THE UNIVERSITY OF CHICAGO

# INCOMPLETENESS UNDER DISCUSSION

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BY
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To my parents.

*Love life more than the meaning of it?*

*Certainly, love it, regardless of logic as you say, it must be regardless of logic,*

*and it's only then one will understand the meaning of it.*

– Fyodor Dostoevsky, *The Brothers Karamazov*.

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# ABSTRACT

This dissertation re-examines a puzzling restriction on assertability of certain zero-marked sentences in the grammar of Mandarin Chinese, the so called *incompleteness* phenomenon (Kong 1994; He 1994; Tang and Lee 2000; Gu 2007; Tsai 2008; Guo 2015; Sybesma 2019; Tang 2022, among others). Unlike the majority of the existing analyses which attribute incompleteness to some context-free grammatical requirement, I establish the novel generalization that incompleteness is sensitive to the explicit or contextually implied Questions Under Discussion (van Kuppevelt 1995; Ginzburg 1996; Roberts 1996/2012; Farkas and Bruce 2010), which captures a wide range of apparently heterogeneous conditions that render incompleteness absent in an explanatory way. Moreover, I relate incompleteness to a set of similarly constrained zero-marked forms in other languages, showing that those zero-marked forms in Mandarin can be syntactically and semantically well-formed.

The dissertation provides a first formal pragmatic account of incompleteness, which attributes the two subcases of incompleteness discussed here, temporal incompleteness and degree incompleteness, to different pragmatic mechanisms. For the temporal case, incompleteness arises because of two incompatible R-based and Q-based implicatures (Grice 1967; Horn 1984). For the degree case, incompleteness arises due to a lexical presupposition encoded by the zero-marked sentences. The pragmatic account explains the QUD-sensitivity of incompleteness as well as captures native speakers' intuition towards an incomplete sentence that it is 'unfinished' instead of outright grammatical. Under the current analysis, the degradedness is attributed to the failure of a context to avoid the conflict of implicature or to satisfy the presupposition, which can be potentially salvaged when the utterance is continued due to the dynamic nature of the context.

The dissertation not only makes a variety of empirical and theoretical contributions to the incompleteness phenomenon, but also shows another effective cross-linguistic implementation of the notion of Question Under Discussion and the related tools in formal discourse theories including alternatives, implicatures, and presuppositions.

# CHAPTER 1

# INTRODUCTION

In natural languages, interpretation is heavily context-dependent. One aspect of context dependency is the ways in which features of context systematically restrict and shape possible conversational moves, such as assertion. A clear example is presupposition. In a context in which John has never smoked, it is odd for one to assert that he stopped smoking. The first two decades of the current century have seen an increased interest in the ways in which explicit or contextually implied *Questions Under Discussion* (QUDs) affect various aspects of interpretation, including assertability (van Kuppevelt 1995; Ginzburg 1996; Roberts 1996/2012; Farkas and Bruce 2010). My dissertation contributes to this line of inquiry by examining a puzzling restriction on assertability in the grammar of Mandarin Chinese, the so called *incompleteness* phenomenon, which, as I show, has been neither adequately described nor adequately explained despite abundant attention (Lu 1986; Kong 1994; Yang He 1994; Nansong Huang 1994; Shen 1995; Jing 1996; Klein et al. 2000; Tang and Lee 2000; Gu 2007; Tsai 2008; Hongyuan Sun 2014; Chen-Sheng Liu 2010, 2018; Zhiling Liu 2018; Yip 2019; Sybesma 2019; Jo-Wang Lin 2020; Tang 2022, among others). In this chapter, I establish the empirical and theoretical scope of the dissertation. Section 1.1 introduces the incompleteness phenomenon and the research questions that the dissertation focuses on, as well as clarifications about what will not be covered or focused in the current investigation. Section 1.2 briefly reviews the representative approaches of incompleteness in the existing literature and identifies the research gap. Section 1.3 gives an overview of the claims made by the dissertation as well as its organization.

## 1.1 Incompleteness in Mandarin Chinese

### 1.1.1 The core data pattern

Descriptively, the incompleteness phenomenon refers to a class of zero-marked sentences in Mandarin that cannot stand alone as independent utterances. The sentences in (1) contain zero-marked predicates whose argument slots are fully saturated, yet native speakers of Mandarin report that those sentences sound "incomplete", "as if the speaker hasn't finished their utterance" (Kong 1994; Yang He 1994; Nansong Huang 1994; Jing 1996). I label the degradedness in each case as "temporal incompleteness" and "degree incompleteness" henceforth – as we will see shortly, the typical way of making those sentences acceptable is to add some aspect marking to (1a) and to add some degree adverb to (1b), which is apparently related to temporal and degree markings respectively. [1] [2]

(1) a. ??Mali he cha.
Mary drink cha
Int: 'Mary {drank/was drinking/is drinking} tea' (temporal incompleteness)

b. ??Mali congming.
Mary clever
Int: 'Mary is clever' (degree incompleteness)

Note that the zero-marked sentences in (1) are not degraded on any interpretation, but just certain ones, namely the episodic reading (i.e. even-in-progress/event-completion reading) for eventive predicates such as (1a) (see Jing 1996; Guo 2015; Sybesma 2019), or the positive reading for gradable predicates such as (1b) (see Chen-Sheng Liu 2010, Grano

1. In this dissertation I will use "*" to mark ungrammaticality that is clearly due to syntactic reasons and "#" for infelicity that is clearly due to pragmatic reasons, and use the symbol "??" to mark the kind of unacceptability whose source is controversial, such as the incompleteness effect.

2. The conventions adopted in the dissertation are as follows. The capitals indicate prosodic prominence while square brackets "$[...]_F$" indicate the "F-marked" constituent (/focus associate) (Jackendoff 1972; Rooth 1985) and square brackets '$[...]_{CT}$' indicate contrastive topics. Abbreviations: CL=classifier, PERF=perfective marker, PROG=progressive marker, DUR=durative marker,EXP=experiential marker, DE=modificational marker, YNQ= yes/no question marker, SFP= sentence final particle, PRT=particle, NEG= negation, PL=plural.

2012). For (1a), it is assertable on the generic/habitual reading, while for (1b), it sounds fine on the comparative reading, as in (2).

(2) a. Mali he cha.
Mary drink cha
'Mary drinks tea' (generic/habitual reading)

b. Mali congming.
Mary clever
'Mary is cleverer (than a discourse-salient person)' (comparative reading)

To obtain the intended readings in (1), overt aspect markers such as the progressive or perfective marker needs to be added to (1a), and an unstressed degree adverb *hen* 'very', whose semantics is claimed to be quite bleached, needs to be added to (1b), as in (3).

(3) a. Mali zai he cha.
Mary PROG drink cha
'Mary was drinking tea'

b. Mali he -le cha.
Mary drink PERF cha
'Mary drank tea'

c. Mali hen congming.
Mary very clever
'Mary is clever'

Until this point, there is almost nothing too surprising about incompleteness since in many languages zero-marked predicates saturated with all the arguments will fail to be independent utterances, English for instance:

(4) a. *Mary drink tea.

b. *Mary clever.

However, the puzzle about Mandarin Chinese is that there are many cases in which zero-marked sentences are exempt from incompleteness. While a full list of environments in

which incompleteness of those zero-marked sentences disappears will be postponed to Chapters 2-6, I would like to mention two of them which are particularly unexpected.

The first is that adding focus to those incomplete sentences generally improves them, either by intonation or overt focus-sensitive operators (Tang and Lee 2000; Gu 2007; Chen-Sheng Liu 2010, 2018), as in (5) and (6).

(5) a. Mali he cha, Yuehan he jiu.
Mary drink tea John drink wine
'[Mary]$_{CT}$ {drank/was drinking/is drinking} [coffee]$_F$, [John]$_{CT}$ {drank/was drinking/is drinking} [wine]$_F$'

b. shi MALI he cha
be Mary drink tea
'It is [Mary]$_F$ who {drank/was drinking/is drinking} tea'

c. zhiyou MALI he cha
only Mary drink tea
'Only [Mary]$_F$ {drank/was drinking/is drinking} tea'

(6) a. Mali congming, Yuehan beng
Mary clever John stupid
'[Mary]$_{CT}$ is [clever]$_F$, [John]$_{CT}$ is [stupid]$_F$'

b. shi MALI congming (bu shi YUEHAN)
be Mary clever not be John
'It is [Mary]$_F$ who is clever, not [John]$_F$'

c. (zhe-xie ren zhong) zhiyou MALI congming.
this-PL person in only Mary clever
'(Among these people) only [Mary]$_F$ is clever'

The second is that continuing those incomplete sentences with some other sentences to form a narrative can also make them acceptable (Kong 1994; Smith 1997; Guo 2015), as in (7) and (8). This strategy reflects native speakers' intuition that those zero-marked sentences are *incomplete*, instead of outright ungrammatical.

(7) a. (gangcai) Mali he cha, xi beizi, (ranhou) qu sanbu.
just.now Mary drink tea wash cup then go walk

'(Just now) Mary drank tea, washed cups, and went for a walk'

b. (gangcai) Mali he cha. turan beizi sui le.
just.now Mary drink tea suddenly cup break PERF
'(Just now) Mary was drinking tea. Suddenly the cup broke.'

(8) a. Mali congming, qinfen, (erqie) youmo
Mary clever hard-working and humorous
'Mary is clever, hard-working, and humorous.'

b. Mali congming. zhexie ti ta dou hui zuo.
Mary clever those question she DOU able solve
'Mary is clever. All of those questions she can solve them.'

### 1.1.2 Research questions

The incompleteness phenomenon raises a lot of questions, and this dissertation will focus on the following ones, which are important in that they have not been fully addressed in the exiting literature.

The first is an empirical question, namely what are the environments in which zero-marked sentences sound incomplete without overt marking and what are those in which incompleteness disappears? There are a lot of existing observations in the literature (Kong 1994; Jing 1996; Tang and Lee 2000; Gu 2007; Tsai 2008; Grano 2012; Chen-Sheng 2018; Sybesma 2019; Niina Zhang 2021, among many others) but I will point out that not all of them are valid. In Chapter 2, Chapter 5, and Chapter 6, I will contribute some novel data regarding incompleteness including clause-embedding constructions, non-root clauses, etc. More importantly, we will see that none of the existing literature provides an explanatory answer to the question what is exactly shared by those environments in which incompleteness occurs or disappears.

The second question concerns the nature of incompleteness. Is it a syntactic, semantic, or pragmatic constraint in the grammar? Why can adding focus, forming narratives, along with many other conditions that apparently have nothing in common with temporal or degree operator, salvage incompleteness? Can temporal incompleteness and degree

incompleteness be treated uniformly? While I use the label "incompleteness" to describe those two kinds of degraded sentences based on native speakers' intuition, it remains to be see whether they actually can be explained in the same theoretical terms.

The third question, is incompleteness a unique, "exotic" property of Chinese grammar, or is it something that we can find in other languages? Most of the existing literature focuses on the aspects of Mandarin that appear to be special compared to other languages, and so it remains an open question whether we can integrate the phenomena and explanation of incompleteness into a bigger picture of cross-linguistic variation and similarity.

### 1.1.3 A caveat on incompleteness

The two kinds of incomplete sentences investigated in this dissertation, temporal incompleteness and degree incompleteness, are only a proper subset of a wider class of incompleteness phenomena in the tradition of Chinese Linguistics (Lu 1986; Hu and Jin 1989; Kong 1994; Yang He 1994; Songnan Huang 1994; Jing 1996; Tang 2001; Gu 2007; Zhiling Liu 2018). This section explains why some other sentences that are often taken to be "incomplete" in the literature are not included in the current investigation.

First, many previous studies (Kong 1994; Yang He 1994; Songnan Huang 1994; Tang and Lee 2000; Gu 2007; Tsai 2008; Guo 2015) point out that some aspectually marked sentences, in particular those that are marked by the perfective *-le*, can still sound incomplete when the object is a bare noun, as in (9).

(9) a. ?Mali chi-le fan.
Mary eat-PERF meal
'Mary had a meal.'

b. ?Mali na-le shu.
Mary take-PERF book
'Mary took a book.'

I do not investigate this kind of incompleteness in this dissertation for two reasons. One is that the unacceptability of the sentences in (9) is clearly milder than the temporal incompleteness such as (10).

(10) a. ??Mali chi fan.
Mary eat meal
Int: 'Mary had a meal.'

b. ??Mali na shu.
Mary take book
Int: 'Mary took a book.'

The other reason is that the judgment for this kind of sentences is still controversial in the literature, partially because the acceptability varies depending on the lexical choice of the bare noun object (Kong 1994; Tang and Lee 2000; Jo-Wang Lin 2017). The sentences in (11) for instance, do not sound incomplete.

(11) a. Mali chi-le shousi
Mary eat-PERF sushi
'Mary had sushi.'

b. Mali na-le manhuashu.
Mary take-PERF comic.book
'Mary took a comic book'

Second, I will ignore the potential variation in syntax and semantics between aspect markers in Mandarin Chinese (Tsai 2008; Zhiling Liu 2018; Lu and Wen 2018) and focus on the representative ones such as the perfective *-le* and progressive *zai*. Tsai (2008) shows that some durative marker *-zhe* fails to make a sentence complete while the progressive marker can usually make a sentence complete, as in (12)-(13). I will not investigate the degradedness of (12) in this dissertation since it seems to be more related to the special properties of *zhe* – crucially, this kind of incompleteness differs from temporal incompleteness and degree incompleteness in that it cannot be salvaged by focus, as in (14).

(12) a. ??Yuehan ku-zhe.
John cry-DUR
Int: 'John is crying.'

b. ??Yuehan he-zhe cha.
John drink-DUR tea
Int: 'John is drinking tea.'

(13) a. Yuehan zai ku.
John PROG cry
'John is crying.'

b. Yuehan zai he cha.
John PROG drink tea
'John is drinking tea.'

(14) a. ??zhiyou YUEHAN ku-zhe
only John cry-DUR
Int: 'Only JOHN is crying'

b. ??Yuehan ku-zhe, Mali xiao-zhe
John cry-DUR Mary laugh-DUR
Int: '[John]$_{CT}$ is [crying']$_F$, [Marry]$_{CT}$ is [laughing]$_F$'

c. ??shi YUEHAN ku-zhe
be John cry-DUR
Int: 'It is John who is crying'

In addition, the incompleteness of sentences involving *zhe* is also sensitive to the lexical selection of the predicates: (15) for instance sounds not degraded at all.

(15) waimian xia-zhe yu.
outside fall-DUR rain
'It is raining outside'

In words, since 'incompleteness' is mostly used as a descriptive term in the literature, the incompleteness phenomena discussed in the previous research can be a set of sentences that are degraded for potentially various kinds of reasons, which by no means can be covered in this dissertation. For this reason, the current investigation will be restricted to the temporal incompleteness and degree incompleteness introduced in Section 1.1.

### 1.1.4 Talking about time in Mandarin

This section aims to show that our investigation on temporal incompleteness is independent of the research on tense in Mandarin. But before that, I will first introduce some basic terminologies about time in language in order to be able to talk about the temporal information expressed by Mandarin sentences.

I adopt a classic Klein/neo-Reichenbachian theory of time (Reichenbach 1947; Klein 1994; see implementations in Mandarin in Smith 1997, Klein et al. 2000, Hongyuan Sun 2014; Yuyin He 2020): the temporal information of a clause can be described in terms of relations between three time intervals: the evaluation time, the topic time (or "reference time"), and the eventuality time. The evaluation time is the time relative to which we evaluate the truth of a clause; this parameter is set to the speech time by default for a root clause. The topic time is the time to which the speaker's claim on the eventuality described by the sentence radical is confined (Klein 1994: 4). The eventuality time is the (maximal) time span in which the relevant event is ongoing or the relevant state holds. To temporally locate an event or state, a sentence uses (viewpoint) aspect to constrain relation between the eventuality time and topic time, and tense to constrain the relation between the evaluation time and topic time. For example, a English sentence such as (16) involves the past tense and perfective aspect, which describe the relations between the three intervals as follows:

(16) Mary drank tea last night.
Eventuality Time: the running time of the Mary drinking tea event
Topic Time: some time span within last night
Evaluation Time: the time of uttering (16) (the speech time)

(17) Temporal information of (16)

a. Perfective aspect: Eventuality Time $\subseteq$ Topic Time

b. Past tense: Topic Time < Evaluation Time

Turning to Mandarin, this language has a variety of overt aspect markers (e.g. the perfective *-le*, the progressive *zai*, etc) to encode the relation between the eventuality time and the topic time but lacks overt tense morphology. Mandarin sentences such as (18) only contain overt aspect markers, and the verbs are not inflected with tense morphology as the English verb in (16), yet they are able to obtain some "default" tense interpretation: past tense reading in (18a) and present tense reading in (18b) (Smith 1997; Smith and Erbaugh 2005; Lin 2006; Sybesma 2007).

(18) a. Mali he -le cha.
Mary drink PERF tea
'Mary drank tea.'

b. Mali zai he cha.
Mary PROG drink tea
'Mary is drinking tea'

We call those tense interpretations "default" because they are not entailed but can be overridden with temporal adverbs which constrain the topic time or other information in the context. In (19a), the past interpretation is overridden, which shows *-le* is indeed a pure perfective marker which locates the eventuality time within the topic time (i.e. some time tomorrow). In (19b), the present interpretation is overridden, which shows that *zai* is a pure progressive marker which locates the topic time (i.e. some time last night) within the eventuality time of the Mary drinking tea event.

(19) a. mingtian Mali he -le cha zhihou, wo hui qu jian ta.
tomorrow Mary drink PERF tea after I will go meet her
'After Mary drinks tea tomorrow, I will go to meet her'

b. zuowan Mali zai he cha.
last.night Mary PROG drink tea
'Mary was drinking tea last night'

Many different approaches have been proposed in the literature to capture the above interpretation pattern (Smith and Erbaugh 2005; Lin 2006, Lin 2012; Sybesma 2007; Hongyuan Sun 2014, Yuyin He 2020), but this dissertation does not intend to argue for one over the others. The reason is that, temporal incompleteness is an issue more relevant to aspect than tense. Firstly, we have seen that the temporal incompleteness is caused by the lack of overt aspect marking of an eventive sentence, instead of the failure of specifying the tense interpretation. As shown by (18) and (19), overt aspect markers do not encode the relation between the topic time and the evaluation time, and it does not cause degradedness in Mandarin – either some default interpretation arises without overt temporal adverbs, or a more specific past/present interpretation arises due to the presence of overt temporal adverbs. Secondly, temporal incompleteness also cannot be salvaged by adding overt temporal adverbs alone (Sun 2014; He 2020) the sentences in (20) still sound degraded on the intended episodic readings.

(20) a. ??zuowan Mali he cha.
last.night Mary drink tea
'Mary {was drinking /drank} tea last night.'

b. ??xianzai Mali he cha.
now Mary drink tea
'Mary is drinking tea now.'

Lastly, in environments in which temporal incompleteness is absent such as focused sentences in (21), a zero-marked sentence is still underspecified in terms of the tense interpretation, and similarly can be specified by overt temporal adverbs. This again shows that whether zero-marked sentences are complete or incomplete is irrelevant to whether the tense interpretation is specified or underspecified.

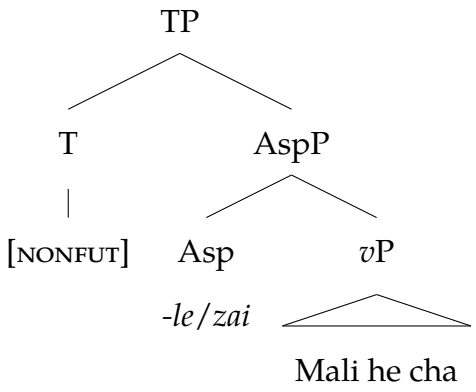
(21) a. zhiyou MALI he cha.
only Mary drink tea
'Only [Mary]$_F$ {was drinking/is drinking/drank} tea.'

b. zuowan zhiyou Mali he cha.
last.night only Mary drink tea
'Only [Mary]$_F$ {was drinking /drank} tea last night'

c. xianzai zhiyou Mali he cha.
now only Mary drink tea
'Only [Mary]$_F$ is drinking tea now.'

In words, however one treats the encoding of the semantic tense in Mandarin, namely the relation between the topic time and the evaluation time, is independent of the temporal incompleteness issue investigated here. As a matter of convenience, I will adopt Hongyuan Sun (2014)'s analysis (see a similar one in He 2020) in assuming that there is a covert non-future tense in a superficially morphologically tenseless Mandarin sentence, which can be understood as a tense feature underspecified between the present and past tense (as long as it is not a future one), as in (22).

(22)




The details of the semantic composition will be elaborated in Chapter 3, when they become relevant. But by adopting this analysis I do not intend to make any commitment about whether Mandarin in fact has covert semantic tenses or a syntactic tense projection – the only purpose is to capture the relatively loose literal meaning of those sentences in Mandarin (ignoring the default interpretation) in some way, and the analysis of incompleteness proposed in the dissertation will be compatible with other theories of tense in

Mandarin that can do so without assuming the presence of syntactic or semantic tenses (Smith 1997; Lin 2006; Lin 2012).

## 1.2 Representative existing approaches

This section reviews the representative approaches of incompleteness in the existing literature in broad strokes. The goal is to give an overall picture of various kinds of approaches instead of the details of each specific analysis since we will evaluate them in detail in Chapter 2 (for temporal incompleteness) and in Chapter 6 (for degree incompleteness). I sort the existing approaches into two broad categories, grammatical approaches and pragmatic approaches, and point out why they are inadequate empirically or/and theoretically.

### 1.2.1 Grammatical approaches

One class of approaches of incompleteness is to attribute incompleteness to the failure of satisfying certain syntactic or/and semantic requirements. While I label some of those accounts as "syntactic" while some of them as "semantic" in the rest of the presentation, I do not intend to make a clear distinction between them because many of the proposed syntactic constraints have corresponding semantic consequences, and vice versa.

I start with a set of accounts that are more "syntactic" (but can be compatible with semantic accounts as well). The core idea shared by them is that zero-marked sentences are sentence radicals and they must project and license certain functional projections such as TP (/IP) and CP in order to be independent utterances, just like in English. Tang and Lee 2000 (see also Tang 2001) for instance, building on Enç (1987), propose the Generalized Anchoring Principle to capture temporal incompleteness, which says that every clause must be either tensed or focused at the Logical Form (LF) interface level, and all the conditions that make an incomplete sentence complete either contribute to anchoring by tense, or anchoring by focus. [3] Tsai (2008) similarly relates temporal incompleteness to a

3. There is a vast literature on the topic of "anchoring", and the term could be used to refer to different

failure of anchoring tense (i.e. to provide a proper temporal reference of a given sentence via syntactic means), and adding certain aspect markers can anchor tense by raising from AspP to the T head. Turning to degree incompleteness, Grano (2012) attributes it to the [+V] constraint of the T head such that it cannot take zero-marked adjectival predicates as complements but must take verbal or functional projections; adding degree adverbs or focus (among others) can satisfy this [+V] constraint. Chen-Sheng Liu (2018), on the other hand, argues that requiring degree adverbs or focus is due to a rule at the Syntax-Prosody Interface called Nonhead Stress Rule (Duanmu 2000).

I argue that these syntactic accounts face at least one of the following challenges. First, all of them, at least in their current forms, fail to explain why continuing a zero-marked sentences with some other sentences to form a narrative can salvage incompleteness. The proposed requirement in each account essentially targets the internal structure of a matrix clause, and so provides no explanation of why putting the sentence within some narrative can help satisfying this sentence-internal requirement. Second, most of them (except Liu 2018) have to assume a syntactic requirement that is very specific to Mandarin Chinese, since it is uncommon across languages for focus to satisfy the same syntactic requirement as tense, aspect, or degree adverbs. Third, all of those accounts target only one kind of incompleteness and do not discuss whether the temporal incompleteness and degree incompleteness can be analyzed in a uniform way or not.

Another set of accounts are relatively more "semantic" (but are potentially compatible with syntactic accounts). Many of them agree that incomplete sentences are degraded because they introduce unbound event or degree variables, and so fail to denote propositions, which is typically taken to be a requirement for a sentence to be assertable. For example, Klein et al. (2000), Hongyuan Sun (2014), and Guo (2015) argue that zero-marked sentences in the case of temporal incompleteness are sentence radicals which denote properties of

grammatical constraints. Giannakidou (2009), for instance, treats anchoring as a requirement of licensing a dependent element which lacks referential "deficiency".

events. To form propositions that assert the actualization of a relevant event requires the addition of tense and aspect to locate the event time relative to the topic time and speech time, following the classical Klein/Neo-Reichenbachian theory of time (Reichenbach 1947; Klein 1994; see implementations to Chinese in Klein et al. 2000; Smith and Erbaugh 2005). While there is no morphologically overt tense in Chinese and its function is often considered to be taken up by some covert tense operator (Hongyuan Sun 2014; Yuyin He 2020) or some semantic rules (Lin 2006), those accounts claim that aspect marking is required in the formation of propositions to bind the event variable. Gu (2007) discusses both temporal incompleteness and degree incompleteness and claims that those zero-marked sentences are degraded because the relevant event or gradable property is not anchored to some reference point on the temporal or degree scale – while she does not explicitly mention the degradedness is due to unbound variables, her account similarly relies on some semantic requirement of matrix clauses. The other semantic accounts attribute incompleteness to the boundedness feature of predicates. Shen (1995) proposes that temporal incompleteness is due to an unbounded feature of verbal predicates, and Chen (2010) focuses on degree incompleteness and proposes that degree adverbs can specify the [-telic] feature of adjectival predicates, which are underspecified in boundedness in Mandarin.

All of these semantic accounts face at least some of the following problems. First, just like the syntactic accounts, they fail to explain why putting a zero-marked sentence within a narrative can satisfy the relevant semantic requirement. Second, they either ignore the data in which focus salvages incompleteness (as in Klein et al. 2000, Sun 2014), or they have to postulate that focus can have the same semantic function as aspect markers or degree adverbs. The relevant semantic function in the latter is to locate an event or a gradable property relative to a reference point (as in Gu 2007), or to specify the boundedness feature (Chen 2010), which is again not motivated from a cross-linguistic perspective. Third, none of these analyses other than Gu (2007) discuss the similarity shared by the temporal incompleteness and degree incompleteness, and even in Gu 2007, the notion of

anchoring (to some reference point) is not formalized.

Lastly, there are several accounts that explicitly attribute incompleteness to both syntactic and semantic requirements. Hu and Shi (2005) for instance, propose that zero-marked sentences in the case of temporal incompleteness are degraded both because they do not project a certain size of sentence structure (IP/CP) to license the referential feature of events and because the event variable in the denotation of the sentence is left unbound. Similarly, Sybesma (2019) relates the incomplete sentences in the temporal case to non-finite sentences, which fail to be matrix sentences for both syntactic and semantic reasons. Those accounts inherit most of the problems of the syntactic and semantic accounts that have: they fail to explain why those zero-marked sentences can improve when put into narratives, and they do not provide an explanation answer for why focus can make an non-finite clause finite in Mandarin Chinese, which is cross-linguistically unattested.

Summarizing, grammatical approaches attribute incompleteness to some syntactic or/and semantic constraint in the grammar but they are neither empirically nor theoretically adequate. Empirically, they fail to capture why continuing a zero-marked sentence to form a narrative can salvage incompleteness; theoretically they have to make some unmotivated assumptions about the syntactic or semantic function of focus in Mandarin.

### 1.2.2 Pragmatic approaches

Another class of approaches of incompleteness takes a quite different perspective from the grammatical ones. They consider zero-marked sentences as both syntactically and semantically well-formed, but degraded for pragmatic reasons. While the analysis I develop in this dissertation will also be a pragmatic one, to understand its new contributions, I will first explain why the existing pragmatic accounts are inadequate.

Kong (1994) proposes that the zero-marked sentences cannot stand as independent utterances because they are not informative enough to be the main point. They can only be a secondary point, which captures native speakers' intuition that incomplete sentences

can be salvaged if they are continued with some other utterance. However, as already pointed out by many researchers in the literature (Tang and Lee 2000; Hu and Shi 2005), this analysis relies on a quite vague notion of "informativity". Kong's notion of informativity is not formalized, and provides no independent standard to decide what amount of informativity is enough for a sentence to be the main point of an utterance. Smith (1997) (see also Smith and Erbaugh 2005, Smith 2008) proposes a related but more specific hypothesis: she observes that zero-marked sentences in the temporal case are incomplete when they are foregrounded in the discourse, but usually can be complete when they are backgrounded. While she does not provide an explanation for this correlation (and in Section 2.3 of Chapter 2 I will argue that this generalization is not entirely correct), this insight will turn out to be extremely important to my investigation of incompleteness. Together with the well established observation that focus can salvage incompleteness, the correlation of incompleteness with foregrounded (/backgrounded)ness suggests that the incompleteness phenomenon is sensitive to the properties of discourse, which in turn provides strong motivation for a pragmatic account.

There are also pragmatic accounts that focus on degree incompleteness only. Krasikova (2008) proposes that zero-marked sentences involving gradable predicates are degraded essentially because their semantics are vague statements, and are blocked by alternatives that are non-vague and more informative. Linmin Zhang (2021) (see also Linmin Zhang 2019; Cong 2021) pursues a different kind of pragmatic blocking story: zero-marked sentences are ambiguous between the positive use and comparative use, and having *hen* disambiguates for the positive use. Due to a manner-related pragmatic principle, the form marked by *hen* is preferred over the zero-marked form whenever the positive reading is intended. Niina Zhang (2021) makes the insightful generalization that degree incompleteness is sensitive to the Question Under Discussion in the context, but does not provide an explanation of why this is the case. In Chapter 6, I will show that these accounts and generalizations cannot capture the full distribution of degree incompleteness. In

addition, they say nothing about the relation between degree incompleteness and temporal incompleteness.

In words, pragmatic approaches are promising in that they provide the basis for an account of the discourse-sensitivity of incompleteness, in which case there should be no need to postulate unmotivated assumptions about the function of focus in Mandarin. But they are not without problems. Some of them (Kong 1994; Smith 1997) are not fully developed or not formalized, and others (Krasikova 2008; Linmin Zhang 2021) are specific to the degree incompleteness, leaving temporal incompleteness unaccounted for.

### 1.2.3 Interim summary

In sum, none of the existing approaches of incompleteness are empirically or theoretically adequate. For the grammatical approaches, they seem to miss the discourse-sensitivity of incompleteness and have to make some assumption about the function of focus, or even narratives in Mandarin in order to capture why incompleteness can be salvaged by aspect markers and degree adverbs but also by a set of conditions that are apparently unrelated to aspect or degree. For the pragmatic approaches, they are either not precise enough or they fail to have something to say about both the temporal incompleteness and degree incompleteness.

## 1.3 Overview of the dissertation

Building on the insights from both the grammatical and pragmatic approaches, the dissertation contributes the first attempt in the literature to approach the incompleteness phenomenon under a formal QUD-based discourse perspective. The main claims of the dissertation can be summarized as the following answers to the research questions proposed in Section 1.1.2:

Q1: *What are the environments in which zero-marked sentences sound incomplete without overt marking and what are those in which incompleteness disappears?*

Incompleteness is sensitive to the Question Under Discussion in the context. Temporal incompleteness correlates with whether the QUD concerns the instantiation of the event. Degree incompleteness correlates with whether the QUD involves degree alternatives.

Q2: *What is the nature of incompleteness? Is it a syntactic, semantic, or pragmatic constraint in the grammar? Why adding focus, forming narratives, along with many other conditions can make incompleteness disappear? Can temporal incompleteness and degree incompleteness be treated uniformly?*

Incompleteness is pragmatic in nature (i.e. zero-marked forms are grammatical and meaningful), though temporal incompleteness and degree incompleteness do not involve exactly the same source of pragmatic mechanism. Temporal incompleteness can be attributed to a conflict between two implicatures, which only arises in contexts with certain QUDs. Degree incompleteness can be attributed to the failure of satisfying a lexical presupposition associated with the zero-marked sentences, which can be avoided in contexts with certain QUDs. The contribution of this pragmatic analysis is that it for the first time captures the apparently heterogenous conditions that can make incompleteness disappear including adding focus, forming narratives, and many others in an explanatory way – they all can shift the QUD in the context.

Q3: *Is incompleteness an exotic property of Chinese grammar, or we can find something similar in other languages?*

Incompleteness is not an *exotic* property of Chinese grammar, but can be related to the phenomena in other languages including the restricted use of imperfective sentences and the degradedness of bare habitual sentences.

The rest of the dissertation consists of three parts. The first part (Chapter 2 - Chapter

5) focuses on temporal incompleteness; the second part (Chapter 6) focuses on degree incompleteness. The last part (Chapter 7) concludes with some remaining issues.

Chapter 2 addresses the empirical question of under which conditions overt aspect marking is required/optional for episodic readings for root eventive clauses. I give an overview of the existing observations as well as new observations concerning the clause-embedding eventive predicates, and show that none of the existing analyses can capture all the data. Instead, I argue for a novel generalization that temporal incompleteness correlates with the QUD concerns the instantiation of the event, which can naturally capture all the data.

Chapter 3 proposes that the aspectually zero-marked sentences in Mandarin are grammatical and meaningful – they are imperfective sentences which involve modality in their semantics. I provide two motivations for this claim. The first is that zero-marked forms can indeed express typical imperfective readings including habitual/generic characterizing readings, continuous readings, futurate readings, and progressive readings (in certain cases). The second is that viewing zero-marked forms as imperfectives can reduce temporal incompleteness to a question of under what conditions imperfective forms have episodic uses and we can find some similar licensing conditions for the episodic uses of imperfectives in other languages.

Chapter 4 proposes a formal pragmatic account of temporal incompleteness. I argue that a zero-marked sentence, whose literal meaning is weaker than episodic interpretations, can imply the episodic interpretation via the R-based principle 'Say no more than you must' (Horn 1984, based on Grice 1967). However, such R-based strengthening is not always available and could be blocked by an incompatible implicature due to the competing Q-based principle 'Say as much as you can'. The discourse-sensitivity of the temporal incompleteness thus can be captured by the interaction between the QUD and the R-based and Q-based implicatures. When the event instantiation is directly addressing the QUD, the Q-based implicature is mandatory which leads to a conflict with the

R-based implicature, giving rise to incompleteness. But when the event instantiation is not directly addressing the QUD, the Q-based implicature is not mandatory and the R-based implicature survives and give rises to the episodic reading.

Chapter 5 provides further support for the proposed pragmatic account by discussing how the account can extend to temporal incompleteness in non-root clauses including clausal complements of attitude and speech verbs, relative clauses, noun complements, and certain temporal adverbial clauses.

Chapter 6 turns to degree incompleteness. While I show that degree incompleteness also correlates with the QUD, I propose a different pragmatic account of it which attributes the degradedness of the relevant zero-marked forms to the failure of satisfying the lexical presupposition of a covert POS morpheme involved in those sentences, mainly based on the parallel between degree incompleteness and how habitual sentences sometimes need frequency phrases (in both Mandarin and English).

Chapter 7 concludes by summarizing the empirical and theoretical contributions of the dissertation and pointing out some open questions for future studies.

# CHAPTER 2

# TEMPORAL INCOMPLETENESS IN ROOT CLAUSES

## 2.1 Temporal incompleteness for episodic readings

This chapter focuses on the empirical question of under which conditions overt aspect marking is required for episodic interpretations of Chinese root eventive clauses. It is often claimed that such marking is always required for root eventive clauses (temporal incompleteness) and the core data pattern supporting such a claim (Kong 1994; Klein et al. 2000; Tang and Lee 2000; Gu 2007; Tsai 2008; Hongyuan Sun 2014; Sybesma 2019; Yuyin He 2020) is summarized as follows. While bare stative predicates can obtain generic or episodic readings (the latter is available only for stage-level stative predicates) as in (1), bare eventive predicates can only obtain generic(/habitual) readings and futurate readings, but not episodic readings. The pattern holds across various types of eventive predicates that describe activities, accomplishments, or achievements, as in (2)-(4).

(1) a. Mali re'ai shige (Individual-level statives)
Mary love poetry
✓Generic: 'Mary {loves, loved} poetry'

(Futurate: NA; Episodic: NA)

b. Mali hen mang (Stage-level statives)
Mary very busy
✓Generic: 'Mary {is, was} (always) busy'

✓Futurate: 'Mary is busy (tomorrow)'.

✓Episodic: 'Mary {is, was} busy ({now, last night})'

(2) Mali he kafei (Activities)
Mary drink coffee
✓Generic: 'Mary (normally) drinks coffee'

✓Futurate: 'Mary drinks coffee (tomorrow).

??Episodic: 'Mary {drank, was/is drinking} coffee.'

(3) Mali he yi-bei kafei (Accomplishments)
Mary drink one-CL coffee
✓Generic (with some adverbs): 'Mary drinks a cup of coffee ??(after lunch)'

✓Futurate: 'Mary drinks a cup of coffee (tomorrow morning).

??Episodic: 'Mary {drank, was/is drinking} a cup of coffee.'

(4) Mali ying (Achievements)
Mary win
✓Generic (with overt Q-adverbs): 'Mary ??(often) wins'

✓Futurate: 'Mary wins (tomorrow).

??Episodic: 'Mary won.'

Native speakers often describe the degraded utterances as 'incomplete' or 'failing to stand alone'. To obtain episodic readings for eventive predicates, overt aspect markings such as perfective *-le* or progressive *zai* are required, as in (5)-(7). [1]

(5) Mali {zai} he {-le} kafei.
Mary PROG drink -PERF coffee
'Mary {was/is drinking, drank} coffee.'

(6) Mali {zai} he {-le} yi-bei kafei.
Mary PROG drink -PERF one-CL coffee
'Mary {was/is drinking, drank} a cup of coffee.'

(7) Mali ying {-le, -guo}.
Mary win -PERF -EXP
'Mary {won, once won}.'

Note that while adding temporal adverbs to those aspectually marked sentences can further specify the location of the topic time as in (8), adding them directly to zero-marked sentences cannot make them complete, as in (9).

1. Most examples in this section involve the perfective *-le* and progressive *zai*, sometimes the experiential *-guo* is used for intransitive predicates to ensure the aspect marker appearing in the sentence-final position is not a sentence-final particle. For *le* in the sentence-final position, I gloss it as LE to remain agnostic whether it is a perfective or a sentence final particle or a mixture of the two.

(8) a. gangcai Mali he -le kafei.
just.now Mary drink -PERF coffee
'Mary drank coffee'

b. xianzai Mali zai he yi-bei kafei.
now Mary PROG drink one-CL coffee
'Mary is drinking a cup of coffee now'

(9) a. ??gangcai Mali he kafei.
just.now Mary drink coffee
Int: 'Mary {was drinking/drank} coffee'

b. ??xianzai Mali he kafei.
now Mary drink coffee
Int: 'Mary is drinking coffee now'

In Section 2.2, I show that such a requirement is relaxed in at least the following cases: (i) when the bare sentence contains certain kinds of focus (Tang and Lee 2000; Chen 2010); (ii) when the bare sentence embeds another finite clausal complement; (iii) when the bare sentence is uttered within some narrative (Chang 1986; Smith 1997; Smith and Erbaugh 2005; Wu 2009). Unlike many previous studies towards the incompleteness phenomenon, I leave aside temporarily some other ways of making an incomplete clause complete such as adding certain modals (deontic or dynamic, but not epistemic ones), or changing the illocutionary force into imperatives as in (10)-(11). The reason is that sentences salvaged by those strategies do not yield episodic readings any more, thus they are not directly relevant to the temporal incompleteness discussed here.

(10) Mali {keneng, yinggai, xiang} he kafei
Mary likely should want drink coffee
'Mary {is likely to, should, want to} drink coffee'

(11) Mali he kafei!
Mary drink coffee
lit: 'Mary (, you) drink coffee!'

Section 2.3 argues that none of the existing approaches towards incompleteness in the

literature can capture all the data presented in Section 2.2.

Section 2.4 establishes a novel correlation between the temporal incompleteness and what is the main point (or what is at-issue) of an utterance. I argue that all the cases in which aspect marking is not required (i)-(iii) share the property that the proposition asserting the relation between the Event Time and Topic Time conveyed by the utterance is not addressing the immediate Question Under Discussion (Roberts 1996/2012).

Section 2.5 concludes.

## 2.2 Overview of when temporal incompleteness is absent

This section discusses three kinds of conditions in which temporal incompleteness is absent: (i) adding projective focus (Section 2.2.1); (ii) embedding another finite clausal complement (Section 2.2.2); and (iii) being uttered within certain narratives (Section 2.2.3). While some of the data for (i) and (ii) has already been noted in the literature (Chang 1986; Tang and Lee 2000; Smith 1997; Smith and Erbaugh 2005; Wu 2009), none of them uses a systematic examination of the data to make the conditions explicit. My goal here is to carefully go through both the existing and new observations and to establish those conditions as precisely as possible.

### 2.2.1 Projective focus

Tang and Lee (2000) observe that adding contrastive focus to an incomplete eventive sentence can make it complete, as in (12). In order to make it clear that the focused sentence can obtain an episodic reading, a past temporal adverb such as *gangcai* 'just now' is added in the sentence to block potential generic or futurate readings.

(12) gangcai TANGMU he kafei, JIERUI he hongjiu
just.now Tom drink coffee Jerry drink wine
'Just now [Tom]$_{CT}$ drank [coffee]$_F$, [Jerry]$_{CT}$ drank [wine]$_F$.' (Contrastive focus)

In fact, overt aspect marking for episodic readings seems generally optional in focus-sensitive environments. (13) shows that intonation-based focus such as elaboration focus and corrective focus can also salvage incompleteness.

(13) a. gangcai Tangmu he NATIE.
just.now Tom drink latte
(In a context in which it is known that Tom drank coffee):

'Just now Tom drank [latte]$_F$' (Elaboration focus)

b. gangcai TANGMU he kafei (bu shi JIERUI)
just.now Tom drink coffee not be Jerry
'Just now [Tom]$_F$ drank coffee (not [Jerry]$_F$)' (Corrective focus)

(14) shows that the existence of overt focus-sensitive operators renders bare sentences exempt from the temporal incompleteness. [2]

(14) a. gangcai shi TANGMU he kafei
just.now be Tom drink coffee
'It is [Tom]$_F$ who drank coffee just now.' [3]

b. gangcai zhiyou TANGMU he kafei
just.now only Tom drink coffee
'Just now only [Tom]$_F$ drank coffee'

c. gangcai Tangmu zhi he NA-bei kafei
just.now Tom only eat that-CL coffee
'Just now Tom only drank [that]$_F$ cup of coffee'

d. gangcai lian TANGMU dou he kafei
just.now even Tom DOU drink coffee
'Just now even [Tom]$_F$ drank coffee'

e. gangcai Tangmu shenzhi he KAFEI
just.now Tom even drink coffee
'Just now Tom even drank [coffee]$_F$'

2. The translation given is just one of the available interpretations of the sentence under a particular intonation. It is known that focus is able to project (Selkirk 1995).

