

Inner Aspect in Mandarin Chinese: Evidence from the interaction between post-verbal
adverbials and post-verbal nominals*

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1. INTRODUCTION

This paper is concerned with two word order questions in Mandarin Chinese. The first issue is the ordering of adverbs. The majority of the adverbs falls between the subject and the main verb, as shown in (1a, b). However, there are three types of adverbs that do not conform to this word order pattern: locatives, frequentatives and duratives. Locatives may appear post-verbally with some verbs such as *shui* ‘to sleep’ in (2c), and frequentatives/duratives are restricted to the post-verbal position as shown in (2a, b).

- (1) a. ta zuotian/guxi/chanchan/manmande/zai xuexia ha-po huaping.
 he yesterday/purposively/often/slowly/at school hit-broke vase
 ‘He broke the vase(s) yesterday/ he broke the vase(s) purposively/ he often breaks
 vases./ He broke the vase(s) slowly/ he broke the vase(s) in school.’
 b. *ta ha-po huaping zuotian/guxi/chanchan/manmande/zai xuexia.
 he hit-broke vase yesterday/purposively/often/slowly/at school
- (2) a. ta nian le [liang nian] shu¹.
 he read PRF [two year] book
 ‘He studied for two years.’

* I am obliged to Prof. Diane Massam for her constant support, supervision, and insightful comments. I am also grateful to Prof. Elizabeth Cowper for her invaluable and inspiring discussions and to Prof. Susana Béjar for her helpful input and suggestions. Thanks also go to my linguistic fellows, in particular, Nattaya Piriawiboon, Maria Kyriakaki and Sarah Clarke for their great ideas and company. This research was supported by SSHRCC Standard Research, # 410-2005-1112, Project Director: Prof. Diane Massam.

¹ The following abbreviations are used in this paper:

CL: classifier EXP: experiential Mod: modifier PRF: perfective PROG: progressive s: singular

- a' *ta [liang nian] nian le shu.
 he [two year] read PRF book
- b. ta ku le [liang ci].
 hecry PRF [two time]
 'He cried two times.'
- b' *ta [liang ci] ku le.
 he [two time] cry PRF
- c. ta shui [zi di shang]
 he sleep [at floor on.top.of]
 'He slept on the floor.'
- c'. ta [zai di shang] shui.
 he [at floor on.top.of] sleep

The second issue which concerns us is the position of the object with the presence of post-verbal adverbials. (3a) shows that definite objects, numeral expressions, and bare nouns may appear before the frequentative *liang ci* 'two times', and (3 c-d) shows that the sentence with the definite object *na-ben shu* 'that book', but not with the numeral expression *yi-ben shu* 'one book' or the bare noun *shu* 'book', is degraded when the object occurs post-adverbially.

- (3) a. ta kan-le na-ben shu/yi-ben shu/shu [liang ci],
 he see-PRF that-CL book/one-CL book/book two time
 haishi zao-bu-dao daan.
 yet find-neg answer
 ‘He read that book/a specific book/the book(s) two times, but cannot find the answer(s).’
- b. ta kan-le [liang ci] yi-ben shu.
 he see-PRF two time one-CL book
 ‘He read one book two times.’
- c. ta kan-le [liang ci] shu.
 he see-PRF two time book
 ‘He read two times.’
- d. ?ta kan-le [liang ci] na-ben shu.
 he see-PRF two time that-CL book
 ‘He read that book two times.’

In this research, we aim to account for the distribution of different types of adverbs, and the word order variability of the object with respect to post-verbal adverbials. We claim that the position of frequentatives and duratives is related to an Aspect Phrase, which encodes the information of telicity, and the word order varieties of the object can be derived if we establish the Aspect Phrase and a functional projection associated with specificity in a structure. In this paper, we show that, first of all, while pre-verbal temporal adverbials, i.e., frame PPs, interact with viewpoint aspect and lexical aspect, post-verbal temporal adverbials, i.e., durative, display a co-occurrence restriction with predicates with respect to their (a)telicity. Second, the object demonstrates various word orders with post-verbal adverbials based on the semantics of the object nominals. It will be shown that while nominals that occur before adverbials seem to have no effect on the telicity of the predicate, the post-adverbial nominals do. We suggest that the post-adverbial nominals bear an (a)telicity feature and thus can affect the aspect of the

event. More specifically, we argue that bare nouns are lexically specified with either [+telic] or [-telic], and sentences with a numeral expression are obligatorily telic.

This paper is organized as follows. We start by examining the syntactic properties of post-verbal and pre-verbal adverbials. This investigation proceeds in two directions. First, we consider temporal adverbials with respect to their compatibility with different classes of predicates, as well as their interaction with the object in terms of word order. Second, we conduct a comparison study between locatives in a post-verbal position and in a pre-verbal position, and show that post-verbal locatives, not pre-verbal ones, are complements of the lexical verb. We devote the second half of section 2 to the examination of post-verbal nominals. It is shown that nominals that appear before the post-verbal adverbial are specific/definite and play little role in determining the (a)telicity of the predicate; in contrast, nominals occurring after the adverbial possess special semantic properties and are in a syntactic position to influence the aspectuality of the predicate. In section 3, we present our framework, which utilizes two different aspect tiers in structure: lexical aspect is articulated by an internal vP shell (Inner Aspect), and viewpoint aspect heads a functional projection outside vP (Outer Aspect). We argue that frequency expressions and temporal adverbials are situated in Inner Aspect, while frame adverbials move further to Outer Aspect. Nominals, which take part in (a)telicity, are also in the domain of Inner Aspect. Section 4 concludes this paper.

2. FORMAL FEATURES OF POST-VERBAL ADVERBIALS AND POST-VERBAL NOMINALS

Duratives, frequentatives, and locatives in Mandarin occupy a post-verbal position, deviant from other adverbs, such as manner adverbs, attitude adverbs, and temporal adverbs, which appear before the verb. In this section, we investigate the syntactic and semantic properties of the post-verbal adverbials with a focus on their interaction with post-verbal nominals, and the differences between pre-verbal and post-verbal adverbials. We begin the section with an introduction to temporal adverbials in Mandarin. Syntactically, durative PPs, i.e., *for*-PPs, occupy a low position, whereas frame PPs, i.e., *in*-PPs, occur pre-verbally. Semantically, on one hand, durative PPs are compatible only with atelic predicates, and on the other hand, frame PPs co-occur with perfective telic predicates. These properties motivate us to propose a fine-grained system with two hierarchical aspectual tiers, corresponding to lexical aspect and viewpoint aspect in Mandarin. Next, we narrow our scope on the post-verbal elements; they demonstrate more intriguing patterns in which we believe lexical aspect might play a key role. We show that while frequentatives and duratives pattern together with regard to their interaction with objects on word order, post-verbal locatives do not co-occur with objects. The prohibition on this co-occurrence indicates that post-verbal locatives are true complements, sisters to V. As for frequentatives and duratives, it is observed that the semantics of post-verbal nominals determines the word order between the object and the adverbial: in general, objects with specific/definite interpretations precede frequentative/durative, and property- and quantity-denoting objects follow these adverbials. It will also be shown that a property-denoting bare nominal has a tight structural affinity with post-verbal adverbials, and it further interacts with duratives

depending on the lexical aspect of the predicate with which the bare nominal compounds. These puzzling behaviours of bare nominals call for a closer examination of their formal features; contra to what is traditionally assumed, the bare nominals in question will be argued to denote properties rather than kinds. This evidence will link to one of the key claims in our proposal that these bare nominals are (a)telicity-bearing elements.

2.1 POST-VERBAL ADVERBIALS VS. PRE-VERBAL ADVERBIALS

2.1.1 INTERACTION BETWEEN ASPECT AND TEMPORAL ADVERBIALS: FRAME ADVERBIALS VS. DURATIVE ADVERBIALS

It has been pointed out that Mandarin differs from English in that accomplishment predicates do not entail their inherent endpoints. For instance, in English, an accomplishment situation followed by an assertion that the event is not complete is a contradiction, whereas in Mandarin, the endpoint of an accomplishment predicate is merely an implicature, and thus can be cancelled. The following examples demonstrate this difference between English and Chinese.

(1) #I wrote a letter yesterday, but I didn't finish writing it.

(Smith 1994: 107)

(2) wo xie-le yi-feng xin, keshi mei xie-wan.

I write-PRF one-CL letter, but not write-finish

'I wrote a letter, but I didn't finish it.'

Tai (1984) claims that there are no simple monosyllabic accomplishment verbs in Mandarin, and to derive an accomplishment verb with the attainment of goal, a resultative V-V compound must be formed, as in (3)². Notice that (3) cannot be followed by an assertion that the event is not complete.

- (3) wo xie-**wan**-le yi-feng xin, #keshi mei xie-wan.
 I write-**finish**-PRF one-CL letter, but not write-finish
 'I finished writing a letter, but I didn't finish it.'

Smith (1994) suggests that the contrast between English and Mandarin lies in the perfective marker *-le*. In English, the perfective viewpoint interacts consistently with all situation types, conveying completion of the event. In Mandarin, the perfective marker *-le* indicates the termination of the event when it co-occurs with activity and accomplishment predicates; on the other hand, the perfective marker *-le* with achievement predicates necessarily entails completion of the event. That is, the event with a perfective accomplishment may be terminated without having reached the final endpoint³.

