta_m(e', x'')]] \wedge \forall e'[e' \sqsubseteq e \rightarrow \exists x'[x' \sqsubseteq h(x) \wedge \theta_m(e', x')]]$ Singh (1998, 188-187)

Because of how the thematic relations differ for these two domains, only count nouns can have non-culminating readings in Hindi. The mass nouns behave almost exactly as Krifka’s analysis predicts, and are likewise analyzed very similarly as a total thematic relation. Although Singh (1991, 1998) seems to have successfully accounted for the Hindi data, there are reasons to believe that this analysis is still insufficient in light of the new data from Mandarin that even mass nouns can have non-culminating reading when it is made definite by presence of a demonstrative. Singh’s (1991,1998) analysis would have wrongly predicted that mass nouns with the demonstratives cannot have the non-culminating reading given the direct object is a mass noun belonging to the mass domain. Therefore, it is necessary to formulate a new analysis that can both explain why non-culminating readings are more likely to occur with the count nouns, but can also occur with mass nouns with the demonstratives.

7.2.2 *Previous Analyses in Mandarin*

Just like in Hindi, Mandarin verbs of consumption and creation have also been observed to allow non-culminating readings in some situations (Smith, 1997; Soh and Kuo, 2005; Koenig and Chief, 2007, among others). However, these previous analyses sometimes disagree in when exactly such readings are allowed. For example, on the one hand, according to Soh and Kuo (2005) as shown in (354), for consumption verbs in Mandarin, it is felicitous to assert that the event is not culminated when the object NP has a demonstrative but not when it has a numeral. Koenig and Chief (2007), on the other hand, show with an attested example from Google that the non-culminating reading can be present even for NP with a numeral as in (355). It seems that native speakers more or less agree that an NP with a demonstrative can indeed have a non-culminating reading in some circumstances, but they differ to various degrees in whether they accept the non-culminating readings for the direct object NP with the numeral, i.e. a quantized NP according to Krifka's (1989; 1998) canonical theory.

- (354) Ta chi-le #liang-ge dangao/ na-ge dangao, keshi mei chi-wan.
He eat-PERF two-CL cake/ that-CL cake but not eat-finish
'He ate two cakes/that cake, but he did not finish eating them/it.'

adapted from Soh and Kuo (2005, 204)

- (355) Wo (...) chi-le liang-chuan dakao, dan mei chi-wan^{Google}
I eat-PERF two-CL kabob, but not eat-finish
'I ate two kabobs, but didn't finish eating them. (lit.)'

Koenig and Chief (2007, 247)

It is probably not that all that surprising that different speakers have such different judgments on whether a non-culminating reading is acceptable, given that most of these sentences by default are considered to describe culminated events through pragmatic reasoning, when uttered on their own without the continuation that specifies that the event was

not completed. Some of these non-culminating readings are admittedly quite hard to get without the suitable contexts and some efforts on the listener's part.

Nevertheless, one important point that the previous studies in Mandarin do agree on is that it is much easier to get a non-culminating reading for an NP with a demonstrative than one with a numeral alone. This suggests that actually referentiality plays a very important role in determining whether a non-culminating reading is felicitous for a given sentence. And yet, none of these aforementioned studies have investigated extensively how referentiality of the direct object NP affects the event semantics, especially since referentiality is not considered as crucial a factor in Krifka's (1989; 1998) canonical account, as he groups the definite NPs together with the quantized NPs both as bounded NPs. And according to the canonical theory, neither should have an non-culminating reading.

For now, it is important to keep in mind that referentiality is an important factor as indirectly observed by these previous analyses. In the following subsection, I define informally what I consider to be referential readings in Mandarin and under what conditions these readings are available. I return to the detailed descriptions and critiques of these previous analyses in §7.5, after presenting my own data and analysis.

7.2.3 Defining Referentiality

Referentiality is an important nominal property that can be more or less considered to be a noun phrase's ability to refer to something and is closely linked to definiteness and specificity (Heusinger, 2002). In the linguistics literature, it is widely accepted that definite descriptions such as 'the book', proper names such as 'Mary', and demonstrative phrases such as 'that book' are referring expressions that usually have actual references in the world (Strawson, 1950; Heusinger, 2002; Longobardi, 2005, among others). In contrast, there are some debates on whether the indefinites have referential uses besides their usual quantificational uses (Fodor and Sag, 1982; Landman, 1989a,b; Meulen, 1981; Landman, 2008, among others) and what types of indefinites have referential uses. In a classical paper by Fodor and Sag

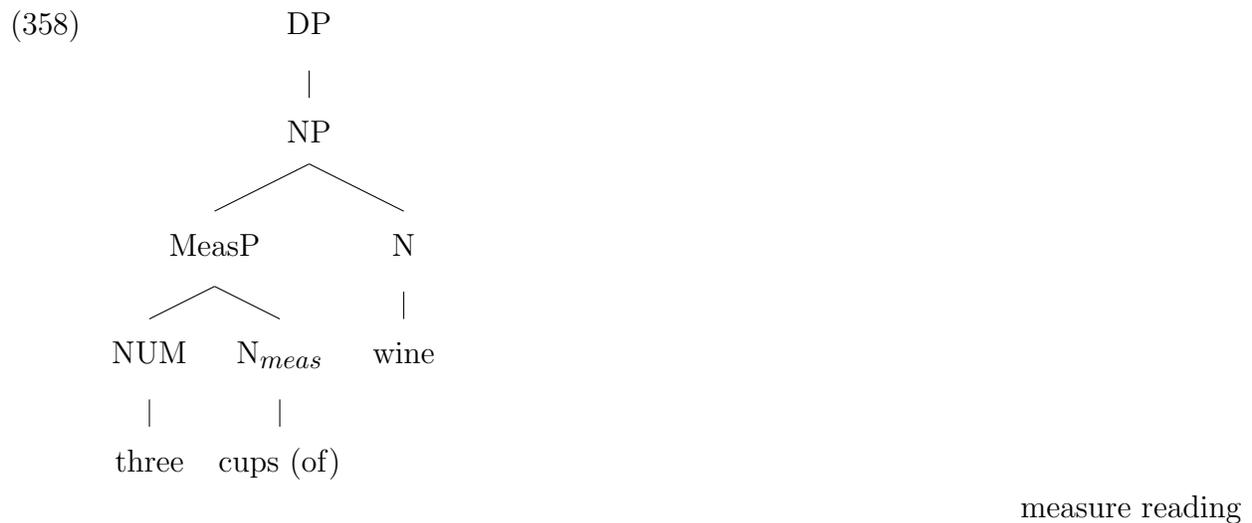
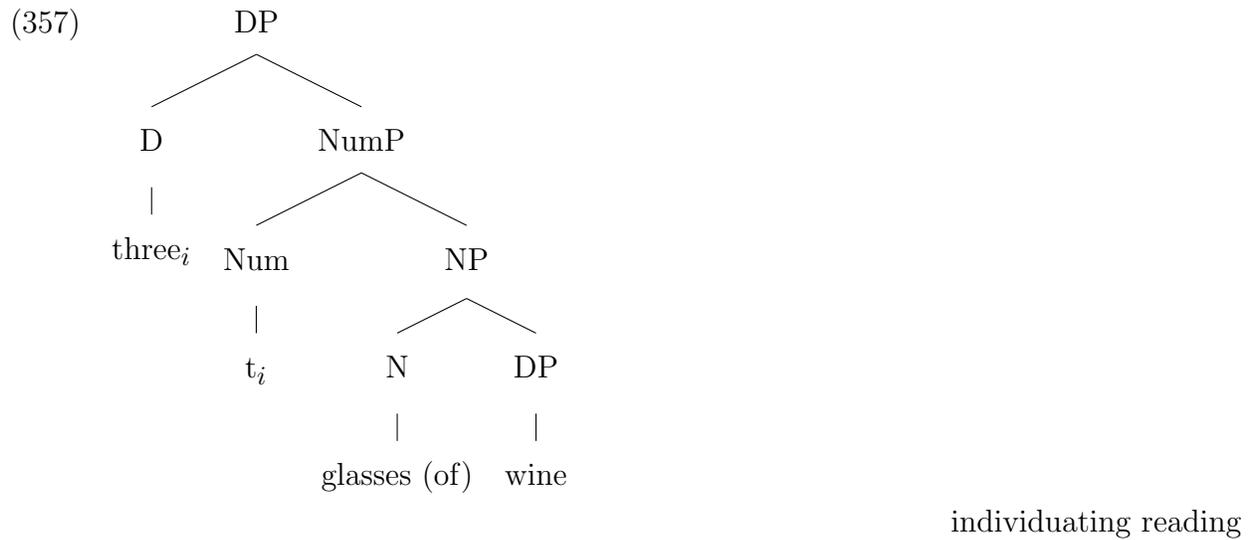
(1982), an indefinite noun phrase such as *a student* is observed to have both quantificational and referential readings. When *a student* is used quantificationally, it behaves like other quantificational phrases such as *each student* and *few students* and can interact with other quantificational phrases scopally. When it is used referentially, as Fodor and Sag (1982) argue, *a student* behaves like a proper name or a demonstrative phrase and do not exhibit any scopal interactions. In other words, when used referentially, *a student* is used to refer to a specific student the speaker has in mind.

(356) Every professor met a student in the syntax class. Fodor and Sag (1982, 355)

For a singular indefinite noun phrase such as *a student*, it is perhaps not that difficult to see why it can have a referential reading as a count noun, since each student is a separate entity from another student. However, for indefinite mass noun phrases such as ‘a liter of water’, it is much harder to decide whether it can also have a similar referential reading, because unlike count nouns, mass nouns do not have inherent atomic parts (cf. Link, 1983). Whereas for count nouns such as *student*, each student is a separate entity from another student; for mass nouns as *water*, each liter of water is not necessarily separable or distinguishable from another liter of water. Because it is much harder to imagine what a specific liter of water would even mean, it seems much harder to assign a referential specific reading to an indefinite mass noun phrase. In other words, referentiality seems to be closely related to atomicity.

The idea that referentiality is linked to atomicity is precisely what Landman (2008) and Rothstein (2009a,b, 2010b) have argued for in a series of their studies. Rothstein (2009a,b, 2010b) argues that for a classifier phrase such as ‘three glasses of water’ with the container classifier *glass*, there are two possible readings: ‘an individuating reading, in which the DP denotes plural objects consisting of three individual glasses of water, and a measure reading, in which the DP denotes quantities of water which equal the quantity contained in three glasses (Rothstein, 2009a).’ The individuating reading is also called the referential reading because the NP *three glasses of water* denotes actual concrete tangible three glasses of water.