3. The cleft sentence might not be the best example for the effect of focus on the bare root clauses since it is possible that the eventive predicate occurs in a non-root clause. The distribution of overt aspect marking in non-root clauses is discussed in Chapter 4.

f. gangcai Tangmu bujin he kafei, hai he hongjiu
just.now Tom not.only drink coffee but.also drink wine
'Just now Tom not only [drank coffee]$_F$ but also [drank wine]$_F$'

The focus-salvaging strategy works for other types of eventive predicates such as accomplishments and achievements as well, as presented in (15)-(16).

(15) a. gangcai TANGMU he yi-bei kafei, JIERUI he yi-bei hongjiu
just.now Tom drink one-CL coffee Jerry drink one-CL wine
'Just now [Tom]$_{CT}$ drank [a cup of coffee]$_F$, [Jerry]$_{CT}$ drank [a glass of wine]$_F$'

b. gangcai zhiyou TANGMU he yi-bei kafei
just.now only Tom drink one-CL coffee
'Just now only [Tom]$_F$ drank a cup of coffee.'

c. gangcai Tangmu shenzhi he yi-bei KAFEI
just.now Tom even drink one-CL coffee
'Just now Tom even drank [a cup of coffee]$_F$'

(16) a. gangcai TANGMU faxian yi-ge dongxue, JIERUI faxian yi-tiao xiaoxi
just.now Tom discover one-CL cave, Jerry discover one-CL brook
'Just now [Tom]$_{CT}$ discovered a [crave]$_F$, [Jerry]$_{CT}$ discovered a [brook]$_F$'

b. gangcai Tangmu zhi faxian yi-ge dongxue
just.now Tom only discover one-CL cave
'Just now Tom only [discovered a crave]$_F$.'

c. gangcai lian TANGMU dou faxian yi-ge dongxue
just.now even Tom DOU discover one-CL cave
'Just now even [Tom]$_F$ discovered a cave.'

While the examples above all involve sub-sentential foci, I show that a focus of larger size ($v$P or above) can also salvage incompleteness, as long as the focal alternatives it evokes are not a set in the form of $\{p, \neg p\}$ (i.e. the focal alternatives are not *polar* but rather *projective* in Kamali (2020)'s terminology). Consider a context such as (17), the matrix predicates of both the question and answer can be bare and the episodic reading is available:

(17) Seeing the empty but messy kitchen...

Q: gangcai [Tangmu zuo dangao]$_F$ ma?
just.now Tom make cake YNQ
'Did [Tom make cake]$_F$ just now (or what)?"

A: bushi. (shi) [Jierui jian niupai]$_F$.
no be Jerry pan-fry steak
'No, [Jerry pan-fried the steak]$_F$'

Crucially, the polar question in (17) can be paraphrased roughly as an 'or what' question instead of an 'or not' question in English. Kamali (2020) argues that the two kinds of polar question differ in their focus semantic value: the former triggers projective focal alternatives, while the latter triggers polar focal alternatives, as illustrated in (18).

(18) Let $p$ = ⟦Tom made cake⟧

a. ⟦Did [Tom make cake]$_F$ (or what)⟧$^f$ = $\{p, q, r, ...\}$ (sentential projective focus)

b. ⟦Did [Tom make cake]$_{PF}$ (or not)⟧$^f$ = $\{p, \neg p\}$ (sentential polar focus)

The differences in (18) can be diagnosed with various tests (Kamali 2020) but for the current purpose, it is most convenient to identify the sentential projective focus in a polar question based on its infelicity of being answered by a conclusive negative answer, c.f. (19), (20). The reason is that for the question marked by sentential projective focus, excluding the prejacent $p$ by a negative answer fails to provide a complete answer to the question (but it provides a complete answer to (20)), leading to the infelicity of a conclusive 'no' answer in (19).

(19) A: The kitchen is so messy. Did [Tom make cake]$_F$ (or what)?

B: Yes./#No./No, [Jerry pan-fried the steak]$_F$.

(20) A: Did [Tom make cake]$_{PF}$ (or not)?

B: Yes./No.

Applying this diagnostic to Chinese, the question in (17) indeed cannot be felicitously

answered with a conclusive 'no', as in (21). In contrast, a truly neutral polar (episodic) question, which is available only with the presence of overt aspect marking, does not show this constraint of negative answers as in (22).

(21) Q: gangcai [Tangmu zuo dangao]$_F$ ma?
just.now Tom make cake YNQ
'Did [Tom make cake]$_F$ just now (or what)?'

A: shi de 'Yes'. /#bu shi 'No'.

(22) Q: gangcai [Tangmu zuo-le dangao]$_{PF}$ ma?
just.now Tom make-PERF cake YNQ
'Did [Tom make cake]$_F$ just now (or not)?'

A: shi de 'Yes'. /bu shi 'No'.

The relevance of this distinction to the current discussion is that while Tang and Lee (2000) claim that turning an incomplete bare sentence into a question can make it complete, as in (17), it is in fact not the interrogative form itself that salvages incompleteness, but rather the sentential projective focus that does it.

Finally, the sentential projective focus should also be distinguished from the category of the all-new focus (or broad focus), which is reserved for the case in which a sentence is uttered in an out-of-the-blue context. There is a debate on whether there is actually F-marking on the sentence uttered in such a context, and if there is what kind of F-marking it should be like (Büring 2016; Kratzer and Selkrik 2020), but I use 'all-new focus' only as a label for the property of out-of-the-blue utterances and will remain agnostic on their exact F-distributions in theory. What is relevant here is that zero-marked eventive sentences are reported to be degraded on episodic readings in an out-of-the-blue context, as shown in Section 1. This shows that a sentence with all-new focus, regardless of what all-new focus means in the theory, cannot be exempted from the temporal incompletess.

To sum up, overt aspect marking on an eventive sentence becomes optional for an episodic reading when the sentence contains projective focus (regardless of what size, or

being introduced by just intonation or focus-sensitive operators), but not polar focus or all-new focus, as summarized in Table 2.1.

Table 2.1: Different types of focus and incompleteness

| | Examples paraphrased in English | Is Asp-marking optional? |
|---|---|---|
| Projective focus | [Tom]$_{CT}$ drank [coffee]$_F$, [Jerry]$_{CT}$ drank [tea]$_F$.<br>Only [Tom]$_F$ drank coffee.<br>Tom even [drank coffee]$_F$.<br>Did [Tom drink coffee]$_F$ (or what)? | Yes |
| Polar focus | Did [Tom drink coffee]$_{PF}$ (or not)? | No |
| All-new focus | Out of the blue: Tom drank coffee. | No |

That the temporal incompleteness is absent when the projective focus exists is puzzling because invoking a set of alternatives, which is what foci do in languages, does not add any aspectual information. All the focused sentences are intuitively compatible with either perfective readings or progressive readings (except for achievement-type predicates) depending on the context (Smith 1997; Smith and Erbaugh 2005; Jo-Wang Lin 2006). The sentences I used above mostly prefer perfective readings, and here are some examples that make the progressive readings salient as in (23).

(23) a. *Context: You hears the typical sound of a working coffee machine and gets the smell of coffee from Tom's office. You asks Mary:*

[Tangmu zuo kafei]$_F$ ma?
Tom make coffee YNQ
'Is Tom making coffee?'

b. gangcai zhiyou TANGMU he yi-bei kafei. turan beizi sui le.
just.now only Tom even drink one-CL coffee suddenly cup break LE
'Just now only [Tom]$_F$ was drinking a cup of coffee. Suddenly the cup broke' [4]

Furthermore, the focused sentences can always take overt perfective or progressive markers, as in (24), which confirms that projective focus itself does not encode any kind of

4. While it is well-known that Chinese allows a non-culmination perfective reading even with overt perfective marking, (23-b) is less likely to be such a case since the non-culmination perfective reading is usually not available for accomplishments with an quantized object (Anqi Zhang 2018).

aspectual information.

(24) a. gangcai shi TANGMU {zai} he {-le} kafei
just.now be Tom PROG drink -PERF coffee
'It is [Tom]$_F$ who {was drinking, drank} coffee just now.'

b. gangcai Tangmu zhi {zai} he {-le} yi-bei KAFEI
just.now Tom only PROG drink -PERF one-CL coffee
'Just now Tom only {was drinking, drank} a cup of [coffee]$_F$.'

c. gangcai lian TANGMU dou faxian -le yi-ge dongxue
just.now even Tom DOU discover -PERF one-CL cave
'Just now even [Tom]$_F$ discovered a cave.'

d. gangcai Tangmu {zai} zuo {-le} kafei ma?
just.now Tom PROG make -PERF coffee YNQ
'{Was Tom making, Did Tom make} coffee just now?'

### 2.2.2 Clause-embedding eventive predicates

This section shows that matrix predicates which embed a finite clausal complement[5] can obtain episodic reading without overt aspect morphology, even in the absence of projective focus.[6] All of the sentences in (25) can be uttered naturally in an out-of-the-blue context, which contrasts with the sentences involving the same predicates taking a nominal argument – they sound incomplete when uttered out-of-the-blue as in (26). [7]

(25) a. Mali shuo(-guo) Yuehan hen koumen
Mary say-EXP John very stingy
'Mary once said that John is stingy' [8]

b. Mali gaosu(-guo) wo Yuehan hen koumen
Mary tell-EXP me John very stingy

5. The label 'finite clause' is used descriptively to refer to the type of clauses that allow overt subjects.

6. The absence of projective focus is confirmed by both the default intonation and the speaker's intuitions about whether a particular part of the sentence is focused psychologically.

7. I use stative predicates in the embedded clauses in order to focus on the behavior of matrix eventive predicates; whether overt aspect marking is required on the eventive predicates within the embedded clauses will be discussed in Chapter 4.

8. There are some other uses of *shuo* in Mandarin, which should be distinguished from this eventive *shuo*, see Yuan and Saito (2020).

'Mary once told me that John is stingy'

c. Mali tingshuo(-le) Yuehan hen koumen
Mary hear-PERF John very stingy
'Mary heard that John is stingy'

(26) a. Mali shuo??(-guo) zhe jian shi
Mary say-EXP this CL affair
'Mary once said (lit. talked about) this affair'

b. Mali gaosu??(-guo) wo zhe jian shi
Mary tell-EXP me this CL affair
'Mary once told me this affair'

c. Mali tingshuo??(-le) zhe jian shi
Mary hear-PERF this CL affair
'Mary heard this affair'

One might doubt whether the predicates taking a clausal complement in (25) are indeed eventive – and I show that they are, based on the classic diagnostics for situation type (/lexical aspect) (Vendler 1957; Verkuyl (1972)) in Table 2.2. The two tests I rely on are the progressive test and 'in an hour' test. In Chinese, stative predicates cannot take the progressive marker *zai*, nor can it be modified by the adverbial 'in an hour'; while eventive predicates can pass at least one of the two tests. The distribution is illustrated with a typical stative predicate such as 'know Chinese' and some eventive predicates that are claimed to express activities, accomplishments, and achievements in the literature (Smith 1994, 1997; Hongyuan Sun 2014; Anqi Zhang 2018), as in (27)-(30).

Table 2.2: Diagnostics for lexical aspect

| | Progressive test | 'In an hour' test |
|---|---|---|
| States | * | * |
| Activities | ✓ | * |
| Accomplishments | ✓ | ✓ |
| Achievements | * | ✓ |

(27) States: *dong zhongwen* 'know Chinese'

a. *Tangmu zai dong zhongwen
Tom PROG know Chinese
'Tom is knowing Chinese'

b. *Tangmu zai.yixiaoshi.nei dong zhongwen
Tom in.one.hour know Chinese
'Tom knew Chinese in an hour'

(28) Activities: *he kafei* 'drink coffee'

a. Tangmu zai he kafei
Tom PROG drink coffee
'Tom is drinking coffee'

b. *Tangmu zai.yixiaoshi.nei he-le kafei
Tom in.one.hour drink-PERF coffee
'Tom drank coffee in an hour'

(29) Accomplishments: *he yi bei kafei* 'drink a cup of coffee'

a. Tangmu zai he yi-bei kafei
Tom PROG drink one-CL coffee
'Tom is drinking a cup of coffee'

b. Tangmu zai.yixiaoshi.nei he-le yi-bei kafei
Tom in.one.hour drink-PERF one-CL coffee
'Tom drank a cup of coffee in an hour'

(30) Achievements: *dasui yi ge huaping* 'break a vase'

a. *Tangmu zai dasui yi ge huaping
Tom PROG break one CL vase
'Tom is breaking a vase'

b. Tangmu zai.yixiaoshi.nei dasui-le yi ge huaping
Tom in.one.hour break-PERF one CL vase
'Tom broke a vase in an hour'

Turning to the clause-embedding predicates we are interested in, all of them can pass either the progressive test or 'in an hour' test (or both) as in (11)-(33), confirming that they are indeed eventive predicates when taking a clausal complement.

(31) a. Mali zai shuo Yuehan hen koumen
Mary PROG say John very stingy
'Mary is saying (lit. talking about) that John is stingy'

b. Mali yi-ge yue nei (jiu) shuo Yuehan hen koumen
Mary one-CL month in then say John very stingy
'In (only) a month, Mary said that John is stingy'

(32) a. ??Mali zai tingshuo Yuehan hen koumen
Mary PROG hear John very stingy
'Mary is hearing that John is stingy'

b. Mali yi-ge yue nei jiu tingshuo Yuehan hen koumen
Mary one-CL month in PRT hear John very stingy
'In just a month, Mary heard that John is stingy'

(33) a. ?Mali zai gaosu wo Yuehan hen koumen
Mary PROG tell me John very stingy
'Mary is telling me that John is stingy'

b. Mali yi-ge yue nei jiu gaosu wo Yuehan hen koumen
Mary one-CL month in then tell me John very stingy
'In just a month, Mary told me that John is stingy'

Another concern is whether the apparent matrix predicates in (25) are in fact syntactically matrix predicates embedding a clausal complement. In English and many other languages, verbs that can take a clausal complement can also have a parenthetical use, as in (34).[9] While the exact syntactic structure of those so-called *slifting* constructions is still under debate (Reinhart 1983; Cinque 1999; Rooryck 2001), it is agreed that the verbs *heard* and *said* in (34) are not matrix predicates (see Koev 2019 for a summary of arguments why they differ from matrix predicates).

(34) a. John is stingy, Mary heard.

b. John is stingy, Mary said.

9. I distinguish between the parenthetical use which involves a marked syntax or morphology compared to the regular clause-embedding constructions and the parenthetical function which can be taken by the matrix verb in a regular clause-embedding construction as long as the relevant semantics is not at-issue.

Turning back to Mandarin, it is possible that the apparent clause-embedding predicates in (25) are exempt from the requirement of being aspectually marked because they are not regular matrix predicates such as those in (26):

(35) Mali tingshuo Yuehan hen koumen
Mary hear John very stingy
A possible structure: 'John is stingy, Mary heard'

While the previous literature that I am aware of does not mention this possibility about those apparent biclausal constructions (Jo-Wang Lin 2006; Huang et al. 2009; Grano 2015), the rest of this section demonstrates that this possibility does not undermine the challenge brought by (25): while some of those predicates indeed can sometimes have a parenthetical syntax, in which case they lose the matrix-predicate-status, there is clear evidence showing that the constructions in (25) do not involve such parenthetical syntax and are structurally regular biclausal constructions.

The first piece of evidence that the examples in (25) must be regular biclausal constructions is based on their interaction with an adverb that can only be locally licensed. Law (2008) shows that the pre-verbal adverb *daodi* 'really' in Mandarin can be associated with a *wh*-phrase in a sentence iff it c-commands the *wh*-phrase and is in its local scope. In a matrix question such as (36), *daodi* is licensed because it c-commands the object *wh*-phrase and is within the local scope of this *wh*-phrase. In an embedded question such as (37), since the *wh*-phrase takes scope over only the embedded clause but not the matrix clause, *daodi* can only occur before the embedded verb in order to be licensed.[10] Finally, (38) is an example showing that *daodi* must not only be in the scope of its *wh*-associate, but more precisely in its local scope: *daodi* can only be associated with the *wh*-phrase in the embedded clause but not the one in the matrix clause as reflected in the available interpretations.

10. Notice that the two sentences without *daodi* are unambiguously interpreted as a matrix question and an embedded question respectively in Mandarin.

(36) Yuehan daodi mai-le shenme?
John really buy-PERF what
'What did John really buy?' (Matrix question)

(37) Mali ⟨*daodi⟩ xiang zhidao [Yuehan ⟨daodi⟩ mai-le shenme]
Mary really want know John really buy-PERF what
'Mary want to know [what John really bought]' (Embedded question)

(38) shei xiangzhidao [Yuehan daodi xihuan shenme]?
who wonder John really like what
✓ 'Who is the $x$ such that John wondered what $x$ really likes?'

✗ 'What really is the $x$ such that John wondered who likes $x$?'

Those properties of *daodi* are useful in terms of diagnosing whether the reportative predicates (*tingshuo* 'hear', *gaosu* 'tell', etc) have the status of matrix predicates as in (25). Consider a reportative construction with a *wh*-phrase:

(39) Mali tingshuo Yuehan mai-le shenme?
Mary heard John buy-PERF what
'What is the $x$ such that Mary heard that John bought $x$?'

Since (39) can only be interpreted as a matrix question, we can use the possible position of *daodi* to identify which verb is the matrix one, as in (40). We find *daodi* can only occur before *tingshuo* 'hear' but not the verb *mai* 'buy' – this shows that the reportative predicate here indeed occur as the matrix predicate.

(40) a. Mali ⟨daodi⟩ tingshuo Yuehan ⟨*daodi⟩ mai-le shenme?
Mary really heard John really buy-PERF what
✓'What is the $x$ such that Mary really heard that John bought $x$?'

✗ 'What did John really buy, Mary heard?'

b. ni ⟨daodi⟩ tingshuo Yuehan ⟨*daodi⟩ mai-le shenme?
you really heard John really buy-PERF what
✓ 'What is the $x$ such that you really heard that John bought $x$?'

✗ 'What did John really buy, you heard?'

This conclusion can be strengthened by the contrast between (40) and the use of *ni shuo* 'you say/according to you' in Chinese, as in (41). The possible occurrence of *daodi* before the apparently embedded verb shows that *shuo* can have a syntactic parenthetical use like the English (34), in which case it loses the matrix-verb-status.

(41) a. ni shuo Yuehan daodi mai-le shenme?
you say John really buy-PERF what
'What did John really buy, according to you?'

b. ni daodi shuo Yuehan mai-le shenme?
you really say John buy-PERF what
'What is the $x$ such that you really said that John bought $x$?'

However, such parenthetical use of *say* is quite restricted in that it seems to allow only the 2nd person pronoun as its external argument. If we replace *ni* 'you' in (41) into a proper name as in (42), the parenthetical use is not available.

(42) Mali ⟨daodi⟩ shuo Yuehan ⟨*daodi⟩ mai-le shenme?
Mary really say John really buy-PERF what
✓ 'What is the $x$ such that Mary really said that John bought $x$?'

✗ 'What did John really buy, according to Mary?'

In a nutshell, as long as we avoid the combination of particular reportative predicates and certain person pronouns, the parenthetical use is unavailable, and for this reason we can safely conclude that the sentences in (25) are indeed regular biclausal constructions.

Another piece of evidence is that the constructions in (25) do not share the typical properties with slifting constructions cross-linguistically. English slifting constructions differ from the regular biclausal constructions in many aspects (Ross 1973; Rooryck 2001) and I will focus on the following two: (i) they cannot be further embedded like regular embedding constructions as in (43); (ii) the reportative predicates do not freely allow adverbial modification as in (44).

(43) a. The rumor that [Mary said John had been to US] spread through the school.

b. *The rumor that [John had been to US, Mary said] spread through the school.

(44) a. She was with Bill, I (*clearly) hear.

b. I (clearly) heard that she was with Bill.

Turning to the sentences in (25), if the aspect marking is optional there because the embedding predicates are not matrix predicates under the potential parenthetical use, we expect that those aspectually unmarked sentences should exhibit similar constraints to (i-ii). But this is not the case, all of them can be further embedded and allow adverbial modification as in (45) and (46).

(45) a. Mali tingshuo Yuehan qu-guo meiguo de shi chuanbian-le xuexiao
Mary hear John go-EXP USA DE affair spread-PERF school
'The affair that Mary heard John had been to US spreads through the school'

b. Mali shuo Yuehan qu-guo meiguo de shi chuanbian-le xuexiao
Mary say John go-EXP USA DE affair spread-PERF school
'The affair that Mary said John had been to US spreads through the school'

c. Mali gaosu wo Yuehan qu-guo meiguo de shi chuanbian-le xuexiao
Mary tell me John go-EXP USA DE affair spread-PERF school
'The affair that Mary told me John had been to US spreads through the school'

(46) a. Mali hen qingchu-de tingshuo Yuehan hen koumen
Mary very clear-DE hear John very stingy
'Mary heard very clearly that John is stingy'

b. Mali xiaosheng-de shuo Yuehan qu-guo meiguo
Mary small.voice-DE say John go-EXP USA
'Mary said in low voice that John has been to US'

c. Mali naixin-de gaosu wo jintian tebie re
Mary patient-DE tell me today extremely hot
'Mary patiently told me that it is extremely hot today'

In short, the potential availability of the parenthetical use cannot explain why the aspect marking is optional for those clause-embedding predicates in (25).

I would like to conclude this section with discussing two more alternatives that do not treat (25) as regular embedding constructions and ruling them out. One alternative is that maybe those constructions involve direct quotation. One way to test this idea is to see whether the first person within the apparent embedded content can be coreferential with the apparent matrix subject– this should be possible if it involves direct quotation. However the contrast in (47) shows that the speech verbs such as 'say' in Chinese cannot involve direct quotation unless the particle *dao* 'at, upon' is used or a notable pausing between the speech verb and the quoted content exists.

(47) a. Mali shuo wo hen koumen
Mary say I very stingy
'Mary said that I(=speaker/*Mary) am stingy'

b. Mali shuo {dao/ PAUSE} "wo hen koumen"
Mary say at I very stingy
'Mary said, 'I(=*speaker/Mary) am stingy'

The other alternative is that the apparent embedded clauses in (25) are in fact nominal phrases rather than clausal complements. Li (2013) argues that in Chinese an apparent clause could be in fact a complex NP containing a covert nominal. But this cannot be true because those predicates in fact require aspect marking when taking overt complex NPs:

(48) a. Mali shuo??(-guo) Yuehan hen koumen de shi
Mary say-EXP John very stingy DE affair
'Mary once mentioned the affair that John is stingy'

b. Mali gaosu??(-guo) wo Yuehan hen koumen de shi
Mary tell-EXP me John very stingy DE affair
'Mary once told me the affair that John is stingy'

c. Mali tingshuo??(-le) Yuehan hen koumen de shi
Mary hear-PERF John very stingy DE affair
'Mary heard the affair that John is stingy'

In sum, the data of clause-embedding predicates shows that overt aspect marking is not always required for matrix eventive predicates when an episodic reading is intended,

and in this case, even no projective focus is present.

### 2.2.3 Within narratives

This section shows that uttering a potentially incomplete zero-marked eventive sentence within a certain kind of narrative can also make it complete.[11] I start with a typical piece of corpus data that has been reported in the literature. (49) is an example from Wu (2009) showing that a bare sentence can obtain an episodic reading without causing incompleteness within a narrative. The bare eventive predicates in this narrative are all interpreted as perfective.

(49) a. mingming zuotian hen guai
Mingming yesterday very well-behaved
'Mingming was very well-behaved yesterday.'

b. ta yi xiake huijia
he once after.class return home
'As soon as he returned home after class,'

c. jiu guaiguai xie gongke
immediately obediently write assignment
'(he) immediately wrote his assignment obediently.'

d. zhengli fangjian
tide.up room
'(Then, he) tidied up his room.'

e. ranhou chi fan
then eat meal
'Then, (he) ate a meal.'

f. yidian dou bu yong wo danxin
a.bit DOU no need I worry
'I did not need to worry (about him) at all!'

If we compare (49) to the bare sentence that is uttered alone in (50), which sounds incomplete, too many factors are left uncontrolled between the two cases so that it is impossible

11. Here is a working definition of a narrative adopted from Pancheva and Zubizarreta (2020): A narrative is a sequence of main clauses $\sigma_1 ... \sigma_n$ linked by a coherence relation (Asher and Lascarides 2003).

to conclude what actually makes the bare sentence complete in the former. For this reason I do not rely exclusively on the corpus data but will adjust and manipulate the corpus data to form a more precise condition of what a narrative should be like in order salvage incompleteness.

(50) ??mingming zuotian zhengli fangjian.
Mingming yesterday tidy.up room
'Yesterday Mingming tidied up his room.'

Let us temporarily work with a minimal condition: An incomplete bare sentence can improve as long as it is uttered with some other sentence, which could be bare as well. Immediately we find this condition too loose in most of the cases except for the advancing narratives that report a sequence of events that occur one after one (which are often connected by temporal connectives), as shown in (51), which is adjusted from (49).

(51) mingming zuotian zhengli fangjian. ranhou ta chi fan.
Mingming yesterday tidy.up room then he eat meal
'Yesterday Mingming tidied up his room. Then, he ate a meal.'

Another similar example created based on introspection is given below:

(52) zaoshang qidian, mingming qichuang. ta xishu, chi zaofan, ranhou shangxue.
morning 7am Mingming get.up he wash.rinse eat breakfast then go.to.school
'This morning at 7 o'clock, Mingming got up. He washed up, had breakfast, and then went to school.'

When the reported events do not occur one after one – for instance, when their running times are (partially) overlapping – then uttering a bare eventive with another bare eventive does not always improve. Instead, it is generally the case that a bare eventive improves if it is followed by another complete sentence, which can be either a stative or an aspectually

marked eventive. The minimal contrast is shown in (53).

(53) a. ??gangcai Mingming he kafei. ta ye kan dianshi.
just.now Mingming drink coffee he also watch TV
Int: 'Just now Mingming was drinking coffee. He was also watching TV.'

b. gangcai Mingming he kafei. ta ye **zai** kan dianshi.
just.now Mingming drink coffee he also PROG watch TV
'Just now Mingming was drinking coffee. He was also watching TV.'

c. gangcai Mingming **zai** he kafei. ??ta ye kan dianshi.
just.now Mingming PROG drink coffee he also watch TV
Int: 'Just now Mingming was drinking coffee. He was also watching TV.'

d. gangcai Mingming he kafei. dajia dou hen youxian.
just.now Mingming drink coffee everybody DOU very relaxed
'Just now Mingming was drinking coffee. everybody was relaxed.'

e. gangcai dajia dou hen youxian. ??Mingming he kafei.
just.now everybody DOU very relaxed Mingming drink coffee
'Just now everybody was relaxed. Mingming was drinking coffee.'

Here is a working hypothesis about how to improve a bare incomplete sentence by uttering it within a narrative:

(54) a. It can improve by adding another bare incomplete sentence (before or after it) as long as the two describe a sequence of events that occur one after one to form an advancing narratives.

b. It can improve if another complete sentence is uttered after it.

Indeed, (54) can find partial support from some existing corpus-based studies and experimental studies on aspectual *-le* in the literature. Chang (1986) investigates when the aspectual *-le* becomes optional in a narrative by examining corpus data and he observes that *-le* tends to be omitted in a multi-sentence narrative, except for the last sentence of that narrative.[12] One example given by him is (55), which is an excerpt from Zheng Zhi's

12. Chang (1986) concludes that the aspectual *-le* marks the 'peak clause' of a discourse segment, which intuitively is the sentence of particular semantic importance within a segment (Hinds 1979).

novel *Jizhan Wu-ming Chuan* 'A Fierce Battle at the Wu-ming River':

(55) a. yipang, zao you yi-ge zhanshi, juanqi 1(.41/.16) xiuzi,
one-side early have one-CL soldier roll-up sleeves

b. cong lao banzhang shenpang shiqi 2(.16/.13) shouju,
from old squad-commander body-side pick-up hand-saw

c. bizhu 3(.14/.15) yikou daqi,
close-up one-CL big-breath

d. xiang lao banzhang neiyang, shunzhe huolu, sou-sou-sou
as old squad-commander that-manner along fire-path whizz-whizz
you panshang 4(.64/.15) liehuo feiteng de mupaijia.
again climb-up fierce-fire fly-gallop DE wood-scaffold.
'On on side, there was already a soldier who rolled up his sleeves and picked up the hand-saw from beside the old sergeant. The soldier took a deep breath, and (moving) along the fire lane, as the old sergeant did, he climbed, with the sounds "whizz-whizz," up the wooden scaffold, which was engulfed in a raging flame. '

There are five places (marked by 1 from 5) in the narrative that can be potentially marked by the aspectual *-le*, and the author only uses *-le* in the place marked by 5, right after the occurrence of the last eventive predicate in this narrative. Chang (1986) further conducted a survey among eighty native speakers in which the participants were presented with (55) (with all occurrences of *-le* removed) and were asked to indicate whether they would like to insert *-le* in each position, and whether the insertion is necessary or optional. The two numbers in the parentheses in each position represent the ratio of the participants who inserted *-le* and considered it obligatory and the ratio of those who inserted *-le* and considered it optional respectively. While there is indeed variation among the speakers, Chang observed that in general the speakers tend to agree with the author in considering the occurrence of *-le* in the place 5 to be the most necessary. This result is compatible with (54): on the one hand, due to (54-b) there is a contrast between how necessary the

insertion of *-le* is for the last sentences and all the sentences before it; on the other, even for the last sentence, 15% of the participants inserted *-le* and considered it optional, and there are still 21% did not insert *-le* at all. This can be explained by (54-a) because this particular narrative in the survey happens to be an advancing narrative in which most of the events occurred one after one.

Without a corpus-based study, it is not possible to test the proposed conditions in a wide range of data, and this dissertation does not intend to provide a detailed generalization of the distribution of bare eventive sentences in narratives anyway. The crucial point here is that bare eventives expressing episodic readings are not uncommon in Chinese, and they are especially productive at least in the narratives that satisfy the conditions in (54).

There is one final case which is apparently unrelated to the two kinds of narrative I discussed above, but I will take it to be a particular kind of narrative: historical narratives such as (56).

(56) a. 1911 nian, Xinhai geming baofa.
1911 year Xinhai revolution break.out
'In 1911, the Xinhai Revolution broke out.'

b. 2008 nian 8yue 8ri, Beijing Aoyunhui zhaokai
2008 year August 8th Beijing Olympics start
'On the August 8th 2008, Beijing Olympics got started.'

At first sight, those examples do not particularly look like 'narratives' because there is only one matrix clause in each utterance. But I follow Arregui et al. (2014) in sorting this case into the general category of 'narratives' because firstly, the eventuality described by the matrix predicate is always interpreted as completed just like the case of advancing narratives, and secondly, the most natural context of (56) (based on the online search result) is one in which the speaker is making a list of the historic events for a period of time. Intuitively, those cases can be viewed as part of some advancing narratives that list the eventualities in a chronological order.

In short, eventive sentences that are not marked by overt aspect marking can give rise to episodic readings within at least certain kinds of narratives.

### 2.2.4 Interim summary

In sum, I showed that overt aspect marking is required for episodic readings (/temporal incompleteness occurs) typically in the utterance of a single monoclausal eventive clause under the default intonation. The requirement is absent in at least the following three cases: (i) when projective focus is added to that clause; (ii) when the clause embeds a clausal complement that is complete itself; (iii) when the clause is uttered within some kind of narrative.

## 2.3 Previous approaches and their problems

This section reviews three representative kinds of approaches towards temporal incompleteness and argues that none of them provides an explanatory account for the empirical observations presented in Section 2.1-2.2.

### 2.3.1 Obligatoriness approaches

The first set of approaches (Klein et al. 2000; Hongyuan Sun 2014; Chen 2010; Sybesma 2019; Yuyin He 2020) argue that temporal incompleteness reflects some syntactic or semantic constraints on the root clauses.

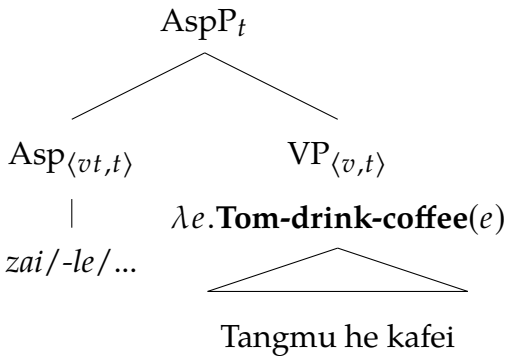
#### 2.3.1.1 Klein et al. (2000): No assertion without aspect

Klein et al. (2000) argue that bare eventive predicates denote properties of eventualities while aspect markers such as the perfective *-le* or progressive *zai* combine with those properties of eventualities and assert the instantiation of the event relative to the topic time, as illustrated in (57). The detailed semantics of the overt aspect marking is not

specified because only the fact that they are functions from properties of eventualities to propositions is important.

(57) a. Tangmu ??{zai} he ??{-le} kafei
Tom PROG drink -PERF coffee
Int: 'Tom {is/was drinking, drank coffee}'

b.



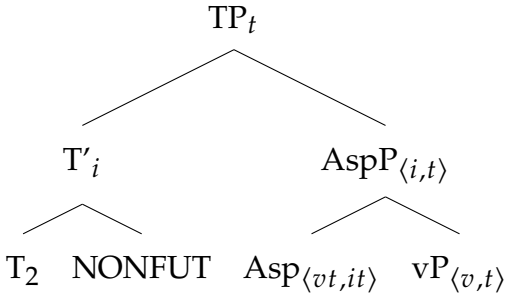

They argue that the bare eventive sentences are degraded because they fail to denote a type $t$ proposition, and by the implicit assumption in their article that assertions can only be made with propositions, no assertion can be made with a bare eventive sentence. In short, the need for overt aspect marking is encoded as a constraint on the semantic type of the linguistic objects that can make assertions.

#### 2.3.1.2 Hongyuan Sun (2014): Type mismatch without aspect

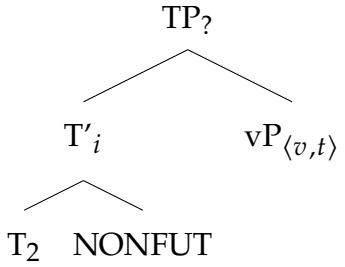
Sun (2014) proposes a similar account to Klein et al. (2000)'s in attributing temporal incompleteness to a semantic constraint. She argues for a referential theory of tense in Chinese: the language has a covert non-future tense feature (NONFUT), which restricts the topic time that is deictically introduced by an indexed pronoun. In an eventive sentence that expresses an episodic reading, a covert projection TP that contains NONFUT exists in its syntactic structure, as shown in (58). Since bare eventive predicates denote properties of eventualities (type $\langle v, t\rangle$), in order for it to compose with the topic time (type $i$) denoted by T', they must first combine with some aspect markers which denote

functions from properties of eventualities to properties of temporal intervals, as in (58-a). The degradedness of an aspectually unmarked bare eventive is attributed to the type mismatch issue, as in (58-b).

(58) a.

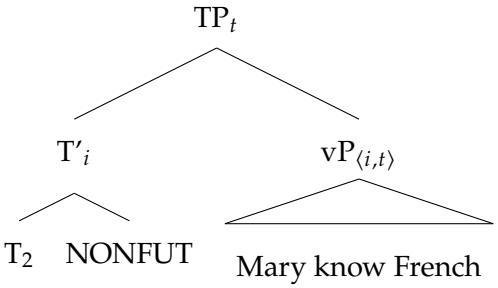



b.

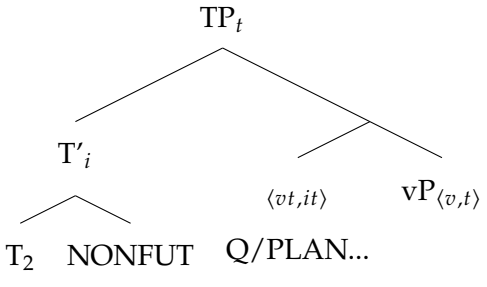



In terms of stative predicates, Sun argues that they denote properties of temporal intervals (following Katz 1995, Kratzer 1998) and do not need aspectual morphology to yield the suitable type that can combine with the topic time, as in (59). And for bare eventives denoting generic or futurate readings, she proposes that a covert quantificational operator Q or a modal operator PLAN combines with the bare eventive to resolve the type mismatch as in (9).

(59)




(60)




#### 2.3.1.3 Interim summary: Obligatoriness approaches undergenerate

Some other implementations of this kind of approach can be found in Chen (2010), Sybesma (2019), Yuyin He (2020), among others. What is shared by those analyses is that temporal incompleteness reflects a strict syntactic or semantic constraint, but this then predicts that bare eventive sentences with episodic readings should be impossible

across the board. As we have seen, this prediction is incorrect: episodic readings are possible for bare sentences in the cases summarized in Section 2.2 and those approaches do not provide an explicit analysis of how the various salvaging strategies can satisfy the same requirement of root clauses.

### 2.3.2 Optionality approaches

The second kind of approaches (Smith 1997, Smith and Erbaugh 2005, Jo-Wang Lin 2006, a.o.) take a completely opposite position from the first one: they argue that overt aspectual morphemes are optional in Chinese, and the information concerning the relation between the Eventuality Time, Topic Time, and Speech Time can be inferred based on a combination of the situation aspect, temporal adverbs, and contextual factors. [13]

#### 2.3.2.1 Smith (1994, 1997, 2008): A boundedness-based approach

Smith (2008) (see also Smith 1994, 1997, Smith and Erbaugh 2005) proposes a boundedness-based deictic pattern for the default temporal interpretation of Chinese sentences. "Boundedness" is an aspectual notion that refers to a property of the situations expressed in the sentences, which is decided by both situation type and viewpoint aspect. Predicates carry some default boundedness feature based on their situation types: states and activities are by default unbounded because they lack inherent endpoints; accomplishments and achievements are by default bounded because the situations expressed by them are temporally closed. The default boundedness feature can further be overridden by viewpoint aspect: an imperfective viewpoint such as a progressive aspect 'views' or 'presents' only part of a situation and turns the situation into an unbounded one; perfective viewpoints such as *-le* or *-guo* make situations visible as bounded, including endpoints.

For Chinese sentences with overt aspect marking, viewpoint aspect determines boundedness, which in turn determines the default location of topic time according to the Deictic

13. Smith and Erbaugh (2005) also point out that the discourse mode also plays a role: narrative and description usually tolerate such aspectually unmarked sentence better.

Principle (61). Some examples are illustrated in (62).

(61) The Deictic Principle (Smith 2008: 7)

a. Unbounded situations are located at utterance time (present)

b. Bounded situations are located before utterance time (past)

(62) a. Mali zai he kafei.
Mary PROG drink coffee
'Mary is drinking coffee.'

Viewpoint: progressive ⇒ Unbounded situation ⇒ Present tense reading

b. Mali he-le kafei.
Mary drink-PERF coffee
'Mary drank coffee.'

Viewpoint: perfective ⇒ Bounded situation ⇒ Past tense reading

Crucially, Smith argues that the bare sentences (or 'zero-marked' sentences in her paper) in Chinese contain a null neutral viewpoint aspect, which is flexible enough, and gives enough information to allow a bounded or unbounded interpretation, depending on the context. When the context does not supply the relevant information, those sentences are interpreted as bounded or unbounded based on the situation type of the predicates:

(63) Default pragmatic interpretation (Adjusted from Smith 2008: 23)

In a zero-marked clause, interpret boundedness according to the situation type of the eventuality.

Smith's analysis correctly captures (i) that bare stative sentences are interpreted as present by default (64); and (ii) that bare eventive sentences (when allowed) can be interpreted based on their situation type (65).

(64) Tangmu reai shige
Tom love poetry
'Tom loves poetry'

Situation type: Unbounded situation ⇒ Present tense reading

(65) a. Tangmu he kafei. wo hen shengqi.
Tom drink coffee I am angry
'Tom is drinking coffee. I am angry.'

Situation type: Unbounded situation ⇒ Present tense reading

b. Tangmu zhi he yi-bei KAFEI.
Tom only drink one-CL coffee
'Tom only drank [a cup of coffee]$_F$'

Situation type: Bounded situation ⇒ Past tense reading

c. Tangmu zhi faxian yi-tiao XIAOJIN
Tom only discover one-CL path
'Tom only discovered [a path]$_F$'

Situation type: Bounded situation ⇒ Past tense reading

However, this analysis cannot explain why sentences with bare eventive predicates are often degraded without focus or the other salvaging conditions in Section 2.2, as noted by Hongyuan Sun (2014) and Yuyin He (2020). According to Smith and Erbaugh (2005), activities are unbounded, and so should be able to obtain present imperfective readings such as event-in-progress readings; accomplishments and achievements are bounded, and so should be able to obtain past perfective readings. The predictions are illustrated in (66). It is not clear why those sentences cannot obtain the default interpretations and sound incomplete.

(66) a. ??Tangmu he kafei.
Tom drink coffee
Prediction: 'Tom is drinking coffee'

b. ??Tangmu he yi-bei kafei.
Tom drink one-CL coffee
Prediction: 'Tom drank a cup of coffee'

c. ??Tangmu faxian yi-tiao xiaojin
Tom discover one-CL path
Prediction: 'Tom discovered a path'

In fact, Smith (1994, 1997) is aware of the constrained distribution of zero-marked sentences (for episodic readings) and she admits that 'the topic of contexts for LVM (Lacking-Viewpoint-Morpheme) sentences deserves study in its own right, especially when both imperfective and perfective interpretations are considered' (Smith 1994: 126). On the other hand, she summarizes two very insightful observations about when the zero-marked sentences are acceptable:

(67) Overt aspect marking is optional when...

a. the viewpoint information of the sentence is already conveyed in the sentence or context (thus overt aspect marking should be redundant).

b. the information conveyed by the sentence is backgrounded instead of foregrounded.

However, she does not go into the empirical details in support of those claims, nor does she provide a more precise generalization and a formal analysis of why those contexts but not others render zero-marked sentences acceptable. For instance, the term 'backgrounded' is intuitive but not clearly defined, and probably for this reason we can immediately find some counterexample to (67). Recall that advancing narratives is one of the typical contexts in which temporal incompleteness is absent (see (51), repeated as (68)); but it is generally agreed that the eventuality described by each sentence in an advancing narrative is foregrounded instead of backgrounded:

(68) mingming zuotian zhengli fangjian. ranhou ta chi fan.
Mingming yesterday tidy.up room then he eat meal
'Yesterday Mingming tidied up his room. Then, he ate a meal.'