Soh and Kuo (2004) show further that a perfective accomplishment is forced to have the completion reading when a numeral object is used in the sentence.

² Lin (2004:66) notes that the necessity of employing verbal compounds to express completion is not a property unique to Mandarin; Japanese, Hindi, and Thai exhibit a similar phenomenon whereby the incremental theme can be interpreted as not having been completely affected.

³ Mandarin accomplishment verbs require a verbal resultative compound to denote a telic event; nonetheless, they still share features of both activities and achievements: they are like activities in that an extended agentive action is involved, and they are like achievements in that a change of state occurs as a result of the action (Lin 2004: 67).

- (4) ta kan-le liang-ben shu, #keshi mei kan-wan.
 he read-PRF two-CL book but not read-finish
 ‘He read two books, but he did not finish reading them.’

Compare (4) with (2): when *liang-ben shu* ‘two books’ is used, we get the contradictory reading as shown in (4). In (2), *yi* ‘a/one’ in Mandarin is ambiguous between an indefinite determiner and the numeral one. However, the sentence in (2) is only acceptable when *yi* ‘one/a’ is interpreted as an indefinite determiner, rather than as ‘one’ (Soh and Kuo 2004: 6).

We follow Smith’s analysis that the perfective aspect *-le* indicates completion in a telic/bounded event, but termination in an atelic/non-bounded event, and assume with Soh and Kuo (2004) that perfective accomplishment verbs in Mandarin entail completion in the context of V-V compounding and numeral objects⁴. With all the pieces of information on perfectivity and lexical aspect in Mandarin, we will show that temporal adverbials in Mandarin interact with aspect in a very interesting way: while duration adverbials (*for*-PPs), which appear post-verbally, are only compatible with atelic events, pre-verbal frame adverbials (*in*-PP) cannot survive in a sentence that entails an incomplete event. Examples in (6a,b) show that the activity predicate *xi-zao* ‘take a bath’ can co-occur with the duratives *san tian* ‘three days’, but disallows the presence of the frame adverbial *san tian nei* ‘in three days’. To allow the presence of the *in*-PP, a completive morpheme *wan* ‘finish’ must be added, as shown in (6c). (6c) expresses the completion of the event of taking a bath, and the contrast between (6c) and (6d) suggests

⁴ Soh (2008) terms the accomplishments without the entailment of completion “atelic accomplishments” and those carrying the entailment that the event is complete “telic accomplishments.”

that duratives cannot appear in a telic environment. Notice that it is not true that duratives are incompatible with a sentence with a completive reading. In (6e), the experiential marker *guo* is employed to signal that the event of taking a bath is a bygone fact, and the use of the durative phrase is legitimate in this case.

(6) a. ta xi-le [san tian] zao.

he wash-PRF three day bath

‘He showered for three days.’

b. *ta [san tian nei] xi-le zao.

he [three day in] wash-PRF bath

Intended, ‘He showered within three days.’

c. ta [san tian nei] xi-**wan**-le zao.

he [three day in] wash-**finish**-PRF bath

‘He finished taking a bath in three days.’

d. *ta xi-**wan**-le [san tian] zao.

he wash-**finish**-PRF three day bath

‘He finished taking a bath for three days.’

e. ta xi-guo [san tian] zao.

he wash-EXP three day bath

‘He showered for three days before.’

If the aforementioned observations are right, then we would expect that duratives cannot appear with achievements and accomplishments, while frame adverbials are allowed to co-occur with these two types of predicates as long as the sentence conveys

completion. This predication is borne out.

(7) a. *tamen jian-le [san tian] mian.

they see-PRF three day face

*‘They met up with each other for three days.’

b. tamen [san tian nei] jian-le mian.

they [three day in] see-PRF face

‘They met within three days.’

c. *tamen [san tian nei] zai jian mian.

they [three day in] PROG see face

*‘They are (in the process of) meeting within three days.’

In (7a, b), the achievement predicate *jian-mian* ‘to meet’ bars the presence of *san tian* ‘three days’, but allows the *in*-PP when the perfective marker *le* is used. *In*-PPs require a complete event, and therefore, *in*-PPs can never appear with the progress marker *zai*, even if the predicate is telic, as shown in (7c).

Next, as mentioned above, a perfective accomplishment predicate with a numeral object would assert the completion of the event. In such contexts, the durative incurs ungrammaticality in (8a), and, in contrast, (8b) is acceptable with the *in*-PP.

(8) a. *tamen xie-le [san fenzhong] [san-ge zi].

they write-PRF three minute three-CL word

*‘They wrote three words for three minutes.’

- b. tamen [san fenzhong nei] xie-le [san-ge zi].
they [three minute in] write-PRF three-CL word
'They wrote three words in three minutes.'

To sum up, frame adverbials are legitimate in a sentence that conveys a complete event. A completive reading can be induced by a perfective telic predicate, a perfective atelic predicate with the completive morpheme *-wan* 'finish', or a perfective atelic predicate with a quantity-denoting object. Durative adverbials are only compatible with atelic predicates. It seems that frame adverbials interact with both viewpoint aspect and lexical aspect, while durative adverbials are sensitive only to lexical aspect. Structurally, frame adverbials appear high and duratives occupy a low position. The syntactic and semantic behaviours of temporal adverbials in Mandarin strongly favour the theory that employs two separate Aspect tiers for viewpoint aspect and lexical aspect, and in section 3, we will capture these properties in a framework with two different functional projections encoding the information of aspect. In the next section, we will make a last point on the distinction between post- and pre-verbal adverbials.

2.1.2 POST-VERBAL LOCATIVES VS. PRE-VERBAL LOCATIVES

Unlike pre-verbal locatives, which are free to co-occur with any type of predicate, post-verbal locatives can only appear with positional verbs, such as *shui* 'sleep', *zuo* 'sit', and *zhu* 'live', as shown in (9) and (10).

(9) a. ta changchang shui [(zai) di shang].
 he often sleep at floor on.top.of

‘He often sleeps on the floor.’

b. ta changchang [*(zai) di shang] shui.
 he often at floor on.top.of sleep

‘He often sleeps on the floor.’

(10) a. *ta changchang chi [zai zuo shang].
 he often eat at table on.top.of

b. ta changchang [*(zai) zuo shang] chi.
 he often at table on.top.of eat

‘He often eats on the table.’

In (10), the verb *chi* ‘eat’ cannot be modified by a post-verbal locative, but it can be modified by the pre-verbal locative *zai zuo shang* ‘on the table’. (9) shows that *shui* ‘sleep’ has no such restriction. This strongly implies that post-verbal locatives are lexically selected by verbs. Notice that the preposition of a post-verbal locative can be omitted, but it does not have this freedom if the locative appears pre-verbally.

Li (1990) proposes that in the case of post-verbal locatives, the preposition *zai* ‘at’ is re-analyzed with the verb and can assign Case to the locative to its right. If this analysis is on the right track, we expect that post-verbal locatives, reanalyzed as the complement of the lexical verb, first of all, should be in complementary distribution with the object, and second, should be unable to be separated from the verb by other intervening elements. This prediction is clearly borne out:

- (11) a. ta changchang shui-(*jiao) zai shafa shang.
 he often sleep-sleep_N at sofa on.top.of
 ‘He often sleeps on the sofa.’
- b. ta changchang shui-*le/guo zai shafa shang.
 he often sleep-*PRF/EXP at sofa on.top.of
- c. *fan_i, ta changchang chi t_i [zai zuo shang]
 rice he often eat at table on.top.of

Intended, ‘Rice, he often eats on the table.’

In (11a), the bare noun *jiao* ‘sleep’ cannot co-occur with the post-verbal locative *zai shafa shang* ‘on the sofa’. (11b) shows that the aspectual markers *-le* and *-guo* cannot appear between the verb and the locative. Notice that a trace of a topicalized object between the preposition and the verb will also induce the intervening effect as shown in (11c)⁵.

In these subsections, we have shown that pre-verbal and post-verbal adverbials demonstrate very different syntactic and semantic properties. Pre-verbal temporal adverbials, i.e., *in*-PPs, interact with both perfectivity and telicity, while post-verbal temporal adverbials, i.e., *for*-PPs, interact only with telicity. Pre-verbal locatives are adjuncts, and post-verbal locatives, in contrast, are complements selected by lexical verbs. In the next section, we shift our scope to post-verbal nominals, which exhibit various word orders with frequentatives and duratives according to the semantics they convey. We will show that post-adverbial bare nominals are in the same syntactic domain as duratives and frequentatives, and thus can affect the telicity of the event and can

⁵ Thanks to Prof. Elizabeth Cowper for drawing my attention to this issue.

optionally form a constituent with duratives and frequentatives.

2.2 ORDER VARIABILITY BETWEEN FREQUENTATIVES/DURATIVES AND NPs

While frequentatives and duratives differentiate themselves from other adverbials in their post-verbal position, a less discussed phenomenon is that they exhibit different word orders with the object⁶. The observation is that frequentatives and duratives must follow the object if the object is specific/definite, and must precede the object otherwise.