According to Landman (2008), the individuating reading and the measure reading can be argued to have two different syntactic structures as in (357) and in (358). As we can see in these two structures, the measure word combines with the noun and the numeral in two different orders. Whereas for the individuating reading, the measure word first combines with the noun and then with the numeral; for the measure reading, the measure word first combines with the numeral and then the noun.



According to Landman (2008) and Rothstein (2009b, 2010b), although concrete measure words such as *glass* can have both readings, abstract measure words such as *liter* and *pound* only have the measure reading as they lack the individuating function. To see why they lack

the individuating function, imagine an amount of three liters of water in a tank. Within this three liters of water, each liter of water is not uniquely separable from the other two liters, and therefore the three liters of water are not individuated into three separate one-liter entities. In contrast, the referential uses of three glasses of water do contain three individuated glasses of water, each uniquely separable from the other two.

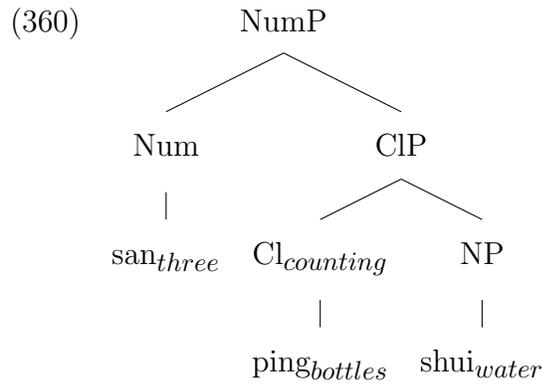
Before I give an informal definition of referentiality, let's first go back to the discussion of Mandarin noun phrases. Crucially different from English, Mandarin requires a classifier between a numeral and a noun. As shown (359), even for a count noun such as *pingguo* 'apple' in Mandarin, an individuating classifier such as *ge* is needed between the numeral and the noun; and the structures of noun phrases with an individuating classifier and a measure classifier are the same in Mandarin.

- (359) a. san *(ge) pingguo
 three CL apple
 'three apples' count nouns
- b. san bang rou
 three pound meat
 'three pounds of meat' mass nouns

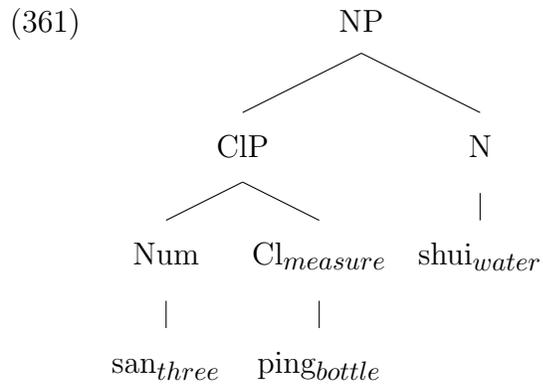
Because in Mandarin, regardless of the count/mass distinction in the noun, all noun phrases obligatorily require a classifier when co-occurring with numerals, Chierchia (1998) proposes that Mandarin nouns do not have the same mass/count distinction as their English counterparts and these Mandarin nouns are all like mass nouns that denote kinds. The mass/count distinction is compositionally brought in via the classifier: the individuating classifier or the concrete measure word used referentially introduces an atomic structure.

Following Chierchia (1998) and Rothstein (2009b, 2010a,b), Li et al. (2008) and Li (2013) also assume that Mandarin nouns are all mass nouns that denotes kinds and similarly propose two different syntactic structures for the numeral classifier phrases in Mandarin with substantial syntactic evidence. Semantically speaking, in the individuating reading, an atomic structure is introduced by the individuating reading of the classifier. However, not all types

of classifiers can introduce an atomic structure. According to Li (2013), abstract measure classifiers such as *sheng* ‘liter’, *bang* ‘pound’ only have the measure reading available and individuating classifiers such as *ge* only have the individuating reading available. In other words, in Mandarin, it is the classifier rather than the noun itself that determines whether an individuating reading is possible, and atoms are introduced by the classifiers rather than by the nouns themselves.



Counting



Measuring

Therefore, for the indefinite numeral-classifier phrases in Mandarin, only the ones with the individuating classifiers and the concrete classifiers with the individuating reading can have referential readings. It seems that a noun phrase’s ability to have an individuated reading is what determines whether it can have a referential reading. Indeed, considering also the cases of the definites, proper nouns and the demonstrative phrases, what all these referential noun phrases have in common is that their referents can be individuated

either inherently or by context or discourse. The definite and the demonstrative NPs can be uniquely identified in a given context and thus in a sense are individuated from the rest of its kind. The proper names denotes unique individuals whose referents are also individuated from other individuals. Therefore, I informally define my understanding of the necessary conditions for referentiality as follows:

(362) A noun phrase can be referential if its referent(s) can be individuated inherently by natural atomic units or by derived atomic units through the context.

Through this definition, in Mandarin, the following types of noun phrases can be referential: indefinite noun phrases with individuating or concrete measure classifiers, definite phrases (in the topic position), demonstrative phrases, and proper names. The indefinite noun phrases can only have referential readings when they have individuating or concrete measure classifiers that introduce inherent natural atom units. In contrast, in addition to the inherent atoms that can be introduced by the classifiers, the definite and demonstrative NPs can also have derived group atoms by context (cf. Link, 1983; Landman, 1989a,b). In other words, definite plurals such as ‘those three men’ can refer to three referential entities separately or collectively refer to the three as a one single group. This group forms its own group atom and behaves like a single individual whose parts are not visible in the collective reading (cf. Link, 1983). I believe that a definite mass noun phrase such as ‘those three liters of water’ similarly can form a group atom to refer to a contextually salient referent measuring up to three liters of water.

I show in the next section that actually all the non-culminating readings can be ultimately accounted by the factor of referentiality alone, and the mass/count distinction of the noun is only indirectly relevant because of their inherent difference in their referentiality.

7.3 Data for Consumption Verbs in Mandarin

In this section, I argue that referentiality rather than the mass/count distinction of the direct object NP determines whether a non-culminating reading can arise. Crucially, I show that regardless of the mass/count distinction of the direct object NP, whenever this NP can be interpreted referentially, a non-culminating reading may arise. This situation arises either when the measure word or the classifier can introduce atomic references, or when an atomic reference can be formed by the use of a demonstrative or by being definite when occurring in the internal topic position.

7.3.1 Indefinite NPs

First, let's consider the case of indefinite NPs. When the object NP is introduced in its canonical object position after the verb, the NP usually has an indefinite reading (cf. Li and Thompson, 1989; Paul, 2002). When we consider various combinations of numeral-classifier phrases here, combining individuating or non-individuating classifiers with mass or count nouns (cf. Rothstein, 2008), we see that regardless of the count/mass distinction of the noun, the non-culminating reading is only felicitous when the classifier or the measure word is individuating, introducing referential atomic entities. Consider the two sentences in (363).

- (363) a. wo chi le san-ge pingguo, mei chi-wan.
 I eat PERF three-CL apple, not eat-finish
 'I ate (some part of) three apples, but didn't finish.'
- b. wo he le san-wan shui, mei he-wan.
 I drink PERF three-bowl water, not drink-finish
 'I drank (some part of) three bowls of water, but didn't finish.'

As shown in (363), it does not matter whether the head noun is a count noun 'apple' or a mass noun 'water', as long as the classifier or the measure word is individuating such as an individuating classifier *ge* in (363a) or a concrete measure word *wan* 'bowl' in Mandarin in (363b), then the sentence can be conjoined with a clause that cancels out the culmination

implicature. The two sentences in (363) can be true in scenarios where each apple is partly eaten or each bowl of water is partly drunk. In other words, the indefinite NPs as the direct object of consumption verbs can give rise to distributive non-culminating readings with an individuating classifier or a concrete measure word with a referential reading.

In comparison with the Hindi data in Singh's (1991, 1998) paper, the Mandarin data are similar in such a way that for the non-culminating reading, each of the atomic parts of the NP must be at least partly consumed. It would be infelicitous to utter sentences in (363), if only two out of the three apples or three bowls of water were partly consumed. However, unlike the Hindi data, even the mass noun such as *shui* 'water' can be compatible with a non-culminating reading, as long as the measure word is a concrete measure word 'bowl' that can introduce atomic references.

In contrast with the referential NPs above, as shown in (364), if the direct object is a non-referential NP, when abstract measure words such as *bang* 'pound' or *sheng* 'liter' are used instead, which do not introduce referential atomic entities but only introduce an abstract amount, then the sentences must entail that all of the amount has been consumed and consequently a non-culminating reading is not felicitous. The sentences in (364) can only be true in scenarios where all three pounds of apples and all three liters of water are completely consumed.

- (364) a. # wo chi le san-bang pingguo, mei chi-wan.
 I eat PERF three-pound apple, not eat-finish.
 Intended 'I ate (some part of) three pounds of apples, but didn't finish.'
- b. # wo he le san-sheng shui, mei he wan.
 I drink PERF three-liter water, not drink finish.
 Intended 'I drank (some part of) three liters of water, but didn't finish.'

To understand why the non-culminating reading correlates with the individuating functions of the classifier or the measure word, let's look closer at the relations between referentiality, the information structure, and the semantic derivation of the Mandarin NP. In the direct object position, usually the NP is introduced as a piece of new information (cf.

Ernst and Wang, 1995; Paul, 2002), so that the object NP cannot be interpreted as a specific entity already mentioned or assumed in the common ground. Because no group atom can be formed through context, the only way for an indefinite NP to be referential is by having atomic parts, where these atomic parts are individuated from each other. In the semantic structure of Mandarin NP, because the NP requires a classifier or a measure word between the numeral and the noun, the classifier or the measure word themselves are commonly believed to be responsible for introducing the atomic structure if such an atomic structure is possible for the interpretation (cf. Chierchia, 1998; Li et al., 2008; Li, 2013). Therefore, in Mandarin an indefinite NP can only be referential when it has an individuating classifier or a concrete measure word with a referential reading.

7.3.2 *Definite NPs*

While previous studies have discussed a great amount about indefinite NPs as the direct object (Krifka, 1989; Singh, 1991, 1998), surprisingly little has been said about definite NPs in event semantics. Especially, it is not yet clear what would happen if different combinations of classifiers or measure words with mass or count nouns were made definite. In Krifka's (1989; 1998) canonical theories, because definite NPs are bounded, as the direct object they would simply induce a event-homomorphic culminating reading. And yet, many subsequent studies observe that definite NPs actually can have non-culminating readings occasionally (cf. Soh and Kuo, 2005; Rothstein, 2008; Piñón, 2008; Kennedy, 2012), without going further into details about the different completion entailment patterns of different types of definite NPs. For example, Piñón (2008) briefly mentions in a footnote that the non-culminating reading is felicitous when the direct object is definite as shown in the following example in (365).