Relatedly, Smith and Erbaugh (2005) claim that narrative is a special discourse mode which involves different temporal principles than the Deictic Principle in (61).[14] But they

14. According to Smith (2003), there are (at least) five discourse modes: narrative, report, description,

focus more on how the relative location between the expressed situations and the advancement of topic time differ among those different discourse modes, and do not discuss why sentences without overt aspect marking are acceptable only in certain discourse modes.

In short, Smith (1994, 1997, 2008) and Smith and Erbaugh (2005) echo with my main claim in Section 2.2 that zero-marked eventive sentences are not always degraded but a precise and formal analysis for the constrained acceptability has yet to be formulated.

#### 2.3.2.2 Jo-Wang Lin (2006): Default aspect theory

Lin (2006) extends the default aspect theory in Bohnemeyer and Swift (2004) to Chinese, which achieves quite similar results as the boundedness-based approach. Bohnemeyer and Swift (2004) show that in languages that allow aspectually unmarked sentences such as German, Inuktitut, and Russian, those unmarked sentences are interpreted based on the telicity of the predicates. They argue that the default aspectual interpretation for a aspectually unmarked predicate is a 'realization' inference, namely that the relevant eventuality expressed by the predicate is realized at the topic time (Klein 1994).

(69) DASP:= $\lambda P \lambda t_{\text{TOP}}.\exists e[\text{REAL}(P, t_{\text{TOP}}, e)]$
(in which $\forall P, t_{\text{TOP}}, e[[\text{REAL}(P, t_{\text{TOP}}, e)] \leftrightarrow \exists e'[P(e') \wedge e' \leq e \wedge \tau(e') \subseteq t_{\text{TOP}}]]$)
(Bohnemeyer and Swift 2004: 286)

The fact that bare telic predicates by default obtain perfective interpretations and bare atelic predicates by default obtain imperfective interpretations in those languages boils down to the differences in what relation between the topic time and the event time must hold in order for an eventuality to count as 'realized' during the topic time. For the eventuality expressed by a telic predicate (e.g. 'drink a cup of coffee), it counts as 'realized' only if its entire running time is included within the topic time, which leads to a perfective reading. For the eventuality expressed by an atelic predicate (e.g. 'drink coffee'), it counts

information, argument.

as 'realized' as long as the running time of a subpart of the event is included within the topic time, thus either an imperfective (/progressive) or perfective reading is possible. The lexical entry they posit for such a default aspect in (69) captures this difference. In addition, since the perfective interpretation is truth-conditionally stronger than the imperfective one, they argue that a bare atelic predicate implicates the imperfective interpretation due to the absence of perfective marking, by Grice's (1975) maxim of Quantity 'Make your contribution as informative as is required'.

Based on their account, Lin (2006) argues that a bare sentence in Chinese can also obtain default viewpoint aspect based on the telicity of the predicates. One adjustment he makes for Chinese (since it is a morphologically tenseless language) is to define default perfective aspect as a temporal-aspectual operator such that the precedence relation between the topic time and evaluation time is encoded, as in (70).

(70) a. Default perfective aspect for telic predicates:
$\lambda P_{\langle i,t\rangle}\lambda t_{\text{Top}}\lambda t_0\exists t[t \subseteq t_{\text{Top}} \wedge P(t) \wedge t_{\text{Top}} < t_0]$

b. Default imperfective aspect for atelic predicates:
$\lambda P_{\langle i,t\rangle}\lambda t_{\text{Top}}\exists t[t_{\text{Top}} \subset t \wedge P(t)]$ (Lin 2006: 6)

The default aspect rule, together with the default topic time rule in (71), can derive a temporal interpretation for any bare sentence. (71) postulates that for an imperfective sentence, the default topic time is the speech time (present), while for a perfective sentence, via the successive applications of Rule a and Rule b, we ultimately obtain a past interpretation.

(71) a. An expression $\phi$ of type $\langle i, t\rangle$ that serves as a translation of a matrix sentence is true iff $[\![\phi]\!](s^*) = 1$, where $s^*$ is the speech time.[15]

b. If $\phi$ is an expression of type $\langle i, \langle i, t\rangle\rangle$, apply the formula

15. Unless there is another topic time made salient by temporal adverbs or contextual factors.

'$\lambda R_{\langle i,\langle i,t\rangle\rangle}\lambda t_0 \exists t_{\text{Top}} R(t_{\text{Top}})(t_0)$' to $\phi$.

The output of these rules can be illustrated with the following two examples. In (72), the main predicate 'Mary be tired' expresses an atelic eventuality, and so it receives imperfective aspect by default. The imperfective sentence further obtain present tense reading.

(72) Mali hen lei
Mary very tired
'Mary is tired'

a. By (70-b): $[\![\text{Mali hen lei}]\!] = \lambda t_{\text{Top}} \exists t[t_{\text{Top}} \subset t \wedge \textbf{tired}(\textbf{Mary})(t)]$

b. By (71-a): $[\![\text{Mali hen lei}]\!] = \exists t[s^* \subset t \wedge \textbf{tired}(\textbf{Mary})(t)]$

In (73), the predicate 'Mary discover a cave' expresses a telic eventuality, and so it receives default perfective aspect. And this perfective sentence obtains past tense reading via the application of (71-b) and (71-a).

(73) Mali faxian yi-ge dongxue. ta hen xingfen.
Mary discover one-CL cave she very excited
'Mary discovered a cave. She was excited.'

a. By (70-a): $[\![\text{Mali faxian yi-jia kafeidian}]\!] =$

$\lambda t_{\text{Top}} \lambda t_0 \exists t[t \subseteq t_{\text{Top}} \wedge \textbf{Mary-discover-a-cave}(t) \wedge t_{\text{Top}} < t_0]$

b. By (71-b): $\lambda t_0 \exists t_{\text{Top}} \exists t[t \subseteq t_{\text{Top}} \wedge \textbf{Mary-discover-a-cave}(t) \wedge t_{\text{Top}} < t_0]$

c. By (71-a): $\exists t_{\text{Top}} \exists t[t \subseteq t_{\text{Top}} \wedge \textbf{Mary-discover-a-cave}(t) \wedge t_{\text{Top}} < s^*]$

This approach achieves roughly the same empirical coverage of the boundedness-based approach in Smith (2008) and suffers from the same problem: it cannot explain why zero-marked eventive sentences are mostly degraded, and are acceptable only in the contexts identified in sections 2.1 and 2.2.

#### 2.3.2.3 Interim summary: Optionality approaches overgenerate

In sum, optionality approaches fail to explain why many aspectually unmarked sentences sound incomplete, namely those root clauses involving eventive predicates (without projective focus etc.) and thus overgenerate. Nevertheless, the main idea underlying those approaches, that at least some zero-marked sentences are grammatical and interpretable in Chinese, is appealing. Both approaches implement their analysis into a wide range of empirical data including zero-marked eventive predicates in the subordinate clauses such as relative clauses and adjunct clauses as in (74) (in Lin 2006), and narratives (in Smith and Erbaugh 2005).

(74) a. wo xihuan na-ge [chi bingjiling] de nvhai
I like that-CL eat ice.cream DE girl
'I like that girl who {is eating/was eathing/ate} ice cream'

b. dang [women shang ke] de shihou, jiaoshi-li lai-le yi-zhi xiaogou
when we have class DE time, classroom-in come-PERF one-CL puppy
'When we were having class, there came a puppy into the classroom'

While I mainly focus on root clauses in this chapter and the next one, it is important to note that if we take those subordinate clauses into consideration, using aspectually unmarked sentences to express episodic readings is quite common in Chinese. When we consider these cases alongside the many examples (with projective focus, embedding another clause, etc as in Section 2.2) of acceptable zero-marked root eventive clauses, we might conclude that the main problems for the optionality approaches, such as (74a-b), might actually be the special cases.

(75) a. ??Mali chi bingjiling
Mary eat ice.cream
Int: 'Mary {is eating/was eating/ate} ice cream'

b. ??women shang ke
we have class
Int: 'We {are having/were having/had} class'

It is noteworthy that Smith (1994, 1997) does mention that aspectually unmarked sentences tend to obtain episodic readings when the information expressed by those sentences is backgrounded rather than foregrounded (otherwise they sound incomplete) (see also Yang 2002). This intuition will be crucial to developing my proposal and I will make it precise that aspect marking becomes optional when the instantiation of the event during the topic time is not directly addressing the QUD. The sentences in (75) are special because their monoclausal structure (without projective focus) restricts the main point to necessarily concern the instantiation of the event.

### 2.3.3 Binary approaches

Tang and Lee (2000) observe that zero-marked eventive sentences sound incomplete and they summarize all the conditions in (76) that can make them complete. In Section 2.1 and Chapter 1 I have pointed out why some of their conditions are empirically incorrect (c, g) or irrelevant to the current discussion (d, e, h, i). For c, we've seen in Section 2.1 (ex. (9)) that adding temporal adverbs alone cannot make zero-marked eventives complete for episodic readings (see also Hongyuan Sun 2014). For g, I showed in Section 2.2.1 that turning a zero-marked eventive into a polar interrogative cannot make it complete, unless the projective focus is added as well. Conditions d and i are irrelevant in that by adding imperative operator or deontic/dynamic modals, episodic readings not maintained anymore. For e, it will be discussed in detail in Chapter 5. For h, it is restricted to a certain kind of incompleteness due to the bare noun object, which is not discussed in this dissertation (see Chapter 1, Section 1.1.3).

(76) A. Temporal anchoring
   a. existence of the sentence final particle *le*
   b. existence of the experiential aspect marker *guo* (but also other aspect markers including perfective *-le*, progressive *zai*)

(c.) existence of temporal adverbs

(d.) in imperatives

(e.) embedding

B. Focus anchoring

f. in contrastive contexts

(g.) in an interrogative context

(h.) objects with adjectives and numerals

C. Temporal & focus anchoring

(i.) (deontic or dynamic) modals

j. negation (which encodes viewpoint aspect)

If we leave the irrelevant conditions aside, (76) ends up claiming that zero-marked eventives cannot obtain episodic readings unless aspect-encoded markers (aspect markers, negation, sentence final particles) or projective focus are added, which is a proper subset of the generalizations made in Section 2.1-2.2.

Tang & Lee base their account on the Anchoring Principle (77) proposed by Enç (1987). Enç argues that each tense in a sentence must be anchored (in English), which could be done in various ways as in (78).

(77) The Anchoring Principle

Each tense much be anchored. (Enç 1987: 642)

(78) Anchoring Conditions

Tense is anchored if it is bound in its governing category, or if its local Comp is anchored. Otherwise, it is unanchored.

a. If Comp has a governing category, it is anchored if and only if it is bound within its governing category.

b. If Comp does not have a governing category, it is anchored if and only if it

denotes the speech time.

The condition in (78-b) captures how the tense in a matrix clause such as (79) is anchored. The local Comp of $\text{PAST}_i$ is anchored by denoting the speech time (with the index 0) since it does not have a governing category. And the tense in this matrix sentence, $\text{PAST}_i$, is anchored since its local Comp is anchored.

(79) Mary ran.
$[_{S'}\ \text{Comp}_0\ [_S\ \text{NP}\ [_{T'}\ \text{PAST}_i\ \text{VP}\ ]\ ]\ ]$

Tenses in subordinate clauses such as relative clauses and clausal complements can be anchored in different ways by being bound in its governing category, as in (80-a), or by having a local Comp that is bound within its governing category, as in (80).

(80) a. John saw the man who was crying. (Anchoring Relative Clause Tenses)
$[_{S'}\ \text{Comp}_0\ [_S\ \text{NP}\ [_{T'}\ \text{PAST}_i\ \text{V}\ [\text{NP}\ [\ \text{Comp}\ [\ \ldots\ \text{PAST}_i\ \ldots$

b. John heard that Mary was pregnant. (Anchoring Complement Tenses)
$[_{S'}\ \text{Comp}_0\ [_S\ \text{NP}\ [_{T'}\ \text{PAST}_i\ \text{V}\ [\ \text{Comp}_i\ [\ \text{NP}\ [\ \text{PAST}_j\ \ldots$

I will not go into the details of Enç's analysis since the relevant point here is that a tense with an index $i$ needs to be anchored by fixing its interpretation in either of the following two ways: (i) when $i$ is anchored via an anchored local Comp with an index $n$, $g(n)$ saturates the evaluation time encoded the in tense as in (81); (ii) when $i$ is anchored via binding, its denotation is the same as its binder via co-indexing.

(81) $[_{S'}\ \text{Comp}_0\ [_S\ \text{NP}\ [_{T'}\ \text{PAST}_i\ \text{VP}\ ]\ ]\ ]$
$[\![\text{PAST}_i]\!] = g(i)$ iff $g(i) < g(0)$
(It denotes an interval in which every moment precedes the speech time)

Tang and Lee (2000) modify the Anchoring Principle as in (82), which states that a sentence must be anchored by tense or (projective) focus.

(82) Generalized Anchoring Principle (GAP)

Every sentence must be either tensed or focused at the LF interface level.

a. Temporal anchoring: an event is anchored with respect to the moment of speech or a reference event (Enç 1987).

b. Focus anchoring: an item is anchored with respect to a reference set of items, or an event is anchored vis-á-vis a reference set of events.

The main idea is that, T head (or Infl head) in Chinese can either be overtly realized as some sentence final particles, or as a phonologically empty particle. In the former case, it does not need to be anchored via Comp since the sentence final particles already encode the relation between the event time and topic time (/speech time). In the latter case, this empty particle can be anchored either to a tense operator in C (whose interpretation is restricted by aspect-encoded markers), or to a focus operator in C (whose interpretation is a reference set of items or events).

While the parallel between the topic time (provided by a tense operator in C) and a reference set of items or events (provided by a focus operator in C) is intuitively appealing, Tang & Lee do not provide a formalization in terms of their parallel in semantics. Recall that the temporal anchoring in Enç (1987) is not purely a syntactic condition– anchoring crucially fixes the interpretation of the tense, which specifies the relation between the topic time and evaluation time. But Tang & Lee do not spell out the semantics of this empty particle, especially why its interpretation needs to be fixed by a reference set of items or events. The closest connection to the existing semantic literature I can think of is that they could say this empty particle is the contextual variable $C_i$ that stores a set of alternatives in Rooth (1992)'s theory of focus interpretation as in (83). Rooth posits that $C_i$ is a free variable that can be fixed pragmatically but must also conform to the constraints imposed

by the focus interpretation of its sister.

(83) One possible semantic formalization of focus anchoring:
$[_{S'}$ Comp $[_S$ ... $[_{T'} \sim C_i$ $VP_F$ ] ] ]

I will not further pursue this parallel in this dissertation, but I admit that this extension could be promising, so that we might end up with a nice parallel between temporal and focus anchoring. My main doubt is that any analysis along this line, unless its semantic implications are fully spelled out, is eschewing the 'real' question about incompleteness, namely why a sentence can be anchored by either tense or focus in the first place. The intuition is of course that the interpretation of tense and focus both involve indexical elements, which need to be fixed by the parameters of the speech situation. But how tense is fixed in Enç (1987) clearly differs from how focus interpretation is fixed in Rooth (1992) in numerous ways. For instance, the latter is never analyzed as being related to Comp at any level. In short, the binary anchoring condition in (82), in its current shape, is a descriptive generalization, but not an explanation.

And on the empirical side, the binary condition fails to cover some of the data in Section 2.2. We've seen that the matrix eventive predicates can drop the aspect marking when they embed another (complete) sentence. Such an example in (25), as repeated in (84), does not contain any projective focus, as validated by the possibility of uttering (84) in an out-of-the-blue context. In addition, uttering (84) does not impose any presupposition such as Mary heard something, confirming the intuition.

(84) Mali tingshuo Yuehan hen koumen
Mary hear John very stingy
'Mary heard that John is stingy'

Another diagnostic for all-new focus (as opposed to projective focus) of a sentence is to see whether the sentence can answer the counterpart of English 'What happened?' in

Chinese, as proposed in Feng (1997).

(85) Q: zenme hui shi? 'What happened?'

A: Mali tingshuo Lisi qu-le guowai
Mary hear Lisi go-PERF abroad
'Mary heard that John went abroad'

Although Tang & Lee's analysis has both theoretical and empirical shortcomings, it also captures an important insight, since it converges with Smith (1997)'s intuition that adding focus, which is a way of changing the information structure of a sentence, correlates with whether eventive predicates need aspect marking for episodic readings. The rest of this chapter aims to explicitly spell out those intuitions with some formal discourse notions.

## 2.4 Temporal incompleteness and at-issueness

When a sentence is uttered by a speaker in a given context, usually it can convey multiple inferences, some of which are intuitively felt to express the main point of the utterance. These inferences constitute the *at-issue* content of the sentence. Such intuitions can be illustrated in the following English examples: uttering each of the sentences can convey several inferences at the same time, but those inferences do not have the same status. Intuitively the main point of (86) is about John's getting a job, and John's being a PhD candidate is a side point. For (87), that John got a job is taken for granted by the speaker when uttering this sentence, and the main point is an exclusive inference.

(86) John, who is a PhD candidate, got a job recently.

$\rightsquigarrow$ John got a job recently. (main point)

$\rightsquigarrow$ John is a PhD candidate. (secondary point)

(87) Only JOHN got a job.

$\rightsquigarrow$ No one else other than John got a job. (main point)

$\rightsquigarrow$ John got a job. (presupposed content)

This notion of main-point-hood (which will be made more precise in Section 2.4.1) sheds light on the empirical observations about the distribution of temporal incompleteness established in Section 2.2 for Chinese root clauses (reproduced in (88)).

(88) A root eventive clause requires overt aspect marking for episodic interpretations, except in the following cases:

a. It contains projective focus.

b. It embeds some finite clausal complement.

c. It is uttered within some narrative.

While the cases (a-c) in which temporal incompleteness is absent are apparently heterogeneous, this section shows that what they have in common, as opposed to a monoclausal sentence without projective focus, is that all of them either cannot convey, or do not necessarily convey the instantiation of the matrix predicate (i.e. the relation between the Eventuality Time and Topic Time) as the main point of the utterance. The correlation between temporal incompleteness and what is at-issue is stated in (89).

(89) *Discourse-sensitivity of temporal incompleteness*

Overt aspect marking on matrix eventive predicates is required for episodic readings only when the instantiation of the event described by the predicate is at-issue.

The rest of this section demonstrates this correlation based on the data discussed in the previous sections. I first clarify the notion of at-issueness and how to diagnose it in Section 2.4.1. Then I show that a monoclausal sentence without projective focus by default evokes the instantiation of the matrix event as the main point – it is for this reason many foregoing studies conclude that temporal incompleteness should be attributed to a strict grammatical constraint because they only consider this part of the data. Finally, I point out that the

three conditions in (88) all can shift the default main point, rendering overt aspect marking optional for episodic intepretations.

### 2.4.1 Diagnosing at-issueness

At-issueness is defined in various ways in the literature (see an overview in Koev 2018), thus I'd like to clarify how I use it here, besides relying on the intuitive judgments about what the main point of an utterance is. I mainly diagnose the (not-)at-issue status of an inference based on the following tests summarized from the literature (Tonhauser 2012; Simons et al. 2017; Koev 2018):

(90) T1. At-issue content can address the Question Under Discussion (QUD)
T2. At-issue content determines the relevant set of alternatives when the sentence is under an interrogative operator
T3. At-issue content can be directly assented or dissented with

As already noticed by the previous literature, not every test targets precisely the at-issue vs. not-at-issue distinction cross-linguistically, but the more tests an inference passes (/fails), we can be relatively confident in concluding such inference is at-issue (/not-at-issue).

#### 2.4.1.1 At-issue content can address the QUD

One common way of deciding whether a certain piece of information is at-issue or not is to see whether the sentence that expresses this piece of information can be a felicitous response to the Questions Under Discussion (Simons et al. 2010; Tonhauser 2012). According to this view, the conversational goal of (many) discourses is to figure out what the actual world is like via cooperative inquiry thus the discourse can be structured by a set of abstract questions that the discourse participants have a joint intention to resolve. In particular, the immediate question (i.e. a set of alternative propositions) which corresponds to the current discourse topic at a given moment is the QUD, and the at-issue content of

an utterance can address the QUD. This property of at-issue content is illustrated in (91), by a sentence involving an appositive. Given an explicitly QUD in each context, while both the matrix clause and the appositive clause in principle answer the question in terms of their semantic content, the latter is infelicitous because the information is packaged in a way does not permit it to be:

(91) a. Q: Did anyone get a job?
A: John, who is a PhD candidate, got a job recently.
b. Q: Has John defended his dissertation proposal?
A: #John, who is a PhD candidate, got a job recently.

Another English example is the slifting construction such as (92). The slifted part 'Mary heard' is argued to serve an evidential function (Faller 2002, 2019; Murray 2014; Koev 2019; among others) instead of providing the at-issue content of the utterance. This can be shown by the infelicity of a response to a question that concerns the evidential part of the slifting sentence.

(92) a. Q: Did anyone hear that John is stingy?
A: #John is stingy, Mary heard.
b. Q: What is John like?
A: John is stingy, Mary heard.

Koev (2018) refers to this kind of at-issueness as being "Q-at issue", which is defined formally in (93)-(94). An at-issue proposition must both change the probability of at least one answer of the current question when being added to the context, and must be appropriately linguistically packaged. The latter requirement rules out a proposition that is semantically relevant but is conventionally marked as not at-issue, such as the appositive in (91) and the slifted part in (92).

(93) A proposition $p$ is Q-at issue relative to the QUD (= $Q$) and a context $c$ iff:

a. $p$ is relevant to $Q$ in $c$ and

b. $p$ is appropriately conventionally marked relative to $Q$

(94) A proposition $p$ is relevant to the QUD (= $Q$) and a context $c$ iff for some $q \in Q$ : $Pr_c(q) \neq Pr_c(q|p)$. (Büring 2003, Simons et al. 2010)

#### 2.4.1.2 At-issue content determines the relevant set of alternatives

Another similar diagnostic provided in Tonhauser (2012) is that the at-issue content of interrogative utterances determines the relevant set of alternatives (the question) that answers must address. Take a polar interrogative containing an appositive as in (95) for instance. It is clear that what is being questioned here is whether John got a job or not, instead of whether John is a PhD candidate or not. This can be confirmed by the possible answers in (95).

(95) Q: Did John, who is a PhD candidate, get a job recently?

a. A1: Yes, he got a job.

b. A2: #Yes, John is a PhD candidate.

#### 2.4.1.3 At-issue contents can be directly assented/dissented with

The third diagnostic is based on the view that an act of assertion provides a proposal to update the common ground (a set of propositions that are taken to be true by all the participants) and reduce the context set (a set of live options of what the actual world is like). Under this view, at-issue content provides such a proposal (/proffered content, Farkas and Bruce 2010; Koev 2013; AnderBois et al. 2015), which can be directly assented or dissented with. A baseline example in English is shown in (96). Since the at-issue update here is the matrix proposition instead of the one provided by the nominal appositive, only the former can be directly assented or dissented with.

(96) S: John, who is a PhD candidate, got a job recently.

a. H1: Yes, he indeed got a job. /No, he didn't.

b. H2: #Yes, John is indeed a PhD candidate./#No, he isn't.

Koev (2018) defines the kind of at-issueness diagnosed via this way as "P-at-issueness" in (97), which is not exactly the same as Q-at-issueness. For instance, the evidential proposition expressed by the slifting construction is not Q-at issue but does seem to be P-at issue, as shown by the possibility of being targeted by the response particles in (98).

(97) A proposition $p$ is P-at issue in a context $c$ iff:

a. $p$ is a proposal in $c$ and

b. $p$ has not been accepted or rejected in $c$. (Koev 2013)

(98) John is stingy, Mary heard.

a. Yes, {he is, ?she heard it}

b. No, {he isn't, she didn't hear it}

In Chinese, different response particles vary in terms of whether they can target only (P-)at issue content. I will use *shide* 'yes' and *bushide* 'no' in the diagnostics since native speakers report a preference of using them to target at-issue content instead of not-at issue ones. This is illustrated with a sentence containing an appositive, as in (99).

(99) A: Chenmeng, jiu shi Xiaoming de meimei, na-le jinpai
Chenmeng particle be Xiaoming DE sister get-PERF Gold.medal
'Chenmeng, Xiaoming's sister, got a Gold medal'

B: shide, ta na-le / bushide, ta mei na.
yes she get-PERF no she not get
'Yes, she got it / No, she didn't'

B': ??shide, ta shi / ??bushide, ta bu shi (Xiaoming de meimei).
yes she be no she not be Xiaoming DE sister
'Yes, she is / No, she isn't (Xiaoming's sister)'

#### 2.4.1.4 Interim summary

In sum, this section presents three tests that target the distinction between at-issue vs. not at-issue contents:

(100) T1. At-issue content can address the Questions Under Discussion (QUD)
T2. At-issue content determines the relevant set of alternatives when the sentence is under an interrogative operator
T3. At-issue content can be directly assented with *shide* or dissented with *bushide*

### 2.4.2 Neutral mono-clauses without projective focus

For a mono-clausal declarative uttered with default intonation (i.e. involving all new focus) such as (101), intuitively its main point concerns the instantiation of the matrix eventuality during a contextually-familiar time, namely that the event of Mary's hearing this affair occurred just now.

(101) (gangcai) Mali tingshuo-le zhe jian shi
just.now Mary hear-PERF this CL affair
'Mary heard this affair just now'

Here are some pieces of evidence for this characterization of the at-issue content of this example. Firstly, a sentence with all-new focus typically is be uttered in an out-of-the blue context, and the QUD-based model often assumes that the implicit QUD in this case is 'What happened at $t_0$?' (in which $t_0$ is a contextually-familiar topic time) or 'What's new?' (van Kuppevelt 1995; Roberts 1996/2012). We can also make the QUD explicit by adding overt questions that can be contextually answered by the instantiation of Mary's hearing event, as in (102). Since (101) can felicitously answer the question, it shows that the instantiation of the event is indeed at-issue.

(102) Q: Do we need to tell Mary about this affair?

A: (gangcai) Mali tingshuo-le zhe jian shi
just.now Mary hear-PERF this CL affair
'Mary heard this affair just now'

Secondly, since at-issue content determines the relevant set of alternatives under a polar interrogative operator, we can consider the polar question transformed from (101) (under the neutral polar question intonation) as in (103).

(103) (gangcai) Mali tingshuo-le zhe jian shi ma?
just.now Mary hear-PERF this CL affair YNQ
'Did Mary hear this affair just now?'

The question (103) clearly asks about whether the hearing event is instantiated during the interval 'just now', instead of other things, such as whether Mary is the agent of the hearing event, or whether this affair is the theme of the hearing event.

Thirdly, since at-issue content can be directly assented or dissented with, we can determine the main point of the neutral mono-clause by looking at what content the hearer's affirmative or negative response is targeting. (104) shows that the direct responses target whether she heard or did not hear the affair.

(104) S: Hey let me tell you something, (101)

H: shide (ta tingshuo-le).
yes she hear-PERF
'Yes (she did)'

H': bushide (ta mei tingshuo).
no she not$_{\text{PERF}}$ hear
'No (she didn't)'

A similar assumption can be found in Abrusán (2011). Abrusán develops an algorithm for calculating the default main point of a sentence based on the notion of *aboutness* and argues that the default main point should be about the entailments concerning the event time of the matrix predicate. From now on I just assume that the main point of

a mono-clausal, eventive sentence under all-new focus concerns the instantiation of an event during the topic time. More interesting cases are discussed in Section 2.4.3-2.4.5, in which other propositions besides the one about the instantiation of the matrix event can be at-issue.

### 2.4.3 Projective focus: the event instantiation is presupposed

According to Abrusán (2011), adding focus is one way of changing the default main point of the sentence. I show that for a mono-clause uttered with projective focus such as (105), the instantiation of the relevant event is not the main point of the whole utterance any more, instead it is presupposed. For this reason overt aspect marking is optional in (105).

(105) zhiyou MALI tingshuo(-le) zhe jian shi
only Mary hear-PERF this CL affair
'Only [Mary]$_F$ heard this affair'

The not-at-issue status of the instantiation of Mary's hearing event is confirmed by the relevant diagnostics. Firstly, although (105) does imply that the Mary's hearing event is instantiated during a contextual-familiar time, this sentence nevertheless is an infelicitous reply to a QUD that can be contextually answered by the information that the event is instantiated, regardless of whether the aspect marking is omitted or not, as in (106).

(106) Q: women yao gaosu Mali zhe jian shi ma?
we need tell Mary this CL affair YNQ
'Do we need to tell Mary this affair?'

A: #(105)

In fact, all those other focusing strategies we discussed in Section 2.2.1 shift the default main point such that the instantiation of the matrix event is taken as if the information is already in the common ground. The focused sentences in (107) are all infelicitous relative to the question in (106).

(107) Q: Do we need to tell Mary this affair?

a. #MALI tingshuo(-le) ZHE jian shi, YUEHAN tingshuo(-le) NA jian shi
Mary hear-PERF this CL affair John hear-PERF that CL affair
' [Mary]$_{CT}$ heard [this]$_F$ affair; [John]$_{CT}$ heard [that]$_F$ affair.'

b. #Mali zhi tingshuo(-le) ZHE jian shi
Mary only hear-PERF this CL affair
'Mary only heard [this]$_F$ affair'

c. #lian MALI dou tingshuo(-le) zhe jian shi
even Mary DOU hear-PERF this CL affair
'Even [Mary]$_F$ heard this affair'

Secondly, the polar question transformed from (105), as in (108), clearly is asking something else other than whether the matrix event is instantiated or not.

(108) zhiyou MALI tingshuo(-le) zhe jian shi ma?
only Mary hear-PERF this CL affair YNQ
'Is that only [Mary]$_F$ heard this affair?'

Thirdly, the information concerning the instantiation of the hearing event conveyed by (105) cannot be directly dissented or assented with, as in (109).

(109) A: zhiyou MALI tingshuo(-le) zhe jian shi 'Only [Mary]$_F$ heard this affair'

B: #shide (ta tingshuo-le).
yes she hear-PERF
'#Yes (she did)'

B': #bushide (ta mei tingshuo).
no she not$_{PERF}$ hear
'#No (she did not)'

### 2.4.4 Biclausal constructions can have evidential uses

It is well-known that biclausal constructions can make either the embedded proposition or the matrix proposition as the main point of the utterance (Simons 2007; Murray 2014; AnderBois 2016; Koev 2019; Faller 2019). This section shows that the embedding con-

struction in Chinese such as (110) can also convey different main points, depending on the context. When the main point concerns the embedded content, the aspect marking is optional because the instantiation of the matrix event can be not at-issue.

(110) Mali tingshuo(-le) Yuehan hen koumen
Mary hear-PERF John very stingy
'Mary (already) heard that John is stingy'

Firstly, we apply the QUD diagnostics to (110). I construct two questions and the embedded content and the matrix content are relevant to one of the questions respectively ($Q_p$ vs. $Q_m$) as in (111)-(112). The observation is that, while the aspectually marked sentence (i.e. by which I mean the sentence whose matrix eventive predicate is aspectually marked) can be felicitous responses to both questions, the aspectually unmarked sentence can only felicitously address $Q_p$ but not $Q_m$.

(111) $Q_p$: Yuehan ren zenmeyang?
John person how
'What's John like?'

A: wo pengyou tingshuo (?guo) Yuehan hen koumen
my friend hear EXP John very stingy
'My friend once heard that John is stingy'

(112) $Q_m$: women hai yong gaosu Mali Yuehan de quedian ma?
we still need tell Mary John DE shortcoming YNQ
'Do we still need to tell Mary John's shortcomings?'

A: Mali tingshuo #(guo) Yuehan hen koumen
Mary hear PERF John very stingy
'Mary once heard that John is stingy'

This shows that the aspectually marked sentence can present either the matrix or the embedded proposition as the at-issue content, while the aspectually unmarked version can only present the embedded proposition as the at-issue content. In other words, the presence of aspect marking (on the matrix eventive predicates) is required whenever the

occurrence of the matrix event is at-issue. When the matrix verb is aspectually unmarked, the matrix content semantically serves an evidential function like English parentheticals, whose content fails to address the QUD as well:

(113) Q: Do we still need to tell Mary about John's shortcomings?
A: (No need.) #John is stingy, Mary heard.

Some might raise the data such as (114) as potential counterexamples to the generalization: the aspectually unmarked sentence can address a question that seems to target the matrix proposition.

(114) Q: weishenme Mali bu gen Yuehan yuehui?
why Mary not with John date
'Why did Mary not date with John?'
A: (yinwei) ta tingshuo Yuehan hen koumen
because she hear John very stingy
'(Because) she heard that John is stingy'

Here is the reason why we would like to avoid questions like (114) in performing the diagnostics. Such question does not exclusively target the matrix proposition of the answer and in fact can also be answered by the embedded proposition alone, as in (115).

(115) Q: weishenme Mali bu gen Yuehan yuehui?
why Mary not with John date
'Why did Mary not date with John?'
A: (yinwei) Yuehan hen koumen
because John very stingy
'(Because) John is stingy'

In contrast, the question used in (112) clearly can only be answered by the matrix content but not the embedded one, which eliminates the potential confounding factors.

This contrast is not limited to a particular example (certain verbs plus certain aspect

marking) but a general phenomena, as illustrated by the data as follows:

(116) $Q_p$: Yuehan ren zenmeyang?
John person how
'What's John like?'

A: Mali tingshuo (??le) Yuehan hen koumen
Mary hear PERF John very stingy
'Mary heard that John is stingy'

(117) $Q_m$: women hai yong gaosu Mali Yuehan de quedian ma?
we still need tell Mary John DE shortcoming YNQ
'Do we still need to tell Mary John's shortcomings?'

A: Mali tingshuo #(le) Yuehan hen koumen
Mary hear PERF John very stingy
'Mary heard that John is stingy'

(118) $Q_p$: Yuehan ren zenmeyang?
John person how
'What's John like?'

A: Mali shuo (?le) Yuehan hen koumen
Mary say PERF John very stingy
'Mary said that John is stingy'

(119) $Q_m$: Yuehan bu ken fuqian, ni bu jingya ma?
John NEG willing pay you NEG surprised YNQ
'Aren't you surprised that John isn't willing to pay (his part)?'

A: Mali shuo #(le) Yuehan hen koumen
Mary say PERF John very stingy
'Mary said that John is stingy'

(120) $Q_p$: Yuehan ren zenmeyang?
John person how
'What's John like?'

A: Mali gaosu (?guo) wo Yuehan hen koumen
Mary tell EXP me John very stingy
'Mary once told me that John is stingy'

(121) $Q_m$: Yuehan bu ken fuqian, ni bu jingya ma?
John NEG willing pay you NEG surprised YNQ
'Aren't you surprised that John isn't willing to pay (his part)?'

A: Mali gaosu #(guo) wo Yuehan hen koumen
Mary tell EXP me John very stingy
'Mary once told me that John is stingy'

Interesting, the distinction also applies to factive embedding predicates such as *faxian* 'discover', which is often considered to presuppose the embedded content. I follow Djärv (2019) (among others) in assuming that factivity is a lexically triggered inference that the speaker is committed to the embedded content, which does not directly decide the discourse status of the embedded content in terms of whether it is at-issue. The conversation in (122) shows that the embedded content of a factive predicate is able to be at-issue relative to the QUD:

(122) Q: Where is John?

A: Mary (just) discovered that [John went abroad].

In short, we can have the presupposed part of a biclausal contribution as the main point of an utterance. Turning to *faxian* 'discover' in Chinese, we find that while it requires overt aspect marking when taking a nominal argument (123), the marking also becomes optional when it takes a clausal complement as in (124).

(123) Mali faxian*(-le) zhengxiang
Mary discover-PERF truth
'Mary discovered the truth'

(124) Mali faxian(-le) [Yuehan hen koumen]
Mary discover-PERF John very stingy
'Mary discovered that John is John stingy'

Crucially, the optionality of the aspect marking correlates with whether the matrix predication is at-issue, just like other non-factive embedding predicates.

(125) $Q_p$: Yuehan ren zenmeyang?
John person how

'What's John like?'

A: Mali faxian (?le) Yuehan hen koumen
Mary discover PERF John very stingy
'Mary discovered that John is stingy'

(126) $Q_m$: women hai yong gaosu Mali Yuehan de quedian ma?
we still need tell Mary John DE shortcoming YNQ
'Do we still need to tell Mary John's shortcomings?'

A: Mali faxian #(le) Yuehan hen koumen
Mary discover PERF John very stingy
'Mary discovered that John is stingy'

For the other diagnostics, I will stick with the example containing the predicate *tingshuo* 'hear' but the same results can be obtained with those factive predicates as well.

Turning to the second diagnostic, we can transform the target sentences into (neutral) polar interrogatives by adding the particle *ma* as in (127).

(127) a. Mali tingshuo-le jinwan xi-li you ge jiangzuo ma?
Mary hear-PERF tonight department-in have CL lecture YNQ
'Did Mary heard that there is a lecture in the department tonight?'

b. Mali tingshuo jinwan xi-li you ge jiangzuo ma?
Mary hear tonight department-in have CL lecture YNQ
'Is it the case that Mary heard there is a lecture in the department tonight?'

Intuitively, the two interrogatives in (127) do not sound equivalent, but the exact difference is hard to be described based on the intuitions. I will use specific contexts to show that in order to ask a neutral question about whether Mary heard something or not, the aspectually marked on (i.e. (127-a)) must be used, while (127-b) is a question that presents whether there is a lecture tonight as at-issue. Consider a scenario in which Ann and Bill are notifying the students in the department about a lecture tonight. Ann doesn't know whether Mary already knows the event or not. In order to decide whether to send Mary an email, she asks Bill:

(128) A: Mali tingshuo #(-le) jinwan xi-li you ge jiangzuo ma?
Mary hear -PERF tonight department-in have CL lecture YNQ
'Did Mary heard that there is a lecture in the department tonight?'

B: shide, ta tingshuo-le
yes she hear-PERF
'Yes, she heard it'

In this case, it is infelicitous to use the aspectually unmarked interrogative.

Instead, if the unmarked interrogative is uttered in another scenario in which whether there is a lecture tonight is under discussion, it could be felicitous. Suppose Mary once told Ann that she heard something about a lecture but Ann couldn't remember its time, then Ann can ask B with the unmarked question as in (129).

(129) A: Mali tingshuo jinwan xi-li you ge jiangzuo ma?
Mary hear tonight department-in have CL lecture YNQ
'Did Mary heard that there is a lecture in the department tonight?'

B: shide, jinwan queshi you yi-ge.
yes tonight indeed have one-GE
'Yes, there is one tonight indeed'

Some speakers report that they feel the aspectually unmarked question in (127-b) can also be used in questioning whether Mary heard something or not, but I find those cases constantly require evidential bias towards the prejacent. We've already seen that in a context without any bias, the aspectually unmarked question cannot be used (128). Consider the following scenario: Mary is the kind of person who will behave very excitedly whenever she hears that there'll be a lecture in the department. One day, Ann sees that Mary looks unusually excited, and she thinks that Mary might have heard about some lecture. Thus she asks Bill to confirm her guess:

(130) Mali tingshuo jinwan xi-li you ge jiangzuo ma?
Mary hear tonight department-in have CL lecture YNQ
'Is it the case that Mary heard there is a lecture in the department tonight?'

The question asked in this case, featured by the obligatory positive evidential bias, contains what Kamali (2020) calls sentential projective focus, which is categorized as projective focus as discussed in Section 2.2.1. In this case, it is the projective focus, instead of the embedding construction, that licenses the absence of overt aspect marking for episodic interpretations. Thus the reported judgments from the speakers about (127-b) do not threaten the current generalizations.

Thirdly, we would like to test whether the instantiation of the matrix event can be directly assented or dissented with for a biclausal construction containing a zero-marked embedding predicate. The results are shown in in (131). Directly assenting or dissenting with the matrix proposition is mildly degraded compared to doing that with the embedded one, but the contrast is not categorical.

(131) Mali tingshuo Yuehan hen koumen
Mary hear John very stingy
'Mary heard that John is stingy'

a. shide, {Yuehan hen koumen, ?Mali tingshuo-guo}
yes John very stingy Mary hear-EXP
'Yes, {John is stingy, Mary heard it}'

b. bushide, {Yuehan bu koumen, ?Mali mei tingshuo-guo}
no John not stingy Mary not hear-EXP
'No, {John is not stingy, Mary didn't}'

Turning to its aspectually marked counterpart, both the matrix and embedded propositions can be directly dissented, as we expected. But we also find mild degradedness with directly assenting the embedded proposition, surprisingly.

(132) Mali tingshuo-guo Yuehan hen koumen
Mary hear-EXP John very stingy
'Mary heard that John is stingy'

a. shide, {?Yuehan hen koumen, Mali tingshuo-guo}
yes John very stingy Mary hear-EXP
'Yes, {John is stingy, Mary heard it}'

b. bushide, {Yuehan bu koumen, Mali mei tingshuo-guo}
no John not stingy Mary not hear-EXP
'No, {John is not stingy, Mary didn't}'

While the results of this diagnostic is less clear, they only show that the instantiation of the matrix event might be P-at issue in (131) but do not rule out the possibility that it is not at-issue in other senses. As discussed in Section 2.4.1, the evidential part in English slifting construction can be P-at issue as well (Koev 2019).

To sum up, the above diagnostics show that for those biclausal constructions in which the matrix eventive predicates allow the omission of overt aspect marking, it is the embedded proposition that is Q-at issue but not the matrix proposition.

### 2.4.5 Narratives can shift what is at-issue

It goes without saying that when uttering a narrative such as (133), multiple propositions are conveyed to update the context set. Our goal is to show that while aspect marking on the eventive predicate in such a cluster is optional, its absence has consequences, namely that the instantiation of the event expressed by the unmarked predicate cannot be the main point of this whole utterance.

(133) Mali tingshuo (-le) zhe jian shi. ta hen jinzhang.
Mary hear PERF this CL affair she very anxious
'Mary heard about this affair. She was anxious'

Firstly, if we use (133) to answer a QUD that concerns the instantiation of the matrix event, indeed the aspectually unmarked cluster sounds infelicitous:

(134) Q: women yao gaosu Mali zhe jian shi ma?
'Do we need to tell Mary about this affair?'
A: Mali tingshuo #(-le) zhe jian shi. ta hen jinzhang.
'Mary heard about this affair. She was anxious'

The second diagnostic is not possible because we cannot transform two declaratives into a single polar question.