Bare nouns in examples like (12) are ambiguous between a property-denoting interpretation and a definite interpretation when they appear with a perfective predicate. The notion of property-denoting will be discussed in the next section, as will the issue of whether these bare nominals are generic. At this point, we simply point out that property-denoting nominals do not have referents; that is, in the reading of ‘he read’ in (12a), *shu* denotes something like “readingness,” and the meaning ‘read’ is completed with the verb *kan* ‘to see’. As shown in (12b,c), the bare nominal *shu* can follow or precede the frequentative *liang ci* ‘two times’, but the observed ambiguity in (12a) cannot be retained: when it is post-‘adverbial’, it can only receive the property-denoting reading, and when it is pre-‘adverbial’, the bare nominal has to be definite.

⁶ As discussed in section 2.1.2, postverbal locatives do not display word order variation as their frequentative and durative counterparts do, since they do not occur with an object. The example is repeated in (i).

(i) wo tiantian shui-(*jiao) zai shafa shang.
I everyday sleep-sleep_N at sofa on.top.of
‘I sleep on sofa everyday.’

(12) a. ta kan-le shu.

he see-PRF book

‘He read./He read the book(s).’

b. ta kan-le [liang ci] shu.

he see-PRF two time book

‘He read two times/*He read the book(s) two times.’

c. ta kan-le shu [liang ci], haishi zao-bu-dao daan.

he see-PRF book two time yet find-neg answer

‘He read the book(s) two times, but cannot find the answer(s) yet.’

*‘He read two times, but cannot find the answer(s) yet.’

The interpretations of bare nominals vary with respect to their syntactic position when they co-occur with duratives. The bare noun *dianying* ‘movie’ together with the verb *kan* ‘to see’ expresses the meaning ‘to movie-watch’. The bare noun *dianying* ‘movie’ obtains a property-denoting reading when it follows the durative, but a definite reading when it precedes the durative, as shown in (13a,b).

(13) a. ta kan-le [liang tian] (de) dianying.

he see-PRF two day Mod movie

‘The event of his movie-watching lasted for two days.’

*‘He watched the movie(s) for two days.’

b. ta kan-le dianying [liang tian],

he see-PRF movie two day

haishi bu zhidao shei shi zhujiao.

yet not know who is leading.role

‘He watched the movie(s) for two days, but still doesn’t know who the main character is.’

*‘The event of his movie-watching lasted for two days, but he still doesn’t know who the main character is.’

When it comes to DPs, native speakers show a preference for the sentences in (14a,c), where the definite phrase precedes the adverbials *liang ci* ‘two times’ and *liang tian* ‘two days’, but report oddity for the sentences in (14b,d), where the reverse order obtains:

(14) a. ta kan-le [na-ben shu] [liang ci].

he see-PRF that-CL book two time

‘He read that book two times.’

b.?ta kan-le [liang ci] [na-ben shu].

he see-PRF two time that-CL book

c.ta kan-le [na-bu dianying] [liang tian].

he see-PRF that-CL movie two day

‘He watched that movie for two days’

d.?ta kan-le [liang tian] [na-bu dianying].

he see-PRF two day that-CL movie

Finally, an NP object introduced by *yi* ‘a/one’ exhibits two word orders with respect to adverbials. As mentioned earlier, *yi* ‘a/one’ is ambiguous between an indefinite determiner and the numeral one. As shown in (15 a, b) and (16 a), *yi ben shu* ‘a/one book’ and *yi bu dianying* ‘a/one movie’ can only be specific when they appear before *shi ci* ‘ten times’ and *shi tian* ‘ten days’; they denote quantity when they are preceded by frequentatives. This intuition is confirmed when we replace *yi* with *liang* ‘two’, which can only be quantity-denoting, and as shown in (15 c,d), the NP *liang ben shu* ‘two books’ only displays a post-adverbial position. Notice that in (15 b), it is required that ten books are involved in the reading event; this conforms to Aoun and Li’s Scope Principle (1993), which states that in Mandarin, the surface word order determines the scope relation. Notice that quantity-denoting nominals do not co-occur with duratives as shown in (16b), and the ungrammaticality of (16b) is due to the incompatibility of duratives and telic events, as mentioned in 2.1.1.

- (15) a. ta kan-le [yi-ben shu] [shi ci] ,
 he see-PRF one-CL book ten time
 zuihao hai shi jie huijia le.
 finally still be borrow home PRF

‘He read a specific book ten times; in the end, he borrowed it home.’

- b ta kan-le [shi ci] [yi-ben shu].
 he see-PRF ten time one-CL book
 ‘He read one book ten times.’

- c. *ta kan-le [liang-ben shu] [liang ci]
 he see-PRF two-CL book two time
- d. ta kan-le [liang ci] [liang-ben shu]
 he see-PRF two time two-CL book

- (16) a. ta kan-le [yi-bu dianying] [shi tian],
 he see-PRF one-CL movie ten day.

yijing keji taici daobeiruliu.

already can line memorize.well

‘He watched a specific movie for ten days, and he already memorized all the lines
 (of the movie) very well.’

- b. *ta kan-le [shi tian] [yi-bu dianying]/ [liang-bu dianying].
 he see PRF ten day one-CL movie two-CL movie

‘He watched one movie/two movies for ten days.’

We summarize the observed order varieties for these three types of adverbials in the following table.

(17)

	appear pre-adverbially?	appear post-adverbially?
bare noun	✓ (definite)	✓ (property-denoting)
numeral NP	X (except for specific <i>yi</i> -NP)	✓ (can only appear after frequentatives, quantity-denoting)
DP	✓	?

Based on the patterns shown above, it could be argued that specificity plays a role in determining the relative word order of the object and the adverbial; more specifically, when the object is [+specific], it precedes frequentatives/duratives; otherwise, it follows the adverbials. We will show that post-‘adverbial’ nominals, but not nominals that precede the adverbials, can affect the aktionsart of the predicate, and therefore, the syntactic position is linked to the ability to affect the (a)telicity of the event. Before we explicate this connection, we would like to explore more syntactic properties of post-adverbial nominals in the next section.

2.3 THE STRUCTURAL AFFINITY BETWEEN POST-VERBAL ADVERBIALS AND POSTADVERBIAL NOMINALS

In this section, we examine the syntactic relation between post-adverbial nominals and frequentatives/duratives. The first point to be made here is that frequentatives and duratives have a tight structural relation with the following bare noun: the fact that the [frequentative/durative + bare N] string can be a target for movement shows that these adverbials and bare nouns may form a syntactic constituent. In the topicalization examples (18), the bare nouns *fan* ‘rice’ and *dianying* ‘movie’ can move along with the frequency expression *na linag ci* ‘those two times’ and the durative phrase *na liang tian* ‘those two days’, respectively, to the front of the sentence.

Topicalization

(18) a. [na liang ci] [fan], ta dou mei chi⁷.

that two time rice he all not eat

Literally: ‘As for the two events of having meals, he did not attend.’

b. [na liang tian (de)][dianying], ta dou mei kang.

that two day Mod movie he all not watch

Literally: ‘As for the two days of movie-showing, he did not watch (any movies).’

Similarly, the combination of *liang ci* ‘two times’ and *fan* ‘wine’ can be scrambled to the pre-verbal position, as shown in (19a). The same behaviour can be observed with the durative *liang nian* ‘two years’ and *shu* ‘book’ in (19b).

Scrambling:

(19) a. ta [liang ci] [jiu] dou mei he.

he two time wine all not drink

Literally: ‘As for the two drinking events, he did not attend (either time).’

b. ta [liang nian (de)][shu] (zhongyu) du-wan le.

he two year Mod book finally read-finish PRF

Literally: ‘As for the two years of studying, he (finally) finished it.’

However, when we consider NumPs and DPs, the following examples indicate that they cannot move along with the adverbials. The definite object *na tai che* ‘that car’ in (20a) and the numeral object *liang tai che* ‘two cars’ in (20b) cannot be topicalized with

⁷ Since the topicalized expression is specific, the demonstrative *na* ‘that’ is required.

the frequentative *na liang ci* ‘those two times’.

(20) a. *[na liang ci] [na-tai che],ta dou xiu-le.

that two time that-CL car he all fix-PRF

Intended, ‘As for the two times of fixing that car, he did it (both times).’

b. *[na liang ci] [liang-tai che],ta dou xiu-le.

that two time two-CL car he all fix-PRF

Intended, ‘As for the two times of fixing two cars, he did it (both times).’

(21) shows that the durative *liang tian* ‘two days’ cannot undergo scrambling with the object, *na ben shu* ‘that book’ in (21a) and *liang ben shu* ‘two books’ in (21b).

(21) a. *ta [liang tian] [na-ben shu] dou kang-le.

he two day that-CL book all read -PRF

Intended, ‘As for the two days of reading that book, he did it.’

b. *ta [liang tian] [liang-ben shu] dou kang-le.

he two day two-CL book all read-PRF

Intended, ‘As for the two days of reading two books, he did it.’

Based on these observations, we conclude that a bare noun can form a constituent with the preceding adverbial, but nominals headed by numerals and demonstratives cannot⁸. Notice that the modification marker *de* can optionally be inserted between the

⁸ As Prof. Béjar points out, (18) and (19) may involve a remnant movement of VP, after the main verb is raised to v and the object is topicalized. This proposal might weaken the claim that the adverb forms a

bare noun and the durative to make the sentence sound more natural⁹. The existence of the bound morpheme *de* in Mandarin indicates constituency between the expressions it connects with (Li 1990). In (22), the adjective *meili* ‘pretty’ is cliticized by *de*, and the whole phrase can be a target for movement such as topicalization, as shown in (22b).