(365) Rebecca ate the apple for five minutes (before dropping it on the floor)

(Piñón, 2008, 1)

However, in these previous studies, only the definite singular NPs are considered, nothing much was said about the definite plural NPs. To fill in this gap, I present the relevant data in Mandarin below in this section.

Let's consider the following examples. If we add a demonstrative *na* 'that' in front of the numeral-classifier phrases in examples (363) and (364) to produce (366) and (367) below, then actually regardless of the mass/count distinction or the type of the classifier or measure word, all example sentences below are felicitous under the right contexts, even for the NPs with non-individuating abstract measure words. For example, imagine a scenario where a mother and a daughter are talking about some amount of apples or water that a relative brought to them earlier. If the mother asks 'did you eat those three pounds of apples/drink those three liters of water', then the daughter can felicitously refer to those three pounds of apples or three liters of water as a definite referential entity as a group, and answer with the sentences in (366) and (367) to express that she did eat some part of those three pounds of apples or those three liters of water.

- (366) a. wo chi-le na san-ge pingguo, mei chi-wan.
 I eat-PERF that three-CL apple, not eat-finish
 'I ate (some part of) those three apples, but didn't finish.'
- b. wo he-le na san-wan shui, mei he-wan.
 I drink-PERF that three-bowl water, not drink-finish
 'I drank (some part of) those three bowls of water, but didn't finish.'
- (367) a. wo chi-le na san-bang pingguo, mei chi-wan.
 I eat-PERF that three-pound apple, not eat-finish
 'I ate (some part of) those three pounds of apples, but didn't finish.'
- b. wo he-le na san-sheng shui, mei he-wan.
 I drink-PERF that three-liter water, not drink-finish
 'I drank (some part of) those three liters of water, but didn't finish.'

In (366), now that the numeral-classifier phrases with the individuating classifiers or measure words are made definite by the demonstrative *na* 'that', there are actually two possible ways to fulfill the truth conditions for the sentences to be true. Unlike their indefinite

counterparts, where each atomic part has to be eaten or drunk at least partially for ‘I ate three apples’ and ‘I drank three bowls of water’ to be true in Mandarin, the definite NPs only require that some part of the contextually salient three apples or three bowls of water to be partly eaten or drunk as a group. For example, if the speaker partook a part of one out of those three apples or a small portion of one bowls out of the three bowls of water, the sentences in (366) are considered true.

- (368) wo san-bang pingguo dique chi-le, dan mei chi-wan.
 I three-pound apple indeed eat-PERF, but not eat-finish
 ‘I ate (the) three pounds of apples indeed, but did not finish.’

Similarly, as shown in (368), preposing the direct object NP to the internal object position also makes the non-culminating reading felicitous because the internal object position is reserved for referential NPs (cf. Ernst and Wang, 1995; Paul, 2002). The internal topic position is a topic position in Mandarin that occurs after the subject and before the main verb, and is called ‘internal’ because there is also an external topic position that is in front of the sentence. The internal topic position can be occupied by the direct object by preposing. When the direct object is preposed to the internal topic position, it signals that the noun phrase concerned is a piece of common ground information known to the speaker and the listener, and hence making the noun phrase at the internal topic position interpretively more or less like an English definite phrase. In (368), it is understood *san bang pingguo* ‘three pounds of apples’ is referring to a definite three pounds of apples that have been mentioned or assumed in the background. And with the definite reading, it is felicitous to assert that the three pounds of apples are partially eaten in Mandarin.

Why does definiteness license non-culminating readings and how does the pattern with the definite NPs relate to the pattern with the indefinite NPs in the previous subsection? Again, just like the individuation function of the classifier or the measure word, definiteness also relates to referentiality because an NP can be made referential by being definite. According to Link (1983) and Landman (1989a,b, 2008), definite plurals can form a group atom, a

referential entity that groups the plural definites into a single entity, because singling out this set of plural entities in the context sets them apart from the rest of their kind. Likewise, I argue that making an amount of mass or count nouns in (368) definite can also create an atomic reference, because this specific amount of stuff is now contextually salient and individuated from the rest of its kind. In other words, besides that individuating classifier or measure words can introduce inherent atomic references, making a group or an amount salient in the context can also form derived atomic references.

Summarizing the patterns from both the indefinite NPs and the definite NPs, one clear pattern emerges: whenever the NP can have a referential interpretation, either through inherent atomic references or derived atomic references in the context, a non-culminating reading can arise for consumption verbs in Mandarin. As shown in Table 7.1, event culmination is entailed only when the consumption verb takes an indefinite NP with an abstract measure word, which does not have any referential reading. For all the other cases, when the direct object NP is definite or when the NP is indefinite with individuating classifiers or concrete measure words, the direct object NP can be referential and can give rise to non-culminating readings: the indefinites obligatorily induce distributive readings and the definites can have non-distributive collective readings.

Table 7.1: Summary of the Data for Consumption Verbs with Different DOs

	Indefinites	Definites
Individuating Classifiers	non-cul. distributive	non-cul. dist. or non-dist.
Concrete Measure Words	non-cul. distributive	non-cul. dist. or non-dist.
Abstract Measure Words	culminating	non-culminating non-distributive

Unlike Singh’s (1991; 1998) analysis of the Hindi data, for Mandarin, the mass/count distinction of the noun is only indirectly relevant by the classifier or measure words that they take. And ultimately, it is referentiality that explains why the individuating function of the classifier or the measure word can give rise to the non-culminating readings for the indefinites. Therefore, through the discussion of the data in this section, we can clearly

see that referentiality is the key factor that explains for when a non-culminating reading is felicitous for the consumption verbs in Mandarin.

7.4 Analysis

From the previous section, it is clear that a non-culminating reading is possible whenever the direct object NP can be interpreted referentially. Based on this new insight, I argue that consumption verbs in Chinese always have a partial thematic relation with its referential direct object. In other words, ‘ate X’ means that at least some part of the referent is eaten. However, when the NP cannot be interpreted referentially, it is interpreted non-referentially as an event measurement function instead, which always entails event culmination. Furthermore, an NP can be referential if it can be individuated from the rest of its kinds.

More specifically, for the referential NP direct objects, I follow Kennedy and Levin (2008) and Kennedy (2012) and propose a quasi-degree-achievement semantics for the partial reading by adapting the partitive operator $part_{\Delta}$ from Kennedy (2012) in my semantic proposal below in §7.4.2. This partitive operator is only present when the direct object NP is referential. And for the non-referential NPs, in §7.4.3 I basically follow Krifka-style analysis and propose that classifiers have a shifted event measure function semantics similar to what is proposed for incremental-theme nouns in Kennedy (2012). The verb stems themselves do not give rise to the non-culminating readings, but instead the non-culminating readings or culminating readings arise through the verbs’ composition with the partitive operator and the referential direct objects, and composition with the event measure functions respectively.

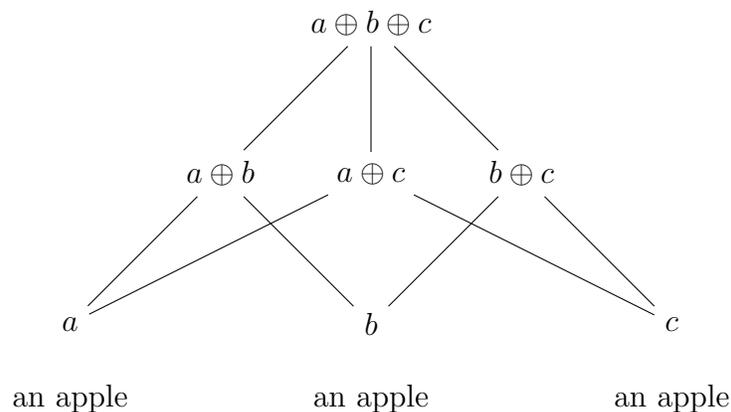
This section is organized as follows: in §7.4.1, I present a simplified version of Li’s (2013) syntactic-semantic analysis of the NPs in Mandarin and my analysis of the group atom formation process for definite NPs to show what sorts of NPs can have referential readings, and then I present my semantic analysis of the consumption verbs composing with the referential direct objects in §7.4.2 and the non-referential direct objects in §7.4.3. In §7.4.4, I briefly compare Mandarin consumption verbs with those in English and conclude that they

are more or less the same in both languages. In §7.4.5, I summarize my analysis by discussing the deeper meanings of the nominal properties.

7.4.1 Semantics of Noun Phrases in Mandarin

Following Link (1983), Chierchia (1998) and Li (2013), I assume that the extension of a noun phrase form a complete join semi-lattice structure in Mandarin. The NP with an individuating classifier or a concrete (container) classifier with a referential reading have an atomic lattice structure, whereas an NP with an abstract classifier or a concrete classifier with the measure reading have a non-atomic bottomless lattice structure. Following Chierchia (1998) and Li (2013), I also assume that the noun root denotes kind, and the count lattices are introduced by the composition of the individuating classifiers or the concrete classifiers (with the individuating reading) with the noun root. For example, as shown in Figure 7.1, the classifier phrase *ge pingguo* has a lattice structure with individual atomic apples as the bottom elements. The classifier *ge* CL picks out apple atoms as the bottom atomic elements of the lattice.

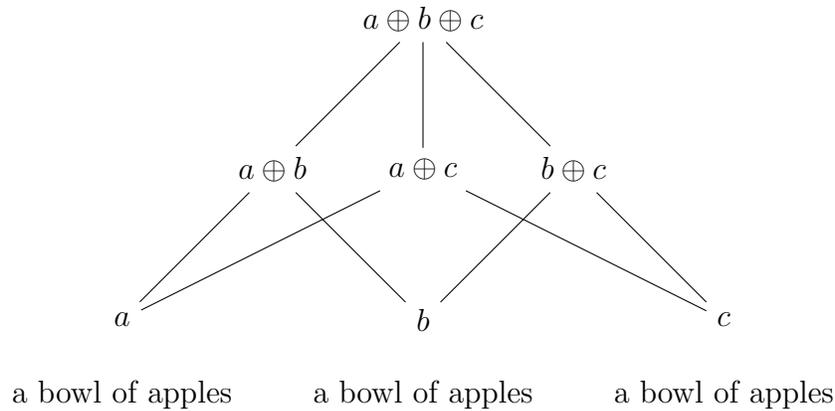
Figure 7.1: The Lattice of *Ge Pingguo* ‘CL Apples’



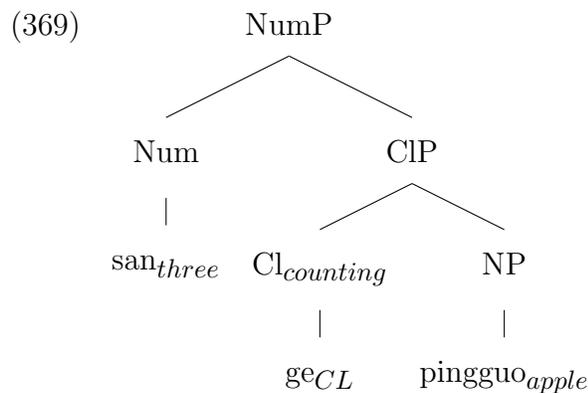
Similar to *ge pingguo* ‘CL apple’, the extension *wan pingguo* ‘BOWL OF APPLES (OR APPLE STUFF)’ with a referential reading also forms an atomic lattice structure with a bowl of apples

or apple stuff as an atom as in Figure 7.2. The atomic unit for *wan pingguo* is a bowl rather than an actual atomic apple, and actually the classifier phrase *wan pingguo* does not specify what shape the apples contained in the bowls are in. The apples might be intact individual apples or they may be cut up apple pieces.