Thirdly, the direct assent/dissent test shows that without aspect marking in (133), it is slightly less natural to directly assent or dissent with the first sentence than with the second one, as in (135). But this distinction is not categorical.

(135) Mali tingshuo zhe jian shi. ta hen jinzhang.
'Mary heard about this affair. She was anxious'

a. shide, {?ta tingshuo guo, ta hen jinzhang}
yes she hear -EXP she very anxious
'Yes, {??she did, she was}'

b. bushide, {?ta mei tingshuo guo, ta bu jinzhang}
no she not hear -EXP she not anxious
'No, {?she didn't, she wasn't}'

Another kind of narrative that can salvage incompleteness is the so-called advancing narrative such as (136). Intuitively, this kind of utterance naturally occurs in a context in which it is taken for granted that a sequence of events whose agent is Mingming was instantiated during a sequence of advancing topic times, and the QUD is to specify each of the event descriptions.

(136) mingming zuotian zhengli (-le) fangjian. ranhou ta chi (-le) fan.
Mingming yesterday tidy.up PERF room then he eat PERF meal
'Yesterday Mingming tidied up his room. Then, he ate a meal.'

By applying the first diagnostic, we observe that the zero-marked advancing narrative is infelicitous as the response to a QUD that concerns the instantiation of either event:

(137) Q: Anyone who tidied up their room can get one credit. Should we give Mingming a credit?

A: (Nodding) mingming zuotian zhengli #(-le) fangjian. ranhou ta chi fan.

'Mingming tidied up his room. Then, he ate a meal.'

(138) Q: Anyone who ate their meal can get one credit. Should we give Mingming a credit?

A: (Nodding) mingming zuotian zhengli fangjian. ranhou ta chi #(-le) fan.
'Mingming tidied up his room. Then, he ate a meal.'

Similar to the result in (135), it is generally possible to target the information that a sequence of events whose agent is Mingming were instantiated:

(139) A: jintian zaoshang Mali qichuang, he kafei, qu xuexiao.
today morning Mary get.up drink coffee go.to school
'This morning Mary got up, drank coffee, and went to school.'

B: shide, ta zaoshang zuo-le yi xilie de shi
yes she morning do-PERF a series DE thing
'Yes, she did a series of things this morning'

B': ?bushide, ta zaoshang shenme dou mei zuo
no she morning what DOU not do
'No, she didn't do anything this morning.'

Turning to historical narratives like (140), they cannot felicitously answer a question that concerns the instantiation of the event described by the zero-marked predicate. They can also be targeted by *shide* 'yes' or *bushide* 'no', as in (141).

(140) Q: In case of the Covid situation, is the Tokyo Olympics still happening?

A: ??shang ge yue, Dongjing Aoyunhui zhaokai
last CL month Tokyo Olympics start
'Last month, Tokyo Olympics got started.'

(141) A: shang ge yue, Dongjing Aoyunhui zhaokai
last CL month Tokyo Olympics start
'Last month, Tokyo Olympics got started.'

B: shide / bushide
yes no
'Yes, it did / No, it didn't'

In short, the above diagnostics show that when an aspectually unmarked eventive sentence is fine within a narrative, the information that the event is instantiated during the topic time, is not Q-at issue.

### 2.4.6 Interim summary

We showed that all those three cases in which temporal incompleteness is absent are those in which the instantiation of the matrix event can be not at-issue. Since the inference that the matrix event is instantiated fails the first two of the (N)AI-diagnostics introduced in Section 2.4.1 in most of the cases, it is more precise to conclude that temporal incompleteness is absent when such an inference is not Q-at issue. The generalization is summarized in (142).

(142) I. When the instantiation of the event is Q-at issue, overt aspect is required for episodic readings:

(a) Q: Do we need to tell Mary this affair?

A: Mary hear ??(-PERF) this CL affair

(b) Q: Do we need to tell Mary that John is stingy?

A: Mary hear ??(-PERF) [John is stingy]

(c) Q: Do we need to tell Mary this affair?

A: Mary hear ??(-PERF) this CL affair. She is anxious.

II. When the instantiation of the event is not Q-at issue, overt aspect is not required for episodic readings:

(a) Only [Mary]$_F$ hear (-PERF) this CL affair

(b) Q: Is John stingy?

A: Mary hear (-PERF) [John is stingy]

(c) Q: Is Mary anxious?

A: Mary hear (-PERF) this CL affair. She is anxious.

## 2.5 Summary

This chapter revisits the claim that Chinese eventive predicates cannot obtain episodic readings without overt aspect marking in root clauses (Klein et al. 2000; Hongyuan Sun 2014; Sybesma 2019; Yuyin He 2020). I argue that this claim is empirically inadequate, based on both the existing data (Smith 1997; Tang and Lee 2000; Jo-Wang Lin 2006; Wu 2009) and new observations involving the clause-embedding eventive predicates. I show that none of the previous accounts can capture all the data: they either under-generate, over-generate, or fail to be explanatory. As a preliminary step towards the formal analysis, I argue for a novel generalization that the optionality of temporal incompleteness correlates with whether the instantiation of the relevant event is the main point (i.e. Q-at issue) of an utterance. The apparently heterogeneous conditions in which overt aspect marking can be omitted for episodic interpretations can be unified in a natural way: all of them allow the main point of uttering the sentence to be not necessarily about the instantiation of the event.

In the next two chapters, I provide a formal analysis for the generalization. In Chapter 3, I propose that those aspectually zero-marked sentences have imperfective semantics, motivated by the availability of typical imperfective readings (e.g. habitual, progressive, futurate readings) with zero-marked forms, and also the possibility for imperfective forms to have episodic readings under certain conditions in other languages. Chapter 4 proposes a pragmatic account of temporal incompleteness in Chinese. I argue that the episodic readings of zero-marked sentences are a result of contextual enrichment based on its imperfective semantics, which is available only when the event instantiation is not Q-at issue. When the event instantiation is Q-at issue, the zero-marked sentence is incomplete because none of the possible contextual enrichment is available.

# CHAPTER 3

# ZERO-MARKED FORMS ARE IMPERFECTIVES

## 3.1 Introduction

In this chapter I will propose that Chinese zero-marked sentences are actually imperfectives: quite the opposite from being "incomplete" either syntactically or semantically, they are simply verbs that compose with a typologically unremarkable imperfective aspectual morpheme that happens to be phonologically null. I will support this hypothesis in two ways. First I show in Section 3.2 that Chinese zero-marked forms have the same range of interpretations typically attested for more transparent imperfectives in other languages. Second, I show in Section 3.3 that overtly marked imperfectives in other languages often are subject to contextual restrictions for episodic readings that are very similar to the restrictions on Chinese zero-marked forms which have led previous researchers to the well known conclusions about "incompleteness". I conclude this chapter by providing a semantic analysis of the Chinese null imperfective morpheme that captures the interpretive properties of zero-marked forms, and then in Chapter 4, I will present my account of so-called "incompleteness": why zero-marked forms can have episodic interpretations only in certain contexts.

## 3.2 Zero-marked sentences have typical imperfective uses

Informally speaking, imperfective aspect encodes an inclusion relation between the eventuality time and topic time such that the eventuality holds during a superinterval of the topic time. Cross-linguistically, an imperfective form typically can have (at least some of) the readings in (1), which intuitively share the core imperfective semantics (Comrie 1976; Dowty 1977; Dahl 1995; Deo 2009; Mair 2012; Gvozdanović 2012; Carlson 2012; Arregui et al. 2014; Cohen 2020).

(1) Typical readings of imperfective morphology

a. Habitual/Generic characterizing readings

b. Progressive readings

c. Continuous readings

d. Futurate readings

In the habitual/generic characterizing reading, a plurality of regularly occurring eventualities is ongoing during the topic time; in the progressive reading, a singular event is ongoing during the topic time; in the continuous reading, a state holds throughout a superinterval of the topic time; the futurate reading can be viewed as a special case of the progressive reading, in which a singular event is ongoing if we count the preparation stage as a part of the event.

Imperfective forms in many languages can have some or all of those uses, as shown in (2)-(5). As revealed by typological studies, the imperfective forms tend to be morphologically minimally marked (Dahl 1985, 1995).

(2) Rendille (East Kushitic, Kenya)

khadaabbe chiirta
letter.PL write.IMPF

Habitual/Generic: 'He {writes, wrote} letters'

Progressive: 'He {is, was} writing letters' (Dahl and Velupillai 2013: 267)

(3) Gujarati (Indo-Aryan, India)

a. Niśā (roj) roṭli banāv-e ch-e
N.NOM.SC everyday bread.NOM.SC make-IMPF.3.SG PRS-3.SG
Habitual/Generic: 'Niśā makes bread (everyday)'

b. Niśā (atyāre) roṭli banāv-e ch-e
N.NOM.SC now bread.NOM.SC make-IMPF.3.SG PRS-3.SG
Progressive: 'Niśā is making bread (right now)'

c. Niśā Navsāvri-mā rah-e ch-e
N.NOM.SC Navsari-LOC live-IMPF.3.SG PRS-3.SG

Continuous: 'Niśā lives in Navsari.' (Deo 2009: 476)

(4) Spanish

a. Hace veinte años, los niños veían menos televisiín.
make twenty years, the children saw.IMPF less TV
Habitual/Generic: 'Twenty years ago children watched less TV.'

b. yo hablaba con mi
I talked.IMPF with my boyfriend
Progressive: ' I was talking with my boyfriend'

c. Juan sabe los nombres.
John know. IMPF the names
Continuous: 'John knowns the names'

d. La semana que viene viajábamos a Paris
the week that comes traveled.IMPF.1PL to Paris
Futurate: 'Next week we were traveling to Paris.'

(5) Simple forms in English

a. John drinks coffee (every day). (Habitual)

b. John goes to Chicago tomorrow. (Futurate)

c. John lives in Chicago. (Continuous)

One straightforward reason to analyze zero-marked sentences in Chinese as imperfectives is that those forms can indeed express Habitual/Generic characterizing readings, futurate readings, continuous readings, and (in certain contexts) progressive readings (Smith 1997; Lin 2006; Hongyuan Sun 2014; Yuyin He 2020). The rest of the section illustrates that each of the uses is available with those zero-marked sentences.

### 3.2.1 Habitual/Generic readings

A generic or habitual characterizing reading is typically conveyed by a zero-marked sentence in Chinese. The sentences in (6) describe some regular, habitual occurrence of an event involving Mary, and the interval between each occurrence can be specified by overt frequency adverbials (e.g. 'often') or restrictive temporal modifiers (e.g. 'after lunch').

(6) a. Mali (jingchang) he kafei
Mary often drink coffee
'Mary (often) drinks coffee.'

b. Mali fan-hou he yi-bei kafei
Mary lunch-after drink one-CL coffee
'Mary drinks a cup of coffee after lunch.'

c. Mali zongshi ying
Mary always win
'Mary always wins.'

The generic reading can be viewed as a subcase of habitual reading (following Carlson 2012) which involves a statement about a species as whole, as in (7).

(7) a. daxiongmao chi zhuzi
panda eat bamboos
'Pandas eat bamboos.'

b. mao zhuo laoshu
cat catch mouse
'Cats catch mice.'

One characteristic of habitual readings is that they describe intensional generalizations instead of a pure summary of eventualities that are accidentally instantiated at a certain frequency (Carlson 1995; Deo 2009, 2020; Cable 2020). For instance, (8-a) can be uttered in a scenario in which Mary just decided an hour ago that she'll become a vegetarian from now on for the rest of her life, but there is no instantiation of her eating vegetarian food yet. Another classic example is (8-b): it can be uttered to describe Mary's occupation, even though it is likely that there hasn't been any instantiation of the delivering event.

(8) a. Mali chi sushi
Mary eat vegetarian.food
'Mary eats vegetarian food'

b. guoqu shi nian de mei zhouliu, Mali yunsong laizi Nanjizhou de xinjian
past ten year DE every Saturday Mary deliver from Antarctica DE mail
'Every Saturday in the past ten years, Mary was in the job of delivering the

mail from Antarctica ’

This intensional generalization reading (or characterizing reading, following Deo 2009) contrasts with the apparent habitual reading conveyed by a perfective-marked counterpart in Chinese. (9) describes an actual generalization about what Mary delivered on Saturdays in the past ten years and there must be an instantiation of the delivering event for each Saturday.

(9) guoqu shi nian de mei zhouliu, Mali yunsong-le laizi Nanjizhou de xinjian
past ten year DE every Saturday Mary deliver-PERF from Antarctica DE mail
‘Mary delivered the mail from Antarctica every Saturday’

In short, zero-marked sentences in Chinese can convey habitual or generic characterizing readings, which is one of the readings typical of imperfectives cross-linguistically.

### 3.2.2 Futurate readings

Zero-marked sentences can obtain the so-called futurate readings as well, which is characterized by the pre-determination of the event occurrence in the future (Copley 2002, 2008; Hongyuan Sun 2014). The sentences in (10) must be interpreted as ‘plans’ or ‘schedules’ at the topic time for events in the future, instead of having a plain future-tense reading (e.g. ‘Mary will drink tomorrow’). This obligatory pre-determination flavor can be confirmed by the unnaturalness of (10-c): since the result of a competition usually cannot be pre-determined in advance, it is odd to use the zero-marked form to have a futurate reading there. In fact, uttering this sentence will make one think that the result of the competition is predetermined, probably because of a bribery.

(10) a. mingtian Mali gen shizhang he kafei
tomorrow Mary with mayor drink coffee
‘Mary drinks coffee with the mayor tomorrow.’

b. mingtian Mali he liang-bei kafei
tomorrow Mary drink two-CL coffee

'Mary drinks two cups of coffee tomorrow.

c. ?mingtian Mali ying.
tomorrow Mary win
'Mary wins tomorrow'

The example (10-c) contrasts with a real counterpart of English future tensed readings in Chinese as in (11), which requires a modal verb such as *hui*.

(11) mingtian Mali hui ying.
tomorrow Mary will win
'Mary will win tomorrow'

The pre-determination of the event not only can be due to an intentional plan or schedule, but also can be due to unintentional laws of nature, as in (12).

(12) mingtian taiyang liu dian xiashan.
tomorrow sun six o'clock sunset
(In the weather forecast:) 'The sun sets at 6pm tomorrow'

Moreover, the pre-determined event does not have to be situated in the absolute future. The English translation of (13) shows that it is compatible with a past tense interpretation in which it describes a plan that was held during a topic time in the past for the future relative to that topic time.

(13) shangzhou Mali qu Xiaweiyi. kexi tade hangban bei quxiao le.
last.week Mary go Hawaii unfortunately her flight PASSIVE cancel LE
'Last week Mary was going to Hawaii. Unfortunately, her flight was canceled.'

### 3.2.3 Continous readings

As discussed in Chapter 2, lexically stative predicates in Chinese are always unmarked (unless change-of-state readings are intended). The sentences in (14) all have continuous readings, namely that the relevant state is ongoing during the topic time.

(14) a. Mali zhu zai Suzhou
Mary live at Suzhou
'Mary lives in Suzhou'

b. Mali dong Yueyu
Mary understand Cantonese
'Mary understands Cantonese'

c. Mali xihuan xiaogou
Mary like puppies
'Mary likes puppies'

### 3.2.4 Event-in-progress readings

We've seen in Chapter 2 that zero-marked sentences in Chinese can obtain event-in-progress readings as well, though this use is relatively constrained. (15) illustrates a context in which the event-in-progress reading is salient, by specifying the topic time to be the speech time.

(15) xianzai zhiyou MALI he kafei.
now only Mary drink coffee
'Only $[\text{Mary}]_F$ is drinking coffee now'

(16) xianzai MALI he KAFEI, YUEHAN he CHA.
now Mary drink coffee John drink tea
'Now $[\text{Mary}]_{CT}$ is drinking $[\text{coffee}]_F$, $[\text{John}]_{CT}$ is drinking $[\text{tea}]_F$'

We can further confirm the availability of the event-in-progress readings with some diagnostics. One diagnostic is based on the different discourse properties of sentences interpreted as perfective and those interpreted as progressive. It is observed that perfective-marked sentences in a sequence are interpreted as occurring one after one, while progressive-marked sentences in a sequence can be interpreted as occurring at the same time (Hinrichs 1986; Partee 1984; Kamp and Reyle 1993; Altshuler 2012). The baselines are illustrated with both English sentences and Chinese sentences that are marked by overt perfective or progressive markers:

(17) a. Mary drank coffee. She listened to the music.

(sequential reading: the topic time is progressing)

b. Mary was drinking coffee. She was listening to the music.

(simultaneous reading: the topic time is not progressing)

(18) a. Mali he-le kafei. Yuehan xi-le beizi.
Mary drink-PERF coffee John wash-PERF cup
'Mary drank coffee. John washed the cup (that Mary just used).' [1]

b. Mali zai he kafei. Yuehan zai xi beizi.
Mary PROG drink coffee John PROG wash cup
'Mary was drinking coffee. John was washing cups.'

Turning to the zero-marked activities and zero-marked accomplishments in Chinese, we find that they can indeed obtain either sequential readings or simultaneous readings, as in (19) and (20).

(19) a. Mali he kafei. (ranhou) Yuehan xi beizi. hen wenxin.
Mary drink coffee then John wash cup very sweet
'Mary drank coffee. (Then) John washed the cup. It was sweet.' [2]

b. gangcai Mali he kafei. Yuehan xi beizi. hen wenxin.
just.now Mary drink coffee John wash cup very sweet
'Mary was drinking coffee. John was washing cups. It was sweet.

(20) a. ?baba zuo yi ge dangao. nv'er song gei mama. hen wenxin.
Dad make one CL cake daughter send to Mom very sweet
' Dad made a cake. The daughter gave it to Mom. It was sweet.'

b. ?baba zuo yi ge dangao. nv'er dun yi guo tang. hen wenxin.
Dad make one CL cake daughter stew one pot soup very sweet
'Dad was making a cake. The daughter was stewing a pot of soup. It was sweet.'

Another diagnostic is that when following a *when*-clause, a perfective-marked sentence

1. Somehow adding contrastive focus improves the simultaneous reading.

2. Note that the first two zero-marked eventives are not uttered with contrastive intonation so they are incomplete. But they can be salvaged by the stative sentence in the end.

obtains an inceptive or terminal reading, while a progressive-marked sentence obtains an ongoing reading, as illustrated by the baselines of Chinese (and also English in their translations)

(21) mama dao jia de shihou, baba chao-le cai.
Mom arrive home DE time Dad cook-PERF dish
'When Mom arrived home, Dad cooked dishes.'

(The cooking event started after or completed before Mom's arriving event)[3]

(22) mama dao jia de shihou, baba zai chao cai.
Mom arrive home DE time Dad PROG cook dish
'When Mom arrived home, Dad was cooking dishes'

(The cooking event overlapped with Mom's arriving event)

The zero-marked eventives following a *when*-clause can obtain either an inceptive reading or ongoing reading, as shown below:

(23) mama dao jia de shihou, baba chao cai, nv'er dun tang, hen wenxin.
Mom arrive home DE time Dad cook dish daughter stew soup, very sweet
'When Mom arrived home, Dad cooked dishes and the daughter stewed soup. It was sweet.'

or 'When Mom arrived home, Dad was cooking dishes and the daughter was stewing soup. It was sweet.'

(24) mama dao jia de shihou, baba chao yi-ge cai, nv'er dun yi-guo tang, hen wenxin.
Mom arrive home DE time Dad cook one-CL dish daughter stew one-pot soup, very sweet
'When Mom arrived home, Dad cooked a dish and the daughter stewed a pot of soup. It was sweet.'

or 'When Mom arrived home, Dad was cooking a dish and the daughter was stewing a pot of soup. It was sweet.'

3. There is a preference for the terminal reading in this example but the inceptive reading can be made salient if we add an adverb such as *mantuntun-de* 'slowly' to the main verb.

The above diagnostics show that zero-marked sentences (when they are free of the incompleteness problem) can convey either event-in-progress or event-completion readings. If zero-marked sentences are imperfectives, the fact that they can convey event-in-progress readings is not surprising at all, because this is indeed a typical use of imperfective forms across languages. What is special here is that the event-in-progress reading of the imperfective form is restricted to certain contexts, namely when the relation between the Event Time and Topic Time is not at-issue. In Section 3.3.1 I will show that a similar contextual restriction can be found with Spanish imperfective forms (Fuchs and Piñango 2019, Fuchs 2020). Turning to the apparent event-completion readings of zero-marked forms, at first sight such use is unexpected because event-completion readings are typically conveyed by perfective morphology cross-linguistically. But in Section 3.3.2 I will show that a similar use is attested by imperfectives in many other languages.

## 3.3 Constraints on imperfective in other languages

This section shows that once we view the incompleteness phenomenon in Chinese as a constraint on using imperfective forms to convey episodic readings, we can connect it to similar phenomena in other languages. Section 3.3.1 and 3.3.2 focus on the constrained event-in-progress reading of the imperfective form in Spanish and the constrained event-completion reading of the imperfective form in Slavic and Romance languages respectively.

### 3.3.1 The constrained event-in-progress readings of imperfectives

In Spanish, there are two markers in the imperfective aspectual domain in the Present tense. One is the periphrastic Present Progressive marker as in (25), which is typically used to convey an event-in-progress reading. The other is the synthetic Simple Present marker which is the general imperfective form and is typically used to convey the habitual reading as in (26-a). The Simple Present form can also convey the event-in-progress reading as in (26-b) (Bull 1965; Comrie 1976; Westfall 1995; Bertinetto 2000, among others), but it has

been observed that such use is contextually constrained (Fernandez de Castro 1999; Roca Pons 1958; Fuchs 2020).

(25) Ana est-à fuma-ndo ahora.
Ana be-PRS.3.SG smoke-PROG now
'Ana is smoking now.'

(26) a. Ana fuma.
Ana smoke.PRS.3.SG.IMPF
'Ana smokes'

b. Ana fum-a ahora.
Ana smoke.PRS.3.SG.IMPF now
'Ana is smoking now.'

There are various hypotheses about what kinds of context license the event-in-progress reading of the Simple Present form, and here I refer to a recent work by Fuchs (2020). Fuchs proposes that the Simple Present form can give rise to event-in-progress readings only when there is shared perceptual access to the asserted event between the speaker and hearer (in Rioplatense Spanish and Central Peninsular Spanish[4]). The hypothesis is supported by acceptability judgments tasks and self-paced reading studies. For instance, in a rich experiential context as in (27-a), the speaker and hearer have shared perceptual access to the event of Ana's son's doing homework, and both the Present Progressive form and the Simple Present form can be used. In contrast, in a poor experiential context as in (27-b), only the Present Progressive form can be used, and the Simple Present form is significantly degraded.

(27) a. Rich Experiential Context: Ana comes home from work, and goes to her son's room, to check how he is doing. She knocks on the door, opens it, and sees him sitting at his desk. Before she can say anything, her son tells her: *Estoy haciendo / hago la tarea* ('I am doing / do homework.')

4. For Mexican Altiplano Spanish, the acceptability of the Simple Present form for the event-in-progress reading is low regardless of the context.

b. Poor Experiential Context: Ana comes home from work, and goes to her son's room, to check how he is doing. She knocks on the door, but her son does not answer. Before she opens the door, her son tells her: *Estoy haciendo* / ??*hago la tarea* ('I am doing / do homework.')

Recall that in Chinese, the event-in-progress reading of the zero-marked form is also contextually constrained, namely that it is only available when instantiation of the event (or the relation between the Event Time and Topic Time) is not at-issue. In fact, having the shared perceptual access to the relevant event between the speaker and hearer falls under this condition since the information that the event is ongoing can enter the Common Ground automatically when the discourse participants are all directly perceiving this event. As expected, we can construct examples in Mandarin Chinese to illustrate a similar contrast. In (28a), with the rich context, either the zero-marked form or the progressive form can be used to express the event-in-progress reading. But with the poor context in (28b), the progressive form is heavily preferred over the zero-marked form.

(28) a. Rich Experiential Context: Ana comes home from work, and goes to her son's room, to check how he is doing. She knocks on the door, opens it, and sees him sitting at his desk. Before she can say anything, her son tells her:

wo (zai) zuo gongke.
I PROG do homework
'I am doing homework'

b. Poor Experiential Context: Ana comes home from work, and goes to her son's room, to check how he is doing. Before she opens the door, her son tells her:

wo ??(zai) zuo gongke.
I PROG do homework
Int: 'I am doing homework'

It would be interesting to further examine whether the Spanish imperfective form also

improves on the event-in-progress interpretation under the other conditions that license the event-in-progress (or episodic, more generally) interpretation of Chinese zero-marked forms, besides the context of the shared perceptual access. Unfortunately this investigation is out of the scope of this dissertation and I have to leave it for future research. What is important is that, even though the licensing conditions in those two languages might not be exactly the same, for at least some of the conditions which licenses the event-in-progress interpretation of Chinese zero-marked forms, it can license the event-in-progress interpretation of the imperfective form in some other language as well.

### 3.3.2 The constrained event-completion readings of imperfectives

I showed in Chapter 2 and Section 3.2 that under appropriate conditions (e.g. with projective focus or in narratives, etc), zero-marked sentences can also convey event-completion readings in certain contexts, as repeated here:

(29) a. mingming zuotian zhengli fangjian. ranhou chi fan.
Mingming yesterday tidy.up room then eat meal
Sequential reading: 'Yesterday Mingming tidied up his room. Then, he ate a meal.' (Advancing narrative)

b. mama dao jia de shihou, baba chao cai, nv'er dun tang, hen wenxin.
Mom arrive home DE time Dad cook dish daughter stew soup, very sweet
Inceptive reading: 'When Mom arrived home, Dad cooked dishes and the daughter stewed soup. It was sweet.' (Inceptive reading)

If zero-marked sentences in Chinese are imperfectives, one immediate question is that why they can convey event-completion readings in (29), which is a typical use of perfective forms across the languages.

Strikingly, we find that imperfectives can also have the so-called 'factual' use which conveys a perfective-like, event-completion reading (Grønn 2004; Altshuler 2012; Arregui

et al. 2014) in other languages, as in (30)-(31).

(30) a. Lena (uže) prinimala eto lekarstvo. (Russian)
Lena (already) took(Impf) this medicine.
'Lena (already) took this medicine.' (Kagan 2007)

b. Marcin malował już obraz. (Polish)
Marcin painted(Impf) already picture
'Marcin already painted a picture.' (Frąckowiak 2011)

(31) a. A huit heures, les voleurs entraient dans la banque, ils
At eight hours, the robbers entered(Impf) in the bank, they
discutaient avec un employé, puis se dirigeaient vers le
discussed(Impf) with an employee, then Refl directed(Impf) towards the
guichet principal. (French)
window main
'At eight, the robbers entered the bank, they discussed with a clerk, then they moved towards the main desk.' (adapted from Jayez 1999)

b. Ayer moría Borges en Ginebra. (Spanish)
Yesterday died(Impf) Borges in Geneva
'Yesterday Borges died in Geneva.' (adapted from Reyes 1990)

Interestingly, the perfective-like use of imperfective in those languages are also constrained, and the reported conditions that license this use heavily overlap with the conditions that allow the episodic use of zero-marked sentences in Chinese. The rest of the section reviews the constrained perfective-like use of imperfectives in some Slavic and Romance languages.

#### 3.3.2.1 Factual imperfectives in Russian

In Russian, there is a formal opposition between imperfective verbs and perfective verbs, and the former canonically express typical imperfective readings such as habitual readings and progressive readings, while the latter express event-completion readings:

(32) Vanja pisal pis'mo.
Vanja write.IMPF.PAST letter

✓ Habitual: 'Vanja used to write a letter (regularly).'

✓ Progressive: 'Vanja was writing a letter'

(33) Vanja napisal pis'mo.
Vanja write.PERF.PAST letter
✓ Perfective: 'Vanja wrote a letter'

However, Russian imperfectives can also express apparent event-completion readings, under certain contexts. Grønn (2004, 2008) shows that one common context that allows such reading is when the event occurrence is presupposed in the preceding discourse, as in (34). This use is sometimes referred to as 'presuppositional imperfectives'.

(34) A: Krasivo ukrasili elku.
beautifully decorate(Perf) Christmas.tree.
'They decorated the Christmas tree beautifully.'

B: Kto ukrašal
who decorate(Impf)
'Who decorated it?' (From Grønn 2008: 150 (2))

This reminds us of how projective focus can salvage an incomplete zero-marked sentence in Chinese, as repeated in (35). Similarly, the existence of focus indicates that the instantiation of the event is presupposed in the context instead of being at-issue.

(35) gangcai zhiyou TANGMU he kafei
just.now only Tom drink coffee
'Just now only [Tom]$_F$ drank coffee'

(The event of Tom's drinking coffee is presupposed in the context)

Another condition for the event-completion reading of Russian imperfectives can be descriptively labeled as 'resultative contexts' (Padučeva 1992; Altshuler 2012; Arregui et al. 2014). The shared intuition from various studies seems to be that (36) has a retrospective viewpoint, emphasizing that the result of having taken the medicine was achieved in the past; and so, the event of taking the medicine was completed in the past as well. Since the

event completion is not presupposed in those context, such use is referred to as 'existential imperfectives'.

(36) Lena (uže) prinimala eto lekarstvo.
Lena (already) took(Impf) this medicine
'Lena has (already) taken this medicine' (From Kagan 2007)

It is not entirely clear how the licensing condition of existential imperfectives can be formally characterized, and according to the existing literature it is still controversial in terms of how to analyze this use (see different analyses in Altshuler 2012; Grønn 2004; Arregui et al. 2014). The relevant point here is that this seems to be largely a semantic-pragmatic condition that is hard to formalize, which resembles our impression about the difficulty of figuring out when a zero-marked sentence in Chinese is well-formed for episodic interpretations. For this reason, it is natural to consider that the availability of event-completion reading for zero-marked sentences in Chinese, which is also regulated by a pragmatic condition, might be related to the case of factual imperfectives in Russian.

#### 3.3.2.2 Narrative/historical imperfectives in Romance

Arregui et al. (2014) show that in Romance languages, imperfective forms allow an episodic reading usually in narratives and historic descriptions, as reproduced in (37)-(38).

(37) Spanish

a. Al amanecer salió el regimiento, atravesó la montaña,
At.the dawn went.out(Perf) the regiment, crossed(Perf) the mountain,
y poco después establecía contacto con el enemigo.
and little later established(Impf) contact with the enemy
'At dawn, the regiment went out, crossed the mountain, and a little later established contact with the enemy.' (Jayez 1999)

b. Ayer moría Borges en Ginebra.
Yesterday died(Impf) Borges in Geneva
'Yesterday Borges died in Geneva.' (adapted from Reyes 1990)

(38) French

a. A huit heures, les voleurs entraient dans la banque, ils
At eight hours, the robbers entered(Impf) in the bank, they
discutaient avec un employé, puis se dirigeaient vers le
discussed(Impf) with an employee, then Refl directed(Impf) towards the
guichet principal.
window main
'At eight, the robbers entered the bank, they discussed with a clerk, then they moved towards the main desk.' (adapted from Jayez 1999)

b. En 1492, Christophe Colomb découvrait l' Amérique.
In 1492, Christopher Columbus discovered(Impf) the America
'In 1492, Columbus discovered America.' (Labelle 2003)

This is very similar to the Chinese examples we discussed in Section 2.2.2, which showed that certain narratives can improve zero-marked sentences and license episodic interpretations. Some of the crucial data is reproduced in (39)-(40).

(39) a. mingming zuotian zhengli fangjian. ranhou ta chi fan.
Mingming yesterday tidy.up room then he eat meal
'Yesterday Mingming tidied up his room. Then, he ate a meal.'

b. gangcai Mali paobu. houlai xiayu le.
just.now Mary run then rain LE
'Mary ran just now. Then it rained. '

Moreover, using zero-marked sentences for event-completion readings in Chinese is also common for historic description and news titles. Here are some examples adjusted from the online corpus:

(40) a. 1911 nian, Xinhai geming baofa.
1911 year Xinhai revolution break.out
'In 1911, the Xinhai Revolution broke out'

b. zuixin! jiaoyubu fabu 2020 nian quanguo gaoxiao mingdan
newest Ministry.of.Education release 2020 year nationwide college list
'The newest! Ministry of Education released the list of the colleges in 2020.'

In short, the connection between narrative/historical imperfectives in Romance and the licensing conditions of zero-marked sentences in Chinese supports my hypothesis that zero-marked sentences in Chinese are imperfectives.

### 3.3.3 Interim summary

Besides that zero-marked sentences can have typical imperfective readings (as shown in Section 3.2), this section provides one more motivation for treating zero-marked sentences as imperfectives: they can convey episodic readings only under restricted contexts, which is similar to the constraints in other languages of using imperfective forms to convey episodic readings. It is not our goal here to elaborate on all the conditions that license the event-in-progress or event-completion readings of imperfectives in those other languages, but their parallel with the constrained episodic uses of Chinese imperfectives is evident. The general pattern in Chinese and those languages is that for some reading $X$ ($X$ = episodic reading in Chinese, and $X$ = event-in-progress/event-completion reading in other languages), the imperfective can convey it only under certain conditions, and although the conditions are not identical across the languages, they have a lot in common. For this reason, we have cross-linguistic motivation to attribute the possible but constrained episodic uses of zero-marked sentences in Chinese to a null imperfective aspect.

## 3.4 The semantics of the imperfective

This section proposes a semantics of the phonologically null imperfective aspect in Chinese. While the previous literature in Chinese is aware that zero-marked sentences can obtain habitual/generic readings, continuous readings, futurate readings, and event-in-progress readings, the four readings have been treated separately. For instance, the habitual use is often attributed to a covert GEN operator (Hongyuan Sun 2014) in the sentence; and the futurate use is considered to involve a covert modal operator (Sun 2014; He 2020). The well-formedness of zero-marked statives is attributed either to the semantic type of

individual-level predicates (denoting properties of time intervals, without argument slots for eventualities, see Sun 2014; Sybesma 2019) or to the covert GEN operator. For the event-in-progress reading, some simply deny that zero-marked sentences can have it (Sun 2014; He 2020) and for those who admit its existence, it is often attributed to a null morpheme for neutral aspect (Smith 1997) or derived by the default aspect (Jo-Wang Lin 2006). The main goal here is to provide a uniform analysis that can capture the typical uses of zero-marked forms. In particular, I propose that zero-marked eventive sentences contain a covert imperfective morpheme and express modalized propositions, which does not entail the event-in-progress or event-completion readings. The contextually constrained episodic readings of zero-marked sentences will be discussed in Chapter 4.

### 3.4.1 Basic setup

I adopt a branching time semantics proposed in Thomason (1970, 1984). The domain of the model includes a nonempty set $\mathcal{T}$ of times with dense ordering that is ordered by a transitive tree-like relation $\prec$ such that for all $t, u, v \in \mathcal{T}$ if $u \prec t$ and $v \prec t$ then either $u \prec v$ or $v \prec u$ if $u \neq v$.

(41) A history on $\mathcal{T}$ is a subset $h$ of $\mathcal{T}$ such that

a. for all $t, u \in h$, if $t \neq u$, then $t \prec u$ or $u \prec t$;

b. if $g$ is any subset of $\mathcal{T}$ such that for all $t, u \in g$, if $t \neq u$, then $t \prec u$ or $u \prec t$, then $g = h$ if $h \subseteq g$.

(42) An interval $i$ ($\in \mathcal{I}$) is a subset of $\mathcal{T}$ such that

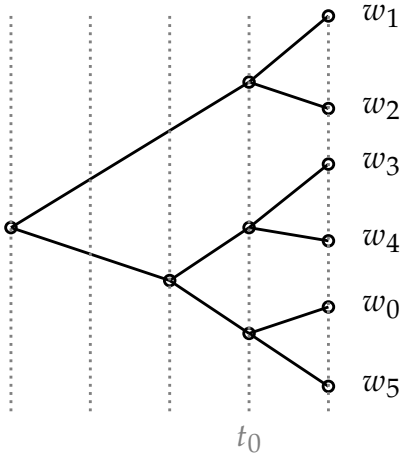
a. $i$ is a proper subset of some history $h \subseteq \mathcal{T}$

b. for all $t_1, t_2, t_3 \in h$, if $t_1, t_3 \in i$ and $t_1 \prec t_2 \prec t_3$ then $t_2 \in i$

Following Cariani (2021), I assume that there is a one-to-one correspondence between possible worlds and histories: for each history, we can identify it with exactly one possible

world, as illustrated in (43).

(43) A branching model with cross-world simultaneity




The cross-world simultaneity relation $R$ partitions the points in $\mathcal{T}$ into equivalence classes, and we can define a relation $MC$ that further partition the intervals in $\mathcal{I}$ into equivalence classes. I assume that frame adverbials such as 'May 21, 2012' denote an equivalence class which contains all the simultaneous intervals in each possible world.

(44) Define $R$ as a cross-world simultaneity relation on $\mathcal{T}$ (adjusted from Cariani):

a. $R$ is a reflexive, symmetric and transitive relation on $\mathcal{T}$.

b. for any $t_1, t_2 \in \mathcal{T}$ and $t_1 \neq t_2$: $R(t_1, t_2)$ iff $\neg(t_1 \prec t_2)$ and $\neg(t_2 \prec t_1)$

(45) Define $MC$ as a cross-world simultaneity relation on $\mathcal{I}$:
for any $i_1, i_2 \in \mathcal{I}$ and $i_1 \neq i_2$: $MC(i_1, i_2)$ iff
$\forall t \in i_1 : \exists t' \in i_2[R(t, t')]$ and $\forall t \in i_2 : \exists t' \in i_1[R(t, t')]$

In other words, frame adverbials denote intensional properties of intervals:

(46) $[\![\text{May 21, 2021}]\!] = \lambda w \lambda i.\textbf{May21-2021}(i, w)$

The correspondence between histories and possible worlds enables a standard intensional

event semantics: we can still evaluate the truth of a sentence relative to a world, which is equivalent of evaluating it relative to a history.

Our ontology further includes a set of sorted eventualities $\mathcal{E}$, and there are two sorts of eventualities, events (in $\mathcal{E}^E$) and states (in $\mathcal{E}^S$). Following Kratzer (2007) (see also Ferreira 2005; Renans 2021), I assume the domain of events contains both singular events and plural events, the latter of which are mereological sums that have other events as their proper parts. Standard definitions of some concepts in Mereology are adopted as follows:

(47) Parthood relation "$\sqsubseteq$":

a. Reflexivity: $\forall e_1[e_1 \sqsubseteq e_1]$

b. Transitivity: $\forall e_1 \forall e_2 \forall e_3[e_1 \sqsubseteq e_2 \wedge e_3 \sqsubseteq e_3 \rightarrow e_1 \sqsubseteq e_3]$

c. Antisymmetry: $\forall e_1 \forall e_2[e_1 \sqsubseteq e_2 \wedge e_1 \sqsubseteq e_2 \rightarrow e_1 = e_2]$

(48) Proper parthood relation "$\sqsubset$":

$e_1 \sqsubset e_2$ iff $e_1 \sqsubseteq e_2 \wedge e_1 \neq e_2$

(49) Overlap relation "$\circ$":

$e_1 \circ e_2$ iff $\exists e_3[e_3 \sqsubseteq e_1 \wedge e_3 \sqsubseteq e_2]$

(50) Mereological sum relation "$\oplus$":

$e = e_1 \oplus e_2 \oplus ... \oplus e_n$ iff $\forall e'[e' \in \{e_1, e_2, ..., e_n\} \rightarrow e' \sqsubseteq e] \wedge \forall e''[e'' \sqsubseteq e \rightarrow \exists e'''[e''' \in \{e_1, e_2, ..., e_n\} \wedge e'' \circ e''']]$

In particular, I follow Ferreira (2016) in assuming that all lexical eventive predicates, including activities, accomplishments and achievements, are closed under sum formation and sentence radicals that contain eventive predicates (i.e. $v$P) denote intensional properties of events (which can be either singular or plural), as in (51).

(51) a. $[\![\text{Mary run}]\!] = \lambda w \lambda e.\textbf{Mary-run}(e, w)$ [5]

5. In most of the cases, I do not spell out the thematic structure of the event description just for conve-

b. $[\![\text{Mary run a mile}]\!] = \lambda w \lambda e.\textbf{Mary-run-a-mile}(e, w)$

Ferreira postulates two abstract operators, *sg* and *pl*, which extract certain members from the denotation of the sentence radical:

(52) a. $sg := \lambda P \lambda w \lambda e.min(e, P, w)$

$min(e, P, w) \leftrightarrow P(e, w) \wedge \neg \exists e' \sqsubset e : P(e', w)$

b. $pl := \lambda P \lambda w \lambda e.sum(e, P, w)$

$sum(e, P, w) \leftrightarrow P(e, w) \wedge \exists e_1, e_2, ..., e_n \sqsubset e[P(e_1) \wedge P(e_2) \wedge ... \wedge P(e_n) \wedge \otimes(e_1, e_2, ..., e_n)] \wedge$

$e = e_1 \oplus e_2 \oplus ... \oplus e_n$ [6]

As an illustration, let us assume that there are only three events of Mary running in world $w_2$ ($e_1, e_2, e_3$). The denotation of the sentence radical *Mary run* and its singular and plural versions can be illustrated in (53).

(53) $[\![\text{Mary run}]\!](w_2) = \{e_1, e_2, e_3, e_1 \oplus e_2, e_1 \oplus e_3, e_2 \oplus e_3, e_1 \oplus e_2 \oplus e_3\}$

a. $sg([\![\text{Mary run}]\!])(w_2) = \{e_1, e_2, e_3\}$

b. $pl([\![\text{Mary run}]\!])(w_2) = \{e_1 \oplus e_2, e_1 \oplus e_3, e_2 \oplus e_3, e_1 \oplus e_2 \oplus e_3\}$

Turning to stative predicates, still following Ferreira (2016), I assume that those predicates are non-atomic: if $P$ is in the extension of a stative predicate such as *Mary live in Suzhou* in a world $w$ and $s$ is in that extension, then (54) always holds:

(54) $\forall s[P(s, w) \rightarrow \exists s'[s' \sqsubset s \wedge P(s', w)]]$

In words, sentence radicals involving stative predicates only have plural denotations as in (55), in which we use capital $E$ or $S$ to represent plural eventualities.

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nience. A more elaborated representation of the semantics of (51a) is: $\lambda w \lambda e.\textbf{run}(e, w) \wedge Ag(e, w) = m$.