(22) a. [AP *meili* *de* [NP *nühai*]]

pretty Mod girl

‘(a) beautiful girl(s)’

constituent with the following object. However, if the examples mentioned earlier are the cases of remnant movement, it is not clear why the same operation cannot apply to the sentences with a DP object, which also can be a target for topicalization.

⁹ Unlike duratives, frequentatives resist the application of *de*-insertion. The failure to employ the *de*-insertion between the bare noun and the frequentative can be explained, if we think of the semantic differences between frequentatives and duratives. As suggested by Sybesma (1999) and Zhang (2002), when a frequency expression is used, the event is viewed as individual and thus countable, and in contrast, when a durative is used to measure out an event, the event is viewed as mass, an entity with continuity. It is possible to insert *de* in the latter case, but not the former. This generalization is also carried over to the nominal domain. Cheng and Sybesma (1999, 2005) notice that the morpheme *de* cannot be inserted between a classifier and a noun, but it can appear optionally between a measure word and a noun. The following examples demonstrate this point:

(i) a. *liang* *ben* (**de*) *shu*

two CL Mod book

‘two books’

b. *liang* *bei* (*de*) *shui*

two cup (Mod) water

‘two cups of water’

Classifiers and measure words are used to count nouns in Mandarin. Classifiers are used when the following noun is a count noun, and a measure word is used to count mass nouns. It is unclear to us why the *de*-insertion is prohibited in the contexts of frequentatives and classifiers, but along the line of discussion above, we would like to suggest that the failure of the *de*-insertion in the frequentative construction can presumably receive the same explanation as classifiers in the nominal domain.

b. [meili de nūhai] renren dou ai.

pretty Mod girl people all love

‘As for pretty girls, everyone loves them.’

The tight structural relation exhibited by bare nouns and post-verbal adverbials has been noticed by many linguists; in Huang (1982), Sybesma (1992) and Yang (2001), it is claimed that a frequency/durative can be reanalyzed or base generated as a classifier, and forms a single constituent with the following bare noun. Two questions immediately arise: (1) Why can only bare nouns have this special restructuring mechanism with the preceding adverbial? (2) If we adopt the analysis that frequency/durative acts as a classifier for the bare noun, we would encounter a semantic mismatch problem, i.e., the function of frequency/durative is to count/measure out the whole event, not to count/measure out the bare noun object. We will take up these issues in the next section.

2.4 BARE NOUNS AS PROPERTY-DENOTING ELEMENTS

It was noted by Cheng and Sybesma (1998) that almost all English intransitive verbs are transitive in Mandarin; for instance, ‘to read’ corresponds to Mandarin *kan-shu* ‘see-book’. More examples are listed in (23). The bare, non-referential objects in (23) must be used with the verb to convey an act in Mandarin, while in English, a simple activity verb can express an act without a dummy object.

(23)

chi-fan ‘eat-rice’= ‘eat’

kan-shu ‘see-book’= ‘read’

chang-ge ‘sing-song’= ‘sing’

shuo-hua ‘speak-speech’= ‘speak’

pao-bu ‘run-step’= ‘run’

liu-bing ‘slide-ice’= ‘skate’

zou-lu ‘walk-road’= ‘walk’

Here we would like to reject the traditional analysis of bare nouns as being generic; we believe that these bare nouns are better analyzed as property-denoting expressions based on the following evidence. First of all, semantically, bare nouns in (23) do not denote kinds. For instance, *shu* ‘book’ in *kanshu* ‘to read’ does not refer to a book kind; the activity of *kanshu* can involve reading novels or magazines. Moreover, *jiao* ‘sleep_N’ in *shui-jiao* ‘sleep-sleep_N’ (= ‘to sleep’) is not a generic way of sleeping, and in *ta zhai chi-fan* ‘he is eating’, rice is not necessarily involved in the eating event. Second, generic nominals are usually found in the context of individual-level predicates, as shown in (24a), but the predicates listed in (23) are stage-level, and can be used in an episodic context. This is shown in (24b).

(24) a. *gou* *you* *yiba*.

dog have tail

‘Dogs have tails.’

b. ta zheng zao shui-jiao
 he now PROG sleep-sleep_N
 ‘He is sleeping now.’

The third difference between generic bare nouns and property-denoting bare nouns is that the former can be co-referential with a covert anaphor, while the latter cannot establish a co-reference relation with an empty nominal. Cheng and Sybesma (1998: 82) also notice that when *chi* ‘eat’ is used alone with the dummy object, the interpretation involves a definite object interpretation-- that is, *pro*.

- (25) a. ta ai gou, wo ye ai ϕ .
 he love dog I also love
 ‘He loves dogs and so do I.’
- b. ta kan-le shu, wo ye kan-le ϕ .
 he see-PRF book I also see-PRF
 ‘He read the book, and so did I.’
- * ‘He read and so did I.’

In (25a), the empty nominal in the second clause is interpreted as *gou* ‘dog’, whereas in (25b), the covert anaphor can only be definite; a property-denoting interpretation is not available in (25b).

A generic bare noun can be substituted by a pronoun, but this is not the case for property-denoting bare nouns. In the following examples, the pronoun *tamen* ‘they’ can refer back to the generic noun *gou* ‘dog’ in (26a), whereas in (26b), the sentence in which

the pronoun *ta* ‘he/she/it’ is co-referential to *shu* ‘book’ in the preceding sentence is judged odd.

(26) a. meigeren dou ai gou; tamen shi renlei zuihao de pengyou.

everyone all love dog they be human best Mod friend

‘Everyone loves dogs; they are human being’s best friend.’

b. meigeren dou kan shu.# ta shi zhishi de laiyuan.

everyone all see book it be knowledge DE source

‘Everyone reads. #It is the source of knowledge.’

The last point is that if the bare noun *shu* in the reply to the question in (27) denotes a book kind, it is unclear to us why it cannot be used as an appropriate, informative reply¹⁰. Notice that if *shu* in (27) is stressed, then the reply is valid; the sentence would mean that I am reading BOOKS/A BOOK.

¹⁰ Prof. Simona Herdan (p.c.) suggested that the pragmatic oddness of (27) may possibly still be contributed to by the generic interpretation of the bare noun *shu*, since a person cannot read a book kind. However, if we replace *shu* with another bare noun *zazhi* ‘magazine’, as shown in (i), (i) is an effective reply to the question in (27). Chierchia (1998) claims that bare nouns in Mandarin are kind-denoting. Therefore, if we accept the proposal that *shu* be a book kind in *kan-shu* ‘to read’, we would leave the contrast between (i) and (27) unaccounted.

(i) wo zai kan zazhi.

I PROG see magazine

‘I am reading magazines/a magazine.’

(27) Q: ni zai kan sheme? (seeing John reading from distance)

you PROG see what

‘What are you reading?’

John: # wo zai kan shu.

I PROG see book

‘I am reading.’

Based on the arguments presented above, we claim that the bare nouns in (23) are not generic and semantically they are of type $\langle e, t \rangle$: they contribute to the verbal meaning with the activity verb, or to put it another way, they restrict the predicate. Take the verb *kan* as an example. The meaning of the verb *kan* is vague; it expresses activities in which eyes are engaged, and not until it combines with a bare noun or a resultative morpheme can the meaning of the predicate become substantial. Therefore, with the bare noun *shu* ‘book’, *kan-shu* means ‘to read’, and with the resultative morpheme *jian* ‘see’, *kan-jian* means ‘to see’. In this sense, property-denoting bare nouns are like incorporated objects in Noun-Incorporation cases (Chung and Ladusaw 2004)^{11 12}. Although we cannot go into detail about how the semantic computation would look when the bare noun forms a

¹¹ Historically, these bare nouns were used as verbs. For instance, *fan* meant ‘to eat’ in the phrase *fan dao geng yu* ‘eat rice drink fish’= ‘eat rice and drink fish soup’ (*shiji*, 109 BC to 91 BC). It may be considered as indirect evidence for the claim that the bare nouns in question are property-denoting but not individual-denoting, since they evolved from verbs.

¹² There are two main proposals in the literature concerning the semantics of bare nouns- in one approach, bare nouns are names for kinds (Carlson 1977, Chierchia 1998, among others), and the other approach treats bare nouns as properties (Chung and Ladusaw 2003). If the analysis of Mandarin bare nouns we pursue in this paper is on the right track, i.e., both property-denoting and kind-denoting bare nouns exist in Mandarin, we might need to call for a hybrid approach.

constituent with the preceding frequentative/durative, we would like to point out that as bare nouns are property-denoting elements, type $\langle e, t \rangle$, they are able to combine with duratives and frequentatives, which are predicates of events, as argued in Parsons (1990), without inducing the semantic mismatch problem. In contrast, if we assume that bare nouns are generic, and hence of type e , the computation cannot continue since duratives and frequentatives do not take non-predicative/eventive constituents as their arguments (**one day of book, *two times of apple*)¹³.