Figure 7.2: The Lattice of *Wan Pingguo* ‘Bowl (of) Apples or Apple Stuff’



For the semantic composition, I basically assume the two syntactic structures proposed in the Li (2013). Refer to Li (2013) for the actual syntactic tests in support of the two different syntactic structures. As shown in (369), when the classifier has an individuating count reading, the classifier first combines with the bare NP to form a CIP and then combine with the numeral to form a NumP.



Counting, adapted from Li (2013)

Also assuming all the basic semantic claims and analyses of Mandarin numeral-classifier

phrases in Li (2013), I simply his analysis and notations along the lines of Krifka (1995) as illustrated in (370) for the ease of exposition. All Mandarin bare nouns have a mass type of meaning and denotes kinds. As in (370a), I use the subscript k as in $apple_k$ to indicate the apple kind. As in (370b), the individuating classifier ge maps a kind to its atomic individuals in a lattice with natural atomic units for that kind. So when the classifier ge composes with $pingguo$ ‘apple’, the CIP phrase characterizes a set of natural atomic individuals for the apple kind, i.e. a set of individual atomic apples as in (370c). By default, $ge pingguo$ has a singular meaning as in (370c), but because Mandarin has no singular/plural distinction, (370c) can shift to a plural meaning in (370d) to denote plural individuals, when composing with numeral larger than one, by the ‘*’ operation in Link (1983).

- (370) a. $\llbracket pingguo \rrbracket = apple_k$
 b. $\llbracket ge \rrbracket = \lambda k \lambda x [Atom_{natural}(k, x)]$
 c. $\llbracket ge pingguo \rrbracket = \lambda x [Atom_{natural}(apple_k, x)]$
 d. $\llbracket ge pingguo \rrbracket = \lambda x [*Atom_{natural}(apple_k, x)]$

When the numerals compose with the CIPs, the numerals have the semantics as in (371), the numeral yi ‘one’ composes with singular predicate P and other numerals larger than one compose with the plural predicate $*P$.

- (371) a. $\llbracket yi \rrbracket = \lambda P \lambda x [P(x) \wedge COUNT(x) = \mathbf{1}]$
 b. $\llbracket san \rrbracket = \lambda *P \lambda x [P(x) \wedge COUNT(x) = \mathbf{3}]$

For example, composing (371a) with (370c), we get the semantics of ‘one apple’ in Mandarin as in (372a). (372a) characterizes a set of singular atomic apple individuals. And similarly composing (371b) with (370d), we get the semantics for $san ge pingguo$ ‘three apples’, which characterizes a set of plural individuals, each individual is a sum of three atomic apples.

- (372) a. $\llbracket yi ge pingguo \rrbracket = \lambda x [Atom_{natural}(apple_k, x) \wedge COUNT(x) = \mathbf{1}]$
 b. $\llbracket san ge pingguo \rrbracket = \lambda x [*Atom_{natural}(apple_k, x) \wedge COUNT(x) = \mathbf{3}]$

In the semantics of the numeral, The COUNT function counts the atomic individual(s) given the specific CIP within the CIP's specific lattice structure depending on what the classifier is. In the case of *ge apple* 'CL apple', the atomic unit is a natural atomic individual apple because *ge* is an individuating classifier that picks out natural atomic units. But the counting unit does not need to be the natural atomic unit for the kind and is actually specified by the classifier rather than the noun. For example, as shown in (373), if we change *ge* 'CL' into *wan* 'BOWL' to form a CIP *wan pingguo* 'bowl of apples', the atomic unit will be a bowl of apples (or apple stuff). Therefore, when the COUNT function is applied to a plural individual in the lattice structure of 'bowls of apples', the COUNT function will return a value based on how many bowls of apples there are.

- (373) a. $\llbracket wan \rrbracket = \lambda k \lambda x [Atom_{bowl}(k, x)]$
 b. $\llbracket wan pingguo \rrbracket = \lambda x [Atom_{bowl}(apple_k, x)]$
 c. $\llbracket san wan pingguo \rrbracket = \lambda x [*Atom_{bowl}(apple_k, x) \wedge COUNT(x) = \mathbf{3}]$

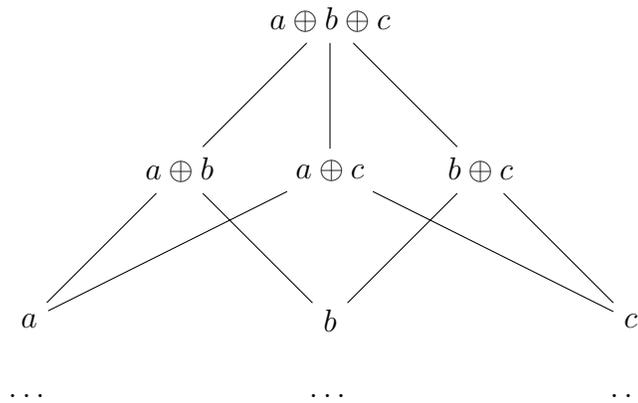
Similarly, when the concrete measure classifier with a referential reading combines with a mass noun *shui* 'water', the same kind of atomic lattice structure is also formed with atoms that consist of individual bowls of water. Because even though *pingguo* 'apple' is a count noun and *shui* 'water' is a mass noun in Mandarin, both *wan pingguo* 'bowl(s) of apples' and *wan shui* 'bowl(s) of water' have atomic lattice structure, it is therefore the classifier that determines whether an NP can have indefinite atomic referents in Mandarin.

- (374) a. $\llbracket wan shui \rrbracket = \lambda x [Atom_{bowl}(water_k, x)]$
 b. $\llbracket san wan shui \rrbracket = \lambda x [*Atom_{bowl}(water_k, x) \wedge COUNT(x) = \mathbf{3}]$

Unlike the NP with a counting-reading classifier, an NP with an abstract measure classifiers or the concrete container classifier with a measure reading has a bottomless non-atomic lattice structure which has the same structure as that of the bare noun head. As shown in Figure 7.3, like the noun *water* in English, the bare noun *shui* in Mandarin also has a bottomless non-atomic lattice structure, in which there are no bottom atomic elements and

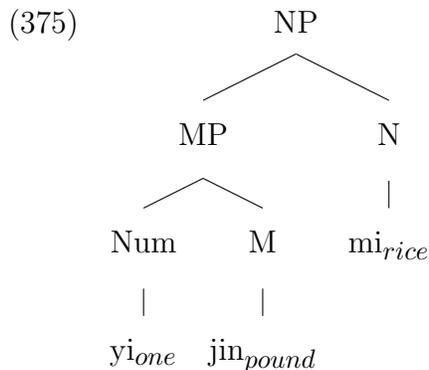
each individual in the lattice is some arbitrary measure of water. And actually not only do bare mass nouns in Mandarin have this structure, bare count nouns such as *pingguo* ‘apple’ without the classifier would have the same bottomless structure as well. As a count noun in Mandarin, the lattice for *pingguo* ‘apple’ nevertheless has some individuals in the lattice that happen to be naturally existent atomic apples (in the actual sense, not in the sense of the atomic bottom elements in the lattice), which can be accessed by individuating classifiers such as *ge* ‘CL’. Mass noun like *shui* ‘water’, on the other hand, are not compatible with the individuating classifiers.

Figure 7.3: A Bottomless Lattice for *Shui* ‘Water’



Given the lattice structure for bare nouns above, the composition of an NP with an abstract classifier works as follows: Syntactically, unlike the classifiers with the counting reading above, an abstract measure classifier such as *bang* ‘pound’ first composes with the numeral to form a measure phrase (MP)¹ and then combines with the noun to form an NP.

1. To avoid confusion about the two different types of ClPs, I have slightly modified the labeling in Li’s (2013) proposal by using M and MP instead here



Measure, (adapted from Li, 2013)

Semantically, as shown in (376), a measure classifier like *jin* ‘(Chinese) pound’ does not map a kind to an atomic lattice structure as a counting classifier does, but rather serves more or less as a measure function that measures some individual in the kind by the unit of the measure word. The \cup operator from Chierchia (1998) lowers the kind meaning to the set of individuals reading. So the *yi jin mi* ‘one (Chinese) pound of rice’ denotes a set of non-atomic individuals of the rice kind, each weighing one pound.

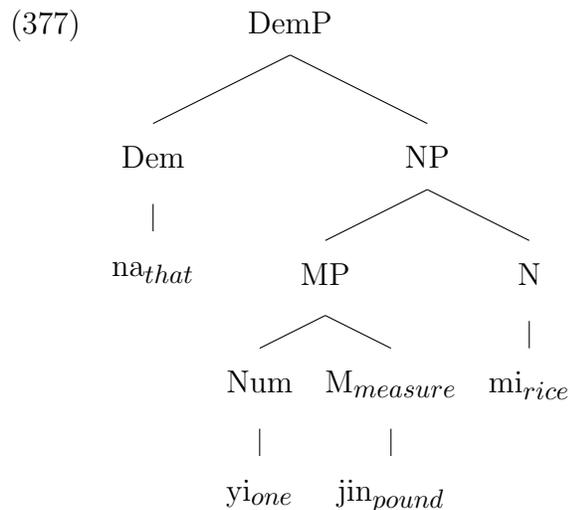
$$\begin{aligned}
 (376) \quad \llbracket jin \rrbracket &= \lambda n \lambda k \lambda x [\cup k(x) \wedge \text{POUND}(x) = n] \\
 \llbracket yi \text{ jin} \rrbracket &= \lambda k \lambda x [\cup k(x) \wedge \text{POUND}(x) = \mathbf{1}] \\
 \llbracket yi \text{ jin mi} \rrbracket &= \lambda x [\cup \text{rice}_k(x) \wedge \text{POUND}(x) = \mathbf{1}] \quad (\text{adapted from Li, 2013})
 \end{aligned}$$

So far, I have shown through a simplified version of Li’s (2013) analysis that indefinite NPs have atomic references with counting classifiers, i.e. individuating classifiers or concrete classifiers with a referential reading, but the NPs with measure classifiers do not. Based on my definition of referentiality earlier in the chapter, an individuated NP that denotes atomic individuals or plural atomic individuals can have referential readings, but non-individuated NPs only have non-referential measure readings. This referential/measure distinction proves to be crucial in predicting whether a non-culminating reading is possible for consumption verbs: a referential direct object can give rise to a non-culminating reading and a non-referential direct object obligatorily entails event culmination.