6. The expression $\otimes(e_1, e_2, ..., e_n)$ means the events $e_1, e_2, ..., e_n$ are pairwise disjoint.

(55) $[\![\text{Mary live in Suzhou}]\!] = \lambda w \lambda S.\textbf{Mary-live-in-Suzhou}(S, w)$

Both events and states are located in time so we further need a function, $\tau$, which maps eventualities to their running time. Since we have plural eventualities, the running time of them will be plural intervals, namely mereological sums of singular intervals that correspond to each singular eventuality that is a proper part of a plural event:

(56) $\tau(e_1 \oplus e_2 \oplus e_3 \oplus ... \oplus e_n) = \tau(e_1) \oplus \tau(e_2) \oplus \tau(e_3) \oplus ... \oplus \tau(e_n)$

### 3.4.2 A modal analysis of the imperfective

Now we are ready to illustrate the analysis. I propose that a zero-marked sentence in Mandarin Chinese contains a covert imperfective morpheme $\varnothing_{\text{IMPF}}$. The semantics of $\varnothing_{\text{IMPF}}$ is given in (57), which incorporates some shared components of the modal-temporal analyses of imperfectivity in the literature (Dowty 1977, 1979; Landman 1992; Bar-el et al. 2005; Arregui et al. 2014), especially in Ferreira (2005, 2016) and Deo (2009).

(57) $[\![\varnothing_{\text{IMPF}}]\!] = \lambda P \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \mathit{INCL}(n(P), i, w')$ in which

a. $\text{INERT}(w, i)$ is a set of inertia worlds relative to $w$ at $i$. A world $w'$ is such an inertia world iff (i) the history of $w'$ is exactly the same as the history of $w$ up to and including $i$; and (ii) $w'$ develops in ways that are most compatible with the relevant facts (including plans, rules, progress) in $w$ up to $i$.

b. $\mathit{INCL}(Q, i, w') = \begin{cases} \exists e[Q(e, w') \wedge \tau(e, w') \supseteq_{NS} i] & \text{if } Q \subseteq \mathcal{E} \\ Q(i, w') & \text{if } Q \subseteq \mathcal{T} \end{cases}$

in which '$\supseteq_{NS}$' is a non-strict superset relation such that $i_1 \supseteq_{NS} i_2$ iff the left boundary of $i_2$ does not precede the left boundary of $i_1$ and the right boundary of $i_1$ does not precede the right boundary of $i_2$. [7]

7. The non-strict superset relation is adapted from the 'inclusion' relation in Ferreira (2016: 361).

c. $n = \begin{cases} sg/pl & \text{if } P \subseteq \mathcal{E} \\ \lambda P.P & \text{if } P \subseteq \mathcal{T} \end{cases}$

The first shared component is that imperfective sentences involve some kind of modality. Following Dowty (1977, 1979), Landman (1992) and many others, I define an inertia modal base INERT, which is a function that takes a world $w$ and an interval $i$, and returns a set of inertia continuations of $i$ in $w$, as in (57-a).

The second component is that imperfective sentences express a temporal inclusion relation between the running time of eventualities and the topic time (in inertia worlds): the relevant eventuality is 'ongoing' during the topic time in some sense. This is captured by the *INCL* relation defined in (57-b). The reason we do not use the regular superset relation between intervals ($\supseteq$) but the non-strict superset relation is because we would like to capture the habitual use in which the running time of a sequence of events does not need to strictly contain the topic time (following Ferreira 2016). We will elaborate on how the ongoingness of events is captured in by (57) in the rest of this sections when we zoom into each of the imperfective uses.

The third component is that the imperfective morpheme can involve existential quantification over plural events in some cases such as the habitual use, or existential quantification over singular events as in some other cases. This is encoded by the variable $n$ in (57), which can be set to either a singular operator *sg* or a plural operator *pl* (defined in (52)) when the input argument is a property of events, as in (57-c). When $P$ is a property of intervals, $n$ does not manipulate on its number property.

In words: the imperfective aspect encodes some inclusion relation between the eventuality time (or some interval) and the topic time in all inertia continuations of the evaluation world. The rest of this section illustrates how the various interpretations of zero-marked sentences – habitual/generic characterizing readings, continuous readings, and futurate readings – can be straightforwardly derived with this lexical entry, plus certain assump-

tions about the singular/plural events and states.

#### 3.4.2.1 Habitual/generic characterizing readings

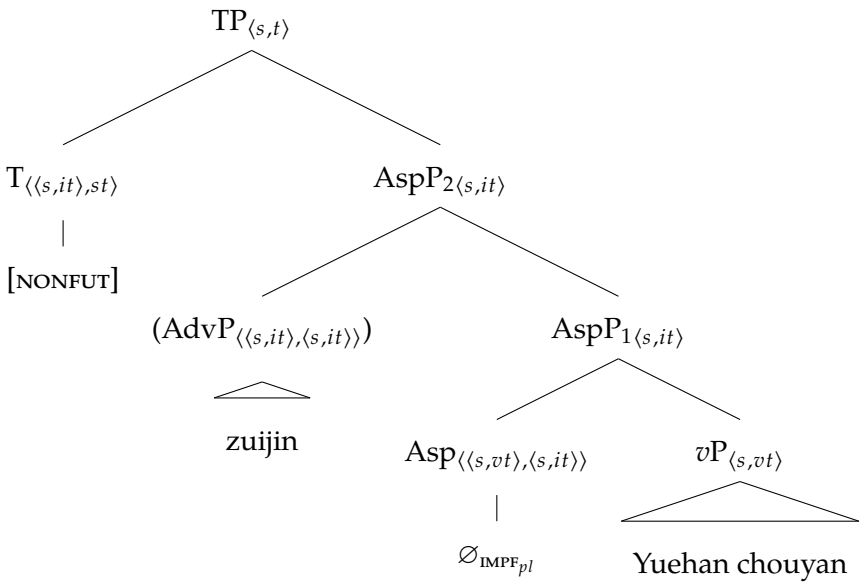
According to my analysis, a zero-marked sentence like (58) under a habitual interpretation, contains a null imperfective aspect. In particular, since we will need to refer to plural events in the habitual use, I argue that the variable $n$ is set to $pl$ in this use, and we henceforth use $\varnothing_{\text{IMPF}_{pl}}$ in (59) to represent such a plural version of the imperfective.

(58) (zuijin) Yuehan chouyan
recently John smoke
'(Recently) John smokes'

(59) For habitual use: the existential quantification is over plural events.
$[\![\varnothing_{\text{IMPF}_{pl}}]\!] = \lambda P_{\langle s,vt\rangle}\lambda w\lambda i.\forall w' \in \text{INERT}(w,i) : \mathit{INCL}(\mathit{pl}(P)(w'), i, w')$

The logical form (LF) of (58) is shown in (60) and the truth conditions are derived step by step in (61). I follow Hongyuan Sun (2014) in assuming that there is a covert non-future tense in the sentence, which introduces the presupposition that the topic time is no later than the evaluation time as in (61e). I assume that temporal adverbials are modifiers of properties of intervals which do not directly saturate the topic time but can restrict the value of the topic time, as in (61c) and (61d).

(60)




(61) a. $[\![vP]\!] = \lambda w \lambda e.$**J-smoke**$(e, w)$

b. $[\![\text{Asp}_1\text{P}]\!] = \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \mathit{INCL}($**J-smoke**$, i, w')$
$= \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \exists E[$**J-smoke**$(E, w') \wedge \tau(E, w') \supseteq_{NS} i]$

c. $[\![\text{zuijin}]\!] = \lambda w \lambda i.$**recently**$(i, w)$

d. $[\![\text{Asp}_2\text{P}]\!] = \lambda w \lambda i. i \subseteq$ **recently**$(i, w) \wedge \forall w' \in \text{INERT}(w, i) : \exists E[$**J-smoke**$(E, w') \wedge \tau(E, w') \supseteq_{NS} i]$

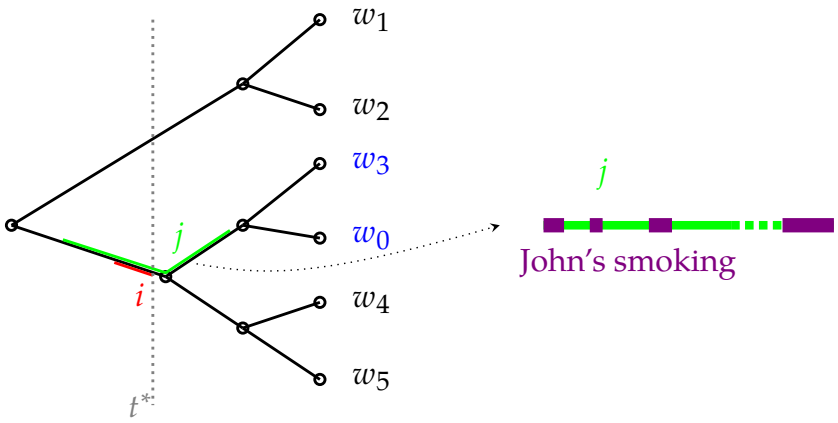
e. $[\![[\text{NONFUT}]]\!] = \lambda P_{\langle s,it \rangle}. \exists i[P(w)(i)]$ defined iff $i \leq t^*$

f. $[\![\text{TP}]\!] = \lambda w. \exists i[i \subseteq$ **recently**$(i, w) \wedge \forall w' \in \text{INERT}(w, i) : \exists E[$**J-smoke**$(E, w') \wedge \tau(E, w') \supseteq_{NS} i]]$ defined iff $i \leq t^*$

(61-f) says that there exists a topic time $i$ within the interval denoted by *zuijin* 'recently', such that in all inertia worlds relative to the evaluation world since the end of $i$, there is a plural event of John smoking whose running time is a non-strict superinterval of $i$. That is equivalent to saying, if things go on their normal course relative to what has been the case recently, there is a plural event of John smoking ongoing recently, by which it means at least one event of John smoking has occurred before the topic time, and at least one event of John smoking will occur after the topic time. Crucially, our definition of the *INCL* relation does not require any temporal overlapping between the running time of any John

smoking event and the topic time, which captures our intuition that under the habitual reading, the relevant event is not literally in progress during the topic. We can visualize this reading in Figure 3.1: Assume that among all the possible worlds, $w_0$ and $w_3$ are inertia continuations relative to the topic time $i$ in the evaluation world, then on those two branches, there is a plural event of John smoking whose running time 'includes' $i$.

Figure 3.1: Visualization of the habitual/generic reading




Since (59) only encodes an existential quantification over plural events, the analysis correctly predicts that without further specification, John could have a habit of smoking every day, every week, every month, etc. The frequency of the relevant event can be restricted by adding overt adverbs of quantification (AQs) to the sentence as in (62):

(62) a. (zuijin) Yuehan jingchang chouyan
recently John often smoke
'(Recently) John often smokes'

b. (zuijin) Yuehan zongshi chouyan
recently John always smoke
'(Recently) John always smokes.'

Adapted from Johnston (1994) (see also Lewis 1975; Cohen 2004; Deo 2009), I propose that overt AQs such as *jingchang* 'often' have the semantic type of modifiers so that by combining with the denotation of *v*P, they return a semantic object that has the right type

to further combine with the imperfective aspect. In particular, they encode a quantifier over temporal intervals in the denotation: for *jingchang* 'often', it encodes a proportional quantifier as in (63) which requires most of the intervals in the restriction are also intervals in which a singular $P$-event is instantiated.

(63) $[\![\text{jingchang}]\!] = \lambda P \lambda w \lambda E.\textbf{MOST}[\lambda i.C(i), \lambda i'.\exists e \sqsubseteq E[min(e, P, w) \wedge \tau(e, w) \subseteq i']]$
in which **MOST** is a proportional quantifier over temporal intervals

Assuming that the restriction argument $P$ of the generalized quantifier can be saturated by the context (represented by $C$) – such that for instance, the quantification is only restricted to the intervals of $i$ that after lunch – we can derive the semantics of (62-a) as in (64).

(64) a. $[\![\text{Yuehan chouyan}]\!] = \lambda w \lambda e.\textbf{J-smoke}(e, w)$

b. $[\![[\text{jingchang [Yuehan chouyan]}]]\!]$
$= \lambda w \lambda E.\textbf{MOST}[\lambda i'.C(i;), \lambda i'.\exists e \sqsubseteq E[min(e, \textbf{J-smoke}, w) \wedge \tau(e, w) \subseteq i'']]$

c. $[\![[\ \varnothing_{\text{IMPF}}\ [\text{jingchang [Yuehan chouyan}]]]\ ]\!]$
$= \lambda w \lambda i. \forall w' \in \text{INERT}(w, i)$ :
$\exists E[\textbf{MOST}[\lambda i'.C(i'), \lambda i''.\exists e \sqsubseteq E[min(e, \textbf{J-smoke}, w') \wedge \tau(e, w) \subseteq i'']] \wedge \tau(E, w') \supseteq_{NS} i]$

d. $[\![\text{(62-a)}]\!] = \lambda w.\exists i[i \subseteq \textbf{recently} \wedge \forall w' \in \text{INERT}(w, i)$ :
$\exists E[\textbf{MOST}[\lambda i'.C(i'), \lambda i''.\exists e \sqsubseteq E[min(e, \textbf{J-smoke}, w') \wedge \tau(e, w) \subseteq i'']] \wedge \tau(E, w') \supseteq_{NS} i]]$
defined iff $i \leq t^*$

The difference between (61-f) ('Recently John smokes') and (62-a) ('Recently John often smokes') is that the quantification contributed by the frequency adverb requires that for most of the intervals in the morning are those in which John is smoking. The prediction seems to be true. If John is not a heavy smoke and only occasionally smokes recently, then under this scenario (58) is true because we can have a plural event in the inertia world to satisfy the truth conditions. But (62-a) is not true under the scenario because it requires during most contextually relevant intervals, John's smoking is instantiated if the world

goes on the normal course.

#### 3.4.2.2 Continuous readings

The proposed semantics for the imperfective aspect can also extend to the continuous readings. For a stative sentence such as (65), I assume the logical form in (66).

(65) Mali zhu zai Suzhou
Mary live at Suzhou
'Mary lives in Suzhou'

(66) $[_{\text{TP}}\ [_{\text{T}}\ \text{NONFUT}\ [_{\text{AspP}}\ \varnothing_{\text{IMPF}}\ [_{v\text{P}}$ Mali zhu zai Suzhou ] ] ] ]

Since we assume that stative predicates such as *Mary live in Suzhou* are like mass nouns and which only contain plural eventualities in the denotations, the imperfective in (66) will involve an existential quantification over plural states as in (67-b).

(67) a. $[\![v\text{P}]\!] = \lambda w \lambda S.\textbf{M-live-in-SZ}(S, w)$

b. $[\![\varnothing_{\text{IMPF}_{pl}}]\!] = \lambda w \lambda P \lambda i.\forall w' \in \text{INERT}(w, i) : \mathit{INCL}(\mathit{pl}(P), i, w')]$

c. $[\![\text{AspP}]\!] = \lambda w \lambda i.\forall w' \in \text{INERT}(w, i) : \mathit{INCL}(\textbf{M-live-in-SZ}, i, w')]$
$= \lambda w \lambda i.\forall w' \in \text{INERT}(w, i) : \exists S[\textbf{M-live-in-SZ}(S, w') \wedge \tau(S, w') \supseteq_{NS} i]$

d. $[\![\text{TP}]\!] = \lambda w.\exists i[\forall w' \in \text{INERT}(w, i) : \exists S[\textbf{M-live-in-SZ}(S, w') \wedge \tau(S, w') \supseteq_{NS} i]]$
defined iff $i \leq t^*$

What (67-d) says is that if things go on their normal course since the end of the topic time $i$, there is a plural state of Mary living in Suzhou and its running time is a non-strict superinterval of $i$. In its current shape, (67-d) does not capture our intuitions about the meaning of (65) for two reasons. First, unlike the habitual sentence, the continuous sentence does require that the state of Mary living Suzhou holds throughout the topic time. In other words, if the plural state of Mary living in Suzhou is temporally discontinuous so that its running time does not overlap with the topic time, our intuition is that (67-d)

should be false under this case. But this is not captured by the truth conditions in (67-d). The second problem is that (65) does not have an obvious modal flavor while its truth conditions under the current account do contain an inertia modality.

For the first problem, I follow Ferreira (2005, 2016) in assuming that stative predicates are different from eventive predicates in being temporally convex, as defined in (68).

(68) If $P$ is temporally convex, then $\forall w \forall e \in \mathcal{E}[P(e,w) \rightarrow \forall t[t \subseteq \tau(e,w) \rightarrow \exists e' \sqsubset e : \tau(S',w) = t \wedge P(e',w)]]$

That means, a temporal discontinuous plural state will not be in the denotation of any stative predicate. Taking this assumption about stative predicates into consideration, (67-d) is equivalent to (69) because having the non-strict superinterval relation does not make any difference from a regular superinterval relation.

(69) $\lambda w.\exists i[\forall w' \in \text{INERT}(w,i) : \exists S[\textbf{M-live-in-SZ}(S,w') \wedge \tau(S,w') \supseteq i]]$ defined iff $i \leq t^*$

For the second problem, one thing we could say is that the special properties of states (in contrast with events) render the contribution of inertia modal base vacuous (Ferreira 2016). The holding of a state such as 'live in Suzhou', 'speak French', 'like puppies' is relatively stable and less sensitive to the external factors. For this reason, either by world knowledge or some default assumptions, the actual world is always an inertia world relative to a state. This assumption together with (68) leads to the entailment in (70), which is a closer paraphrase of our intuition about the meaning of (65).

(70) $\lambda w.\exists i \exists S[\textbf{M-live-in-SZ}(S,w) \wedge \tau(S,w) \supseteq i]$ defined iff $i \leq t^*$

In words, the current analysis of the imperfective can capture the continuous reading of zero-marked sentences once certain special properties of stative predicates are clarified.

#### 3.4.2.3 Futurate readings

Now we turn to the futurate readings of zero-marked sentences, as in (71).

(71) Mali mingtian paobu
Mary tomorrow run
'Mary {runs, is running} tomorrow'

To derive the this reading, I follow Dowty (1979) in assuming that the future-oriented frame adverbial *mingtian* 'tomorrow' adjoins directly to *v*P below the position of the imperfective aspect. The LF of (71) is shown in (72).

(72) $[_{\text{TP}}\ [_{\text{T}}\ \textsc{nonfut}\ [_{\text{AspP}}\ \varnothing_{\text{IMPF}}\ [_{v\text{P}_2}$ mingtian $[_{v\text{P}_1}$ Mali paobu ] ] ] ] ]

A step-by-step derivation is in (73). I adopt Dowty (1979)'s analysis of those future frame adverbial like 'tomorrow' as in (73-b). The semantics of *mingtian* (in the futurate use) takes an eventuality property and returns an intensional property of an interval such that the eventuality is instantiated within the day that immediately follows the day including it, as in (73c). This property saturates the first argument of the null $\varnothing_{\text{IMPF}}$ and the $n$ in the semantics of $\varnothing_{\text{IMPF}}$ is interpreted vacuously since it combines with a property of intervals, as in (73-e).

(73) a. $[\![v\text{P}_1]\!] = \lambda w \lambda e.\textbf{M-run}(e, w)$

b. $[\![\text{mingtian}]\!] = \lambda P \lambda w \lambda i.\text{AT}(P, \text{DAY}_{+1}(i), w)$ in which $\text{DAY}_{+1}(i)$ returns the day that immediately follows the day including $i$. [8]

c. $[\![v\text{P}_2]\!] = \lambda w \lambda i.\text{AT}(\textbf{M-run}, \text{DAY}_{+1}(i), w)$

d. $[\![\varnothing_{\text{IMPF}}]\!] = \lambda w \lambda P \lambda i.\forall w' \in \text{INERT}(w, i) : \mathit{INCL}(n(P), i, w')]$

8. I follow Condoravdi (2001) in defining the AT relation as follows:

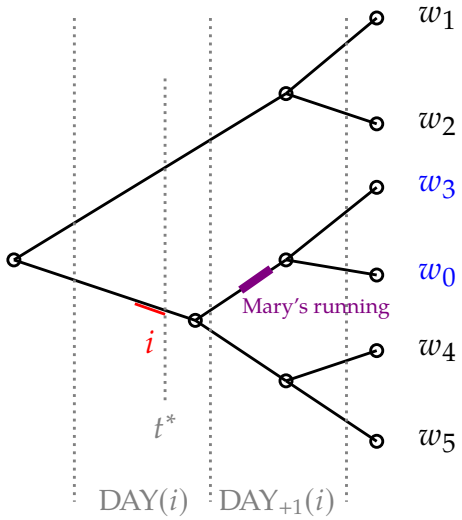
$$\text{AT}(P, i, w) = \begin{cases} \exists e[P(e, w) \wedge \tau(e, w) \subseteq i] & \text{if } P \subseteq \mathcal{E}^E \\ \exists e[P(e, w) \wedge \tau(e, w) \circ i] & \text{if } P \subseteq \mathcal{E}^S \\ P(i, w) & \text{if } P \subseteq \mathcal{T} \end{cases}$$

e. $[\![\text{AspP}]\!] = \lambda w \lambda i . \forall w' \in \text{INERT}(w, i) : \text{AT}(\textbf{M-run}, \text{DAY}_{+1}(i), w')$

f. $[\![\text{TP}]\!] = \lambda w . \exists i [\forall w' \in \text{INERT}(w, i) : \text{AT}(\textbf{M-run}, \text{DAY}_{+1}(i), w')]$ defined iff $i \leq t^*$

What (73-f) says is that if things go on a normal course relative to what has been the case up to the end of the topic time $i$ (in which the preparation, plans or predetermination of Mary's running are especially relevant), the event of Mary running is instantiated during the day immediately follows the day including $i$. Figure 3.2 visualizes the futurate reading: in the inertia worlds $w_0$ and $w_3$, in which the preparation or plan of Mary's running up to the speech time progresses normally, Mary's running event is instantiated in the next day following the day including $i$. Comparing 3.2 to the diagram of habitual use in 3.1, the existence of the forward-shifting frame adverbial is crucial in capturing the futurate reading since strictly speaking it does not refers to a property of the topic time in the inertia continuations, but rather a property of a future interval relative to the topic time.

Figure 3.2: Visualization of the futurate reading




#### 3.4.2.4 Interim summary

I showed that various interpretations of the zero-marked, imperfective sentences in Chinese, including the habitual/generic one, the continuous one, and the futurate one, can

be uniformly captured by the proposed lexical entry of $\varnothing_{\text{IMPF}}$. This is the first uniform treatment of those uses in Chinese and the successful extension of the existing uniform analyses of (some) imperfective uses (Dowty 1979; Ferreira 2005; Deo 2009, among others) provides cross-linguistic support for those analyses.

### 3.4.3 Apparent episodic readings

Under appropriate conditions (e.g. within narratives), zero-marked forms in Chinese can give rise to episodic readings as well, which could be either an event-in-progress reading or an event-completion reading, as in (74).

(74) zuotian Mali paobu. turan xiayu le.
yesterday Mary run suddenly rain LE
'Yesterday Mary {was running, ran}. It rained suddenly.'

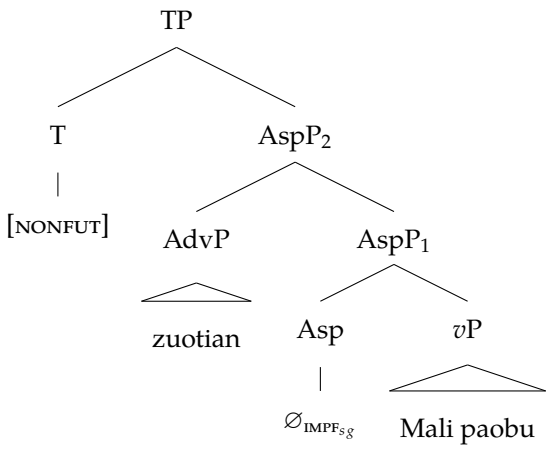
I am going to first show that under the current proposal, the truth conditions we derive for the zero-marked sentence in (74) are weaker than the actual episodic interpretation, which seems to be a problem at first sight. Nevertheless, I argue that this is in fact desirable because there is evidence showing that the apparent event-in-progress or event-completion readings are not always entailed by those zero-marked forms.

Since the episodic interpretation in (74) refers to singular but not plural events, I propose that the $n$ variable in the denotation of $\varnothing_{\text{IMPF}}$ is set to the value of $sg$, as in (75).

(75) $[\![\varnothing_{\text{IMPF}_{sg}}]\!] = \lambda P_{\langle s,vt\rangle}\lambda w\lambda i.\forall w' \in \text{INERT}(w,i) : \mathit{INCL}(sg(P)(w'),i,w')$

The derivation of the truth conditions of (74) is quite similar to that of the futurate reading except that in this case there is no forward-shifting frame adverbial below AspP. Instead, I argue that in this case the frame adverbial occurs above AspP to restrict the topic time and the LF of the sentence is shown in (76).

(76)




The full derivation of the semantics of (74) is shown in (77):

(77) a. $[\![v\text{P}]\!] = \lambda w \lambda e.\textbf{M-run}(e, w)$

b. $[\![\text{AspP}_1]\!] = \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \exists e[\textbf{M-run}(e, w') \wedge \tau(e, w') \supseteq_{NS} i]$

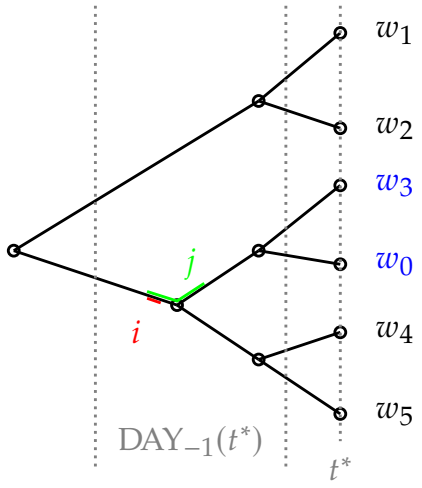
c. $[\![\text{zuotian}]\!] = \lambda w \lambda i. i \subseteq \text{DAY}_{-1}(t^*)(w)$

d. $[\![\text{AspP}_2]\!] = \lambda w \lambda i. i \subseteq \text{DAY}_{-1}(t^*)(w) \wedge \forall w' \in \text{INERT}(w, i) :$
$\exists e[\textbf{M-run}(e, w') \wedge \tau(e, w') \supseteq_{NS} i]$

e. $[\![\text{TP}]\!] = \lambda w. \exists i \subseteq \text{DAY}_{-1}(t^*)(w)[\forall w' \in \text{INERT}(w, i) :$
$\exists e[\textbf{M-run}(e, w') \wedge \tau(e, w') \supseteq_{NS} i]]$ defined iff $i \leq t^*$

The truth conditions in (77-e) can be paraphrased as 'There is a contextually familiar topic time $i$ within yesterday such that in all inertia continuations of the actual world since the end of $i$, there is at least a partial instantiation of Mary's running at the future-extending superinterval $j$ of $i$.' The branching diagram in 3.3 visualizes the truth conditions: if we assume that the inertia worlds relative to $w_0$ and $i$ are $w_3$ and $w_0$ (in other words, the actual world indeed develops in an inertial way after $i$), then in those two worlds, the event time of Mary's running either includes or is identical to the topic time.

Figure 3.3: Visualization of the apparent episodic reading




Since (77-e) only says that Mary's running event should be at least partially realized during the topic time in inertial worlds, it is weaker than a typical progressive or perfective reading in which at least partial instantiation of the event in the *actual* world is entailed. The question is, if (74) indeed denotes such a modal proposition, why it can give rise to the apparent episodic readings?

There is reason to believe that the literal meaning of (74) is in fact weak and the apparent event-in-progress reading and event completion reading arise due to various kinds of contextual enrichment. For instance, the episodic inference of (74) can in fact be canceled in certain cases, as shown in (78). In this case, the unenriched, literal meaning of the zero-marked form is close to a futurate reading with a topic time in the past, as indicated by the translation 'Mary was about to run'.[9]

(78) zuotian Mali paobu. ta hai mei pao jiu xiayu le.
yesterday Mary run she yet not run then rain LE
'Mary was about to run yesterday. It rained before she started.'

9. The difference lies in the existence/absence of forward-shifting frame adverbial below the AspP. Due to the absence of such adverbial, the temporal location of Mary's running event in the inertia continuations necessarily includes $i$. Thus the translation 'Mary was about to run' is not a precise counterpart of (77-e) since the former presupposes that Mary was not running during the topic time.

It is also possible to reinforce the episodic inference that the event is (at least partially) instantiated, as in (79).

(79) zuotian Mali paobu. turan xiayu le. dan ta haishi pao-le.
yesterday Mary run suddenly rain LE but she still run-PERF
'Mary was about to run yesterday. Suddenly it rained. But she still ran.'

The pattern is not specific to a particular verb but is productive. It is possible to cancel and reinforce the episodic inference with an accomplishment-type predicate, as in (80).

(80) a. gangcai Mali zuo yi-ge dangao, turan ting shui le, henbuxing
just.now Mary make one-CL cake suddenly stop water LE unfortunately
ta hai mei kaishi zuo
she yet not start make
'Just now Mary was about to make a cake. Suddenly there was a water cut.
Unfortunately she hasn't started'

b. gangcai Mali zuo yi-ge dangao, turan ting shui le, xinghao ta
just.now Mary make one-CL cake suddenly stop water LE fortunately she
yijing zuo-hao le
already do-complete LE
'Just now Mary was about to make a cake. Suddenly there was a water cut.
Fortunately she has already made it'

Cancelling the event realization inference for zero-marked achievements is much harder, as in (81), but in Chapter 4 I will show that the failure of defeasibility is related to the instantaneous nature of achievements, thus it does not threaten the current claim.

(81) gangcai Mali dao shan-ding. ??ta hai mei dao jiu shuaidao le
just.now Mary reach hill-top. she yet not reach then fell LE
Int: 'Just now Mary was about to reach the hill-top. She fell before reaching it.'

Crucially, denying the inference that at least part of the event is instantiated is not possible for sentences with overt aspect marking such as perfective or progressive, which indicates that those sentence entail at least partial realization of the event:

(82) (zuotian) Mali {zai} pao {-le} bu. #ta hai mei pao jiu xiayu le.
yesterday Mary PROG run -PERF foot. she yet not run then rain LE
'(Yesterday) Mary {was running, ran}. #It rained before she started.'

(83) gangcai Mali {zai} zuo {-le} yi-ge dangao. #turan ting shui le,
just.now Mary PROG drink -PERF one-CL cake suddenly stop water LE
henbuxing ta hai mei kaishi zuo
unfortunately she yet not start make
'Just now Mary {was making, made} a cake. Suddenly there was a water cut. #Unfortunately she hasn't started'

The contrast between the zero-marked sentence and the overtly marked sentences argues against Smith (1997)'s proposal that zero-marked sentences have neutral viewpoint aspect, which is underspecified between a perfective reading and a progressive one. A formal characterization of the neutral aspect can be found in Pancheva (2003).

(84) $[\![\text{NEUTRAL}]\!] = \lambda P \lambda t_{TOP}.\exists e[P(e) \wedge \tau(e) * t_{TOP}]$ (from Pancheva (2003))
where $\tau(e) * t_{TOP} := \tau(e) \circ t_{TOP} \wedge \exists t[t \in t_{TOP} \wedge t \notin \tau(e) \wedge \forall t'[t' \in \tau(e) \rightarrow t < t']]$

But we've seen that the literal meaning of a zero-marked sentence is weaker than the counterpart marked by overt progressive and perfective marking since the latter entails at least part of the event is instantiated, while the former merely implicates so.

In the next chapter, I will elaborate on how an apparent episodic interpretation of a zero-marked sentence arise via contextual enrichment from its weak imperfective semantics. One source of enrichment is that when the instantiation of the relevant event is presupposed (with projective focus, advancing), the interpretation of the zero-marked form incorporates this part of existing information in the common ground (following how Grønn 2004 treats Russian factual imperfectives). Another source is that when the instantiation of the relevant is not obviously in the common ground but is not at-issue, the episodic inference arises as a result of the interaction between the hearer's Gricean reasoning and the inertia modal semantics. The context-sensitivity of the episodic uses of

imperfective forms can be attributed to the availability of those kinds of contextual enrichment. But the important point in this section is that the literal meaning of zero-marked sentence in episodic use comes from the imperfective semantics, which is underspecified and compatible with a perfective or progressive interpretation.

## 3.5 Summary

This chapter argued that the zero-marked sentences in Chinese are imperfective sentences. There are two major motivations for this claim. Firstly, zero-marked sentences can indeed convey typical imperfective readings such as the habitual/generic characterizing readings, futurate readings, continuous readings and (the constrained) progressive readings. Secondly, while at first sight it is surprising that zero-marked sentence can convey event-completion readings in certain contexts, such use of imperfective forms is in fact not uncommon cross-linguistically. More interestingly, the licensing conditions of using imperfective forms to convey event-in-progress readings or event-completion readings in some Romance and Slavic languages heavily overlap with the conditions that allow zero-marked sentences in Chinese to obtain episodic readings. The parallel between different languages is shown in Table 3.1.

Table 3.1: Restricted episodic uses of imperfectives in different languages

| Imperfective form | Romance | Russian | Chinese |
|---|---|---|---|
| Habitual, Continuous | ✓ | ✓ | ✓ |
| Event-in-progress | ✓ (Constrained in Spanish) | ✓ | Constrained |
| Event-in-completion | Constrained | Constrained | Constrained |

Based on those motivations, I provided a modal-temporal analysis for the imperfective aspect, which can directly or indirectly derive the habitual/generic characterizing readings, futurate readings, continuous readings. For the (constrained) progressive and event-completion readings, I showed that the apparent episodic inference is not entailed in those sentence. How the core semantics of the imperfective aspect is adjusted in different

uses is summarized in (85).

(85) $[\![\varnothing_{\text{IMPF}}]\!] = \lambda P \lambda w \lambda i . \forall w' \in \text{INERT}(w, i) : \mathit{INCL}(n(P), i, w')$

| Imperfective uses in Mandarin | the value of $n$ | forward-shifting Adv | INERT |
|---|---|---|---|
| Habitual/Generic reading | *pl* | no | not vacuous |
| Continous reading | *pl* | no | vacuous |
| Futurate reading | vacuous | yes | not vacuous |
| Apparent episodic reading | *sg* | no | not vacuous |

In the next chapter, I turn to the question why zero-marked eventive sentences can sometimes give rise to apparent episodic readings as in (86)-(87) but often cause incompleteness in other cases like in (88).

(86) Contextual enrichment by anaphora resolution

a. zhiyou MALI paobu.
only Mary run
'Only [Mary]$_F$ ran.'

b. Mali PAOBU, Yuehan YOUYONG.
Mary run John swim
'[Mary]$_{CT}$ [ran]$_F$, [John]$_{CT}$ [swam]$_F$'

(87) Contextual enrichment by Gricean reasoning

a. Mali faxian [mingtian hen re]
Mary discover tomorrow very hot
'Mary discovered that it is hot tomorrow' (Evidential use)

b. zuotian Mali paobu. turan xiayu le.
yesterday Mary run suddenly rain LE
'Yesterday Mary {was running, ran}. It rained suddenly.' (Narratives)

(88) ??zuotian Mali paobu

yesterday Mary run

Int: 'Yesterday Mary {ran, was running}'

I propose that the apparent episodic interpretations are enabled by either anaphoric resolution (when the aspectual information of the event described by the IMPF-marked predicate is already in the common ground) or by Gricean reasoning (the aspectual information of the event described by the IMPF-marked predicate is not in the common ground but is automatically taken for granted). When the event instantiation is at issue in the context, I argue that none of the contextual enrichments can work, so that it is not possible for the sentence to convey an episodic reading.

# CHAPTER 4

# A PRAGMATIC ACCOUNT OF INCOMPLETENESS

## 4.1 Introduction

This chapter provides a pragmatic account of temporal incompleteness, namely the restricted episodic uses of zero-marked eventive sentences (i.e. imperfective sentences). I propose that the context-sensitive incompleteness essentially reflects two opposed forces in inference strategies in the communication (Zipf 1949; Atlas and Levinson 1981; Horn 1984): the R principle which enriches the literal meaning of an utterance by considering what needs not be said due to its salience or stereotypicality, and the Q principle which enriches the literal meaning of an utterance by considering what could have been said to better achieve the discourse goal. In particular, I argue that the R principle is responsible for the fact that zero-marked eventive sentences can at least in some cases give rise to episodic readings without entailing them, while the Q principle is responsible for the fact that zero-marked sentences generally sound degraded on episodic interpretations when the event occurrence is at-issue.

The chapter is organized as follows. Section 4.2 gives an overview of the two main components that the pragmatic analysis relies on: (i) the Q and R principles developed in Horn (1984) based on the Gricean theory of implicatures; (ii) a formal dynamic modeling of at-issue and not-at-issue updates and anaphoric relations in the discourse (AnderBois et al. 2015). Section 4.3 illustrates how imperfective forms give rise to apparent episodic readings via the R principle, and explains why this implicature behaves like a presupposition in the case of zero-marked sentences with projective focus but not in the other cases such as narratives or evidential uses. Section 4.4 shows that why the enrichment based on the R principle is not always available, and its availability depends on whether the event instantiation during the topic time is at-issue. Section 4.5 concludes.

## 4.2 Two main components

### 4.2.1 From Gricean program to Horn's division of pragmatic labor

Grice (1967) first points out that the (non-natural) meaning of an utterance consists of not only the truth-conditional aspects contributed by the lexical meaning of each word and how they are syntactically combined (*what is said*), but also the implications derived as a result of a hearer's reasoning about the speaker's intention of making an utterance under a certain context (*conversational implicatures*). [1] Take Bill's utterance in (1) for instance, while the uttered sentence literally means 'Mary ate at least some of the cake', which leaves it open whether she ate all of it or not, in this context we tend to get the implication that she didn't eat all of the cake. We use '$\rightsquigarrow$' to mark this kind of non-literal meaning.

(1) Ann: Is there any cake left? I am hungry.
Bill: Mary ate some of the cake.
$\rightsquigarrow$ Mary didn't eat all of the cake.

According to Grice, conversation implicatures arise because the participants in the discourse are assuming each other to behave rationally and cooperatively, following the *Cooperative Principle* and four maxims under it as in (2).

(2) *Cooperative Principle* (Grice 1967): "Make your contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."

a. *Maxim of Quality*:

1. Do not say what you believe to be false.
2. Do not say that for which you lack adequate evidence.

1. Grice also discusses another kind of implicatures that are encoded conventionally (*conventional implicatures*) as opposed to *what is said*, but we will ignore this category since they are not directly relevant to the current discussion.

b. *Maxim of Quantity*:

   1. Make your contribution as informative as is required (for the current purposes of the exchange)
   2. Do not make your contribution more informative than is required.

c. *Maxim of Relation*: Be relevant

d. *Maxim of Manner*:

   1. Avoid obscurity of expression.
   2. Avoid ambiguity.
   3. Be brief.
   4. Be orderly.

Our implementation of Gricean program relies on a taxonomy of the maxims proposed by Horn (1984). Horn sorts the conversational maxims in (2) (except for Maxim of Quality[2]) into two general principles that correspond to the Force of Unification (speaker's Economy) and the Force of Diversification (hearer's Economy) respectively, which are two competing forces in communication that forge language change as first argued by Zipf (1949), as in (3). The Q Principle (or hearer's Economy) represents the need for the speaker to convey as much as possible (if relevant), which is mainly covered by the first maxim of Quantity ($\text{Quantity}_1$). The R Principle (or speaker's Economy), on the other hand, represents the speaker's preference to make the least effort, namely to utter as little as possible as long as the intended full message can be recovered by the hearer, which includes Relation, Manner, and the second maxim of Quantity ($\text{Quantity}_2$).

(3) a. The Q Principle (Hearer-based):
   Make your contribution sufficient (c.f. $\text{Quantity}_1$)
   Say as much as you can (given R)

2. As noted by Grice as well, Maxim of Quality has a special status and is already included in the felicity conditions of performing the relevant speech act (i.e. making an assertion).

Lower-bounding principle, induing upper-bounding implicata

b. The R Principle (Speaker-based):

Make your contribution necessary (c.f. Relation, Quantity$_2$, Manner)

Say no more than you must (given Q)

Upper-bounding principle, induing lower-bounding implicata

The Q Principle essentially generates upper-bounding implicatures. A hearer tends to reason that the speaker means no more than what s/he utters, because otherwise s/he should have uttered the more informative alternative by Quantity$_1$. An example of Q-based, upper-bounding implicatures is scalar implicatures as in (4), which are negations of the more informative alternatives to the uttered form.

(4) a. She ate *some* of the cake.

→ ('entails') She ate at least some, potentially all of the cake.

$\rightsquigarrow_Q$ It is not the case that she ate *all* of the cookies.

Together: She ate some but not all of the cake.

b. She ate *three* cookies.

→ She ate at least 3 cookies.

$\rightsquigarrow_Q$ It is not the case that she ate {*three, four, five* ...} cookies.

Together: She ate exactly 3 cookies.

c. She ate cookies *or* candies.

→ She ate at least one of them, cookies or candies, potentially both.

$\rightsquigarrow_Q$ It is not the case that she ate cookies *and* candies.

Together: She ate either cookies or candies but not both.

Those implicatures are called "scalar implicatures" because their derivations intuitively rely on a scale of expressions ordered by their informativeness (a Horn scale) as in (5).

(5) a. $\langle some, all \rangle$

b. $\langle three, four, five, \ldots \rangle$

c. $\langle or, and \rangle$

The formal details of deriving scalar implicatures will be postponed to Section 4.4.1 when they are relevant.

Turning to the R principle, it generates lower-bounding implicatures, namely the enrichments from what is said to something more precise based on the world knowledge. Atlas and Levinson (1981) and Levinson (1983, 2000) spell out the intuition behind the principle as in (6) and (7).

(6) The Principle of Informativeness: Read as much into an utterance as is consistent witth what you know about the world. (Levinson 1983: 146-147)

(7) If a predicate Q is semantically nonspecific with respect to predicates $\mathrm{P}_i$, $1 \leq i \leq n$, but for some $j$, $1 \leq j \leq n$, $\mathrm{P}_j$ is stereo-typical of Qs, then in saying 'Q(t)' a speaker will convey '$\mathrm{P}_j$(t)'. (Atlas and Levinson 1981: 42)

Some examples of R implicatures are given in (8). In (8-a), while the utterance is underspecified in terms of whose finger is broken, the fact that the speaker doesn't utter more indicates that it is not necessary to do so because the hearer can infer it to be the unmarked situation (i.e. the speaker's finger is broken instead of others's) (by $\text{Quantity}_2$). (8-b) represents a different application of the R principle: the speaker uses the more marked expression 'produced ...' instead of the shorter one 'sang', and s/he must do so for a reason, probably indicating that John did the singing not in the stereotypical way. This is an example of 'flouting' the maxim of Manner, that the speaker's purposeful violation of a maxim can also generate implicatures.