In our proposal, which will be presented in the next section, we claim that frequency expressions and durative adverbials occupy a functional projection, labeled as Inner Aspect, scoping over VP. Therefore, they are still event modifiers but not the modifiers of the bare noun. We suggest that the configuration for restructuring frequentatives/duratives with the following bare noun would require both of the constituents to stay in a local domain, that is, the Inner Aspect. This claim will be further supported by evidence that bare nouns contribute to (a)telicity. Again, we would not expect a generic nominal be able to play a role in determining the telicity/aspectuality of the predicate.

In the beginning of this section, we showed that although locatives and temporal adverbials in Mandarin can have different positions in a sentence, they display quite different syntactic behaviours. In the case of temporal adverbials, frame adverbials, i.e., *in*-PPs, interact with both viewpoint and lexical aspect and structurally appear high, whereas durative adverbials, *for*-PPs, which are structurally low, are only sensitive to lexical aspect. In the case of locatives, it is shown that post-verbal locatives are true

¹³ Yang (2001) proposes that the semantics of the frequency expression with the numeral denotes a function that maps a set of events onto a set of plural events with the designated atomic parts. They are of type $\langle \langle e^e t \rangle, \langle e^e t \rangle \rangle$, in which e^e stands for the type of events; the [numeral+frequentative] complex requires a *property* argument rather than a *kind* argument (Yang 2001:146).

complements of the lexical verb and exhibit selectional restrictions to the lexical verb; pre-verbal locatives are compatible with any predicates.

Next, we showed that frequentatives and duratives interact with nominals in word order: they intervene between the verb and the object if the object is non-specific, but follow the object if the object is definite/specific. We further argued that bare nominals, but not NumPs or DPs, can form constituents with frequentatives and duratives when they appears post-adverbially. We followed this up with an investigation of the semantics of bare nominals. We showed that bare nominals are not generic quantifiers, but property-denoting elements. We believe that due to this semantic property, it is possible for bare nominals to form a constituent with the preceding adverbial.

3. INNER ASPECT AND EVENTUALITY¹⁴

In this section, we consider the following issues brought up in the previous sections.

- 1) How do we present the differences of frame adverbials and durative adverbials with respect to their interaction with aspect in a structure?
- 2) How can a structure reflect the varieties of word order exhibited by nominals and adverbials?
- 3) What role do bare nouns play in aspect, if we assume that frequentatives/duratives are associated with lexical aspect, and the mechanism of restructuring can only take place locally?

We will resolve the issues following a brief review on the literature on aspect.

3.1 INNER ASPECT AND OUTER ASPECT

Vendler (1967) proposed a four-way classification of events into states, activities, accomplishments and achievements based on the aspectual properties of verbs. Examples of the four event types are given below:

¹⁴ The following discussion assumes the theory of feature checking in the framework of Minimalism. However, we will focus on the structure of the sentences involving post-verbal adverbials and nominals, and on how an interpretation can be read from a given configuration; we will not commit to articulate the intricacy of the feature checking mechanism in this paper.

(28) states: know, believe, love

activity: run, swim, sleep

accomplishment: climb a mountain, draw a circle, write a letter

achievement: win, die, notice, forget

These four types of verbs are referred to as aktionsart or lexical/situational aspect, and this is distinguished from viewpoint aspect, which comprises perfective and imperfective. According to Vendler (1967), activities and states are unbounded/atelic events since they do not entail an end point, whereas both accomplishments and achievements express a change of state and hence are telic. Furthermore, states can be separated from the other three classes in that they do not denote dynamic situations, and achievements can be paired with states, and activities with accomplishments, based on their compatibility with the progressive tense. To capture the properties above, a semantic decomposition can be employed:

(29) States: [-dynamic, -telic, -durative]

Activities: [+dynamic, -telic, +durative]

Accomplishments: [+dynamic, +telic, +durative]

Achievements: [+dynamic, +telic, -durative]

Research on aspect investigates whether Vendler's verb classes are based on ontological, extra-linguistic knowledge without grammatical correspondents. If the grammar does pay attention to distinctions of verb type, which part of the grammar reflects the differences? Cowper (1999, 2003) claims that in English, aspect is encoded at

the Inflectional level with the dependent feature [Interval], which is spelled out as *-ing*. The following examples support her point. In (30), the predicate ‘wear a school uniform’ can be stative or eventive when the clause is non-progressive, but in the context of the progressive tense, both sentences in (31) can only receive an eventive interpretation.

(30) a. Fritz wore a school uniform as a child. (stative)

b. Fritz wore a school uniform twice this week (eventive).

(Cowper 2003:3)

(31) a. The children were playing in the yard.

b. The heckler was being rude.

(Cowper 2003:4)

Clarke (2009, in press) notices that some languages encode the distinctions of states and events at the level of VP. For instance, in Inuktitut, lexical morphemes, such as the inceptive morpheme *-liq* and the habitual morpheme *-gak*, which attach within the VP, can modify event structure, but cannot appear with stative verbs. (32a,b) show that the morpheme *-liq* can co-occur with the activity verb *pisu-* ‘walk’, but not with the copular verb *-u-*. The morpheme *-gak* behaves the same way. In (33a,b), *-gak* cannot appear with the stative predicate *-u-*, but it can with the activity verb *tilli* ‘to steal’.

(32) a. *pisu-liq-tuq*

walk-liq-part.3s

‘He/She is going for a walk.’

b. *arna-u-li-junga.

woman-be-liq-part.1s

‘I’m starting to be a woman.’

(33) a. tilli-ga-juk

steal-gak-part.3s

‘He always steals; he keeps stealing.’

b. *anna-u-ga-juk

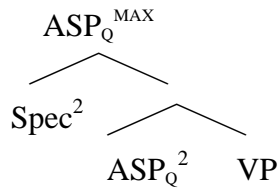
woman-be-gak-part.3s

‘She is always a woman.’

Similarly, in Malagasy, as reported in Travis (in prep: 308), there are two morphemes which bear the telicity information: *aha-* carries the feature [+telic] and *an-/i-*, the feature [-telic], and pairs can be created by alternating between these two forms, for example, *mitsapa/mahatsapa* ‘to inspect/to notice’. Travis (in prep) takes this as evidence that the information of telicity is encoded vP-internally in Malagasy.

Krifka (1992) claims that all verbs are inherently atelic in the sense that they don’t specify a culmination point but only a path. Incorporating this view in her account on event structure, Borer (2005) contends that atelicity is an unspecified default aspectual feature, and locates it at Aspect Phrase, which articulates lexical aspect. This is illustrated in the following diagram.

(34)



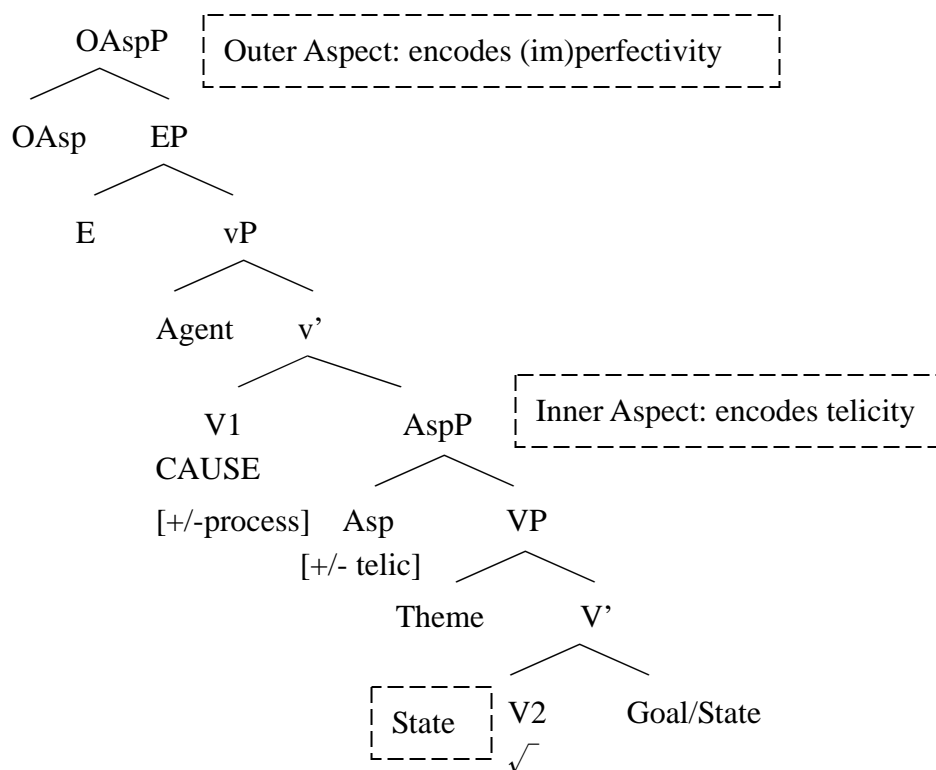
The subscript Q stands for quantity, and the superscript 2 specifies the head-spec agreement. The configuration in (34) is intended to account for a long-observed phenomenon that a quantificational object can affect the aspectuality of an event, as in (35), in which the plural object *carts* changes the predicate to an activity.

(35) a. Mary built a cart in three hours/*for three hours. (accomplishment)

b. Mary built carts *in three hours/for three hours. (activity)

In the same vein, Travis (in prep) proposes that aktionsart is computed at AspP inside vP, while viewpoint aspect is represented at the outer aspect, OAspP, which has scope over E(vent)P, as shown in (36).