Besides the indefinite NPs with individuating classifiers or concrete measure classifiers

with a referential reading, all the definite NPs regardless the classifier type can give rise to a non-culminating reading as the direct object of the consumption verbs. I have hypothesized in the previous section that the referential function of the demonstrative and the internal topic position can individuate the definite NP from the rest of its kind by the group atom formation process (cf. Link, 1983).

To implement this group atom formation idea, I assume the syntactic structure in (377).



Individuating Function of the Demonstrative

I propose the semantics for *na* ‘that’ as in (378) which creates a definite group atom whose material part is equivalent to a individual in the set of P . Therefore, the meaning of *na yi-jin mi* ‘that one (Chinese) pound of rice’ in (378b) describes a definite group atom, whose material part equals the material part of a non-atomic individual of rice that weighs one pound.

- (378) a. $\llbracket na \rrbracket = \lambda P \iota x [Atom_{group}(x) \wedge \exists y [P(y) \wedge mpart(x) = mpart(y)]]$
 b. $\llbracket na \text{ yi jin mi} \rrbracket = \iota x [Atom_{group}(x) \wedge \exists y [\cup rice_k(y) \wedge POUND(y) = \mathbf{1} \wedge mpart(x) = mpart(y)]]$

In the next subsections, I discuss how these different types of NP with different referential properties compose with the consumption verbs in Mandarin. I basically propose that

consumption verbs have partial reading with referential NPs and that non-referential NPs serve as event measurement that forces a culminating reading with the consumption verbs.

7.4.2 *Semantic Composition with the Referential NP*

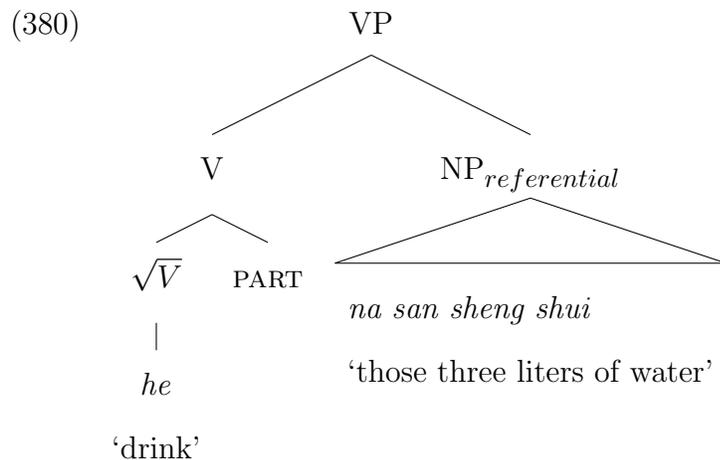
When the direct object has a referential reading or several possible referential readings, the referential entities are each in a partial thematic relationship with the consumption verb. In other words, as long as each atomic part of the NP is taken in part, the sentence will be semantically true.

To model this partial thematic relationship, I adapt and modify my own version of the partitive operator from Kennedy (2012) in (379). This new partitive operator combines with the verb root to give it a partial meaning with respect to a patient NP. Notice that this partitive operator can only appear when the direct object is referential.

$$(379) \quad \llbracket \text{PART} \rrbracket = \lambda P_{\langle v, t \rangle} \lambda x \lambda d \lambda e [P(e) \wedge \text{part}_{\Delta}(x)(e) = d \wedge \text{patient}'(x)(e)]$$

Adapted from (Kennedy, 2012)

For the semantic composition, I propose the following syntactic structure in (380).



As shown in (380), syntactically speaking, first the partitive head composes with the verbal root *he* ‘drink’ to generate a partial reading of the verb, expecting a patient referential NP object as the next step of composition. For the referential direct object, I consider it more

appropriate to call the referential direct object's thematic relation with the verb a patient relation rather than a theme relation, because the direct object is only partially affected. To see how the consumption verb composes with a singular predicate, let's derive the meaning for 'drink those three liters of water' in Mandarin step-by-step as follows in (381), where the definite NP denotes a group atom consisting of three liters of water.

- (381) a. $\llbracket na\ san\ sheng\ shui \rrbracket$
 $= \iota x [Atom_{group}(x) \wedge \exists y [\cup water_k(y) \wedge LITER(y) = \mathbf{3} \wedge mpart(x) = mpart(y)]]$
- b. $\llbracket he\ PART \rrbracket = \llbracket PART \rrbracket (\llbracket he \rrbracket)$
 $= \lambda x \lambda d \lambda e [drink'(e) \wedge part_{\Delta}(x)(e) = d \wedge patient'(x)(e)]$
- c. $\llbracket he\ na\ san\ sheng\ shui \rrbracket = \llbracket he\ PART \rrbracket (\llbracket na\ san\ sheng\ shui \rrbracket)$
 $= \lambda d \lambda e \iota x [Atom_{group}(x) \wedge \exists y [\cup water_k(y) \wedge LITER(y) = \mathbf{3} \wedge mpart(x) = mpart(y)] \wedge$
 $drink'(e) \wedge part_{\Delta}(x)(e) = d \wedge patient'(x)(e)]$

As shown in (381a), *na san sheng shui* 'those three liters of water' denotes a definite entity of water which measures to three liters in amount. It is interpreted referentially and can enter into a partial patient relation with the verb *he* 'drink' with the help of the partitive operator. The partial meaning of *he* 'drink' is derived from the composition of my version of the partitive operator and the verbal stem.

Besides the definite NPs, I have argued that the indefinite NPs that contain atoms are also referential. In Mandarin, the indefinite NPs with referential readings are the count NPs with an individuating classifier or the NPs with a concrete measure classifier with a referential reading. The composition of the consumption verbs with the semantically singular indefinite NP predicates would be more or less the same as above in (381).

However, in the case where the direct object denotes plural individuals, the semantic composition works slightly differently. For the semantically indefinite plurals, the consumption verbs have a distributive reading over all the atomic parts within the plural individual. I adapt the distributive operator by Link (1983) to model the distributive reading as in (383).

(382) Link's D operator

$$\llbracket D \rrbracket = \lambda P \lambda x \forall y [y \leq x \wedge Atom(y) \rightarrow P(y)]$$

(Takes a predicate P over individuals and returns a predicate that applies to any individual whose atomic parts each satisfy P.) (Champollion, 2016, 15:11)

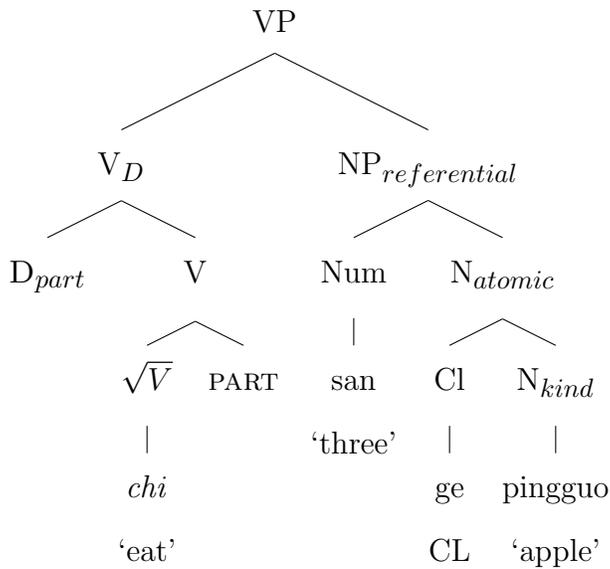
(383) Modified D operator for partitive verbs:

$$\llbracket D_{part} \rrbracket = \lambda P_{\langle e, \langle d, \langle v, t \rangle \rangle \rangle} \lambda x \lambda e \forall y \exists d [y \leq x \wedge Atom(y) \rightarrow \exists e' [e' \leq e \wedge P(y)(d)(e')]]$$

This distributive operator for partitive verbs takes in a partitive verbal predicate P of type $\langle e, \langle d, \langle v, t \rangle \rangle \rangle$ and gives back a predicate that can be applied to a plural individual so that for each of the atomic individual within the plural individual, there is a degree d to which the atomic individual is partly affected.

I propose the following syntactic structure in (384) for the distributive reading for the composition of consumption verbs with the indefinite plurals.

(384)



- (385) a. $\llbracket \text{san ge pingguo} \rrbracket = \lambda x [^* \text{Atom}_{\text{natural}}(\text{apple}_k, x) \wedge \text{COUNT}(x) = 3]$
- b. $\llbracket \text{chi part} \rrbracket = \lambda x \lambda d \lambda e [\text{eat}'(e) \wedge \text{part}_{\Delta}(x)(e) = d \wedge \text{patient}'(x)(e)]$
- c. $\llbracket \text{D chi PART} \rrbracket = \lambda x \lambda e \forall y \exists d [\text{Atom}(y) \wedge y \leq x \rightarrow \exists e' [e' \leq e \wedge \text{eat}'(e') \wedge \text{part}_{\Delta}(y)(e') = d \wedge \text{patient}'(y)(e')]]$
- d. $\llbracket \text{D chi PART san ge pingguo} \rrbracket$
 $= \lambda x \lambda e \forall y \exists d [^* \text{Atom}_{\text{natural}}(\text{apple}_k, x) \wedge \text{COUNT}(x) = 3 \wedge [\text{Atom}(y) \wedge y \leq x \rightarrow \exists e' [e' \leq e \wedge \text{eat}'(e') \wedge \text{part}_{\Delta}(y)(e') = d \wedge \text{patient}'(y)(e')]]]$ event identification
 $= \lambda e \exists x \forall y \exists d [^* \text{Atom}_{\text{natural}}(\text{apple}_k, x) \wedge \text{COUNT}(x) = 3 \wedge [\text{Atom}(y) \wedge y \leq x \rightarrow \exists e' [e' \leq e \wedge \text{eat}'(e') \wedge \text{part}_{\Delta}(y)(e') = d \wedge \text{patient}'(y)(e')]]]$ existential closure

As we can see in (385), this correctly derives the reading that each of the apple is partially eaten. For ‘ate three apples’ to be true in Mandarin, all of the three apples need to be at least partially eaten. The sentence *wo chi le san-ge pingguo* ‘I ate three apples’ is not true if not all of the three apples are eaten.