(8) a. I broke a finger.

$\rightsquigarrow_R$ I broke my finger.

b. John produced a series of sounds that corresponded closely with the score of 'Home sweet home'.

$\rightsquigarrow_R$ John sang 'Home sweet home' in an untypical way. (He did not sing well.)

In Section 4.3, I will show that a zero-marked imperfective sentence can give rise to an episodic reading via the R principle, but as discussed in Section 4.4 this R-based enrichment is sometimes blocked by an opposite scalar implicature due to the Q principle, namely when the event instantiation within the topic time is at-issue.

### 4.2.2 A formal dynamic theory of (not-)at-issue updates

In Chapter 2, I relied on the notion of at-issueness to characterize what is shared by the cases in which zero-marked forms can give rise to episodic readings. Before we present any formal analysis of the context-sensitive incompleteness, it is necessary to first provide a consistent theory of discourse in which the contribution of at-issue and not-at-issue information can be formally distinguished. This section adopts a recent unidimensional dynamic framework developed in AnderBois et al. (2015) (based on Stalnaker 1978; Groenendijk and Stokhof 1991; Roberts 1996/2012; Farkas and Bruce 2010), which is suitable for our purpose as it not only distinguishes between how at-issue and not-at-issue information is added to the Common Ground (/Context Set), but also keeps track of the anaphoric information across at-issue and not-at-issue updates.

According to the classic dynamic theory (Heim 1982; Groenendijk and Stokhof 1991), the meaning of a sentence lies in the way how it changes the Stalnakerian Context Set, which is the set of worlds that are still live options. As pointed out by AnderBois et al. (2015), if we model the Context Set with a world variable $w^{cs}$, there is only one way to update the CS, namely eliminating worlds by eliminating assignments, and incrementally restricting the CS. In order to distinguish between at-issue and not-at-issue contents,

AnderBois et al. propose to treat discourse contexts as sets containing the classic Stalnakerian Context Set and all their subsets, and use the designated propositional variable $p^{cs}$ to store the current Context Set (CS). For an at-issue assertion, it puts forth a proposal, which is stored with a propositional discourse referent (*dref* henceforth), $p$, to update the CS by restricting possible future contexts to those that have non-empty intersections with $p$, namely $p^{cs} \cap p$. If accepted, the CS is updated by assigning a new value to the dref $p^{cs}$ (':=' is used to indicate (re)assignment of values to variables):

(9) $p^{cs} := p^{cs} \cap p$

For not-at-issue information such as the content of appositives, it does not put forth a proposal and directly eliminate the assignments that assign to $p^{cs}$ at least one world in which the proposition is not true. Following Farkas and Bruce (2010), we argue that the update of not-at-issue content happens automatically without regular negotiation associated with at-issue content. We further distinguish between not-at-issue but new information and presuppositions, while the former constitutes an update of the CS, the latter are preconditions on the input Context Set.

We follow AnderBois et al. in implementing the analysis of different kinds of updates in an extension of Dynamic Predicate Logic (Groenendijk and Stokhof 1991). Our models consist of domains of individuals $\mathcal{D}$, eventualities $\mathcal{E}$, temporal intervals $\mathcal{T}$, and possible worlds $\mathcal{W}$, and the interpretation function $\mathcal{I}$ that assigns a subset of $\mathcal{D}_n$ to any $n$-ary relation $\mathcal{R}$ relative to any world $w$, i.e., $\mathcal{I}_w(\mathcal{R}) \subseteq \mathcal{D}^n$. We have variables over individuals ($x, y, z$...), eventualities ($e_1, e_2, ...$), temporal intervals ($i_1, i_2, ...$), and worlds ($w, w', ...$) and propositions/sets of worlds ($p, p', p^{cs}, q, l, m, ...$), and the usual inventory of non-logical constants: individual constants (**John**, . . .), properties (**person**, **yesterday**, ...), $n$-relations (**meet**, ...), etc. Formulas are interpreted relative to a pair of assignments $\langle g, h \rangle$, i.e., they denote binary relations between an input assignment $g$ and an output assignment $h$. The relevant components of the formal interpretation system are illustrated as follows:

(10) Introducing new variables:

a. $[\![[v]]\!]^{\langle g,h\rangle} = 1$ iff for any variable $v'$ s.t. $v' \neq v$: $g(v') = h(v')$

b. $[\![[x_p]]\!]^{\langle g,h\rangle} = 1$ iff

(i) for any variable $x'$ s.t. $x' \neq x$: $g(x') = h(x')$, and

(ii) $\begin{cases} \textbf{Dom}(h(x)) = h(p^{cs}) \text{ if } p \subseteq p^{cs} \text{ is the at-issue proposal} \\ \textbf{Dom}(h(x)) = h(p) \text{ otherwise} \end{cases}$

(11) Atomic formulas:

a. $[\![R_p(x_1, ..., x_n)]\!]^{\langle g,h\rangle}$ is defined iff for any $i \in \{1, .., n\}$, $h(p) \subseteq \textbf{Dom}(h(x_i))$.

b. If defined, $[\![R_p(x_1, ..., x_n)]\!]^{\langle g,h\rangle} = 1$ iff $g = h$ and for all worlds $w \in h(p)$: $\langle h(x_1)(w), ..., h(x_n)(w)\rangle \in \mathcal{I}_w(R)$

(12) Complex formulas:

a. $[\![\phi \wedge \psi]\!]^{\langle g,h\rangle} = 1$ iff there exists an assignment $k$ such that $[\![\phi]\!]^{\langle g,k\rangle} = 1$ and $[\![\psi]\!]^{\langle k,h\rangle} = 1$.

b. $[\![\textbf{NOT}_p^{p'}(\phi)]\!]^{\langle g,h\rangle} = 1$ iff

(i) $[\![[p'] \wedge \phi]\!]^{\langle g,h\rangle} = 1$, and there is no $h'$ s.t. $[\![[p'] \wedge \phi]\!]^{\langle g,h'\rangle} = 1$ and $h(p') \not\subseteq h'(p')$ and

(ii) $h(p) \cap h(p') = \emptyset$

c. $[\![\textbf{INERT}_{p,i}^{p'}(\phi)]\!]^{\langle g,h\rangle} = 1$ iff

(i) $[\![[p'] \wedge \phi]\!]^{\langle g,h\rangle} = 1$, and there is no $h'$ s.t. $[\![[p'] \wedge \phi]\!]^{\langle g,h'\rangle} = 1$ and $h(p') \not\subseteq h'(p')$ and

(ii) for all $w \in h(p)$, $\textbf{INERT}(w, i) \supseteq h(p')$

d. $[\![\textbf{possible}_p^{p'}(\phi)]\!]^{\langle g,h\rangle} = 1$ iff

(i) $[\![[p'] \wedge \phi]\!]^{\langle g,h\rangle} = 1$, and there is no $h'$ s.t. $[\![[p'] \wedge \phi]\!]^{\langle g,h'\rangle} = 1$ and $h(p') \not\subseteq h'(p')$ and

(ii) for all $w \in h(p)$, $\textbf{MB}(w) \cap h(p') \neq \emptyset$

Let us illustrate the system with several examples. For the Chinese imperfective sentence in (13), it contributes an at-issue proposal as in (14). Since we will not deal with habitual sentences in the rest of this chapter, for convenience I will abbreviate the contribution of the imperfective aspect in (13) as an intensional relation between properties of eventualities and temporal intervals, as in (14) and (15). I leave out certain details in the static representation of the imperfective proposed in Chapter 3 (as repeated in (16)) because for the apparent episodic use, it involves a singular event (in inertia worlds) and this is equivalent to saying that in the inertia worlds, there exists a singular event whose running time is a regular superset of the topic time $i$, as abbreviated in (15). The contribution of tense is also left out in the representation for simplicity.

(13) xianzai Yuehan paobu.
now John run
'John is going to run now'. (futurate reading)

(14) a. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $[i] \wedge \mathbf{now}_p(i) \wedge [x] \wedge x = \mathbf{John} \wedge \mathbf{IMPF}^{p'}_{p,i}(\mathbf{run}(x), i) \wedge$

c. Acceptance: $[p^{cs}] \wedge p^{cs} = p$

(15) Abbreviations of imperfective (for apparent episodic use):
$\mathbf{IMPF}^{p'}_{p,i}(\mathbf{run}(x), i)$ stands for $\mathbf{INERT}^{p'}_{p,i}([e_{p'}] \wedge \mathbf{run}_{p'}(e, x) \wedge \tau_{p'}(e) \supseteq i)$

(16) For the apparent episodic use: the $n$ variable is set to $sg$.
$[\![\varnothing_{\text{IMPF}_{sg}}]\!] = \lambda P_{\langle s,vt\rangle} \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \mathit{INCL}(sg(P)(w'), i, w')$
$= \lambda P_{\langle s,vt\rangle} \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \exists e[P(e, w') \wedge \tau(e, w') \supseteq_{NS} i]$
$= \lambda P_{\langle s,vt\rangle} \lambda w \lambda i. \forall w' \in \text{INERT}(w, i) : \exists e[P(e, w') \wedge \tau(e, w') \supseteq i]$

Furthermore, while I argue that stative sentences are also imperfective sentences, since we've shown in Chapter 3 that the contribution of the inertia modality is vacuous, I will leave out the modal part for sentences like (17), as in (18).

(17) zuotian Mali hen nanguo.
yesterday Mary very sad
'Mary was sad yesterday'

(18) a. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $[i] \wedge \textbf{yesterday}_p(i) \wedge [x] \wedge x = \textbf{Mary} \wedge [s] \wedge \textbf{sad}_p(s, x) \wedge \tau_p(s) \supseteq i \wedge$

c. Acceptance: $[p^{cs}] \wedge p^{cs} = p$

I illustrate how at-issue and not-at-issue information is added to the Context Set differently with an English sentence containing an appositive such as (19), as in (20). The semantic content of the appositive is directly added to the Context Set, while the content of the matrix clause is stored with a propositional dref which restricts the Context Set only after being accepted.

(19) John, who met Mary yesterday, is worried now.

(20) a. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $[x] \wedge x = \textbf{John} \wedge$

c. Imposal: $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge [y] \wedge y = \textbf{Mary} \wedge [e_1] \wedge \textbf{meet}_{p^{cs}}(e_1, x, y) \wedge \tau_{p^{cs}}(e_1) \subseteq i_1 \wedge$

d. Issue: $[i_2] \wedge \textbf{now}_p(i_2) \wedge [s_2] \wedge \textbf{worried}_p(s_2, x) \wedge \tau_p(e_2) \supseteq i_2 \wedge$

e. Acceptance: $[p^{cs}] \wedge p^{cs} = p$

Lastly, while AnderBois et al. do not mention how implicatures are represented in this system, I will present implicatures as part of the discourse update (but are generally defeasible) as well, as in (21).

(21) Updating the discourse with 'John broke a finger yesterday'.

a. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $[x] \wedge x = \textbf{John} \wedge [i] \wedge \textbf{yesterday}_p(i) \wedge [y] \wedge \textbf{finger}_p(y) \wedge [e] \wedge \textbf{break}_p(e, x, y) \wedge$

c. $\rightsquigarrow_R$ **possession**$_p(x, y)\wedge$

d. Acceptance: $[p^{cs}] \wedge p^{cs} = p$

I will mostly stick to the dynamic framework presented here in this chapter except for Section 4.4.1, in which I switch back to the static framework to discuss how scalar implicatures are derived generally, because the dynamic discourse effect of utterances is not relevant there. But the switch between those two systems is only for convenience and once we complete calculation of the scalar implicatures, we can represent the ultimate contribution of the implicatures in the dynamic framework straightforwardly as in (21).

## 4.3 Deriving episodic readings via the R principle

This section shows that the zero-marked imperfective sentences in Chinese can give rise to episodic readings via the R principle. I will distinguish between two slightly different cases of how the R-based reasoning leads to episodic readings. The first case is that an imperfective sentence gets strengthened into an episodic reading by incorporating the existing information of a context-familiar temporal interval and an eventuality into its interpretation (Grønn 2004; Altshuler 2014), and that process is made possible via the R-based implicature that what is *salient* in the context needs not be said. The second is that an imperfective sentence gets strengthened into an episodic reading due to the R-based implicature that what is *stereotypical* needs not be said (Horn 1984; Bar-el et al. 2005). While both cases similarly involve the spirit of R-based reasoning, Section 4.3.1 shows that making this distinction is necessary because the piece of information concerning the relation between the Eventuality Time and Topic Time can have different not-at-issue (NAI) statuses in different licensing contexts of zero-marked sentences. Section 4.3.2 and 4.3.3 illustrate how each kind of enrichment based on the R principle works respectively.

### 4.3.1 Different NAI statuses

In Chapter 2, I showed that zero-marked eventive sentences can give rise to episodic readings in the following contexts (repeated in (22)-(24)). I also argued that what is shared by those contexts is that the relation between Eventuality Time and Topic Time (/Reference Time) is not at issue (i.e. not directly addressing the QUD).

(22) zuotian Mali (shi) he NATIE.
yesterday Mary be drink Latte
'Yesterday Mary {is/was drinking, drank} [Latte]$_F$.' (Projective focus)

(23) zuotian Mali shuo [Yuehan chi-le du mogu].
yesterday Mary say [John eat-PERF poisonous mushroom]
'Yesterday Mary said that John ate poisonous mushrooms.' (Evidential use)

(24) a. zaoshang Mali qichuang, he kafei, (ranhou) qu xuexiao.
morning Mary get.up drink coffee then go school
'This morning Mary got up, drank coffee, and went school.' (Advancing)

b. gangcai Mali he kafei, turan beizi sui-le.
just.now Mary drink coffee suddenly cup break-LE
'Just now Mary was drinking coffee. Suddenly the cup broke' (Non-advancing)

c. 1879 nian, Aidisheng faming baichideng.
1879 year Edison invent light.bulb
'In 1879, Edison invented light bulbs' (Historical)

In this section, I'd like to further distinguish the status of being not-at-issue and old (/presupposed) versus the status of being not-at-issue but new (/pre-updated). I show that the piece of information stating the aspectual relation is presupposed in the case of projective focus but is pre-updated to the Common Ground in the case of evidential use or narratives. There are two pieces of evidence for such a distinction.

Firstly, we've already seen in Section 2.4 of Chapter 2 that when applying the different tests for NAI information to the contexts in (22)-(24), the results of the dissent/consent test differ. In Chinese, we have a set of responsive particles (*shide* 'yes', *bushide* 'no') that can target the distinction we are interested in here, namely whether a piece of information

is old or new. Let us look at some baseline examples. In (25), A utters a sentence with the exclusive focus operator 'only', which presupposes the prejacent and asserts an exclusive inference ('All the other contextually-relevant people besides Mary are not Shanghainese'). While we can use *shide* 'yes' or *bushide* 'no' to target the assertion (which is the new information proposed to update the CG), as in $B_1$, it is quite odd to do so with the presupposed information as in $B_2$. By contrast, it is possible to dissent with the presupposed information with a marked means such as *dengdeng* 'Wait a minute!' (Fintel 2004) as in $B_3$, just like in English.

(25) A: zhiyou MALI shi Shanghai ren.
only Mary be Shanghai people
'Only [Mary]$_F$ is Shanghainese'

$B_1$: shide, qita ren dou bu shi Shanghai ren /bushide, Lisi ye shi Shanghai ren.
yes other people DOU not be Shanghai people no Lisi also be Shanghai people
'Yes, all the other people are not Shanghainese / No, Lisi also is Shanghainese'

$B_2$: #shide, Mali shi Shanghai ren / #bushide, Mali bu shi Shanghai ren.
yes Mary be Shanghai people no Mary not be Shanghai people
'Yes, Mary is Shanghainese / No, Mary isn't Shanghainese'

$B_3$: dengdeng, Mali bu shi Shanghai ren!
wait Mary not be Shanghai people
'Wait a minute, Mary isn't Shanghainese!'

The particles *shide* and *bushide* can not only target main assertions, but also secondary assertions, as long as they contribute new information. A typical case of secondary assertions is the content conveyed by nonrestrictive relative clause (Potts 2005). As in (26), both the proposition conveyed by the matrix sentence and the proposition conveyed by the non-restrictive relative clause can be targeted by *shide* or *bushide*. [3]

3. There is still some difference between using *shide* to target the secondary assertion and using it to target the main assertion – the former is slightly degraded, which might be explained by their difference w.r.t. Q-at-issueness (Koev 2018).

(26) A: na-ge xuesheng, Mali jiao-guo de, shi Shanghai ren.
that-CL student Mary teach-EXP DE be Shanghai people
'That student, who Mary taught before, is Shanghainese'

$B_1$: shide, ta shi Shanghai ren / bushide, ta bu shi Shanghai ren.
yes he be Shanghai people no he not be Shanghai people
'Yes, he is Shanghainese / No, he isn't Shanghainese'

$B_2$: ?shide, Mali jiao-guo ta / bushide, Mali mei jiao-guo ta.
yes Mary teach-EXP him no Mary not teach-EXP him
'Yes, Mary taught him before / No, Mary didn't teach him before'

Now we can turn to the cases in which zero-marked eventive sentences give rise to episodic readings. In the case of projective focus, it is very odd to directly assent with *shide* or dissent with *bushide* the information that the eventuality is (partially) instantiated (i.e. there exists some event of Mary drinking during the topic time), as in (27). Instead, *dengdeng* 'Wait a minute' can be used naturally to target this inference.

(27) A: zuotian Mali (shi) he NATIE 'Yesterday Mary drank [Latte]$_F$'

B: #shide, ta he-le dongxi. / #bushide, ta mei he dongxi.
yes she drank-PERF thing no she not$_{PERF}$ drink thing
'#Yes, she drank something. / #No, she didn't drink anything'

B': dengdeng, Mali mei he dongxi!
wait Mary not drink thing
'Wait a minute, Mary didn't drink anything!'

But in the case of evidential use or narratives, it is less odd to target the actuality inference with *shide* or *bushide*, as in (28) and (29)-(31).

(28) A: zuotian Mali shuo [Yuehan chi-le du mogu].

'Yesterday Mary said that John ate poisonous mushrooms.'

B: shide, Mali shuo-le / bushide, Mali mei shuo.
yes Mary say-EXP no Mary not say
'Yes, Mary said it / No, Mary didn't say it'

(29) A: zaoshang Mali he kafei, (ranhou) qu xuexiao.

'This morning Mary drank coffee, and went to school.'

B: shide, {ta zuo-le yi xilie de shi /ta he-le kafei /ta qu-le
yes she do-PERF a series DE thing she drink-PERF coffee she go-PERF
xuexiao} / bushide, {ta shenme dou mei zuo/ ta mei he kafei/ ta mei
school no she what DOU not do she not drink coffee she not
qu xuexiao}.
go school
'Yes, she {did a series of things /drank coffee /went to school} / No, she didn't {do anything, drink coffee, go to school}'

(30) A: gangcai Mali he kafei, turan beizi sui-le.

'Just now Mary was drinking coffee. Suddenly the cup broke.'

B: shide, ?ta zai he kafei / bushide, ta shenme dou mei zai he.
yes she PROG drink coffee no she what DOU not PROG drink
'Yes, she was drinking coffee / No, she wasn't drinking coffee'

(31) A: 1879 nian, Aidisheng faming baichideng. 'In 1879, Edison invented light bulbs'

B: shide, ta faming-le / bushide, ta mei faming.
yes he invent-PERF no he not invent
'Yes, he did / No, he didn't'

The reason is that for the information that is taken to be already in the Common Ground, there is no need to accept it and some marked means (e.g. 'Wait a minute' as in Fintel 2004) is often needed in order to reject it. In contrast, if some information is new, it is more natural to indicate assent or dissent with it.

Another piece of evidence is that while the zero-marked sentence with projective focus cannot be uttered in an out-of-the-blue context, the zero-marked sentence in evidential use or within some narrative can be. Imagine a context in which Ann has been traveling in the past month and when she returned to her city, she bumped into her friend Beth. Mary and John are their friends. Under this context, it is very odd to utter a (zero-marked) sentence with projective focus.

(32) Ann: Hey, we haven't met for a while. Anything new?

Beth: #zuotian banye Mali (shi) he NATIE. 'Last midnight Mary drank [Latte]$_F$'

But for the other two cases, they are not that odd in this out-of-the blue context:

(33) Ann: Hey, we haven't met for a while. Anything new?

Beth: zuotian Mali shuo [Yuehan chi-le du mogu].
yesterday Mary say [John eat-PERF poisonous mushroom]
'Yesterday Mary said that John ate poisonous mushrooms.'

(34) Ann: Hey, we haven't met for a while. Anything new?

Beth: zuotian banye, Mali qichuang, he kafei, qu xuexiao.
yesterday midnight Mary get.up drink coffee go.to school
'Last midnight, Mary got up, drank coffee, and went to school.'

(35) Ann: Hey, we haven't met for a while. Anything new?

Beth: zuotian, caomei yinyue jie kaimu.
yesterday strawberry music festival start
'Yesterday, Strawberry Music Festival got started.'

This contrast is not surprising since presuppositions are usually taken to be requirements on the input Common Ground, and it is not always easy to accommodate presuppositions in the context above. In contrast, if some information is pre-updated to the Common Ground, it does not impose any requirement on the input Common Ground.

In sum, among various kinds of licensing conditions of the episodic use of zero-marked sentences, it is necessary to distinguish between the case of projective focus and the cases of evidential use and narratives. While the information that the event is (partially) instantiated is not-at-issue in all those cases, in the former it is presupposed while in the latter it is pre-updated to the Common Ground. The next two sections formalize how zero-marked sentences give rise to episodic interpretations via the R Principle.

### 4.3.2 What is salient needs not be said

This section proposes a formal analysis of how zero-marked eventive sentences obtain apparent episodic interpretations when they contain projective focus, with their literal meaning being weak imperfective semantics. Let us start with an example containing elaboration focus such as (36), in which case the information that John met someone is already in the Common Ground upon B's utterance.

(36) A: zaoshang Yuehan jian-le yi-gen ren.
morning John meet-PROG one-CL person
'John met a person this morning. '

B: dui. ta (shi) jian MALI.
right he be meet Mary
'Right. He met [Mary]$_F$.' (Elaboration focus)

This case resembles the so-called 'presuppositional imperfectives' in Russian and I adopt a very similar analysis from Grønn (2004) and Altshuler (2014) to capture the data in Chinese. The main idea is that for the zero-marked imperfective sentence in (36), the event it describes can find an event antecedent in the preceding discourse, so that whatever has been said about that antecedent (e.g. whether it is ongoing or completed relative to the topic time) can be incorporated into the interpretation of the zero-marked sentence. In (36) for instance, how the zero-marked sentence gets enriched via the presupposed information can be informally characterzied in (37).

(37) For the zero-marked sentence *ta jian MALI* in the context of (36):

a. Literal meaning: In the inertia continuations of a contextually-familiar (temporal) interval, John met Mary.

b. What is presupposed: John met a person within a contextually-familiar interval.

$\Rightarrow$ Combining a and b: John met Mary within a contextually-familiar interval.

The reasoning process in (37) is intuitive, but once the discourse change in (36) is truthfully translated into the dynamic framework introduced in Section 4.2.2, as in (38), more needs to be said about how the presupposed aspectual information is 'incorporated' into the interpretation of the zero-marked sentence. As in (38), A's utterance introduces a topic time dref, $i_1$, and asserts that a meeting event is completed in $i_1$. For B's utterance, it asserts an imperfective predication (elaborated in (39)) involving a temporal interval $i_2$, and due to the presence of elaboration focus, I argue that $i_2$ is anaphoric to $i_1$.

(38) a. Proposal$_A$: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue$_A$: $[i_1] \wedge \mathbf{morning}_p(i_1) \wedge [x] \wedge x = \mathbf{John} \wedge [y] \wedge \mathbf{person}_p(y) \wedge [e_1] \wedge \mathbf{meet}_p(e_1, x, y) \wedge \tau_p(e_1) \subseteq i_1 \wedge$

c. Proposal$_A$ accepted: $[p^{cs}] \wedge p^{cs} = p \wedge$

d. Proposal$_B$: $[q] \wedge q \subseteq p^{cs} \wedge$

e. Issue$_B$: $[i_2] \wedge [z] \wedge z = \mathbf{Mary} \wedge \mathbf{IMPF}^{q'}_{q,i_2}(\mathbf{meet}(z)(x), i_2) \wedge$ (Anaphora: $i_2 = i_1$)
Or simply: $[z] \wedge z = \mathbf{Mary} \wedge \mathbf{IMPF}^{q'}_{q,i_1}(\mathbf{meet}(x, z), i_1) \wedge$

(39) $\mathbf{IMPF}^{q'}_{q,i_1}(\mathbf{meet}(x, z), i_1)$ stands for $\mathbf{INERT}^{q'}_{q,i_1}([e_{2_{q'}}] \wedge \mathbf{meet}_{q'}(e_2, x, z) \wedge \tau_{q'}(e_2) \supseteq i)$

However, since an imperfective sentence does not entail the existence of a relevant event in the evaluation world but only in the inertia continuations of $i_1$, the formula that represents B's utterance does not introduce a meeting event dref (whose Agent is John and whose theme is Mary) into the global domain. Just based on the truth-conditions and anaphora resolutions, we cannot achieve the reasoning in (37) because the meeting event $e_2$ introduced in the scope of a modal operator (see the elaboration of the imperfective predication in (39)) cannot be anaphoric to $e_1$ directly.

I argue that this gap can be bridged by the pragmatic reasoning based on the R principle 'Say no more than you must'. Horn (1984) cites Atlas and Levinson (1981) and Levinson (2000) for more detailed maxims under this principle such as (40), and what is especially

relevant is the maxim in (40-d), which is reduplicated from Levinson 2000.

(40) Informativeness Principle (Levinson 2000: 114)

1. Speaker's side: the maxim of Minimization. "Say as little as necessary"; that is, produce the minimal linguistic information sufficient to achieve your communicational ends (bearing Q in mind).

2. Recipient's corollary: the Enrichment Rule. Amplify the informational content of the speaker's utterance, by finding the most specific interpretation, up to what you judge to be the speaker's m-intended point, unless the speaker has broken the maxim of Minimization by using a marked or prolix expression. Specifically:

a. Assume the richest temporal, causal and referential connections between described situations or events, consistent with what is taken for granted.

b. Assume that stereotypical relations obtain between referents or events, unless this is inconsistent with (a).

c. Avoid interpretations that multiply entities referred to (assume referential parsimony); specifically, prefer coreferential readings of reduced NPs (pronouns or zeros).

d. Assume the existence or actuality of what a sentence is about if that is consistent with what is taken for granted.

Since the occurrence of a meeting event whose agent is John within $i_1$ is salient in the discourse, it is easy to accommodate that the meeting event whose agent is John and whose theme is Mary also occurred within $i_1$ and is the same event as $e_1$, since this accommodation is perfectly consistent with the literal meaning of B's utterance. This step of reasoning is represented in (41f).

(41) ...

e. $\text{Issue}_B$: $[z] \wedge z = \textbf{Mary} \wedge \textbf{IMPF}^{q'}_{q,i_1}(\textbf{meet}(x, z), i_1) \wedge$

f. $\rightsquigarrow_R [z] \wedge z = \textbf{Mary} \wedge [e_2] \wedge \textbf{meet}_q(e_2, x, z) \wedge e_1 = e_2 \wedge$

Or simply: $\rightsquigarrow_R y = z = \textbf{Mary}$

g. Proposal$_B$ accepted: $[p^{cs}] \wedge p^{cs} = q$

In words, the process of how the zero-marked imperfective sentence in (36) gives rise to an apparent episodic interpretation involves at least three components: the anaphora resolution of the topic time to an existing interval via the elaboration focus, the R reasoning which accommodates the actual occurrence of the event expressed by the predicate, and the identification of this accommodated event with an existing event whose aspectual information is already in the Common Ground.

Examples involving contrastive focus, such as (42), can be explained in a similar way. Assuming that A's question presupposes the formula in (43) is true relative to $p^{cs}$, namely both Mary and John did exercise within the topic time $i_1$ yesterday, B's utterance contributes two imperfective predications involving $i_1$, as in (44-c). Via the R principle, we can accommodate the occurrent of Mary's running event and John's swimming event within $i_1$ and identify those events with the event drefs $e_1$ and $e_2$ that are already introduced into the discourse. In this way the imperfective sentence in (42) can update the CS as if it is a perfective sentence.

(42) A: zuotian Mali he Yuehan gezi zuo-le shenme yundong?
yesterday Mary and John each do-PERF what exercise
'What exercise did Mary and John do yesterday?'

B: Mali PAOBU, Yuehan YOUYONG.
Mary run John swim
'[Mary]$_{CT}$ [ran]$_F$, [John]$_{CT}$ [swam]$_F$' (Contrastive focus)

(43) $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge x = \textbf{Mary} \wedge [e_1] \wedge \textbf{exercise}_{p^{cs}}(e_1, x) \wedge \tau_{p^{cs}}(e_1) \subseteq i_1 \wedge y = \textbf{John} \wedge [e_2] \wedge \textbf{exercise}_{p^{cs}}(e_2, y) \wedge \tau_{p^{cs}}(e_2) \subseteq i_1$

(44) a. Proposal$_B$: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $\textbf{IMPF}^{p'}_{p,i_1}(\textbf{run}(x), i_1) \wedge \textbf{IMPF}^{p'}_{p,i_1}(\textbf{swim}(y), i_1) \wedge$ (Anaphora to $i_1$)

c. $\rightsquigarrow_R [e_3] \wedge \mathbf{run}_p(e_3, x) \wedge [e_4] \wedge \mathbf{swim}_p(e_4, y) \wedge e_1 = e_3 \wedge e_2 = e_4$

Or simply: $\rightsquigarrow_R \mathbf{run}_p(e_1, x) \wedge \mathbf{swim}_p(e_2, y)$...

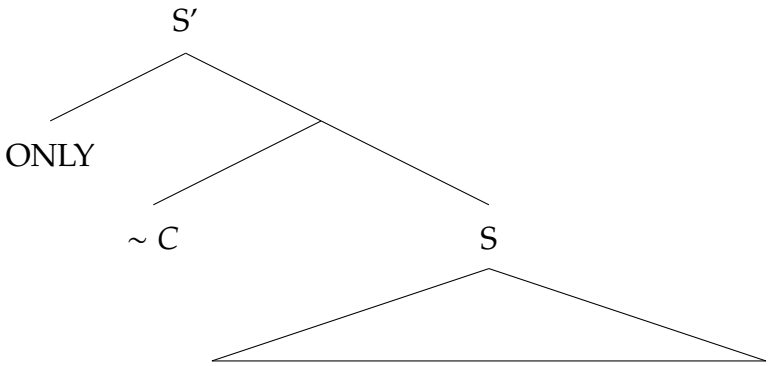
A slightly more complicated example is the one with an overt focus operator such as 'only', reproduced in (45).

(45) A: zuotian Mali he Yuehan dou pao-le bu
yesterday Mary and John DOU run-PERF foot
'Yesterday both Mary and John ran.'

B: budui! zhiyou MALI paobu
wrong only Mary run
'Wrong! Only [Mary] ran.'

Let us first look at the static semantics of a zero-marked sentence containing *zhiyou* 'only', putting the context aside. I adopt a bipartite theory of focus-sensitive operators (Quek and Hirsch 2017) such that the adnominal *zhiyou* 'only' is semantically vacuous and it is always a (covert or overt) sentential operator ONLY that contributes the exclusive semantics, as illustrated in (46). The semantics of ONLY is borrowed from the standard treatment of 'only' in Rooth (1985, 1992), which presupposes the prejacent of ONLY (i.e. the positive inference) and asserts the negation of all the contextually-relevant focus alternatives of the prejacent (i.e. the negative inference).

(46) $\text{ONLY}(p) = \lambda w : p(w).\forall p' \in C[p'(w) \rightarrow p' \subseteq p]$ (where $C \subseteq [\![\text{S}]\!]^f$)




[NONFUT[$\varnothing_{\text{IMPF}}$ [zhiyou [Mary]$_F$ run]]]

a. $[\![\text{S}]\!] = \lambda w.\exists i_1 : i_1 \leq now[\forall w' \in \text{INERT}(w, i_1) : \exists j[i_1 \subseteq_{ini} j \wedge \forall k \in \mathcal{R}_j^{inf} : \exists e[\textbf{run}(e, \textbf{Mary}, w') \wedge \tau(e, w') \circ k]]]$

b. $[\![\text{S}]\!]^f = \{\lambda w.\exists i_1 : i_1 \leq now[\forall w' \in \text{INERT}(w, i_1) : \exists j[i_1 \subseteq_{ini} j \wedge \forall k \in \mathcal{R}_j^{inf} : \exists e[\textbf{run}(e, x, w') \wedge \tau(e, w') \circ k]]] \mid x \in D_e\}$

c. $[\![\text{S}']\!] = \lambda w : [\![\text{S}]\!](w).\forall p' \in C[p'(w) \rightarrow p' \subseteq [\![\text{S}]\!]$ in which $C \subseteq [\![\text{S}]\!]^f$

Let us assume that the salient focus alternative to the prejacent include '[NONFUT[$\varnothing_{\text{IMPF}}$ [zhiyou [John]$_F$ drink Latte]]]' and '[NONFUT[$\varnothing_{\text{IMPF}}$ [zhiyou [John and Mary]$_F$ drink Latte]]]'. B's utterance asserts the negation of this alternative and presupposes $[\![\text{S}]\!]$. Turning to its dynamic representation, B's utterance contributes a formula in (47).

(47) a. Proposal$_B$: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Presupposed by Proposal$_B$: $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge x = \textbf{Mary} \wedge$ $\textbf{IMPF}^{p'}_{p,i_1}(\textbf{run}(x), i_1) \wedge [y] \wedge y = \textbf{John}$

c. Issue: $\textbf{NOT}^{p'}_{p}(\textbf{IMPF}^{p''}_{p',i_1}(\textbf{run}(y), i_1)) \wedge \textbf{NOT}^{q}_{p}(\textbf{IMPF}^{q'}_{q,i_1}(\textbf{run}(y), i_1)) \wedge ...$

Note that (47) does not exactly represent the apparent episodic interpretation of B's utterance, namely 'Only Mary ran'. The presupposition in (47) is weaker than that of the episodic interpretation 'Mary ran', and its negative inference is stronger than that of the episodic interpretation 'It is not the case that John ran and it is not the case that both John and Mary ran'. I consider the stronger assertion is not a problem since it entails 'John didn't run', and the weaker presupposition can be satisfied by the context. In (45), A's utterance asserts that Mary and John ran. For B's utterance, one can infer that B only disagrees with part of A's proposal, which is the proposition that John ran', but without signaling explicit disagreement, B should agree with A's proposal that Mary ran. In other words, the proposition 'Mary ran' is already added to the Common Ground since B does not disagree with it; thus the weak presupposition of the zero-marked sentence in B's utterance is not problematic.

In sum, this section provides a formal analysis of how zero-marked sentences containing projective focus can give rise to apparent episodic readings. The process mainly involves the anaphora resolution of the Topic Time variable introduced by the zero-marked sentence plus the pragmatic reasoning which identifies an accommodated event with an existing eventive discourse referent whose aspectual information is known.

### 4.3.3 What is stereotypical needs not be said

In this section, we turn to cases in which the event instantiation is not technically presupposed but uttering a zero-marked sentence can still give rise to episodic readings. There are two cases of this category: a zero-marked clause-embedding predicate can give rise to episodic readings on the evidential use; a zero-marked sentence within some narrative can achieve that as well. Those examples are reproduced as follows.

(48) zuotian Mali shuo [Yuehan chi-le du mogu].
yesterday Mary say [John eat-PERF poisonous mushroom]
'Yesterday Mary said that John ate poisonous mushrooms.' (Evidential use)

(49) a. gangcai Mali he kafei. ta xianzai hen jingshen.
just.now Mary drink coffee she now very refreshed
'Just now Mary {was drinking coffee, drank coffee}. She is refreshed now'

b. zaoshang Mali qichuang, he kafei, qu xuexiao.
morning Mary get.up drink coffee go.to school
'This morning Mary got up, drank coffee, and went to school.' (Advancing)

c. 1879 nian, Aidisheng faming baichideng.
1879 year Edison invent light.bulb
'In 1879, Edison invented light bulbs' (Historical)

Here is a sketch of my proposal. Since the aspectual information of the event described by the zero-marked predicate is not already in the Common Ground, the actuality inference must come from some other source, which I argue to be a stereotypicality-based R implicature in Horn (1984)'s sense. Following Bar-el et al. (2005), I show that due to the inertia modality in the semantics of $\varnothing_{\text{IMPF}}$, the hearer by default infers that the event is at least

ongoing and maybe completed from the zero-marked sentence with a past-oriented frame adverbial, unless the speaker explicitly utters information that contradicts this inference.[4] When there is no such contradictory information, this inference can further be confirmed or specified by several factors in the continuing discourse: e.g. the coherence relations between the zero-marked utterance and the utterances following it.

I first show that this actuality inference is quite 'automatic' in that it arises by default as long as the speaker does not explicitly deny it in the continuing discourse. In all the examples in (48)-(49), there is no explicit contradictory information in the discourse to prevent the inference that the event described by the zero-marked predicate is ongoing or completed within the past topic interval, and in fact this inference can be confirmed or strengthened by other factors in the discourse. In (48), when the matrix proposition is taking the evidential function, the hearer naturally infers that the matrix event has already occurred, as by world knowledge only actualized events can serve as evidence for the embedded at-issue proposition. In the narratives, the hearer can further confirm this inference based on how they consider the zero-marked sentence relates to the utterances following it in terms of the discourse coherence (Asher and Lascarides 2003; Jasinskaja and Karagjosova 2020). In a narrative such as (49-a), the most natural coherence relation one can infer between the first sentence and the second one is a 'Result' relation. By world knowledge the hearer can readily confirm that the drinking coffee event was at least partially actualized. In a narrative such as (49-b), it is natural for a hearer to infer a 'Narration' relation between the zero-marked sentences (Hobbs 1985; Asher and Lascarides 2003; Altshuler and Melkonian 2014). This relation describes a chronological report in which the order of events matches the textual order of the relevant predicates. Moreover, the hearer can further infer that it is most likely to be an advancing narration in which each event occurred right after the end of the previous event because by world knowledge

4. In some cases, it is very hard to cancel this inference, for instance achievements always get perfective reading, probably because of the instantaneous nature of those eventualities.

those actions usually cannot be done by the same person at the same time. But if we change the predicates so that the events described by them can easily have overlapping running time, then the interpretation is much more flexible, as shown in (50).

(50) zaoshang Mali he kafei, chi jianbing, kan dianshi.
morning Mary drink coffee eat pancake watch TV
'This morning Mary {was drinking coffee, drank coffee}. Shen {was eating, ate} pancakes, and {watching, watched} TV.'

In (49-c), while there is no sentence following it, I argue that it is often taken to be part of a larger historical narration in which the historical events are uttered in a chronological order. For this reason, the interpretation is that the relevant event has occurred.

Nevertheless, the event-ongoing or event-completion interpretation of the zero-marked sentence in (48)-(49) is just a result of the hearer's confirmation of the default actuality inference based on their understanding of discourse coherence or other factors in the discourse. This default actuality inference is defeasible, as the speaker can explicitly deny it without contradicting herself. The defeasibility is shown in (51)-(53): in those cases, the actuality inference is canceled, and the zero-marked sentence is interpreted as the literal meaning, which can be roughly paraphrased as a futurate reading in the past tense. [5]

(51) zuotian Mali gen laoshi shuo [Yuehan da-le ren]. dan hai mei
yesterday Mary to teacher say John beat-PERF person but yet not

5. However, the denial is appropriate only at certain point, namely the time point immediately after the zero-marked sentence. In (i) for instance, if the denial does not immediately follow the target sentence, it sounds odd:

(i) zaoshang Mali qichuang, he kafei, qu xuexiao. #danshi beizi turan sui le. ta shenzhi hai mei kaishi he.
morning Mary get.up drink coffee go.to school but cup suddenly break LE she even yet not start drink
Int: 'This morning Mary was going to get up, drink coffee, and go to school. Suddenly the cup broke. She didn't even start drinking it.'

This is probably due to a pragmatic requirement discussed by Walker (1996) that conversants must provide evidence of a detected discrepancy in belief as soon as possible.

kaikou jiu bei Bi'er zuzhi le.
open.mouth JIU BEI Bill stop LE
'Yesterday Mary was going to tell the teacher that [John beat a person]'. But Bill stopped her before she opened her mouth.'

(52) Mali he kafei. turan beizi sui le. ta shenzhi hai mei kaishi he.
Mary drink coffee suddenly cup break LE she even yet not start drink
'Mary was about to drink coffee. Suddenly the cup broke. She didn't event start drinking'

(53) zaoshang Mali he kafei, ting yinyue, turan beizi dao zai yinxiang
morning Mary drink coffee listen music suddenly cup fall on sound.box
shang, ta shenzhi mei kaishi he na-bei kafei, ye mei kaishi fang yinyue.
top she even not start drink that-CL coffee also not start play music
'This morning Mary about to drink coffee and listen to music. Suddenly the cup fell on the sound box. She didn't even start drinking that cup of coffee and she didn't start playing the music'

The exception is that the event-completion inference of zero-marked achievements seems not defeasible, as in (54). We will leave this exception aside and go back to it later.

(54) a. gangcai Mali dao shan-ding. ??ta hai mei dao jiu shuaidao le
just.now Mary reach hill-top. she yet not reach then fell LE
Int: 'Just now Mary was about to reach the hill-top. She fell before reaching it.'

b. Mali shuai dao. turan yi-ge ren fuzhu ta. ??suoxing ta
Mary fall down suddenly one-CL person hold her fortunately she
zuihou mei shuai dao.
eventually not fall down
Int: 'Mary was about to fall down. Suddenly a person held her. Fortunately, she didn't fall down eventually.'

Leaving the exception in (54) aside, the meaning pattern here can be summarized as follows: (i) Zero-marked sentences by default 'invite' the inference (or implicate) that at least part of the event is instantiated when there is no contradictory information in the context, which results in progressive or completive readings; (ii) But such an episodic

inference can be explicitly denied (at an appropriate point in the discourse).

Such a pattern resembles a similar property of non-culminating accomplishments in Salish languages. Bar-el et al. (2005) show that accomplishments in St'át'imcets and Sḵwx̱wú7mesh, without overt tense or aspect marking, by default give rise to the culmination interpretation, as in (55) and (56).