(36)



Dowty's four aspectual classes are also captured in (36): V1 encodes Process, and possesses the feature [+/-process] and thus distinguishes achievements and states on one hand, and activities and accomplishments on the other hand; the head Asp encodes telicity and distinguishes accomplishments and achievements from activities and states. In line with Borer's analysis of quantificational objects, Travis claims that for an object to be able to measure out a predicate, it must move to [SPEC, Asp] to Agree with Asp⁰.

Recall that a pre-verbal frame PP in Mandarin interacts with the perfective morpheme *-le* and telic predicate, whereas a post-verbal durative PP only concerns telicity. The analysis suggested in Travis (in prep) teases apart the two types of aspect in structure, and would be a suitable framework to work in, if we assume that the linear order of temporal adverbials is a reflex of structural hierarchy.

Before we present the structure for Mandarin post-verbal adverbials, we will examine bare nominals, which will be shown to participate in the computation of telicity.

3.2 INNER ASPECT ANALYSIS OF EVENT STRUCTURE IN MANDARIN

3.2.1 BARE NOUNS REVISITED

In section 2.4, we observed that verbs that require a bare noun to express a complete meaning are activity verbs, such as *chi-fan* ‘eat rice=to eat’ and *kan-shu* ‘see book=to read’. Cheng and Sybesma (1998) argue that the presence of the bare nouns is due to the unavailability of generic *pro* in Mandarin. However, this analysis is not tenable, since we have shown that it is possible to have a covert nominal with a generic interpretation, and furthermore, the bare nouns in question are not generic but property-denoting. In her experimental study, Tieu (2007) shows that Chinese speakers can use *pro* with a generic interpretation. Following the transitivity theory of Cummins and Roberge (2005), Tieu (2007) claims that bare nouns are indispensable since structurally the object is always projected regardless of the lexical choice of verb. Based on the evidence of single constituency with post-verbal adverbials and the evidence presented below, we would like to provide another way of looking at these bare nominals. We suggest that bare nominals may take part in determining the telicity of predicates in Mandarin, in a way similar to the morphemes *aha-* and *an-/i-* in Malagasy.

Take *pao-bu* ‘run-step’, for example. In (37a), when the verb *pao* ‘run’ appears alone without the following bare noun, the sentence can only mean ‘he ran away/he escaped’. Hoekstra (1992) suggests that in the case of verbs of movement, such as *pao*, if it is not followed by any overt element, usually there is a covert predicate, typically meaning

‘away’. Therefore, the predicate in (37a) is shifted to achievement because of the empty constituent ‘away’, which contributes to the telicity. (37b) shows that the verb *pao* ‘run’ cannot stand alone and must take the bare noun *bu* ‘step’ to convey an action event, as illustrated in (37e). Crucially, (37c) shows that even with the help of the progressive marker *zai*, the meaning of (a)telicity cannot be obtained with the verb alone; the goal phrase *dao xuexiao* ‘to school’ in (37d) provides an end point to the predicate, and thus the event is interpreted as telic. To express atelicity, the bare noun *bu* ‘step’ in (37e) is used.

(37) a. ta pao-le.

he run-PRF

‘He ran away.’= ‘He escaped.’/ *‘He ran.’

b. *ta pao.

he run

c. *ta zai pao

he PROG run

Intended, ‘He is running.’

d. ta pao dao xuexiao.

he run to school

‘He ran to school.’

e. ta zai pao-bu

he PROG run-step

‘He is running.’

There are also cases in which the bare noun provides the feature [+telic]. (38a) and (38b) are such examples.

(38) a. ta jie-le hun.

he tie-PRF marriage

‘He got married.’

b. tamen jian-guo mian.

they see-EXP face

‘They met with each other before.’

(39) a. *ta jie-le [san tian] hun.

he tie-PRF three day marriage

*‘He was in the process of getting married for three days.’

b. *tamen jian-le [san tian] mian.

they see-PRF three day face

*‘They were in the process of meeting with each other for three days.’

The predicates in (37) with the bare nouns, *jie-hun* ‘to get married’ and *jian-mian* ‘to meet’, are telic, and thus are not compatible with the durative *san tian* ‘three days’, as shown in (39).

As suggested in Krifka (1992), verbs are inherently atelic in the sense that they don’t specify a culmination point but only a path. We would like to claim that verbs are semantically atelic, but to compute (a)telicity, a specific structural configuration, i.e., an

agreement between the specifier and Asp⁰, must be established¹⁵. To achieve that effect, we propose that at least in Mandarin, verbs resort to compounding a resultative morpheme, nominals or adding a goal argument. Bare nominals in Mandarin thus participate in the computation of (a)telicity when they appear in [SPEC, AspP]. In the next section, we will show that duratives and frequentatives are situated in AspP. Since bare nominals can form a constituent with duratives/frequentatives, bare nominals must be located inside AspP as well and hence have an effect on the (a)telicity of the predicate.

Take a look at the cases of (38) again. The bare noun contributes the meaning of telicity to the event: *hun* ‘marriage’ in *jie-huan* ‘to get married’ specifies the endpoint of the activity; that is, marriage is the result of the activity of marrying, and *mian* ‘face’ in *jiang-mian* ‘to meet’ designates a goal to the action. Notice that with the same bare nouns, telic predicates can be created, as shown in (40a-c). Interestingly, if the bare noun appears to the left of the verb, such as *mian* ‘face’ in (40d), it does not contribute to the telicity of the predicate anymore, since it is not at the right structural position to do so¹⁶. (41a,b) shows that the pre-verbal bare nominal *mian* ‘face’ cannot form a constituent with the frequentative *san ci* ‘three times’, nor can it be adjacent to the adverbial.

¹⁵ Goal phrases and resultative morphemes bring culmination to the predicate, and thus delimit the event, though they are not in the configuration of [spec XP Asp]. Please see Borer (2005) for details on how the assignment of the value of telicity is implemented to the event, and also see Ritter and Rosen (1998) for the treatment of secondary predicates in the event structure.

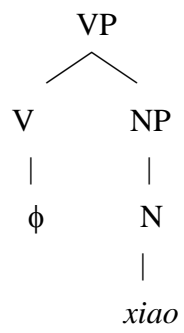
¹⁶ Notice that the noun *mian* ‘face’ modifies the event of talking by providing the way the event takes place and it is not an argument of the verb *tan* ‘talk’; it can be argued that *mian* ‘face’ adjoins to vP just like other manner adverbs.

- (40) a. *li-huan* ‘leave-marriage’= ‘to get divorced’ (achievement)
 b. *ding-huan* ‘book-marriage’= ‘to get engaged’ (achievement)
 c. *zhao-mian* ‘shine-face’= ‘to meet’ (achievement)
 d. *mian-tan* ‘face-talk’= ‘to discuss with someone face to face’ (activity)

- (41) a. tamen (*[san ci]) mian (*[san ci]) tan-le [san ci].
 they three time face three time talk-PRF three time
 ‘They talked face to face three times.’
 b. * [san ci mian] tamen dou tan le .
 three time face they all talk PRF