When the consumption verb composes with a semantically plural object, it has obligatory distributive reading as described above. However, when *san-ge pingguo* is made definite by adding the demonstrative *na* ‘that’ in front, the distributive reading is no longer required. This is because the three apples can form a group atom just like in the case of ‘those three liters of water’ and is turned into a semantically singular object. It is no longer necessary for all three of the apples to be eaten, but sufficient even if only one or two apples are eaten.

- (386) $\llbracket \text{na san ge pingguo} \rrbracket$
 $= \iota x [\text{Atom}_{\text{group}}(x) \wedge \exists y [^* \text{Atom}_{\text{natural}}(\text{apple}_k, y) \wedge \text{COUNT}(y) = 3 \wedge \text{mpart}(x) = \text{mpart}(y)]]$

Notice that the relevant atomic parts made available by the sentences are not necessarily the actual smallest atomic parts of the reference in the real world, because in the case of definite plurals or definite mass nouns, group atoms can contain actual smaller atoms within, but these smaller atoms are not made invisible for the group atom reading. As long as the

group atom is partially consumed, it does not matter whether each of the smaller atoms is consumed.

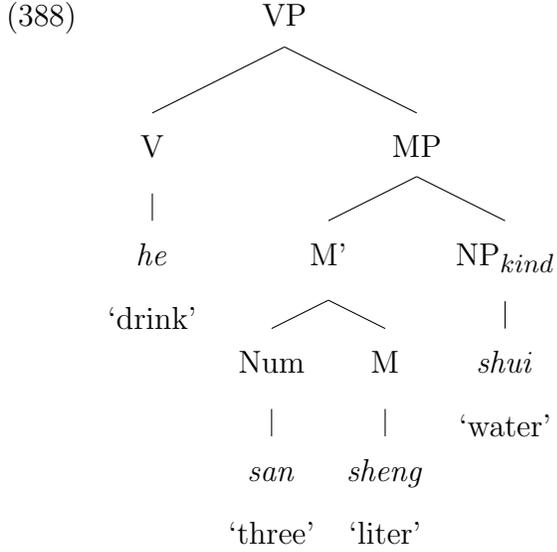
In summary, I have proposed that when the NP has a referential reading, the consumption verbs have a partial reading by composition with a partitive operator. In the case of semantically plural objects, the consumption verb has an obligatory distributive reading which can be modeled by the presence of a distributive operator D_{part} for the partitive predicate. However, in the case of the definite NPs, the distributive reading is not required, as they are treated as singular objects because of their group atom formation process.

7.4.3 *Semantic Composition with the Non-Referential NP*

When the direct NP does not have a referential reading, however, I propose a Krifka-style analysis that they serve as event measurements instead. In other words, the direct object NP denotes the amount of stuff that is involved in the event rather than some specific referential entities. Following Kennedy (2012), I argue when a classifier has a measure reading, the classifier is shifted to an event measure function as illustrated by *sheng* ‘liter’ in (387), that measures how many liters of substance denoted by a noun is incrementally changed in an event (cf. Kennedy, 2012).

(387) $\llbracket sheng_{inc} \rrbracket = \lambda d \lambda P \lambda x \lambda e [P(x) \wedge \text{LITER}_{\Delta}(x)(e) = d]$ (adapted from Kennedy, 2012)

In terms of the syntax-semantics interface for the non-referential measurement reading, following the syntactic structure for measurement readings proposed for numeral-classifier phrases by Li (2013), I propose the structure in (388). Notice that in this structure, because the NP has a non-referential measure reading, the partitive operator is absent so that a non-culminating reading cannot arise.



Let's look at the semantic composition of 'drink three liters of water' in Mandarin and see why this predicate can only have a culminating and event homomorphic reading.

- (389) a. $\llbracket san\ sheng \rrbracket$
 $= \llbracket sheng_{inc} \rrbracket (\llbracket san \rrbracket)$
 $= \lambda d \lambda P \lambda x \lambda e [P(x) \wedge \text{LITER}_{\Delta}(x)(e) = d](\mathbf{3})$
 $= \lambda P \lambda x \lambda e [P(x) \wedge \text{LITER}_{\Delta}(x)(e) = \mathbf{3}]$
- b. $\llbracket san\ sheng\ shui \rrbracket = \llbracket san\ sheng \rrbracket (\llbracket shui \rrbracket)$
 $= \lambda x \lambda e [\cup water_k(x) \wedge \text{LITER}_{\Delta}(x)(e) = \mathbf{3}]$
 $= \exists x \lambda e [\cup water_k(x) \wedge \text{LITER}_{\Delta}(x)(e) = \mathbf{3}]$ (existential closure)
- c. $\llbracket he \rrbracket = \lambda e [drink'(e)]$
 $\llbracket he\ san\ sheng\ shui \rrbracket = \exists x \lambda e [drink'(e) \wedge \cup water_k(x) \wedge \text{LITER}_{\Delta}(x)(e) = \mathbf{3}]$
(event identification)

As shown in (389), the measure word *sheng* 'liter' has a shifted event measurement function reading that measures how much of substance denoted by a noun is incrementally changed in an event. The measure word *sheng* 'liter' first takes in the degree argument *san* 'three' and then the noun *shui* 'water' to give rise to an event description that involves three liters of water. Through event identification, this event description composes with the verb

he ‘drink’ to create a new event description which describes a drinking event involving three liters of water incrementally changed. Because the three liters of water is entirely involved in the event, the predicate can only have a culminating reading. In this case, the predicate does have a true accomplishment type of semantics in Krifka’s sense and does entail event culmination.

Besides the abstract measure words and the concrete (container) measure words used non-referentially, it is possible that individuating classifiers can also be used in a measure reading way. In this case, the reading for the VP would also be a telic accomplishment reading. Therefore, consumption verbs with NPs with individuating classifiers or NPs with concrete (container) classifiers can be ambiguous between the atelic partial quasi-degree-achievement reading or the telic accomplishment reading.

7.4.4 *Comparison with English Consumption Verbs*

My analysis for the Mandarin consumption verbs above can actually be adapted for the English consumption verbs as well. Basically, despite of the classifier difference between English and Mandarin NPs, English consumption verbs also allow non-culminating reading with a referential direct object, and entail event culmination with a non-referential direct object with a measure reading (cf. Kennedy, 2012). The reason why we are under the impression that English does not allow non-culminating accomplishments for consumption verbs is that the Krifka-style analysis predominates and over-applies to the referential cases. In other words, the indefinite NPs in English are mostly analyzed as non-referential measure readings with the consumption verbs in previous studies.

However, there seems to be a legitimate difference between Mandarin and English consumption verb predicates that the cases of indefinite plurals in English seem to strongly disfavor the non-culminating partial readings. For example, *ate three apples* in English has not been reported in previous studies to have a similar non-culminating reading as its counterparts in Hindi or Mandarin. I believe the reason to be that it is much harder for English

indefinites to have the referential reading, probably because English has the definite article or that English also has the expressions such *eat of* or *drink of* as alternatives. Pragmatically speaking, if an English speaker wants to refer to three specific apples, the speaker can choose to add a definite article and use *the three apples* instead. Alternatively, if the English speaker wants to emphasize the partial reading, *ate of three apples* could have been used instead of *ate three apples*. I leave this as an open question for future research as to why exactly English does not seem to allow non-culminating readings for the indefinite plurals, which theoretically can also have referential readings.

7.4.5 *Summary of Analysis*

To summarize, the culminating vs. non-culminating reading dichotomy for consumption verbs ultimately boils down to how the NP is interpreted: only when the NP is referential, can a part represent the whole atomic reference (cf. Rothstein, 2009a,b). And in a patient thematic relation, affecting a part stands for affecting the whole. Depending on the classifier or measure word, a numeral-classifier phrase in Mandarin can be interpreted either referentially or non-referentially with a measurement reading or both, and these two types of readings are different syntactically and semantically (cf. Rothstein, 2010b; Li, 2013). Whereas in the referential reading, each referential entity is atomic which means that it has a boundary and is distinguishable from other referential entities; in the non-referential reading, none of the abstract measurement units is distinguishable from each other. For example, in ‘three apples’ and ‘three bowls of water’, each apple and each bowl can be distinguishable from another apple and another bowl, while in ‘three liters of water’, each liter of water is not distinguishable from another liter of water. Precisely because referential entities are individuated, a sub-part of a referential entity can uniquely refer back to that referential entity, whereas a sub-part of a non-referential amount cannot. Therefore, ‘eat three apples’ can be true in case that each of the three apples is partially eaten, whereas ‘drink three liters of water’ cannot be true with a non-culminating reading because the three liters of water is

not referring to three separate entities of one liter of water that can be partly consumed.

7.5 Comparison with Previous Analyses

In comparison with previous analyses, my analysis brings a previously mostly neglected factor, the referentiality of the noun phrase into the discussion of mereological analyses of telicity in event semantics. The Mandarin data I have presented show that referentiality holds the key to understanding why and when a non-culminating reading is possible for a consumption verb with a bounded direct object.

7.5.1 Comparison with Singh (1991, 1998)

More specifically, when compared with Singh's (1991, 1998) analysis of the Hindi data, my analysis argues that there is only one partial thematic relation between the verb and the direct object that only the referential NP can enter into, instead of stipulating two different thematic relations in the mass and count domain. The culminating reading is explained as following naturally from the non-referential measure reading of the NP, which serves only as an event measurement but does not enter into the partial thematic relation.

Although Singh (1991, 1998) also mentions atomicity as part of her analysis, she does not link the atomicity to referentiality and definiteness. It is not entirely clear how her account would treat a definite direct object differently from an indefinite direct object. From what I understand of her proposal, the direct object has a partial thematic relation with the verb if the direct object is a count noun and it has a total thematic thematic relation if it is a mass noun (or a count noun understood as material rather than individuals). According to her analysis, in Hindi 'drink three liters of beer' and 'drink those three liters of beer' will both stand in a total thematic relation with the verb, and do not allow non-culminating reading. If Singh's analysis is directly applied to the Mandarin data, it would wrongly predict that 'drink those three liters of water' cannot have a non-culminating partial-success reading.