(55) ts'áqw-an'-lhkan ta n-kíks-a
eat-TR-1SG.SU DET SG.POSS-cake-DET
'I ate my cake.' (St'át'imcets)

*Native speaker's comments: "Sounds like you ate all of it."*

(56) chen p'aya̱k-an ta tetxwem
1SG.SU fix-TR DET car
'I fixed the car.' (Sḵwx̱wú7mesh)

*Native speaker's comments: "You already fixed it."*

They further show that such a culmination inference is not entailed, but is an 'invited' default implicature. Both (55) and (56) can be continued with overt denials of the culmination as in (57) and (58).

(57) ts'áqw-an'-lhkan ta n-kíks-a lhkúnsa ku aq'it, t'u7 qelh-cál-lhkan ku
eat-TR-1SG.SU DET SG.POSS-cake-DET now DET day but save-ACT-1SG.SU DET
k'wík'wena7 t'u natcw
few until tomorrow
'I ate my cake today, but I saved a little for tomorrow' (St'át'imcets)

(58) na p'aya̱k-ant-as ta John ta snexwilh-s welh haw k̲-as 7i huy-nexw-as
RL fix-TR-2ERG DET John DET canoe-3POSS CONJ NEG IRR-3CNJ PART finish-LC-3ERG
'He engaged in fixing his canoe but he didn't finish (fixing) it.' (Sḵwx̱wú7mesh)

The parallel is that Chinese zero-marked eventives can implicate (partial) instantiation in absence of contradictory information in the context; while for those two Salish languages, bare accomplishments can implicate culmination by default as well.

We are interested in how Bar-el et al. (2005) capture the 'invited' inference of culmi-

nation in the semantics. What kind of literal meaning should the Salish bare accomplishments have such that they can by default implicate but not entail the culmination? Their proposal, informally speaking, says that a bare accomplishment such as (55) is true iff some event $e$ is instantiated in the actual world and in all inertia continuations of the actual world, there is culmination of the event of eating my cake caused by $e$. The semantics they assign to (55) is given in (59):

(59) $[\![(55)]\!]^{w_0,g} = \exists e$[I am the agent of $e \wedge e$ is controlled by me in $w \wedge \tau(e) \subseteq g(i) \wedge$
$\forall w'$[$w'$ is an inertia world w.r.t. $w_0$ at the beginning of $e \rightarrow$
$\exists e'$[the cake is eaten up in$w'(e') \wedge e$ causes $e'$ in $w'$]]]

Their analysis draws on the modalized approach for imperfectives (Dowty 1977, 1979; Landman 1992). The idea is that the literal meaning of (55) asserts the existence of some event $e$ controlled by the speaker in the evaluation world $w_0$, and only in those so-called inertia worlds in which the event develops in ways most compatible with the past course of the event, there is a culmination of an eating cake event caused by $e$. If the speaker does not make any comment about whether the event develops normally or not, then the default inference will be that it does, and for this reason, the sentence by default implicates the culmination inference. But the inference is defeasible since it is not entailed.

While Bar-el et al. (2005) do not specify the nature of such a default implicature, I argue that it belongs to the kind of R-implicatures in Horn (1984)'s taxonomy, which arises from the Speaker-based principle that one does not need to say more than they must. From the hearer's perspective, they can enrich the interpretation of a sentence from the literal meaning to something more precise and specific based on world knowledge, as in (60). One aspect of world knowledge, according to Atlas and Levinson (1981), concerns whether some situation is stereotypical or not, and a sentence is by default enriched intso the stereotypical meaning that is compatible with the literal meaning, as in (61).

(60) The Principle of Informativeness: Read as much into an utterance as is consistent witth what you know about the world. (Levinson 1983: 146-147)

(61) If a predicate Q is semantically nonspecific with respect to predicates $P_i$, $1 \leq i \leq n$, but for some $j$, $1 \leq j \leq n$, $P_j$ is stereo-typical of Qs, then in saying 'Q(t)' a speaker will convey '$P_j$(t)'. (Atlas and Levinson 1981: 42)

Since we also proposed the modalized imperfective semantics for the zero-marked sentences in Chinese in Chapter 3, we are able to capture the fact that those sentences by default implies that the relevant event is (partially) instantiated in absence of contradictory information in the context. For instance in (62), after uttering the zero-marked sentence, the speaker goes on to say something about the weather, and since he/she does not further comment about Mary's running event, the hearer will assume that nothing abnormal has occurred and the running event in fact was (at least partially) instantiated, which is the stereotypical case. Recall that in Chapter 2 I showed that in this kind of narrative, the aspectually marked sentence (usually the last sentence in the narrative) is at-issue, and the zero-marked sentence is not at-issue but new, which is similar to the discourse status of appositives. With the framework in Section 4.2.2, the discourse change and the pragmatic enrichment can be illustrated in (63).

(62) gangcai Mali paobu. turan xiayu le.
just.now Mary run suddenly rain LE
'Just now Mary {was running /run}. Suddenly it rained'

(63) a. Imposal: $[i_1] \wedge \mathbf{just.now}_{p^{cs}}(i_1) \wedge [x] \wedge x = \mathbf{Mary} \wedge \mathbf{IMPF}^{p'}_{p^{cs},i_1}(\mathbf{run}(x), i_1) \wedge$
$\rightsquigarrow_R [e_1] \wedge \mathbf{run}_{p^{cs}}(e_1, x) \wedge \tau_{p^{cs}}(e_1) \supseteq i_1 \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge [e_2] \wedge \mathbf{rain}_p(e_2) \wedge \tau_p(e_2) \subseteq i_2 \wedge ...$

Furthermore, even with the R-implicature that the world has developed inertially,

the relation between the running time of Mary's running and the topic time $i_1$ is still underspecified in a way such that either an ongoing or completive interpretation is possible in this context (as reflected by the part '$\tau_{p^{cs}}(e_1) \supseteq i_1$'). This is exactly what we want, since it has been observed that those zero-marked eventives are compatible with both progressive and perfective readings, depending on the context and the lexical aspect of the predicates (Smith and Erbaugh 2005; Lin 2006).

One remaining puzzle is that, if the episodic inference is a defeasible implicature, why it is much harder to cancel it when we have a zero-marked achievement-type predicate in the sentence, as in (64).

(64) gangcai Mali didao shan-ding. ??ta hai mei didao jiu shuaidao le
just.now Mary reach hill-top. she yet not reach then fell LE
Int: 'Just now Mary was about to reach the hill-top. She fell before reaching it.'

Interestingly, a similar property is found in Russian imperfective sentences (Leinonen 1982; Grønn 2004; Altshuler 2014). The imperfective form of non-achievements leads to a defeasible culmination inference while the imperfective form of achievements leads to a non-defeasible culmination entailment, c.f. (65), (66).

(65) Ja **dočit-yva-l** poslednie stročki pis'ma. xotja ne do-čita-l
I read.up-IMPF-PST last lines letter even.though not read.up-PST
ix do konca
them until end
'I (have) read the last lines of the letter. Even though I did not finish it.'

(66) K nam **priezža-l** otec domoj #no on ne smog najti naš dom.
to us arrive.IMPF-PST father home but he not able find our house
'Father arrived at home to see us, #but was unable to find our house'

The failure of defeasibility is clearly related to the instantaneous nature of achievements. The literal meaning of the zero-marked sentence involving an achievement like (64) is given in (67). Even though it is not explicitly indicated in the lexical entry of $\varnothing_{\text{IMPF}}$, the

inertia modal involved in (67) in fact implicitly requires at least certain preparation or intention of having the event instantiated in the evaluation world. Since achievements are instantaneous, we can imagine that it is almost impossible for the evaluation world to continue in a non-inertial course because an achievement might have already culminated in one second right after the end of the topic time, before anything else that potentially interrupts the culmination could happen.

(67) a. Imposal: $[i_1] \wedge \textbf{just.now}_{p^{cs}} \wedge [x] \wedge x = \textbf{Mary} \wedge \textbf{IMPF}^{p'}_{p^{cs},i_1}(\textbf{reach-hill-top}(x), i_1) \wedge$ ...

For this reason, it is relatively hard to cancel the culmination inference of zero-marked achievements. However, if we set up 'slow-motion' scenarios in which achievements can be non-instantaneous, it is in fact possible to cancel the culmination inference, as in (68).

(68) Context: *The Moon's surface gravity is about 1/6th as powerful as Earth's, so when the astronaut walk on the hill, every step takes much more time than on Earth. Now we are watching the astronaut Mary who is moving close to the top of a hill from the monitor:*

Mali didao shan-ding. turan ta cai dao yi-kuai shitou, hai mei didao jiu shuaidao le.
Mary reach hill-top suddenly he step on one-CL rock yet not reach then fell LE

'Mary is reaching the hill-top. Suddenly she stepped on the rock. She fell down before reaching it.'

To sum up, we can derive the (generally defeasible) episodic inference of zero-marked sentences from its imperfective semantics plus R-implicatures. The inertia-modal semantics plays an important role in this process, since it naturally explains why the implicature is automatic enough to be 'default' even though it is still defeasible.

### 4.3.4 Interim summary

This section proposes that the episodic readings of zero-marked sentences in Chinese, which are available when the event instantiation information is not-at-issue, can be derived via contextual enrichments. I distinguish between two cases of contextual enrichment, though both of which involve pragmatic reasoning based on the R principle. When the event occurrence is presupposed, the interpretation of a zero-marked sentence can be enriched with the aspectual information of an existing event in the discourse, via the R principle 'What is salient needs not be said'. Thus the aspectual interpretation of the zero-marked sentence inherits the presupposed information. When the event instantiation is not presupposed, the interpretation of a zero-marked sentence can also be enriched via the R principle 'What is stereotypical needs not be said'. The combination of the imperfective semantics and the R-implicature can lead to a (defeasible) episodic inference that (at least some part of) the event is instantiated.

The proposed analysis differs from the existing approaches that derive the default aspect interpretation from the lexical aspect (Lin 2006) or posit a covert neutral aspect (Smith 1997) in that under the current analysis those sentences denote modalized propositions and do not entail the instantiation of any part of the event in the actual world. Instead, the apparent episodic interpretation is attributed to pragmatic strengthening.

## 4.4 Incompleteness: conflicting implicatures and uncooperativeness

The proposed mechanism of how zero-marked sentences obtain episodic readings in Section 4.2 raises a question: If the episodic inference can be obtained via anaphora or a default R-based implicature, then why will incompleteness ever arise? In a neutral monoclausal utterance such as (69), the episodic inference cannot be presupposed due to the default intonation, but why can't the hearer infer the default interpretation that the event was ongoing or completed within the topic interval? The speaker does not utter

anything that contradicts this interpretation; so it should, in principle, be available given everything I have said so far.

(69) ??zuotian Mali paobu.
yesterday Mary run
Int: 'Yesterday Mary {ran, was running}'

As we concluded from Chapter 2, not only (69), but in fact all utterances in which the event instantiation is at-issue like (69) sound degraded to native speakers on the intended episodic readings. The puzzle is why the availability of the episodic interpretations correlates with whether the episodic inference is at-issue or not. In this section, I argue that when the episodic inference addresses the QUD, the zero-marked form gives rise to a scalar implicature that contradicts the default interpretation, due to the existence of the "better" alternatives marked by overt progressive or perfective morphemes. The fact that the speaker chooses to utter a less informative form gives rise to intentional ignorance implicatures, which is an inappropriate conversational move. Furthermore, I show that those implicatures, though problematic, are mandatory in certain contexts (van Kuppevelt 1996; Lauer 2014; Rett 2014). The current proposal not only accounts for the context-sensitivity of incompleteness (as shown in Chapter 2), but also captures the intuitive feelings of native speakers about those degraded sentences such as 'incomplete' and 'as if you haven't finished your utterance'.

The plan of this section is as follows: Section 4.4.1 presents a formal theory of how scalar implicatures are derived, which is a kind of Q implicature. Section 4.4.2 and Section 4.4.3 address why incompleteness arises only when the QUD concerns the event instantiation.

### 4.4.1 A neo-Gricean theory of scalar implicatures

I start with an informal derivation of scalar implicatures under the classical Gricean program and then motivate a neo-Gricean implementation that mainly incorporates insights from Sauerland (2004) and Katzir (2007). The reasoning process that leads to the scalar

implicature of a sentence like (70) can be elaborated in (71).

(70) Mary ate some of the cake. $\rightsquigarrow_Q$ Mary didn't eat all of the cake.

(71) a. The speaker uttered *Mary ate some of the cake*.

b. The speaker could have uttered a more informative form *Mary ate all of the cake* (since $\langle$*some*, *all*$\rangle$ forms a Horn scale), which is relevant to the current purposes of exchange.

c. But the speaker didn't utter it. Assuming that he is cooperative, it must be the case that he is not in a position to utter it, namely it is not case that he believes that Mary ate all of the cake.

d. Assuming the speaker is optimally informed about the topic of the conversation (e.g. we know Bill stayed with Mary all the time), it must be the case that he believes that Mary didn't eat all of the cake.

While the derivation above is intuitive, it is imprecise in many ways. For instance, it is not clear what kinds of expressions can form a Horn scale (Gazdar 1979; Horn 1984; Matsumoto 1995; Sauerland 2004; Katzir 2007) and how the derivation works when a scalar expression is embedded under other logical operators (Sauerland 2004; Chierchia 2004; Katzir 2007; Fox 2007; Chierchia et al. 2012; Bar-Lev and Fox 2020). It is not possible to evaluate and compare all the approaches here and I will just introduce some definitions and rules (mainly from Sauerland 2004 and Katzir 2007) for a formal implementation that are important to how we derive incompleteness in the next subsection.

I define two formal relations '$\lesssim$' (structural complexity, following Katzir 2007) and '$\subset_Q$' (contextual informativity) that can derive the 'scale-mates' on a Horn scale that is evoked by uttering a sentence containing a scalar item. The idea is that the more informative alternative expressions compared to the uttered form we would consider in Step (71-b) should also be structurally no more complex than the uttered form, and relevant to the

current purpose. As elaborated in (72), the set of structural alternatives for $\phi$ is defined as a set of expressions that can be transformed from $\phi$ by operations such as deletions, contractions, and substitutions. Furthermore, the condition c in (72) encodes the role that discourse factors play in generating the alternatives. Since Fox and Katzir (2011) argue that the set of formal alternatives for a sentence *S* in context *C* is determined the same way for both Scalar Implicatures and Association with Focus, this condition is reminiscent of the how alternatives are evoked for overt focus operators such as 'only'.

(72) Structural Alternatives (Katzir 2007: 679)

Let $\phi$ be a parse tree. The set of *structural alternatives* for $\phi$, written as $A_{str}(\phi)$, is defined as $A_{str}(\phi)$: = $\{\phi'$: $\phi' \lesssim \phi\}$, in which:

a. (Structural Complexity) $\phi' \lesssim \phi$ iff we can transform $\phi$ into $\phi'$ by a finite series of deletions, contractions, and substitutions of constituents in $\phi$ with constituents of the same category taken from $L(\phi)$;

b. (Substitution Source) The substitution source for $\phi$, written as $L(\phi)$ is the union of the lexicon of the language with the set of all subtrees of $\phi$.

c. (Sensitivity to F-distribution) The transformation in step a. can only apply to the F-marked constituents of $\phi$.

In order to capture the fact that we are not considering every alternative expression that is logically stronger than the uttered form unless it is relevant to the current purposes of exchange, I deviate from Sauerland (2004) and Katzir (2007) in ordering the alternatives by the contextual informativity defined in (73) instead of logical entailment relations.

(73) a. The 'contextually at least as informative as' relation '$\subseteq_Q$': $p \subseteq_Q q$ (read as '$p$ is at least as informative as $q$ relative to a Question Under Discussion $Q$') iff $\forall r \in Q : (q \rightarrow r) \rightarrow (p \rightarrow r)$.

b. The 'contextually more informative' relation '$\subset_Q$': $p \subset_Q q$ iff:

(i) $p \subseteq_Q q$;

(ii) $\exists r \in Q : (p \rightarrow r) \wedge (q \nrightarrow r)$.

Finally, I adopt Sauerland (2004)'s *epistemic step* (based on Gazdar 1979; Soames 1982; Horn 1989) to formalize the steps from (71-c) to (71-d)) in (74). Sauerland proposes that based on the Gricean Quantity-1 Maxim, the failure of uttering a more informative and no-more-complex alternative $\psi$ only leads to an ignorance implicature as in (71-c), namely it is not the case that the speaker believe $\psi$. It is also called a primary implicature. For the stronger implicature 'the speaker believes that $\psi$ is false' in (71-c), it only arises with the additional assumption such as the speaker is optimally informed about the topic of the conversation and holds a belief with respect to $\psi$ (i.e. that $K\psi \vee K\neg\psi$ holds), which is not part of the Gricean maxims. Sauerland calls the latter an secondary implicature and argues that the calculation of this secondary implicature needs to take into account its consistency with the conjunction of the uttered proposition and all the primary implicatures.

(74) a. If $\psi \in A_{str}(\phi)$ and $\psi \subset_Q \phi$, then $\neg K\psi$ is a primary implicature of $\phi$. [6]

b. (Epistemic step:) If $\neg K\psi$ is a primary implicature of $\phi$ and $K\neg\psi$ is consistent with the conjunction of $\phi$ and all the primary implicatures of $\psi$, then $K\neg\psi$ is a secondary implicature of $\phi$.

We will work with this formal algorithm from now on.

### 4.4.2 Incompleteness: A conflict between R and Q implicatures

I argued that aspectually zero-marked eventive sentences in Chinese are grammatical forms and can potentially convey episodic readings by contextual enrichment based on the R principle from their imperfective semantics.

The puzzle is that, as discussed in Chapter 2, a zero-marked eventive often sounds

6. '$\neg K\psi$' is read as 'It is not the case that the speaker believes $\psi$'.

degraded when the QUD concerns whether the event is instantiated or not, as in (75)-(76). In this case, the event instantiation is not presupposed (so the enrichment via R principle plus anaphora resolution is not available), but why is it that the zero-marked sentences cannot be enriched into episodic readings via a stereotypicality-based R implicature, as in a narrative or an evidential construction like (77)?

(75) ??gangcai Mali pao bu
just.now Mary run foot
Int: 'Mary {was running, ran} just now' (Out of the blue)

(76) Q: Do we need to inform Mary about today's weather?

A: ??Mali tingshuo [jintian hen re]
Mary hear today very hot
Int: 'Mary heard that it is hot today'

(77) a. gangcai Mali paobu. turan xiayu le.
just.now Mary run suddenly rain LE
'Just now Mary {was running, ran}. It rained suddenly.'

b. Mali tingshuo [jintian hen re]
Mary hear today very hot
'It is hot today, Mary heard' (As an answer to 'What is the weather like today?')

I propose that the degradedness is caused by an opposite Q (/scalar) implicature that arises mandatorily due to the QUD. Take (75) for instance, let us assume that the implicit QUD in this case is 'What happened?' or maybe a more specific one such as 'Did Mary run just now?' (Roberts 1996/2012; Abrusán 2011). The details of this assumption do not really matter as long as it captures our intuition that when uttering a sentence like (75) under the default intonation, the instantiation of Mary's running at the contextually familiar interval ($i_0$) is the main point. To simplify as much as possible, I paraphrase the immediate QUD when uttering (75) as $Q_1$ in (78).

(78) $Q_1$: Is Mary's running event actualized within the topic time denoted by *just now*?

Uttering the zero-marked eventive in (75) in this context not only conveys its literal meaning (and possibly R implicatures), but also has the effect of making the hearer wonder why the speaker does not utter the relevant stronger alternatives based on the Q Principle.

(79) The Q Principle (Hearer-based):

Make your contribution sufficient (c.f. $\text{Quantity}_1$)

Say as much as you can (given R)

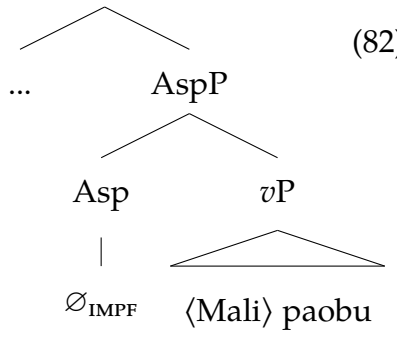
I argue that there are at least the following two alternatives that are salient, namely the ones that contain the overt progressive and perfective markers:

(80) a. gangcai Mali zai pao bu
just.now Mary PROG run foot
'Mary was running just now'

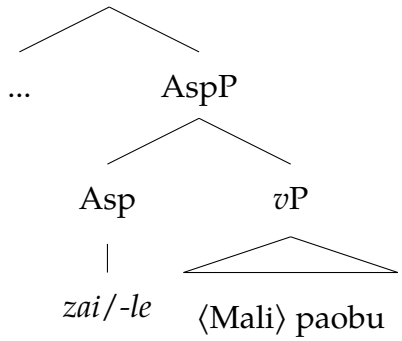
b. gangcai Mali pao-le bu
just.now Mary run-PERF foot
'Mary ran just now'

Now we can derive the Q implicatures of uttering the zero-marked form with the algorithm in Section 4.4.2. Based on the definition of structural complexity in (72), (80-a) and (80-b) are no more complex than (75) because they can be derived from the syntactic structure of the uttered sentence (81) by substituting the covert imperfective morpheme with overt aspectual morphemes, as in (82). Note that since we adopt Katzir (2007) which calculates the complexity of alternatives based on their structure, the zero phonology of the imperfective morpheme does not factor into the complexity measure since (75) projects a structure of the same size as its overtly marked alternatives, c.f. (81), (82). Additionally, the substitution conforms to the F-distribution condition in (72) because (75) is uttered with an all-new focus.

(81) Uttered:




(82)




Following a more or less standard treatment of aspectual morphemes in Chinese (Smith 1997; Lin 2003; Hongyuan Sun 2014; Anqi Zhang 2018; Yuyin He 2020), I argue that the perfective *-le* takes properties of eventualities and return properties of time intervals during which the eventuality is completed (83-a). For the progressive morpheme, I adopt an intensional treatment (following Dowty 1977; Landman 1992), which entails only partial realization of the eventuality.

(83) a. $[\![\text{-}le]\!] = \lambda P_{\langle s,vt\rangle}\lambda w\lambda i.\exists e[P(e,w) \wedge \tau(e,w) \subseteq i]$

b. $[\![zai]\!] = \lambda P_{\langle s,vt\rangle}\lambda w\lambda i.\exists e[\tau(e,w) \subseteq i \wedge \forall w' \in \text{INERT}(w,i) : \exists e'[e \sqsubseteq e' \wedge P(e',w') \wedge i \subseteq \tau(e',w')]]$

The literal meaning of (75) and its structural alternatives in (80a-b) is given in (84a-c), respectively. The details do not matter since all we need to capture is that (75)'s structural alternatives do entail at least part of the event is actualized within the topic time, while (75) does not entail it.

(84) a. $[\![[\text{just.now } [\varnothing_{\text{IMPF}} \text{ [Mary run]}]]]\!] = \lambda w.\exists i \subseteq \textbf{just.now}(w)[\forall w' \in \text{INERT}(w,i) : \exists j[i \subseteq_{ini} j \wedge \forall k \in \mathcal{R}_j^{inf} : \text{COIN}(\textbf{Mary-run}, k, w')]]$

b. $[\![[\text{just.now } [\text{ PROG [Mary run}]]]]\!] = \lambda w.\exists i \subseteq \textbf{just.now}(w)\exists e[\tau(e,w) \subseteq i \wedge \forall w' \in \text{INERT}(w,i) : \exists e'[e \sqsubseteq e' \wedge \textbf{Mary-run}(e',w') \wedge i \subseteq \tau(e',w')]]$

c. $[\![[\text{just.now } [\text{-PERF [Mary run}]]]]\!] = \lambda w.\exists i \subseteq \textbf{just.now}(w)\exists e[(\textbf{Mary-run}(e,w) \wedge \tau(e,w) \subseteq i]$

Both of the alternatives in (84b-c) are more informative than the zero-marked form relative to the QUD in (78) based on our definition of contextual informativity in (73), since they each entail one answer to the QUD which is not entailed by the uttered form.

(85) a. $[\![$[just.now [PROG [Mary run]]]$]\!] \subset_{Q_1} [\![$[just.now [$\varnothing_{\text{IMPF}}$ [Mary run]]]$]\!]$

b. $[\![$[just.now [-PERF [Mary run]]]$]\!] \subset_{Q_1} [\![$[just.now [$\varnothing_{\text{IMPF}}$ [Mary run]]]$]\!]$

Following the adjusted formal algorithm of calculating scalar implicatures in Sauerland (2004), we derive the primary implicatures of uttering (84a) in (86).

(86) Primary implicatures of uttering (75)

a. $\neg K$(Mary was running just now)

b. $\neg K$(Mary ran just now)

The next step is to check if each of the primary implicatures can be strengthened without contradicting any of the primary implicatures or the prejacent.

(87) Epistemic step:

a. Is $K$(Mary wasn't running just now) consistent with (84-a) $\wedge$ (86-a) $\wedge$ (86-b)?
$\rightarrow$ Yes, if you believe there is no partial instantiation of the running event, then it is not the case that you believe there is partial or complete instantiation of it, which is consistent with (86-a) and (86-b).

b. Is $K$(Mary didn't ran just now) consistent with (84-a) $\wedge$ (86-b)?
$\rightarrow$ Yes.

In other words, based on the Q principle, (75) implies that Mary wasn't running just now and Mary didn't run just now. Those Q implicatures run into conflict with the potential R implicature that at least part of Mary's running event is actualized during just now, as summarized below:

(88) Uttering the zero-marked eventive in Chinese 'Just now Mary run' out of the blue:
$\rightsquigarrow_Q$ (Mary wasn't running just now) $\wedge$ (Mary didn't run just now)
$\rightsquigarrow_R$ Mary engaged in running just now.

My claim is that the degradedness of zero-marked sentences observed in (75)-(76) – and the so-called "incompleteness effect" more generally – is due to the conflicting Q and R implicatures in (88). But in order to substantiate this analysis, I must explain why a conflict between implicatures would ever be problematic enough to cause degradedness. Why can't only one of the implicatures is generated (and the other is canceled), or simply both of them are canceled, in which case an utterance of (75) should just have an ignorance implicature in (89)?

(89) a. Canceling Q implicature:
$\rightsquigarrow_R$ Mary engaged in running just now.
b. Canceling R implicature:
$\rightsquigarrow_Q$ Mary didn't run just now.
c. Cancelling both Q and R implicatures:
$\rightsquigarrow$ Ignorance about whether Mary ran just now or not.

We can first rule out the option in (89-a) because it is well-known that Q implicatures can be mandatory when they are at-issue (van Kuppevelt 1996; Rett 2014). It is hard to cancel the scalar implicature 'John has exactly three children' in (90), in which the scalar implicature is directly relevant to the QUD, but the cancellation is natural for (91).

(90) Q: How many children does John have?
A: He has three children. ??In fact, he has four.

(91) Q: Who has three children?
A: John has three children. In fact, he has four.

Since the Q implicature in (88) is directly addressing the QUD ('What happened?' or 'Did Mary run?'), it cannot be easily canceled.

How about the option of canceling the R implicature? Why can't we just take the utterance of the zero-marked sentence to imply that the relevant event isn't instantiated during the topic time? I do not have a full story about this, but empirically such a move seems not possible either. Let us look at some typical examples of R implicatures in English (Horn 1984 and Levinson 2000) in (92). For (92a), they arise because the stereotypical case of breaking a finger to break one's own finger. For (92b), the collective reading is considered the default stereotypical case since to derive the distributive reading some covert distributivity operator needs to be assumed. For (92c), the precedence and causal inference arises since it is also the most default interpretation of two events described in a sequence.

(92) a. John broke a finger.
$\rightsquigarrow_R$ John broke his finger.

b. John and Mary bought a piano.
$\rightsquigarrow_R$ They bought it together. (Horn 1984)

c. John turned the key and the engine started.
$\rightsquigarrow_R$ John turned the key and then, therefore, the engine started. (Schmerling 1975)

Now, if we manipulate the QUD to be explicitly about the difference between the literal meaning and the enriched meaning with the R implicature, as in (93)-(95), we predict the utterance to generate a Q implicature that is in contradiction with the R-enriched meaning.

(93) Q: Did John break HIS finger or not?
A: #John broke a finger.
$\rightsquigarrow_R$ John broke his finger.

$\rightsquigarrow_Q \neg$ (John broke his finger).

(94) Q: Did John and Mary buy a piano together or separately?

A: #John and Mary bought a piano.

$\rightsquigarrow_R$ They bought it together.

$\rightsquigarrow_Q \neg$ (They bought it together).

(95) Q: Did the engine start because John turned the key?

A: #John turned the key and the engine started.

$\rightsquigarrow_R$ John turned the key and then, therefore, the engine started.

$\rightsquigarrow_Q \neg$ (John's turning the key caused the engine to start

However, what happens in (93)-(95) is not that the Q implicature takes over the R implicature or vice-versa; instead, native speakers report that A's utterances in the conversations below are degraded and uncooperative ('they are being "cagey" about it', 'as if they were intentionally withholding information').

From (93)-(95), we see that it is also not an option to cancel both of the implicatures in (93)-(95) to indicate the ignorance about the answer, which suggests that the option in (89-c) might also fail for Chinese zero-marked sentences. Instead, you must make ignorance explicit as in (96)-(97) in those cases.

(96) Q: Did John break HIS finger or not?

A: He broke a finger, but I don't know if that's his or other's.

(97) Q: Did John and Mary buy a piano together or separately?

A: They bought a piano, but I don't know if they bought it together or not.

Note that I am not saying all ignorance implicatures that are relevant to the QUD are uncooperative and must be made explicit. For instance, the implicit ignorance implicature in (98) is felicitous, even though it is relevant to the QUD. The difference between (93)-(95)

and (98) is that in the former the ignorance is a result of canceling two opposing Q and R implicatures, while in the latter it is a regular implicature due to the Q principle.

(98) Q: Who ate the cake?
A: John or Mary.
$\rightsquigarrow_Q$ The speaker doesn't know which one of them ate the cake.

In contrast, when the QUD does not make the more informative alternative (directly) relevant, the utterances in (93)-(95) are more likely to obtain the R implicatures alone:

(99) Q: Every worker broke their finger in the accident.
A: No, only John broke a finger.
$\rightsquigarrow_R$ 'No, only John broke his finger.'

(100) Q: Did the engine start because JOHN turned the key?
A: No, BILL turned the key and the engine started.
$\rightsquigarrow_R$ 'No, the engine started because BILL turned the key'

(101) Q: John and Mary bought a piano together.
A: No, BILL and Mary bought a piano.
$\rightsquigarrow_R$ 'No, BILL and Mary bought a piano together'

In sum, I argue that the incompleteness problem is pragmatic in nature – it reflects the unacceptability of a needlessly uncooperative utterance. After hearing a zero-marked sentence like (75), the hearer becomes confused because the speaker seems to intend to convey that the event is at least partially instantiated by not commenting on whether the world went on inertially or not, but this enrichment by R implicature is contradicted by the Q implicature. What's worse, both the R implicature and Q implicature directly address the QUD so neither of them can be easily canceled. In short, it is definitely not cooperative to use the zero-marked form so if the speaker indeed intends to convey the

episodic reading.

This proposal, of course, immediately raises questions for the data such as (77) in which the R implicature survives without being contradicted by the Q implicature. The next section turns to those cases and argue that all of them can easily have the QUD not to concern the actualization of the relevant event, so that the R implicature can arise alone just like the cases in (99)-(101).

### 4.4.3 Cases in which the Q implicature is optional

Section 4.4.2 derives the incompleteness of zero-marked sentences in contexts in which the QUD concerns the event instantiation from the conflict between Q and R implicatures, which are obligatory in such contexts. This section returns to the cases in which the event instantiation is not at-issue, such as a narrative which contains a zero-marked sentence, a clause-embedding zero-marked sentence in the evidential use, and a sentence with projective focus. My goal in this section is to formalize what the discourse is like in those cases, especially how the default QUD is shifted so that the contradictory scalar implicatures do not arise.

#### 4.4.3.1 Narratives

In Section 4.3.3, I showed that when an zero-marked eventive sentence forms a narrative with some other sentence(s) as in (102)-(103), the hearer infers a default interpretation that each event described by the zero-marked predicate was actualized based on a stereotypicality-based R implicature (which can be optionally confirmed by the coherence relations). The relevant pragmatic process is reproduced right below each example:

(102) gangcai Mali paobu. Turan xiayu le.
just.now Mary run suddenly rain LE
'Mary engaged in running just now. Suddenly it rained.'

a. Imposal: $[i_1] \wedge \textbf{just.now}_{p^{cs}}(i_1) \wedge [x] \wedge x = \textbf{Mary} \wedge \textbf{IMPF}^{p'}_{p^{cs},i_1}(\textbf{run}(x), i_1) \wedge$

$\rightsquigarrow_R [e_1] \wedge \mathbf{run}_{p^{cs}}(e_1, x) \wedge \tau_{p^{cs}}(e_1) \supseteq i_1 \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge [e_2] \wedge \mathbf{rain}_p(e_2) \wedge \tau_p(e_2) \subseteq i_2 \wedge ...$

(103) zaoshang Mali paobu, he kafei, qu xuexiao.
morning Mary run drink coffee go.to school
'This morning Mary ran, drank coffee, and went to school.'

a. Imposal: $[x] \wedge x = \mathbf{Mary} \wedge [i_1] \wedge [e_1] \wedge [i_2] \wedge [e_2] \wedge [i_3] \wedge [e_3]...$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $\mathbf{IMPF}^{p'}_{p,i_1}(\mathbf{run}(x), i_1) \wedge \mathbf{IMPF}^{p'}_{p,i_2}(\mathbf{drink\text{-}coffee}(x), i_2) \wedge$
$\mathbf{IMPF}^{p'}_{p,i_3}(\mathbf{go\text{-}school}(x), i_3) \wedge$

d. $\rightsquigarrow_R \mathbf{run}_p(e_1, x) \wedge \mathbf{drink\text{-}coffee}_p(e_3, x) \wedge \mathbf{go\text{-}school}_p(e_3, x)$

What is shared by those cases is that the QUD does not concern the actualization of the event described by the zero-marked predicate. For (102), the at-issue update is contributed by the second sentence in the narrative as in (102c) and the R implicature is associated with a not-at-issue imposal as in (102a). For (103), as I argued in Section 4.3.3 the hearer infers a default interpretation that each event described by the zero-marked predicate occurred one after one in the order of the textual order, relying on both the R implicature and the world knowledge that those events usually cannot be temporally overlapping. In this case, the at-issue update concerns the descriptive content of the events $e_1, e_2, e_3$ in a sequence, whose actualizations are accommodated as an imposal in (103a). [7] I argue that those two cases are just like (99)-(101) (repeated as (104)), in which the opposite Q implicature either is not mandatory or it is not generated at all due to its not-at-issue status, so that the R implicature can survive. For this reason, we can obtain the episodic readings with those zero-marked forms.

7. One question is why a narrative like (103) can trigger accommodation of the actualization of some events, while a monoclausal utterance like *zaoshang Mali paobu* 'Mary ran this morning' cannot. I do not have a principled answer to the empirical contrast that the event actualization tends to be at-issue in the latter case, but it seems that the presence of rhetoric relations in a narrative plays a role.

(104) a. Q: Every worker break their finger in the accident.

A: No, only JOHN broke a finger.

$\rightsquigarrow_R$ 'No, only JOHN broke his finger.'

b. Q: Did the engine start because JOHN turned the key?

A: No, BILL turned the key and the engine started.

$\rightsquigarrow_R$ 'No, the engine started because BILL turned the key'

c. Q: John and Mary bought a piano together.

A: No, BILL and Mary bought a piano.

$\rightsquigarrow_R$ 'No, BILL and Mary bought a piano together'

One virtue of the current pragmatic account is that it not only explains why the degradedness of Chinese zero-marked eventive sentence is sensitive to the QUD, but also captures native speakers' intuitions of this kind of degradedness as 'incompleteness'. Our consultants consistently make comments such as 'It sounds like the speaker hasn't finished their utterance' or 'And then?' after hearing the zero-marked sentence such as (105). My analysis explains the hearer's expectation of the speaker to utter more as follows. Upon hearing (75) (and assuming the speaker is likely to utter more as in (102) and (103)), the instantiation of Mary's running event could either be the main point of the utterance or not. If the instantiation of Mary's running event is directly addressing the QUD, then simply uttering the zero-marked form is uncooperative due to the conflict between the mandatory Q and R implicatures. In this case the speaker is expected to continue to provide more information about whether the event is actually instantiated or not, or even just to explicitly flag the ignorance. (106) illustrate such kinds of continuation, all of which salvage the degradedness. This would be completely unexpected on a syntactic account of incompleteness, where the relevant sentences are just plain ungrammatical.

(105) ??gangcai Mali pao bu
just.now Mary run foot
Int: (Out of the blue:) 'Mary {was running, ran} just now'

(106) a. gangcai Mali paobu. ta pao-le hen jiu.
just.now Mary run she run-PERF very long
'Just now Mary ran. She ran for a long time.'

b. gangcai Mali paobu, turan xiayu le, xinghao ta mei kaishi pao.
just.now Mary run suddenly rain LE luckily she not start run
'Just now Mary was about to run. Suddenly it rained. Luckily she hasn't started.'

c. gangcai Mali paobu. dan turan xiayu le suoyi wo bu zhidao ta
just.now Mary ran but suddenly rain LE so I not know she
you-mei-you pao.
PERF-NEG-PERF run
'Just now Mary was about to run. Suddenly it rained so I don't know whether she ran or not'

On the other hand, if the instantiation of Mary's running does not directly address the QUD as in (102) or (103), then the Q implicature becomes optional. In this case the hearer can successfully enrich the meaning of the zero-marked form with the R principle. But since Mary's running is not the main point, the speaker is expected to continue with another sentence that can potentially provide the main point. The narratives such as (102) and (103) are examples of this kind of continuation.

(107) (gangcai) Mali paobu. ta buxiaoxin shuai-le yi jiao.
just.now Mary run she by.accident fall-PERF one fall
'Just now Mary {ran, was running}. She fell down by accident.'

In short, the hearer's intuition that a zero-marked eventive is incomplete is because the only way for the speaker to avoid being uncooperative (e.g. being underinformative and potentially contradictory) at that point is to utter more, either about the eventuality expressed by the zero-marked eventive, or about something else as in the narrative cases.

#### 4.4.3.2 Biclausal sentences in the evidential use

In Section 4.3.3, I showed that when an eventive predicate embeds another clausal complement, overt aspect marking can become optional for episodic readings. This section provides a formalization of the different possibilities of how a biclausal construction such as (108) can update the discourse, in particular what the update looks like when the matrix content serves an evidential function so that the Q implicature does not rise mandatorily.

(108) zuotian Mali tingshuo Yuehan zai Zhijiage
yesterday Mary hear John at Chicago
'John is in Chicago, Mary heard yesterday'

With *-le*: It can answer either a question about John's location or a question about whether Mary heard it or not.

Without *-le*: It can only answer a question about John's location.

What makes (108) differs from its mono-clausal counterpart (109) is that besides the familiar option of updating the proposition expressed by the matrix clause as the at-issue *proposal*, the biclasual construction can evoke a special kind of update that puts forth only the embedded content (usually a reported claim) as the at-issue proposal (Simons 2007; Murray 2014; AnderBois 2016; Koev 2019; Faller 2019), rendering the instantiation of the matrix event as a 'side point'. When the information concerning the instantiation of the matrix event is not at-issue, namely addressing the QUD, no Q implicatures are forced, and the R implicature can give rise to the episodic reading effectively.

(109) ??zuotian Mali tingshuo zhe jian shi
yesterday Mary hear this CL affair
Int: 'Mary heard this affair yesterday'

I will call the the former regular updating option as an symmetric update (following AnderBois 2016) and the special option of putting forth only the embedded content as a proposal as an asymmetric update. The rest of the section provides a formalization of

each updating option.

For symmetric update formalized in (110), the entire proposition is put forth as an at-issue proposal and the instantiation of the matrix hearing event is at-issue as in (110-b). In this case, the actualization of the matrix event is directly relevant to addressing the QUD so that the mandatory Q implicature contradicts with the potential R implicature as in (110-c), causing incompleteness. This captures the generalization that uttering (108) without overt aspect fails to make the matrix proposition at-issue.

(110) a. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

b. Issue: $[x] \wedge x = \textbf{Mary} \wedge [i_1] \wedge \textbf{yesterday}_p(i_1) \wedge [q] \wedge [i_2] \wedge \textbf{now}_q(i_2) \wedge [y] \wedge y = \textbf{John} \wedge [z] \wedge z = \textbf{Chicago} \wedge [s_1] \wedge \textbf{In}_q(s_1, y, z) \wedge \tau(s_1) \supseteq i_2 \wedge \textbf{IMPF}^{p'}_{p,i_1}(\textbf{hear}(x, q), i_1) \wedge$

c. the QUD: Did Mary hear about John's location?

$\rightsquigarrow_R [e_1] \wedge \textbf{hear}_p(e_1, x, q) \wedge \tau(e_1) \supseteq i_1$

$\rightsquigarrow_Q \textbf{NOT}^{p'}_p([e_{2_{p'}}] \wedge \textbf{hear}_{p'}(e_2, x, q) \wedge \tau_{p'}(e_2) \subseteq i_1)$ (Mandatory)

(The static counterpart: ¬[[just.now Mary heard-PERF John at Chicago]])

$\Rightarrow$ Incompleteness!

For the asymmetric update in (111), I argue that only a modalized version of the embedded proposition is put forth as the at-issue proposal as in (111-c) (following Murray 2014) [8], while the matrix proposition is an not-at-issue update which is modeled as an imposal on the Context Set as in (111-a) and (111-d). Such a treatment captures the intuitions that uttering (108) without overt aspect marking can only make the claim about the John's location at-issue, but on the other hand, since it is a reported claim whose source is Mary's indirect evidence, the speaker is not publicly committed to the truth of embedded proposition but is to the possibility that it is true instead.

8. Another possibility is that the embedded content is attributed as the 'dependent' commitment for the speaker (see Faller 2019); this choice does not matter here.

(111) a. Imposal: $[x] \wedge x = \textbf{Mary} \wedge [i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge$

b. Proposal: $[q] \wedge q \subseteq p^{cs} \wedge$

c. Issue: $\textbf{possible}_q^{q'}([i_2] \wedge \textbf{now}_{q'}(i_2) \wedge [y] \wedge y = \textbf{John} \wedge [z] \wedge z = \textbf{Chicago} \wedge [s_1] \wedge \textbf{In}_{q'}(s_1, y, z) \wedge \tau(s_1) \supseteq i_2) \wedge$

d. Imposal: $\textbf{IMPF}_{p^{cs}, i_1}^{p'}(\textbf{hear}(q)(x), i_1) \wedge$

e. the QUD: Where is John?