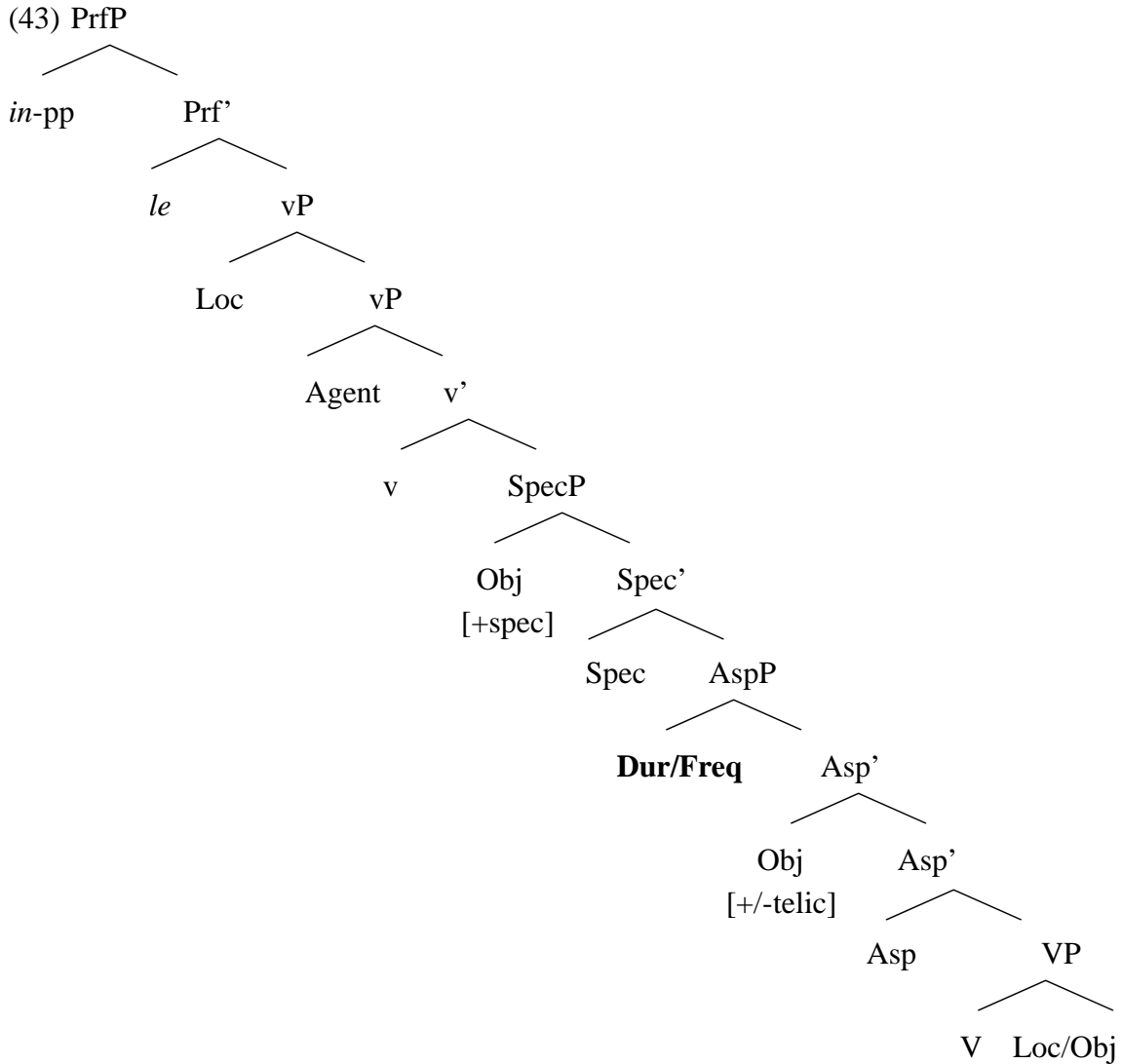
Before we move on to the syntactic representation of post-verbal adverbials in Mandarin, we would like to clarify a few points. As argued above, Mandarin verbs require external help to value the (a)telicity of the predicate; however, there are very few verbs that seem to be able to perform the task by themselves, such as *si* ‘to die’, *ying* ‘to win’, and *shu* ‘to lose’. There are also some activity verbs in Mandarin that do not require a bare noun to convey an action event, such as *ku* ‘to cry’, and *xiao* ‘to laugh’. For the first set of the verbs, that is, *si* ‘to die’, *ying* ‘to win’, and *shu* ‘to lose’, we assume with Lin (2004) and others that they might possess [+telic] as a lexical feature; as for the second set of verbs (*ku* ‘to cry’, *xiao* ‘to laugh’), we follow Cheng and Sybesma’s (1998) analysis that they involve conflation, a mechanism in which a noun is incorporated into the verb position. It can be assumed that the telicity information is transmitted to the verb with the application of conflation.

(42) *xiao* ‘laugh’ (Cheng and Sybesma 1998: 85)



3.2.2 PROPOSAL

We propose the following structure for Mandarin sentences involving temporal adverbials, locatives and frequentatives¹⁷:



There are several points we wish to make regarding the representation sketched above in answering the following questions:

¹⁷ We did not incorporate Travis' E(vent)P in the structure of (43), since the existence of this functional projection in Mandarin would require further research which is beyond the scope of this paper.

- 1) How do we present the differences of frame adverbials and durative adverbials with respect to their interaction with aspect in the structure?
- 2) How can the structure reflect the variations of word order exhibited by the nominals and the adverbials?

Let's start from the second question. First of all, post-verbal locatives, as complements of the verb, occupy the same position as the object; they do not participate in the computation of (a)telicity, and therefore initiate no movement to AspP. On the other hand, pre-verbal locatives are adjuncts, and are attached to vP as an event modifier.

Second, as claimed by Soh and Kuo (2004), definiteness and specificity in Mandarin have no correlation with telicity. When co-occurring with a perfective achievement, definite and specific objects do not induce a contradiction, as shown in (44). In contrast, the quantity-denoting object *liang ben shu* 'two books' in (45) turns the predicate into a telic one, and makes unacceptable the following assertion that denies the completion of the event.

(44) ta kan-le na/yi-ben shu, keshi mei kan-wan.
 he read-PRF that/one-CL book but not read-finish
 'He read that/a specific book, but he did not finish reading it.'

(45) ta kan-le liang-ben shu, #keshi mei kan-wan.
 he read-PRF two-CL book but not read-finish
 'He read two books, but he did not finish reading them.'

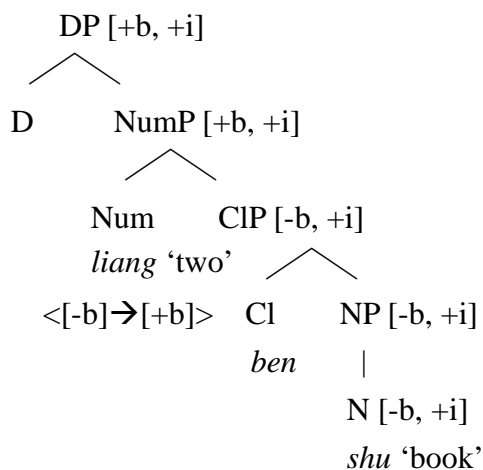
To account for the contrast observed above, Soh and Kuo (2004) associate the telicity feature with the numeral projection in the nominal domain. Following Jackendoff (1991), they assume that nominal arguments bear the conceptual features [\pm b(ounded)] and [\pm i(nternal structure)]. The boundedness feature indicates whether the boundaries of an entity are in view or are of concern, and the internal structure feature indicates whether the entity has inherent division into discrete members (Soh and Kuo 2007: 7). The feature specification of different types of nominals is provided below.

(46)

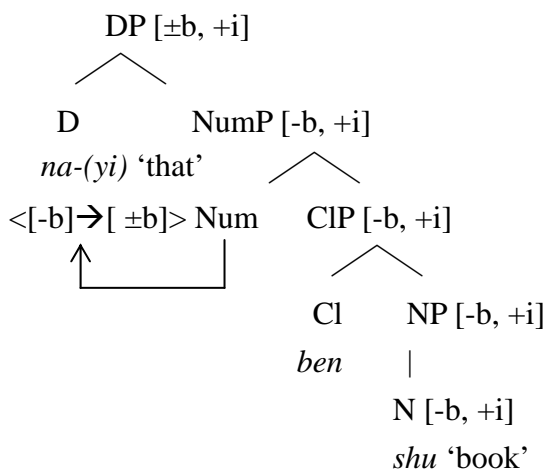
[+b, -i]	individuals	eg. a pig
[-b, -i]	substances	eg. water
[+b, +i]	groups	eg. a committee
[-b, +i]	aggregates	eg. furniture

Soh and Kuo adopt the view that Mandarin nouns are mass, and assume that nouns such as *shu* ‘book’ bear [-b, +i]. They propose that, first of all, a numeral changes the value of the boundedness feature of its selected constituent from [-b] to [+b]. Second, D-elements change the [-b] feature of the complement to [\pm b], which means that the nominal has the option of being either [+b] or [-b]. The applications of the feature changing rules are demonstrated as below.

(47) a. Numeral expressions [+b, +i]



b. Demonstrative noun phrases [±b, +i]¹⁸



In (47), the derivation starts with a noun specified as [-b, +i]. The feature percolates up to the CIP level; classifiers do not change the value of the boundedness feature or the value of the internal structure feature of the NP. In (47a), the numeral head changes the feature of [-b] to [+b], and as a result, the constituent is specified as [+b, +i]. On the other hand, in (47b), the demonstrative head changes the boundedness value of the constituent from [-b] to [±b]. The resulting feature specification, [±b, +i], percolates up to the DP level. Based on the derivations in (47), numeral constituents, such as *liang ben shu* ‘two books’,

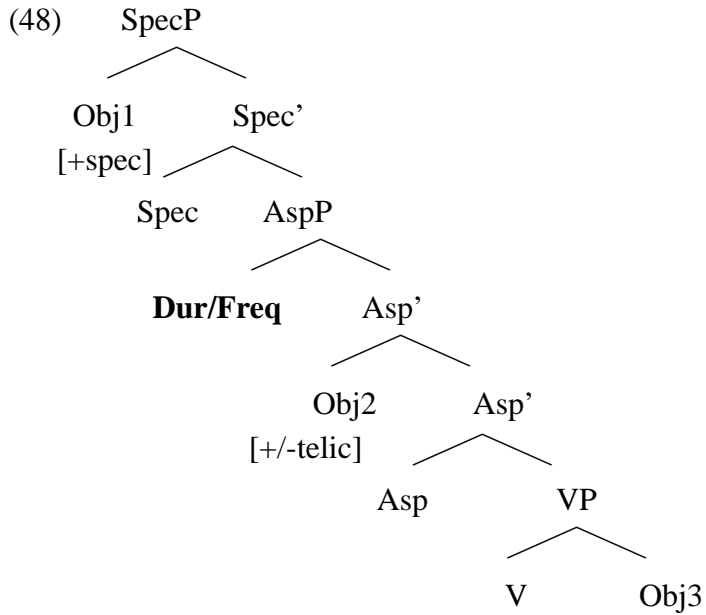
¹⁸ The structure involves a Num to D movement. It has been argued that a numeral with a referential interpretation adjoins to D, no matter if D is lexically filled by a demonstrative or not (Tang 1990, Li 1997).

bear [+b, +i], and delimit the event, while demonstrative/indefinite noun phrases, specified with [\pm b, +i], leave the event ambiguous between telic and atelic. The difference between the feature specifications of numeral expressions and those of definite/specific nominals explains the contrast shown in (44) and (45), that quantity-denoting objects, but not definite/specific objects, are able to delimit the event.