In comparison, my analysis links referentiality with atomicity/individuation in that I claim that a referential object is an object that can be individuated from the rest of its kind. Therefore, under my analysis ‘drink those three liters of water’ in Mandarin can have a non-culminating reading, because ‘those three liters of water’ is understood as an individuated referential object by virtue of its definiteness.

Another major difference between Singh’s (1991; 1998) analysis and my analysis is that the atomic structure of the noun phrase is introduced by the noun in her analysis, whereas in my analysis it is introduced by the classifier or measure word in Mandarin. This could just be a language-specific difference between Hindi and Mandarin, but this difference makes different predictions about the NPs with concrete measure words as the direct object. Whereas Singh (1991, 1998) reports that ‘drink three glasses of beer’ only have culminating reading in Hindi, I have reported in this chapter that ‘drink three bowls of water’ in Mandarin can have an non-culminating reading when the measure word ‘bowl’ is understood referentially as actual bowls of water. Our analyses have different predictions because ‘three glasses of beer’ in Singh’s analysis belongs to the mass domain by virtue of beer as the mass noun, and consequently has a total thematic relation with the verb. However, in my analysis, ‘three glasses of beer’ belongs to the count domain and is a plural individual in an atomic lattice structure of ‘glasses of beer’, and consequently can have non-culminating partial reading because in my analysis referential atomic objects can be each partially eaten.

7.5.2 Comparison with Soh and Kuo (2005)

In their study of Mandarin perfective aspect and verbs of creation and consumption, Soh and Kuo (2005) also observe that definiteness influences whether the event can have a non-culminating reading for the consumption verbs. They correctly claims that the nominal properties, including definiteness, affect whether a creation or a consumption verbal predicate can have a non-culminating reading. I agree with Soh and Kuo (2005) that definite NPs (by which they mean the NPs with the demonstratives in Mandarin) can have non-culminated

reading in Mandarin. However, I disagree with their observation that that all direct object NPs with a numeral have a culminating reading. As shown in the examples repeated below, although Soh and Kuo (2005) show in their examples that the non-culminating reading is infelicitous for the numeral-classifier NP as the direct object of a consumption verb as in (354), Koenig and Muansuwan (2000) already calls this observation into question in a later study by showing that numeral-classifier NP can have a non-culminating reading

- (354) Ta chi-le #liang-ge dangao/ na-ge dangao, keshi mei chi-wan.
 He eat-PERF two-CL cake/ that-CL cake but not eat-finish
 ‘He ate two cakes/that cake, but he did not finish eating them/it.’

adapted from Soh and Kuo (2005, 204)

- (355) Wo (...) chi-le liang-chuan dakao, dan mei chi-wan.^{Google}
 I eat-PERF two-CL kabob, but not eat-finish
 ‘I ate two kabobs, but didn’t finish eating them. (lit.)’

Koenig and Chief (2007, 247)

Because Soh and Kuo (2005) and I have different judgments on the indefinite NPs with the numeral, inevitably their analysis would wrongly predict that when a consumption verb has any indefinite numeral-classifier NP as the direct object, the predicate only has culminating reading in the perfective. Nevertheless, let’s briefly examine their proposal below.

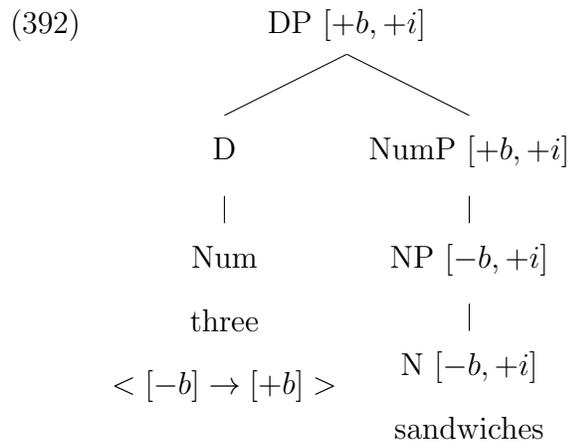
Soh and Kuo (2005) adopt a feature-base analysis of NP and propose that ‘nominal arguments may bear the conceptual features \pm bounded [$\pm b$] and \pm internal structure [$\pm i$](Soh and Kuo, 2005).’ For example, as shown in (390), groups and individuals are bounded, whereas substances and aggregates are not bounded. Following Krifka’s (1989) analysis, when the direct object is bounded, the verbal predicate is also bounded and hence telic.

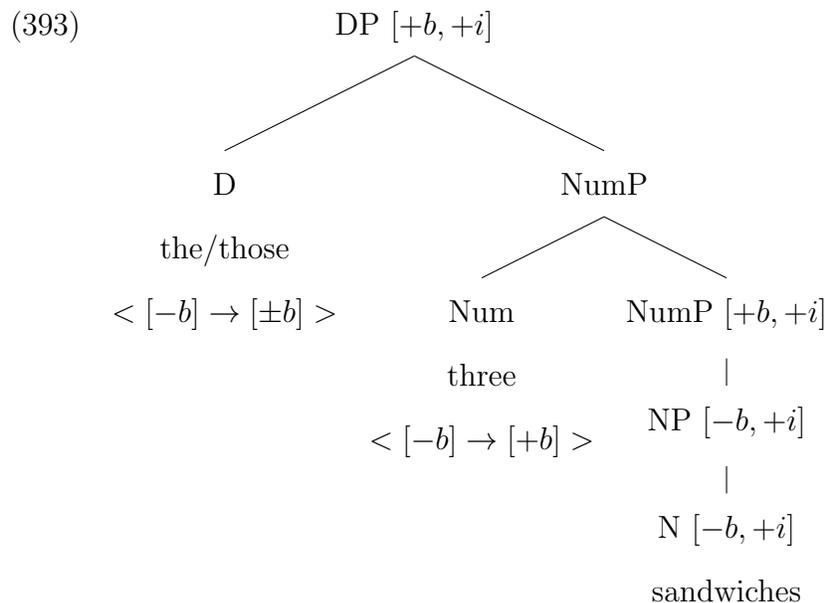
- (390) [$+b, -i$] individuals (a pig)
 [$-b, -i$] substances (water)
 [$+b, +i$] groups (a committee)
 [$-b, +i$] aggregates (buses, castle)

According to Soh and Kuo (2005), the presence of a numeral or an element in D can change the features of the four categories in (390) in the following way: the numeral changes a $[-b]$ feature into a $[+b]$ feature and an element in D, i.e. a demonstrative or a definite article, changes a $[-b]$ feature to a $[\pm b]$ feature that allows for both bounded and unbounded interpretations. The reason why an element in D changes the $[-b]$ into a $[+b]$ is that this element in D has a referential function that can bring the boundary of the substance or the aggregates into view (Soh and Kuo, 2005, 209).

- (391) Numeral $[-b] \rightarrow [+b]$
 Element in D $[-b] \rightarrow [\pm b]$

So according to this analysis, for example, an indefinite numeral NP as in (392) and (393) and a definite numeral NP would have the following features through feature percolation from the parts below.





Because both the indefinite numeral NP phrase and the definite one have the same features $[+b]$, their proposal predicts that with consumption verbs these two both have an obligatory event culmination reading in Mandarin. However, as I have argued extensively in this chapter, both the indefinite count NPs such as ‘three sandwiches’ and the definite NPs in Mandarin can have non-culminated reading.

Through briefly discussing the proposal by Soh and Kuo (2005), we see that although Soh and Kuo (2005) have made a crucial observation about definiteness’ contribution to the non-culminating reading, due to insufficient and partly inaccurate data, their analysis falls short of accounting for the full patterns I have presented in this chapter.

7.5.3 Comparison with Koenig and Chief (2007)

In their study of Mandarin accomplishment predicates and the non-culminating readings, Koenig and Chief (2007) investigate all the non-culminating accomplishments in Mandarin in general and do not focus on the consumption verbs in Mandarin. Koenig and Chief (2007) crucially observe that the Mandarin perfective marker *le* cannot be the cause of non-culminating readings because not all predicate types can have non-culminating reading in Mandarin, and determine that the non-culminating readings stem instead from the

verbal predicates themselves. They basically adopt a scalar analysis for all the accomplishment predicates in Mandarin, and argue that the Mandarin accomplishments denote scalar change events like degree achievements. For example, they propose that in Mandarin *sha* ‘kill’ ‘involves seriously lowering the degree of somebody’s health (Koenig and Chief, 2007, 251)’ and consumption verbs such as *chi* ‘eat’ denotes object-oriented scalar change event descriptions.

However, because they do not include indefinite mass nouns with abstract measure words in their discussion, Koenig and Chief (2007) incorrectly conclude that the nominal properties of the direct object are irrelevant for the non-culminating reading for Mandarin accomplishments. Their analysis would wrongly predict that predicates like ‘drink water’ and ‘drink three liters of water’ can have a non-culminating reading in Mandarin, which is shown to be not the case in this chapter.

My analysis of the consumption verbs with referential direct objects basically is also a scalar analysis by invoking the *part* operator by Kennedy (2012), which creates a scalar change on the parts of the referential object. However, different from Koenig and Chief (2007), I propose that the direct objects without a referential reading are interpreted as event measurements and consequently induce a culminating reading when composed with the consumption verbs.

7.6 Conclusion

This chapter investigates the patterns of non-culminating readings for consumption verbs in Mandarin to shed light on the functions of the nominal properties of the direct object in Mandarin. I have argued that referentiality plays a key role in determining when it is possible to assert that the direct object is only partially consumed when the direct object is quantized. Through investigating different combinations of indefinite and definite numeral-classifiers phrases, I find that the non-culminating reading is felicitous for referential NPs, but not for non-referential NPs. And an NP can be referential when it is definite or when

it is indefinite with an individuating classifier or a concrete measure word with a referential reading. The NP is obligatorily non-referential when it is indefinite with an abstract measure word. In other words, it is referentiality rather than the count/mass distinction of the noun that ultimately determines whether a non-culminating reading can arise for Mandarin consumption verbs.

When the direct object NP is non-referential, the verbal predicate has a proper accomplishment semantics in Krifka's sense and it only gives rise to a culminating reading. This shows that Mandarin also has the Krifka-style accomplishment predicates through the composition of the verb and the non-referential bounded direct object NP and these true accomplishments do culminate in the perfective. The cases of 'non-culminating accomplishments' for the consumption verbs are actually cases where the verb composes with an NP that can potentially have a referential reading in addition to a non-referential measurement reading. In other words, these predicates are ambiguous between a degree-achievement-like activity reading and an accomplishment reading. The so-called 'non-culminating' reading only arises when the consumption verbal predicate is interpreted as an activity predicate.

CHAPTER 8

CONCLUSION

In this dissertation, I have investigated the non-culminating accomplishments in Mandarin. Two over-arching questions I set up to answer in the first chapter are whether non-culminating accomplishments arise from a single source or multiple sources and how we can reliably test out the contributions of each part. To answer these two questions, I have adopted a step-by-step method to tease apart the contributions of different parts by studying each sub-type of non-culminating accomplishments in depth within the same language.

In this chapter, I explain how the findings and analyses in the three different subtypes all come together to inform us about the source problem and the reason why non-culminating accomplishments exist in Mandarin in §8.1. Then, I discuss some remaining issues and future directions in §8.2. In §8.3, I conclude this chapter by pointing out some contributions of my dissertation.

8.1 The Overall Picture

Coming back to the source problem I have established in Chapter 2, I conclude for Mandarin that the perfective is not the source of the non-culminating readings but rather the semantics of different parts of the verbal predicates are the sources of non-culminating readings in Mandarin. Unlike most previous studies, which claim that there is one single source for all non-culminating accomplishment readings within a language, I have demonstrated that for different types of predicates, more than one factors can contribute to the non-culminating reading of a potential accomplishment predicate. More specifically, I have shown that transitivity, degree semantics, and the referentiality of the direct object can all be factors that influence whether a non-culminating reading can arise for a potential accomplishment predicate.

As to why Mandarin can give rise to the so-called ‘non-culminating’ accomplishments,

the simple answer is that Mandarin does not have accomplishment verb stems, but it has compositionally-derived accomplishment predicates: the Dowty-style accomplishment predicates as in the resultative verbal compounds in Chapter 5, and the Krifka-style accomplishment predicates as in the consumption verbs with a non-referential measure NP as the direct object in Chapter 7. Both kinds of accomplishment predicates in Mandarin are fully compositional and they do entail event culmination in the perfective. Therefore, true accomplishment predicates do culminate. The ones that allow non-culminating readings are actually activity predicates mistaken for accomplishment predicates. We can say that non-culminating accomplishments are somehow a misnomer because the seemingly accomplishment-like predicates that can have non-culminating readings are actually not strictly speaking accomplishment predicates semantically in the first place.

The ‘non-culminating accomplishments’ are arrived at from different ways, corresponding to different ways of building accomplishments: Dowty’s way of adding a result state to the activity part and Krifka’s way of having an argument-event homomorphism between a bounded direct object and a gradual verb. For the equivalents of Dowty-style accomplishments in Mandarin, the bare transitive verbs can give rise to non-culminating readings in Mandarin because they are packaged as manner verbs that do not encode the result states in the semantics of the verb. For the equivalents of Krifka-style accomplishments, some of them have the non-culminating readings because the direct object NP is interpreted referentially as a patient instead of the non-referential measurement reading. For both types of accomplishment predicates in Mandarin, the verb stems themselves are lexically activities: the Dowty-type verb stems are transitive activities where the verbs carry the thematic information, whereas the Krifka-type consumption verb stems are intransitive activity that rely on its direct object to provide the thematic information.

Comparing Mandarin and English, the main difference between the two languages lies in the way the Dowty-style accomplishments are built: whereas English lexically builds Dowty-style accomplishment in the bare transitive verbs, Mandarin compositionally derives Dowty-

style accomplishment predicates by adding the resultative morphemes onto the activity verbs to form resultative verbal compounds. Therefore, unlike English, Mandarin bare transitive verbs do not have event culmination entailments in the perfective.

Mandarin and English are basically the same regarding the consumption verbs for the Krifka-style accomplishments. Both languages allow non-culminating readings for consumption verbs with referential direct objects. The true Krifka-style accomplishments are the ones with non-referential direct objects, which only have a measurement reading. However, for whatever reason, it seems somehow harder to access the referential readings for the English indefinite NPs so that it superficially seems that English does not allow non-culminating readings, when the direct object is an indefinite NP; whereas Mandarin and Hindi allow non-culminating readings for the indefinite count NPs.

Besides the Dowty-style accomplishments and the Krifka-style accomplishments, in this dissertation I have also investigated the degree achievements in Mandarin, which have been considered to be ambiguous between an accomplishment reading and an activity reading in the previous literature. Mandarin degree achievements are more heterogeneous than their English counterparts. The de-verbal degree achievements in Mandarin are identical to their English counterparts, but the de-adjectival ones are actually inchoative stative predicates instead of dynamic degree-achievement predicates.

8.1.1 Global Factors

Although for each subtype of non-culminating accomplishments in Mandarin, I have developed a different analysis suitable for the sub-type, it is not the case that there are no general factors that unify all different subtypes of the non-culminating accomplishments. In Mandarin, transitivity is an overarching factor throughout the different types of non-culminating accomplishments I have examined in this dissertation. We see that bare transitive verbs in Mandarin are lexicalized as manner verbs with low affectedness and that the change-of-state processes are almost exclusively encoded in the intransitives instead. Because of this general

tendency in the lexical semantics of Mandarin, we see that Mandarin seems to ubiquitously allow many different sorts of non-culminating accomplishments and perhaps more so than some other languages.

Scalarity is another factor that is relevant for both the Mandarin degree achievements in Chapter 6 and the incremental-theme verbs in Chapter 7. For both Chapter 6 and Chapter 7, one of the reasons why non-culminating readings can arise is that the verbal predicates have an associated event scale of change and a non-maximal degree of change reading is allowed by the semantics, even though the pragmatics prefers a stronger maximal degree of change reading. The verbal scale comes from the associated adjective core for the degree achievements and from the PART operator that establishes a scale based on the parts of the referential direct object.

One of the novel factors I have discussed extensively in my dissertation is the referentiality of the direct object for consumption verbs. I have crucially demonstrated that non-referential direct object NPs have an event measurement reading that entails event culmination, and that referential direct object NPs allow the non-culminating readings by the partial meaning of the verbs. A major contribution of my dissertation is that I examine carefully different culmination patterns of the consumption verbs with comprehensive combinations of indefinite and definite numeral-classifier phrases in Mandarin, which previously have only been investigated partially in various studies.

8.1.2 Speculation of Cross-Linguistic Patterns

With regards to the ultimate question why some languages allow the so-called ‘non-culminating accomplishments’, we can say that it fundamentally lies in the different ways languages package their verbal meaning differently. In Mandarin the apparent accomplishment predicates that allow non-culminating readings are not true accomplishments, and the true accomplishments do culminate in the perfective. The true accomplishments in Mandarin are the resultative verbal compounds and the consumption verbs with a direct object with a non-

referential measurement reading, and both entail culmination in the perfective. Therefore, we can also say that true accomplishments with the canonical accomplishment semantics do culminate.

Given the general picture I end up with for Mandarin non-culminating accomplishments, I make a few speculations about the cross-linguistic typologies of non-culminating accomplishments as follows: the degree achievements and the Krifka-style incremental-theme verbs cross-linguistically allow partial-success non-culminating readings because of the scalar semantics. However, some languages can access the referential readings for the direct objects of the consumption verbs more easily than others, so that superficially it may seem like languages like English or Japanese do not allow non-culminating readings for the incremental-theme consumption verbs.

Table 8.1: Speculations about Cross-Linguistic Typologies

Non-Culminating Readings?	Mandarin	English	Japanese
Transitive Dowty-Style	✓ (fa ps)	×	variable
Transitive Degree Achievement	✓ (fa ps)	✓ (fa? ps)	✓ (fa ps)
Intransitive Degree Achievement	✓ (ps)	✓	(possibly ✓ (fa ps))
Transitive Krifka-Style	✓ (ps)	✓ (ps)	✓ (ps)

Languages vary the most regarding how they package the meaning of their transitive verbs and this affects the non-culminating readings for the Dowty-style accomplishment equivalents most perspicuously. On one end of the spectrum, there are languages like Mandarin that allow for non-culminating readings even for verbs with high affectedness such as ‘kill’ and ‘fix’. On the other end of the spectrum, there are also languages like English which do not allow any non-culminating readings for this class and universally package the Dowty-style accomplishment semantics lexically in the verb stems as result verbs. Somewhere in the middle, there are also languages such as Japanese that allow some verbs of lower affectedness such as ‘open’ to have a non-culminating reading but disallow verbs of higher affectedness such as ‘kill’ to have a non-culminating reading in the perfective (cf. Ikegami,

1981; Tsujimura, 2003). The transitivity factor also influences the possible non-culminating readings for the degree achievements because it seems that some languages such as Mandarin and Japanese allows a failed-attempt reading for a transitive degree-achievement such as ‘burn’, but English only allows at most a partial-success reading for ‘burn’. It is possible that like Mandarin, Japanese also package the transitive degree achievements as manner verbs so that a failed-attempt is possible.

8.2 Looking Ahead

There are still a few remaining questions I would like to research further in my future studies.

The first question regards the pragmatics component. For all the non-culminating accomplishments in Mandarin, the default reading through pragmatic strengthening is that the event has culminated. I have tentatively suggested in Chapter 5 that we can account for the default culminating readings by pragmatic inferences based on the speaker’s world knowledge of the usual outcomes of actions. However, I have yet to propose a detailed mechanism how this pragmatic strengthening process really works in event semantics in Mandarin.

The second question is about the referential properties of the direct object for creation verbs. In Chapter 7, I have chosen to focus on consumption verbs in Mandarin and left out the discussion of creation verbs. The reason for this choice is that I consider the referential properties of a previously non-existent object that comes into existence through the creation event less well-defined than the ones that are already in existence. It is not entirely clear to me at this stage, whether a partially created object can be considered a referential object. In my future research, I would like to investigate further whether and how referentiality of the direct object plays a role for creation verbs.

The third question regards the cross-linguistic patterns of non-culminating accomplishments. I would like to investigate further whether if we can establish an implicational typology of non-culminating accomplishments based on the factor such as transitivity and scalarity. Perhaps having one kind of non-culminating accomplishments in a language would

imply that the language is also very likely to have another type of non-culminating accomplishments. In this dissertation, I have mostly compared Mandarin with English, and in the future I would like to extend this comparison to more languages of various types.

8.3 Conclusion

My dissertation contributes significantly to Chinese linguistics by offering a first comprehensive account of ‘non-culminating accomplishments’ in Chinese. In my dissertation, I have also constructed a new step-by-step approach to investigate event semantics cross-linguistically and argue that it is necessary to conduct an in-depth study of various related subtypes of non-culminating accomplishment phenomena within one single language in order to truly understand where the source of a specific reading really comes from and how the interactions between different parts of the grammar contribute to specific readings. Furthermore, in Chapter 7, to the best of my knowledge, I offer one of the first detailed studies of how referentiality and atomicity contribute to non-culminating accomplishment readings, which will open up new venues of research for other languages with similar non-culminating accomplishments.

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