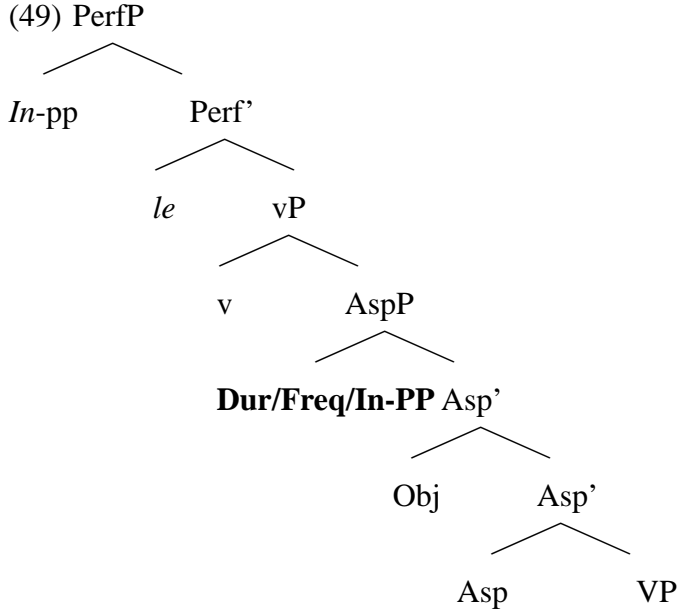
In terms of interaction with post-verbal adverbials, as shown in section 2, definite/specific nominals appear before adverbials, whereas property-denoting bare nouns and quantity-denoting NumPs follow the adverbials. We will spell out the aforementioned contrasts by arguing that on one hand, the definite/specific object moves from a position labeled Obj3 in (48) to SpecP above the inner aspect, in which durative/frequentative inhabits, with a stop over [SPEC, AspP] to assign [\pm telic/bounded] value to Asp⁰. On the other hand, quantity-denoting and property-denoting objects, notated as Obj2 in (48), are raised to [SPEC, AspP], valuing the (a)telicity feature against Asp⁰. We assume with Ritter and Rosen (2005) that the telicity feature on Asp⁰ is not deleted but rather is interpreted at LF as indicating that the predicate denotes a bounded or unbounded event. Bare nominals, property-denoting elements, can optionally trigger restructuring and form a constituent with the preceding adverbial in the domain of AspP¹⁹.

¹⁹ This reanalysis is optional since the adverbials can sometimes be preposed without the bare nominal. In (i), the frequency expression *liang ci* ‘two times’ undergoes scrambling to the medial position without the bare noun *fan* ‘rice’.

(i) ta liang ci dou mei chi fan.
 he two time all not eat rice
 ‘As for those two times, he did not eat.’



Now we backtrack to the first question: how does syntax reflect the differences between frame adverbials and durative adverbials? Following Travis' Inner Aspect approach, we argue that there are two syntactic components that articulate lexical aspect and viewpoint aspect in Mandarin: Inner Aspect is the locus of lexical aspect, and the perfective morpheme *-le* heads a functional project PerfectiveP(PrfP), which is correspondent to Travis' Outer Aspect. Ignoring the irrelevant projections and the verb movements in (43), the following tree diagram shows the hierarchy of the two layers of Aspect.



Temporal adverbials, including duratives and frame PPs, and frequentatives base-generate at AspP, while frame PPs move further up to PrfP for feature checking. Durative PPs are specified with [-telic], and are only compatible with atelic predicates. An object associated with [+telic] will lead to a crash at LF when co-occurring with a durative in AspP. Frame PPs bear the feature of [+perfective], and are present with perfective telic predicates; they start at AspP, licensed by [+telic] on Asp^0 , and end at [SPEC, PrfP] to check off [+perfective] against Prf^0 , which is spelled out as *-le*. We assume that at LF, the feature bundle { [+perfective], [+telic] } gives rise to a completive reading, and indicates that the natural endpoint of the event is reached. The string { ... PrfP [+perfective] ... Asp [-telic] } gives rise to a terminative reading, and indicates that the arbitrary end point of the event is reached. Lastly, frequency expressions are not specified with any (a)telicity feature, and hence are allowed to co-occur with either telic or atelic predicates.

To recap, we have shown that bare nominals in Mandarin can play a role in

determining the (a)telicity of the predicate. The word order varieties exhibited by different types of nominals and post-verbal adverbials are explained by movement triggered by [+specific] on the object. Regarding the post-“adverbial” bare nouns and NumPs, we showed that they are raised to the Inner Aspect phrase and enter the computation of aspectuality. We adopt Soh and Kuo’s feature analysis of nominals, and assume that definite and specific NPs bear [\pm telic], which results in the ambiguity on (a)telicity of the event. We proposed that the aspectual verb class of the predicates is encoded syntactically at Inner Aspect, while another functional projection outside vP, i.e., Outer Aspect, is responsible for the viewpoint of the event in Mandarin. Temporal adverbials and frequentatives are claimed to adjoin to the Inner Aspect phrase, while frame PPs move upward to the Outer Aspect (PrfP) to discharge its uninterpretable [+perfective] feature. The additional movement of frame PPs accounts for their pre-verbal position and also for the completive meaning that accompanies the presence of *in*-PPs.

4. CONCLUSIONS AND REMAINING ISSUES

In this paper we addressed three issues: the various syntactic positions of adverbials in Mandarin, the interaction between frequentatives/duratives and different types of post-verbal nominals, and the restriction on the co-occurrence of temporal adverbials with different aspectual verb classes of predicates. Based on the syntactic and semantic behaviours of temporal adverbials, we proposed that in Mandarin, aspectual information is encoded by two functional projections: the Outer Aspect presents viewpoint aspect and the Inner Aspect is the locus of lexical aspect. This analysis accounts for the following language facts. First, durative PPs interact with lexical aspect, and frame PPs access both lexical and viewpoint aspect; second, structurally, frame PPs occupy a higher position than duratives.

We conclude that the surface position for frequentatives/duratives results from successive verb movement, and post-verbal locatives are complements of the lexical verb and display s-selectional properties with the verb. As for the word order variation exemplified by nominals and post-verbal adverbials, it is achieved by object movement that involves feature checking of [+specific] on definite/specific nominals, and also object movement that is related to the computation of (a)telicity; the latter movement is implemented by raising a nominal to [SPEC, AspP] to value the (a)telicity feature on Asp⁰. We claim that property-denoting bare nouns and quantity-denoting NumPs are crucial to the (a)telicity of the predicate. We also showed that post-‘adverbial’ bare nouns denote a property rather than a kind; the semantic properties and the syntactic position of these post-adverbial bare nouns enable them to undergo reanalysis with post-verbal adverbials and form a constituent with them.

There are two paths this ongoing research can take in the future. First, we can perform a

typological comparison of how aspect can be reflected in a grammar. It has been mentioned that the event/stative distinction can be made at different levels in syntax. While Cowper (1999, 2003) shows that English and Spanish utilize the inflectional phrase to encode the information of eventiveness, Clarke (2009, in press) points out that the distinction between event and stative might be determined at the level of VP in languages such as Inuktitut and Japanese. In this research, we suggest that Mandarin might form a third group: the grammar might pay attention to the boundedness of the predicate in addition to the distinction between event and stative. As claimed in the previous section, temporal adverbials in Mandarin are sensitive to the telicity of the predicate. We show below that statives are compatible with the perfective marker *-le*, experiential *guo*, and progress marker *zhe* if they are ‘bounded’; however, these aspectual markers cannot appear in sentences that describe “atelic” states. In (50), the predicate *hong* ‘red’ can co-occur with the perfective marker *-le*, experiential *guo*, and progress marker *zhe*, whereas in (51), the sentence with the stative verb *xiang* ‘resemble’ is ruled out in the context of aspectual markers.

(50) a. ta de lian hong-le wu fenzhong.

he Mod face red-PRF five minute

‘His face was red for five minutes.’

b. ta de lian yinwei shai taiyang hong-guo.

he Mod face because bask sun red-EXP

‘His face was red because of basking in the sun.’

c. ta de lian hong-zhe,dong ta zai yianjian
 he Mod face red-PROG when he PROG speech
 de shihou.
 Mod time

‘His face was red when he was giving a speech.’

(51) ta xiang-*le/*guo/*zhe baba.

he resemble-PRF/EXP/PROG father

‘He resembles father.’

Second, the Inner Aspect analysis proposed in this paper suggests that event-modifiers are present at different positions in a structure: frequentatives, duratives, and argument-like locatives are shown to be located inside vP, while locative adjuncts and frame PPs, along with other adverbials such as manner adverbs, appear outside vP. In Korean and Finnish, adverbials are distinguished by case markers: event-delimiters including frequentatives, duratives, and locatives are marked with accusative, while true adjuncts are either bare or bear oblique case. The relation between case-assignment and telicity will be another interesting project for future study.

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