$\rightsquigarrow_R [e_1] \wedge \textbf{hear}_{p^{cs}}(e_1, x, q) \wedge \tau(e_1) \supseteq i_1$

...

Since the actualization of the matrix event is not directly addressing the QUD, there are no mandatory Q implicatures (roughly 'Mary didn't hear that John is in Chicago'). Thus the R implicature can enrich the literal imperfective interpretation of the hearing event into the episodic interpretation.

#### 4.4.3.3 With projective focus

We've seen in Section 4.3.2 that adding projective focus, either introduced by pure intonation (e.g. contrastive focus), or by overt focus-sensitive operators such as *only*, can render zero-marked eventive sentences acceptable for episodic interpretations. In those cases, the instantiation of the relevant event is taken for granted and is not Q-at-issue. Some of the examples and how the R-based implicature is derived are reproduced in (112)-(113), and (114)-(115).

(112) A: zaoshang Yuehan jian-le yi-gen ren.
morning John meet-PROG one-CL person
'John met a person this morning. '

B: dui. ta (shi) jian MALI.
right he be meet Mary
'Right. He met [Mary]$_F$.' (Elaboration focus)

(113) a. Presupposition: $[i_1] \wedge \textbf{morning}_{p^{cs}}(i_1) \wedge [x] \wedge x = \textbf{John} \wedge [y] \wedge \textbf{person}_{p^{cs}}(y) \wedge$

$[e_1] \wedge \mathbf{meet}_{p^{cs}}(e_1, x, y) \wedge \tau_{p^{cs}}(e_1) \subseteq i_1 \wedge$

b. Proposal$_B$: $[q] \wedge q \subseteq p^{cs} \wedge$

c. Issue$_B$: $[i_2] \wedge [z] \wedge z = \mathbf{Mary} \wedge \mathbf{IMPF}^{q'}_{q,i_2}(\mathbf{meet}(x, z), i_2) \wedge$ (Anaphora: $i_2 = i_1$)

Or simply: $[z] \wedge z = \mathbf{Mary} \wedge \mathbf{IMPF}^{q'}_{q,i_1}(\mathbf{meet}(x, z), i_1) \wedge$

f. $\rightsquigarrow_R [z] \wedge z = \mathbf{Mary} \wedge [e_2] \wedge \mathbf{meet}_q(e_2, x, z) \wedge e_1 = e_2 \wedge$

Or simply: $\rightsquigarrow_R y = z = \mathbf{Mary}$

...

(114) A: zuotian Mali he Yuehan gezi zuo-le shenme yundong?
yesterday Mary and John each do-LE what exercise
'What exercise did Mary and John do yesterday?'

B: Mali PAOBU, Yuehan YOUYONG.
Mary run John swim
'[Mary]$_{CT}$ [ran]$_F$, [John]$_{CT}$ [swam]$_F$' (Contrastive focus)

(115) a. Presupposition: $[i_1] \wedge \mathbf{yesterday}_{p^{cs}}(i_1) \wedge x = \mathbf{Mary} \wedge [e_1] \wedge \mathbf{exercise}_{p^{cs}}(e_1, x) \wedge$
$\tau_{p^{cs}}(e_1) \subseteq i_1 \wedge y = \mathbf{John} \wedge [e_2] \wedge \mathbf{exercise}_{p^{cs}}(e_2, y) \wedge \tau_{p^{cs}}(e_2) \subseteq i_1$

b. Proposal$_B$: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $\mathbf{IMPF}^{p'}_{p,i_1}(\mathbf{run}(x), i_1) \wedge \mathbf{IMPF}^{p'}_{p,i_1}(\mathbf{swim}(y), i_1) \wedge$ (Anaphora to $i_1$)

d. $\rightsquigarrow_R [e_3] \wedge \mathbf{run}_p(e_3, x) \wedge [e_4] \wedge \mathbf{swim}_p(e_4, y) \wedge e_1 = e_3 \wedge e_2 = e_4$

Or simply: $\rightsquigarrow_R \mathbf{run}_p(e_1, x) \wedge \mathbf{swim}_p(e_2, y)$...

In both context, it is already in the Common Ground that the event described by the zero-marked predicate was actualized (e.g. the meeting event in (112) and the exercising events in (114). In other words, the actualization inference cannot be at-issue and the Q implicature 'John didn't meet Mary' for (112) or 'Mary didn't run and John didn't swim' for (114) do not mandatorily arise. For this reason, the zero-marked sentence with projective focus can give rise to the episodic readings without causing incompleteness.

### 4.4.4 Interim summary

This section shows that when the event instantiation is at-issue, a zero-marked sentence is degraded because the alternatives marked by overt aspect markers are in direct competition with the zero-marked form for the intended episodic reading. When they are competing with each other, the resulting Q implicatures are in conflict with the R implicature, giving rise to degradedness. Such degradedness is essentially about uncooperativeness. The proposed pragmatic theory accounts for the context-sensitivity of incompleteness: whenever the event instantiation can be NOT at-issue, either due to projective focus, the evidential use of biclausal constructions, or narratives, the Q implicatures are optional, and the R implicature alone can enrich the literal meaning of zero-marked eventives into episodic readings. Moreover, the current proposal captures native speaker's intuitions about the degradedness involved in this puzzle– 'as if the speaker hasn't finished their utterance'. The zero-marked sentence is not really unacceptable, but just the way the speaker uses it is uncooperative and confusing, which can be potentially salvaged if the speaker utters more.

## 4.5 Summary

This chapter presents a formal pragmatic account of temporal incompleteness in Chinese. I proposed that zero-marked sentences can obtain the episodic readings via the reasoning based on the R principle 'Say no more than you must' (together with some other contextual factors). There are two slightly different cases of such R-based enrichment, in one case (i.e. with projective focus), the R-based implicature helps incorporate the existing aspectual information of an existing event into the literal meaning; in the other case (i.e. narratives or evidential use), there is no presupposed aspectual information and the enrichment is mainly based on the inertial modal semantics in the literal meaning plus the R implicature that 'What is stereotypical needs not be said'. Moreover, such R-based enrichment is not

always available and might be blocked by a contradictory Q-based implicature depending on the QUD. The context-sensitivity of the degradedness of the zero-marked eventive sentences can be captured by the interaction between the QUD and R and Q implicatures: when the actualization of the relevant event is at-issue, the Q implicature is mandatory, which leads to a conflict with the R implicature, causing incompleteness; when the actualization of the relevant event is not-at-issue as in the case involving projective focus, narratives, and evidential use, the Q implicature is not mandatory and the R implicature is not blocked.

# CHAPTER 5

# TEMPORAL INCOMPLETENESS IN NON-ROOT CLAUSES

## 5.1 Introduction

I have approached the puzzle of temporal incompleteness mainly based on the data of root clauses in Chinese. I showed that overt aspect marking on matrix eventive predicate is required for episodic interpretation only when the event instantiation is directly addressing the QUD. The analysis I proposed for incompleteness is pragmatic in nature: while the zero-marked zero-marked eventive can in principle obtain the event instantiation inference via the R principle (Horn 1984), the Q principle can cause a contradictory scalar implicature, whose optionality depends on the QUD. The conflict between the two implicatures lead to the degradedness of zero-marked sentences in those cases, and the pragmatic analysis captures the context-sensitivity of the incompleteness phenomenon.

This section extends the current account to a wider range of empirical data, namely the distribution of overt aspect marking (for episodic readings) in non-root clauses. In Section 5.2, I discuss what kind of data is directly relevant to the current investigation. Section 5.3 and Section 5.4 turn to different kinds of non-root clauses that are relevant; I show that the current pragmatic account can capture the incompleteness pattern of those non-root clauses. Section 5.5 concludes.

## 5.2 Clarification on the data selection

There is a variety of non-root clauses in Chinese, including verbal complements, noun complements, relative clauses, adverbial clauses, etc. In particular, I will only focus on the non-root clauses that can admit overt aspect marking and give rise to episodic readings in the first place. For instance, the complements of some predicates such as *xiangyao* 'want', *dasuan* 'plan', *jueding* 'decide' cannot take overt aspect marking (for syntactic or/and

semantic reasons), and unsurprisingly they do not allow episodic readings as in (1)[1]. For this reason they are not directly relevant to the current discussion.

(1) a. Yuehan xiangyao [{*zai} chi {*-le} pangxie]
John want PROG eat PERF crab
Int: 'John wants to {be eating, have been eating, have eaten} crabs.'

b. Yuehan dasuan [{*zai} chi {*-le} pangxie]
John plan PROG eat PERF crab
Int: 'John planned to {be eating, have been eating, have eaten} crabs.'

c. Yuehan jueding [{*zai} chi {*-le} pangxie]
John decide PROG eat PERF crab
Int: 'John decided to {be eating, have been eating, have eaten} crabs.'

The non-root clauses that can give rise to episodic interpretations relative to the local evaluation world or the actual world mainly include the complements of attitude and speech verbs, noun complements, relative clauses, and certain adjunct clauses. In (2), the complement clauses can take the progressive/perfective marker to convey a proposition (which is the content of believing/saying) that John's eating crabs event was ongoing or completed within the topic time. Similarly, noun complements in (3) and relative clauses in (4) can take overt aspect marking to convey episodic readings.

(2) Complements of attitude or speech verbs

a. Mali xiangxin [Yuehan {zai} chi {-le} pangxie]
Mary believe John PROG eat PERF crab
'Mary believed that John {was eating, ate} crabs'

b. Mali shuo-guo [Yuehan {zai} chi {-le} pangxie]
Mary say-EXP John PROG eat PERF crab
'Mary once said that John {was eating, ate} crabs'

(3) Noun complements

1. Note that when the object of the non-root clauses in (1) are changed to a definite nominal such as *na-zhi pangxie* 'that-CL crab', the embedded predicate can actually take a completive *-le*, whose meaning is different from the perfective *-le*, but is similar to the meaning of the particle 'up' in 'eat up this crab' in English.

a. Mali xiangxin [Yuehan {zai} chi {-le} pangxie] de xiaoxi
Mary believe John PROG eat PERF crab DE news
'Mary believes the news that John {was eating, ate} crabs.'

b. Mali xiangxin [Yuehan {zai} chi {-le} pangxie] zhe-jian xiaoxi
Mary believe John PROG eat PERF crab this-CL news
'Mary believes the news that John {was eating, ate} crabs.'

(4) Relative clauses

a. Mali renshi na-ge [{zai} chi {-le} pangxie] de nanhai
Mary know that-CL PROG eat PERF crab DE boy
'Mary knows the boy that {was eating, ate} crabs.'

b. na-zhi [Yuehan {zai} chi {-le}] de pangxie feichang da
that-CL John PROG eat PERF DE crab very big
'The crab that John {was eating, ate} was very big.'

For adjunct clauses such as (5), since they often encode certain temporal relations between the eventualities described by the adjunct and root clauses, they are selective in terms of what kinds of aspect markers they can admit. For the adjunct clause in (5-a) which can roughly translated as 'During the time when ...', it can take the progressive *zai* but not the perfective *-le*. By contrast, the adjunct clause in (5-b) can only take the perfective *-le* but not the progressive marker. But as long as an adjunct clause can take some overt aspect marking and convey an episodic reading, I consider it relevant.

(5) Some adjunct clauses

a. [Yuehan {zai} chi {*-le} pangxie] de shihou, Mali zou-le jinlai
John PROG eat PERF crab DE time Mary walk-PERF in
'During the time when John was eating crabs, Mary walked in'

b. [Yuehan {*zai} chi {-le} pangxie] zhihou, Mali zou-le jinlai
John PROG eat PERF crab after Mary walk-PERF in
'After John finished eating crabs, Mary walked in'

Lastly, there is a set of data involving the complements of verbs such as *shefa* 'try' (literal: 'devise a way'), *changshi* 'try' (literal: 'make an attempt'), *qing* 'invite' as in (6)

which are apparently relevant because the embedded predicates in (6) all can take the perfective marker *-le* (but not the progressive *zai*). Interestingly, when *-le* appears in the embedded clause, the sentence entails the occurrence of both the event described by the embedded predicate and the event described by the matrix predicate in the actual world.

(6) a. Yuehan shefa [chi -le panxie]
John try eat -PERF crab
'Mary tried to eat and she indeed ate crabs.'

b. Mali qing Yuehan [chi -le pangxie]
Mary invite John eat -PERF crab
'Mary invited John to eat crabs and John indeed ate crabs'

Nevertheless, it is often agreed in the literature that the embedded *-le* in (6) is originated in the Aspect of the matrix clause and is lowered onto the embedded verb for syntactic reasons (Grano 2015; see a variant in which *-le* is not literally 'lowered' but agrees with a matrix probe in Huang 2018, Huang 2022). Importantly, there is evidence showing that the perfective *-le* has matrix semantic scope, and it is only syntactically 'lowered' from the matrix clause to the embedded clause. One piece of evidence is that an experiential adverb *congqian* in the matrix clause can be licensed by an embedded experiential marker *-guo* in such constructions. In Chinese, *contqian* 'once' cannot occur alone but need to be be licensed by the experiential *-guo* in the same clause:

(7) Yuehan congqian chi ??(-guo) pangxie.
John once eat -EXP crabs
'John once ate crabs'

Turning to sentences such as (6), we find that *-guo* in the complement can license the adverb *congqian* in the matrix clause, as in (8). This is in contrast with the complement of a speech or attitude predicate in (9), which does not allow the association between a matrix *congqian* and the embedded *-guo*.

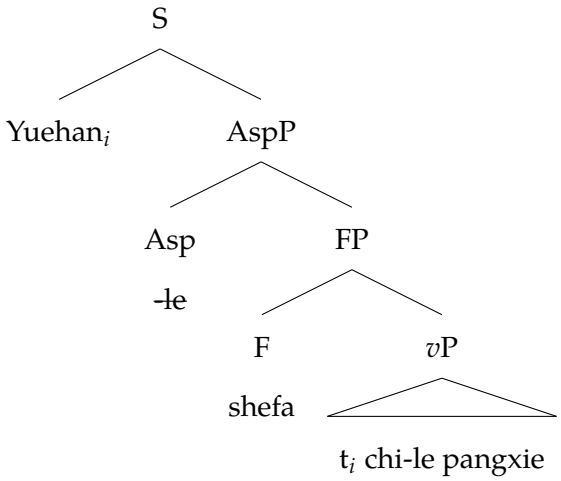
(8) a. Mali congqian shefa chi -guo pangxie
Mary before try eat -EXP crab
'Mary tried to eat crabs and he indeed ate crabs before'

b. Mali congqian qing Yuehan chi -guo pangxie
Mary before invite Lisi eat -EXP crab
'Mary invited John to eat crabs and John indeed ate crabs before'

(9) Mali (*congqian) shuo [Yuehan (congqian) chi-guo pangxie]
Mary before say John once eat-EXP crab
(Int:) 'Mary said (before) that John ate crabs (before)'

Grano (2015) proposes an essentially monoclausal structure for the sentence (8), as illustrated in (10). The matrix predicate is a functional head which selects for a *v*P, and the aspect *-le* is originated in the matrix clause. He argues that the aspectual suffix *-le* can only attach to a verb but not a functional head, thus it has to be lowered to attach to the embedded predicate *chi* 'eat'.

(10)




Crucially, under such an analysis, the complement of the matrix predicate *shefa* is a truncated clause such that it is as small as *v*P and does not include AspP. For this reason I do not consider those constructions relevant because the aspect marking is in fact originated in the matrix clause.

There is further support that those complements are truncated compared to the com-

plements of speech or attitude predicates. It has been observed that the two kinds of complement differ in whether they constitute an opaque domain for certain syntactic operations (Li 1985, 1990; C.-T. Huang et al. 1999, 2022; Huang et al. 2009; Grano 2015). The complements in (8) allow an embedded object to be passivized out of them into the matrix clause, as in (11), but such a long distance passivization is not possible for the complements of speech or attitude predicates, as in (12).

(11) a. zhe dao cai bei Mali shefa chi -guo.
this CL dish BEI Mary try eat -EXP
'The dish has been ' tried to eat' by Mary'

b. zhe dao cai bei Mali qing Yuehan chi-guo le
this CL dish BEI Mary invite John eat-EXP LE
'This dish has been 'invite John to eat' by Mary.'

(12) a. *Yuehan bei Mali toulu jingcha zhua-zou le.
John BEI Mary reveal police arrest LE
'*John$_i$ was revealed by Lisi that the police had arrested t$_i$.'

b. *Yuehan bei Mali xiwang jingcha zhua-zou le.
John BEI Mary hope police arrest LE
'*John$_i$ was hoped by Lisi that the police had arrested t$_i$.'

Another operation which the complements of *v*P size are transparent to is the long-distance *suo*-climbing (Chiu 1993; Jiang 2008; Ting 2010). *Suo* is an object relative pronoun in the Classical Chinese, and it is often used in a relative clause form in (13) in which case it undergoes clitic climbing from the object position to the left of the VP.

(13) ta suo xihuan de yi-ben shu
she SUO like DE one-CL book
'a book that she likes'

For the *v*P-size complements, they allow *suo* to undergo long-stance climbing to the left of the matrix verb, as in (14).

(14) a. ta suo shefa kan-guo de yi-ben shu
she SUO try read-EXP DE one-CL book
'a book that she tried to read before'

b. ta suo qing Yuehan chi-guo de yi-dao cai
she SUO invite John eat-EXP DE one-CL dish
'a dish that Mary invited John to eat before'

However, for complements of speech or attitude predicates, *suo* cannot climb from an embedded object position to the left of the matrix predicate (Ting 2010). The sentences in (15) are only acceptable if another relative clause marker *de* is added to the matrix clause; but in such a case no long-distance *suo*-climbing is involved since the double occurrence of *de* indicates that there are two stacked relative clauses. In short, those complements form an opaque domain to the long distance *suo*-climbing.

(15) a. Mali suo shuo *(de) Yuehan kan-guo de yi-ben shu
Mary SUO say DE John read-EXP DE one-CL book
'a book that Mary said that John read before'

b. Mali suo xiangxin *(de) Yuehan chi-guo de yi-dao cai
Mary SUO believe DE John eat-EXP DE one-CL dish
'a dish that Mary said that John ate before'

The above differences between two kinds of complements are often used to argue for the presence of a finite vs. nonfinite distinction in Chinese, though it is still an ongoing debate (C.-T. Huang 1984, 1982; 1999, 2021; Li 1985, 1990; C.-C. Tang et al. 2000; Jonah Lin 2011, 2012; Xu 1986; Hu et al. 2001; Jo-Wang Lin 2010; Grano 2015; Yuyin He 2020). I will remain agnostic towards this debate but just use 'non-finite' and 'finite' as labels for the more transparent *v*P-size complements and the more opaque larger size complements. In other words, we will not discuss the non-finite complements such as (6) in the rest of the section because essentially they are too small to admit overt aspect marking in the first place.

In sum, I show that mainly the kinds of non-root clause in (16) are relevant to our discussion of temporal incompleteness.

(16) a. Complements of attitude or speech verbs

b. Relative clauses

c. Noun complements

d. Certain adverbial clauses (e.g. *zai ... de shihou* 'During the time when ...', *... zhiqian/zhihou* 'Before/after ...'

## 5.3 Complements of attitude or speech verbs

This section looks into the distribution of overt aspect marking for episodic readings in the complements of attitude or speech predicates. In order to have a full picture of the data pattern, I sort the predicates into four kinds, based on whether they are factive or not and whether they are eventive or not, as in Table 5.1.

Table 5.1: Different kinds of clause-embedding predicates

| | | |
|---|---|---|
| non-factive | stative | *renwei/juede* 'think', *xiangxin* 'believe', *xiwang* 'hope' |
| | eventive | *tingshuo* 'hear', *fouren* 'deny', *gaoso* 'tell', *xuancheng* 'claim', *huangcheng* 'lie' |
| factive | stative | *zhidao* 'know', *hen kaixin* 'be happy (that)', *hen zhenjing* 'be shocked (that)' |
| | eventive | *faxian* 'discover', *chengren* 'admit', *toulu* 'reveal' |

The basic pattern is in (17). In an out-of-the blue context, it is generally hard to drop overt aspect marking for eventive predicates in those complements, regardless of the factivity and eventivity of the predicates that select them. In order to rule out the possibility that the degradedness is caused by the matrix predicate, overt aspect marking is added to the eventive matrix predicates *tingshuo* 'hear' and *faxian* 'discover', but as in (17-b) and (17-d), the relevant sentences seem to remain degraded.

(17) a. yisheng renwei [zuotian Yuehan chi ??(-le) haixian].
doctor think yesterday John eat -PERF seafood
'The doctor thinks that John ate seafood yesterday.'

b. yisheng tingshuo (-le) [zuotian Yuehan chi ??(-le) haixian].
doctor hear PERF yesterday John eat -PERF seafood
'The doctor heard that John ate seafood yesterday.'

c. yisheng zhidao [zuotian Yuehan chi ??(-le) haixian].
doctor know yesterday John eat -PERF seafood
'The doctor knows that John ate seafood yesterday.'

d. yisheng faxian (-le) [zuotian Yuehan chi ??(-le) haixian].
doctor discover PERF yesterday John eat -PERF seafood
'The doctor discovered that John ate seafood yesterday.'

Quite similar to how incompleteness can be salvaged for root clauses, adding projective focus to some constituent(s) in the complement or the matrix clause can improve the sentences, as shown in (18) and (19).

(18) *Projective focus in the clausal complement*

a. yisheng renwei [zuotian YUEHAN chi (-le) haixian] (bu shi MALI).
doctor think yesterday John eat -PERF seafood not be Mary
'The doctor thinks that [John]$_F$ ate seafoodyesterday, not [Mary]$_F$.'

b. yisheng tingshuo (-le) [zuotian Yuehan zhi chi (-le) HAIXIAN].
doctor hear PERF yesterday John only eat -PERF seafood
'The doctor heard that John only ate [seafood]$_F$ yesterday.'

c. yisheng zhidao [zuotian Yuehan chi (-le) HAIXIAN, Mali chi (-le)
doctor know yesterday John eat -PERF seafood Mary eat -PERF
NIUROU].
beef
'The doctor knows that [John]$_{CT}$ ate [seafood]$_F$ , [Mary]$_{CT}$ ate [beef]$_F$.'

d. yisheng faxian (-le) [zuotian Yuehan shenzhi chi (-le) HAIXIAN].
doctor discover PERF yesterday John even eat -PERF seafood
'The doctor discovered that John even ate [seafood]$_F$ yesterday.'

(19) *Projective focus in the matrix clause*

a. (shi) LIN yisheng renwei [zuotian Yuehan chi (-le) haixian] (bu shi ZHAO
be Lin doctor think yesterday John eat -PERF seafood not be Zhao
yisheng).
doctor
'[Dr. Lin]$_F$ thinks that John ate seafood yesterday. (Not [Dr. Zhao]$_F$)'

b. zhiyou LIN yisheng tingshuo (-le) [zuotian Yuehan chi (-le) haixian].
only Lin doctor hear PERF yesterday John eat -PERF seafood
'Only [Dr. Lin]$_F$ heard that John ate seafood yesterday.'

c. yisheng (shi) ZHIDAO [zuotian Yuehan chi (-le) haixian], bu shi
doctor be know yesterday John eat -PERF seafood not be
TINGSHUO.
hear
'The doctor [knows]$_F$ that John ate seafood yesterday, not [heard]$_F$ it.'

d. lian LIN yisheng dou faxian (-le) [zuotian Yuehan chi (-le) haixian].
LIAN Lin doctor DOU discover PERF yesterday John eat -PERF seafood
'Even [Dr. Lin]$_F$ discovered that John ate seafood yesterday.'

This is expected because with projective focus, the occurrence of the event expressed by the embedded predicate (henceforth, the embedded event) can easily be not-at-issue. For (18-a), what is taken for granted is that (the doctor thinks that) someone ate seafood yesterday, and what is under discussion is who (the doctor thinks that) the agent of this event was. For (18-b), it is naturally uttered in a context which presupposes that Dr.Lin heard that John ate seafood yesterday and what is under discussion is whether someone other than John heard it. The other examples in (18) and (19) can be explained similarly.

The incompleteness of the complements can generally be salvaged by uttering the sentences within a narrative, unsurprisingly. In (20), a stative sentence is uttered after the target sentence, in which case the hearer has the option of taking the second sentence as the main point of the utterance and the first sentence is not-at-issue.

(20) a. yisheng renwei [zuotian Yuehan chi (-le) haixian]. ke meiyouren tongyi.
doctor think yesterday John eat -PERF seafood but nobody agree
'The doctor thinks that John ate seafood yesterday. But nobody agrees.'

b. yisheng tingshuo [zuotian Yuehan chi (-le) haixian]. ta tebie danxin.
doctor hear yesterday John eat -PERF seafood she really worried
'The doctor heard that John ate seafood yesterday. She was really worried.'

c. yisheng zhidao [zuotian Yuehan chi (-le) haixian]. ta tebie danxin.
doctor know yesterday John eat -PERF seafood she really worried
'The doctor knew that John ate seafood yesterday. She was really worried.'

d. yisheng faxian [zuotian Yuehan chi (-le) haixian]. ta tebie danxin.
doctor discover yesterday John eat -PERF seafood she really worried
'The doctor discovered that John ate seafood yesterday. She was really worried'

Note that, I just claimed that for biclausal constructions, there is an option of updating either the matrix content or the embedded content as the at-issue one. We have seen that when an eventive predicate embeds another complete sentence (stative or aspectually marked eventive), the aspect marking on the matrix eventive is optional because there is an option of updating the embedded proposition as the main point, as in (21).

(21) a. yisheng tingshuo (-le) [Yuehan xihuan chi tianshi].
doctor hear PERF John like eat dessert
'The doctor heard that John likes to eat dessert.'

b. yisheng tingshuo (-le) [Yuehan zuowan he -le kafei].
doctor hear PERF John last.night drink PERF coffee
'The doctor heard that John drank coffee last night.'

Since all the matrix verbs in (17) are either stative or aspectually marked, in principle there should also be an option of updating the proposition related to the matrix event as the main point, rendering the embedded proposition not at-issue. But then our account seems to wrongly predict that overt aspect marking can be dropped just like the optionality of such aspect marking on matrix verbs in (21). It is even more puzzling that the complement of factive predicates is not exempt from temporal incompleteness – factive predicates are well-known to presuppose the truth of their complements, and if the complement is presupposed, shouldn't it be the case that the occurrence of the embedded event is necessarily not at-issue?

In the face of those challenges, the following subsections show that our account can be maintained nevertheless once taking a closer look at the data. Section 5.3.1 argues that there is no correlation between factivity and not-at-issueness (following Djärv 2019) and a distinction should be made between the embedded proposition being part of the at-issue update and the embedded proposition being entirely not at-issue. Section 5.3.2 extends the formal pragmatic analysis to the data.

### 5.3.1 As part of the at-issue content

In this section, I first show that the factivity of a predicate does not determine the (not-)at-issueness of the proposition expressed by its complement. Instead, uttering a biclausal construction that contains either a factive or non-factive predicate is generally felicitous as an answer to a question to which the embedded content is relevant, which indicates that the embedded content is 'at-issue' at least in some way. This is shown in (22).

(22) Q: Yuehan zenme kou.tu.bai.mo?
John why foam.at.the.mouth
'Why is John foaming at the mouth?'

$A_1$: yisheng renwei [ta chi-le haixian]
doctor think he eat-PERF seafood
'The doctor thinks that he ate seafood'

$A_2$: yisheng shuo [ta chi-le haixian]
doctor say he eat-PERF seafood
'The doctor said that he ate seafood'

$A_3$: wo {zhidao /hen zhenjing} [ta chi-le haixian]
I know very shocked he eat-PERF seafood
'I {know, am shocked} that he ate seafood' [2]

$A_4$: yisheng (gang) faxian [ta chi-le seafood]
doctor just discover he eat-PERF seafood
'The doctor (just) discovered that he ate seafood'

Djärv (2019) made similar observations about factive predicates in English and German, as in (23). While she considers that not all factive predicates can do so, for instance emotive predicates such as 'resent', 'glad that' as in (23-c), I find it not impossible to construct contexts in which the embedded content addresses the QUD, as in (24).

(23) Q: Where is Mary?

2. There is a preference for the attitude/emotion holder to be the speaker in this case (see also (23), (24), (25)), which probably can be explain by the pragmatic principle of being relevant: intuitively, providing information about one's own attitude/emotion seems less distracting than providing information about someone else's under the context of (22).

a. I know that she went abroad.

b. I just found out that she went abroad.

c. #I resent that she went abroad.

(24) Q: Where is Mary?

a. I am very shocked that she went abroad.

b. I am very glad that she is now in a safe place.

c. I am very sorry that she has gone to a far place.

The pattern concerning the emotive predicates can be firmed with the data in Chinese:

(25) Q: Yuehan zhe-ci kaoshi zenmeyang?
John this-time exam how
'How was John's performance in this exam?

$A_1$: wo chao kaixin ta tongguo-le kaoshi
I extremely happy he pass-PERF exam
'I am extremely happy that he passed the exam'

$A_2$: ta tebie aonao [ziji mei tongguo kaoshi]
he extremely upset self not-PERF pass exam
'He is extremely upset that he didn't pass the exam'

But the fact that the complement of both a factive and a non-factive predicate can be at-issue still does not address the puzzle here – as long as the matrix proposition can be at-issue, then we should expect overt aspect marking to be optional for the embedded eventive predicates in (17). This leads to the my second claim that the asymmetry between the matrix and embedded eventive predicates w.r.t dropping the aspect marking (in an out-of-the blue context) is caused by an asymmetrical relation between the matrix proposition ($m$) and the embedded proposition ($p$): while $m$ is not a part of $p$, $p$ is a proper part of $m$. That means, when $m$ constitutes the main update of the context and ($p$ itself is not), since $p$ is part of $m$, there are two possible statuses of $p$. The first is that $p$ is 'quasi-at-issue' as the part of the at-issue matrix proposition; the second is that $p$ is not even 'quasi-at-issue'

and is entirely not-at-issue at both the global and local level. In words, for a biclausal construction with the form '[$_S$ *x* V(-ASP) [$_{S'}$ ... ]]', there are at least three different options of updating the context by uttering it, as informally characterized in (26).

(26) For the sentence '[$_S$ *x* V(-ASP) [$_{S'}$ ... ] ]', let $p$ = ⟦S'⟧, $m$ = ⟦S⟧

| | At-issue update | QUD |
|---|---|---|
| ① $p$ is at-issue | $p$ | What is the way things are? |
| ② $p$ is quasi-at-issue | $m$ | What is the way things are? |
| ③ $p$ is entirely not at-issue | Regarding $p$, *x* V(-ASP) it. | Regarding $p$, did (/does) *x* V it? |

I argue that only in the third case overt aspect marking can be omitted on the embedded eventive predicates, because the alternatives (which contain overt aspect markings in the complements) are truly irrelevant to the QUD, which will not give rise to mandatory scalar implicatures. However, this option is not available in an out of the blue context (or with default intonation of the biclausal construction) such as (17) probably either because it is not easy to accommodate the Question Under Discussion 'Regarding the state of affair *John ate seafood*, did (/does) the doctor {think so/hear it/know it/discover it}?' in this context, or because the default intonation does not favor such an option. Recall that in Chinese, just like English, the default intonation for a declarative sentence with a transitive predicate is to have the prosodic prominence on the object (Feng 1997; Duanmu 2000); in other words, the same intonation can answer a question whose *wh*-phrase corresponds to the object as well.

(27) Q: *zenme le?* 'What happened?' /

*Lisi he-le shenme?* 'What did John drink?' /

*#Lisi zenme-le baijiu?* 'What did John do to the liquor?' /

*#shei he-le baijiu?* 'Who drank the liquor'

A: Yuehan he-le **baijiu**
John drink-PERF liquor
'Lisi drank the liquor' (boldfacing indicates the prosodic prominence)

(28) Q: #*zenme le?* 'What happened?' /

*Lisi zenme-le baijiu?* 'What did John do to the liquor?'

A: Yuehan **he**-le baijiu
John drink-PERF liquor
'Lisi drank the liquor'

(29) Q: #*zenme le?* 'What happened?' /

*shei he-le baijiu?* 'Who drank the liquor'

A: **Yuehan** he-le baijiu
John drink-PERF liquor
'Lisi drank the liquor'

While there is no explicit discussion on the default intonation of biclausal constructions, a natural extension is to assume that the default prosodic emphasis also falls on the complement of the main verb, and for this reason under the default intonation, there are two possibilities in terms of focus distribution: one is the all-new focus (/broad focus), the other is that the complement is focused. Those two correspond to the first two choices in (26) respectively. For the third choice, I argue just like in (28) the prosodic emphasis must shift to the matrix verb, and the complement should be de-accented. Indeed, we can construct such a context in which the embedded proposition is already mentioned (e.g. given) in the context, and the prosodic emphasis is on the matrix verb. As predicated by my account, the omission of overt aspect marking becomes much more acceptable:

(30) Context: This morning John and his friends were sent to the Emergency Room of Hospital *X*. They were all foaming at the mouth for unknown reasons. All the doctors went to the ER to treat the patients. Ten minutes later, John's neighbor informed a nurse (Ann) that John ate seafood and Ann immediately calls the head nurse Beth in ER:

A: Yuehan chi-le haixian. mashang gaosu yisheng-men!
John eat-PERF seafood right.now tell doctor-PL
'John ate seafood. Tell the doctors right now!'

B: meishi. Lin yisheng (yijing) faxian-le [Yuehan chi (-le) haixian]
no.worries Lin doctor already discover-PERF John eat -PERF seafood
'No worries, Dr.Lin (already) discovered that [John ate seafood]'

(30) can be compared to a context such as (31), in which everything B said, both the embedded proposition, and the matrix proposition are discourse-new in the conversation, and even when the matrix proposition is considered to contribute to the at-issue update, the embedded proposition is quasi-at-issue as part of the at-issue update.

(31) Context: This morning John and his friends were sent to the Emergency Room of Hospital *X*. They were all foaming at the mouth for unknown reasons. All the doctors went to the ER to treat the patients. An hour later, the hospital dean (Ann) called the Head nurse (Beth) to ask if doctors have made any progress.

A: tianna, yisheng-men zai zuo shenme ma?
god doctor-PL PROG do what YNQ
'For God's sake, are the doctors doing anything?'

B: Li yisheng faxian-le [Yuehan chi ??(-le) haixian]
Li doctor discover-PERF John eat -PERF seafood
'Dr.Lin discovered that [John ate seafood]'

Note that to license the choice 3, *p* is not necessarily presupposed in the context but only needs to be given (/explicitly or implicitly mentioned, see Büring 2016). This can be illustrated with examples of non-factive predicates in (32).

(32) A: *zenme huishi?* 'What happened?'

B: keneng zuotian Yuehan chi-le haixian
likely yesterday John eat-PERF seafood
'It is likely that John ate seafood yesterday'

A: *na yao gaosu Lin yisheng ma?* 'Should we inform Dr. Lin ? '

B: bu yong, ta {ye renwei / yijin tingshuo-le} [zuotian Yuehan chi haixian]
no need she also think already hear-PERF yesterday John eat seafood

'No need, she {also thinks, already heard} that John ate seafood yesterday'

This claim can be further supported by the fact that, if we topicalize the clausal complement, which is possible in Chinese, overt aspect marking becomes optional in the complement, as shown in (33) and (34). The topicalization forces the not-at-issue status of the embedded proposition and the kind of discourse update in choice 3. As expected, since the matrix predication must be at-issue in this case, overt aspect marking is indeed obligatory for eventive clause-embedding predicates as in (34).

(33) a. [zuotian Yuehan chi(-le) haixian]$_1$ ne, yisheng xiangxin $t_1$
yesterday John eat-PERF seafood TOP Mary believe
'That John ate seafood yesterday, the doctor believes it.'

b. [zuotian Yuehan chi(-le) haixian]$_1$ ne, yisheng zhidao $t_1$
yesterday John eat-PERF seafood TOP Mary know
'That John ate seafood yesterday, the doctor knows it.'

(34) a. [zuotian Yuehan chi(-le) haixian]$_1$ ne, yisheng shuo*(-guo) $t_1$
yesterday John eat-PERF seafood TOP doctor say-EXP
'That John ate seafood yesterday, the doctor once said it.'

b. [zuotian Yuehan chi(-le) haixian]$_1$ ne, yisheng faxian-*(le) $t_1$
yesterday John eat-PERF seafood TOP doctor discover-PERF
'That John ate seafood yesterday, the doctor discovered it'

In sum, this section shows that (i) factivity of a clause-embedding predicate should be teased apart from the not-at-issueness of the proposition expressed by its complement; and that (ii) the asymmetry between the matrix and embedded eventive predicates in terms of omitting overt aspect marking (in an out-of-the-blue context) can be attributed to the asymmetry that the default intonation only supports the updating choices in which the embedded proposition is at-issue or quasi-at-issue while the updating choice in which the embedded proposition is entirely not at-issue requires a marked intonation (/context). The next section turns to a formal account of the data.

### 5.3.2 The formal analysis

This section argues that the proposed pragmatic account in Chapter 4 can be successfully extended to the potential incompleteness of speech/attitude complements.

I first show why incompleteness arises with zero-marked complements in an out-of-the-blue context – as I have argued in Section 5.3.1, the typical default intonation in such a context only supports the kind of updates in which the actualization of the event expressed by the embedded verb is either at-issue or quasi-at-issue as in (35).

(35) For the sentence '[$_S$ $x$ V(-ASP) [$_{S'}$ ... ] ]' under the default intonation.
(Let $p = [\![\text{S}']\!]$, $m = [\![\text{S}]\!]$)

| | At-issue update | QUD |
|---|---|---|
| ① $p$ is at-issue | $p$ | What is the way things are? |
| ② $p$ is quasi-at-issue | $m$ | What is the way things are? |

Taking a biclausal construction involving an attitude complement in (36) for instance, the updating option ① for the construction without overt aspect marking on the embedded verb can be formalized within the dynamic framework (see Chapter 4, Sec 4.2.2) in (37).

(36) Lin yisheng renwei [zuotian Yuehan chi ??(-le) haixian].
Lin doctor think yesterday John eat -PERF seafood
'Dr. Lin thinks that John ate seafood yesterday.' (Out-of-the-blue)

(37) Option ①: the embedded proposition is at-issue

a. Imposal: $[x] \wedge x = \textbf{Dr.Lin} \wedge [i_1] \wedge \textbf{now}_{p^{cs}}(i_1) \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge \textbf{yesterday}_p(i_2) \wedge [y] \wedge y = \textbf{John} \wedge \textbf{IMPF}^{p'}_{p,i_2}(\textbf{eat-seafood}(y), i_2) \wedge$

d. Imposal: $[s_1] \wedge \textbf{think}_{p^{cs}}(s_1, x, p) \wedge \tau_{p^{cs}}(s_1) \supseteq i_1 \wedge$

We have discussed similar cases (e.g. the evidential use of clause-embedding predicates) in Chapter 4 and in such a case, the proposition expressed by the attitude complement

is put forth as the at-issue update as in (37-c), while the matrix predication is imposed on the Context Set (see (37-a) and (37-d)). For the at-issue proposition in (37-c), while it does not entail the actualization of John's eating-seafood event, it can imply it via the R principle 'Say no more than you must'; however since the actualization of this event is directly addressing the QUD, the alternatives of (37) in which the embedded verb is overtly marked are relevant, and give rise to mandatory Q implicatures, as in (38). There is a conflict between those enrichments since with the R implicature the interpretation is roughly as 'John ate/was eating seafood yesterday', while the Q implicatures are it is not the case that John ate seafood yesterday. For this reason, the updating option ① causes incompleteness.

(38) ...

e. QUD: What is the way things are? (/What happened to John?)
$\rightsquigarrow_R [e_1] \wedge \textbf{eat-seafood}_p(e_1, y) \wedge \tau_p(e_1) \supseteq i_2 \wedge$
$\rightsquigarrow_Q \textbf{NOT}_p^{p'}([e_{2_{p'}}] \wedge \textbf{eat-seafood}_{p'}(e_2, x) \wedge \tau_{p'}(e_2) \subseteq i_2)$ (Mandatory)
(The static counterpart: $\neg[\![$yesterday John eat-PERF seafood$]\!]$)

Turning to the updating option ②, in this case, the entire proposition contributed by the biclausal construction is put forth as an at-issue update, as in (39b). I argue that since R implicatures can generally be calculated locally as in (40) (Rett 2014, 2020), it is possible to calculate a stereotypicality-based R implicature within the local scope, as in (39c); but since the entire proposition is at-issue, the actualization of John's eating-seafood event as the content of Dr. Lin's attitude is quasi-at-issue and renders relevant the alternatives that have overt aspect marking on the embedded verb. In other words, the Q implicatures 'Dr. Lin doesn't think that John ate seafood yesterday' will mandatorily arise in this case, which contradicts with the R implicature 'Dr. Lin thinks that John ate/was eating seafood yesterday'. That's why the utterance (36) with the updating option ② causes incompleteness as well.

(39) Option ②: the embedded proposition is quasi-at-issue

a. Proposal: $[m] \wedge m \subseteq p^{cs} \wedge$

b. Issue: $[x] \wedge x =$ **Dr.Lin** $\wedge [i_1] \wedge$ **now**$_m(i_1) \wedge [p] \wedge [i_2] \wedge$ **yesterday**$_p(i_2) \wedge [y] \wedge y =$ **John** $\wedge$ **IMPF**$^{p'}_{p,i_2}$(**eat-seafood**$(y), i_2) \wedge [s_1] \wedge$ **think**$_m(s_1, x, p) \wedge \tau_m(s_1) \supseteq i_1 \wedge$

c. QUD: What is the way things are?

$\rightsquigarrow_R [e_{1_p}] \wedge$ **eat-seafood**$_p(e_1, y) \wedge \tau_p(e_1) \supseteq i_1$

$\rightsquigarrow_Q$ **NOT**$^{m'}_m([s_{2_{m'}},] \wedge [r] \wedge [e_{2_r}] \wedge$ **eat-seafood**$_r(e_2, x) \wedge \tau_r(e_2) \subseteq i_2 \wedge$ **think**$_{m'}(s_2, x, r) \wedge$ $\tau_{m'}(s_2) \supseteq i_1) \wedge$

(The static counterpart: ¬[[Lin doctor think [yesterday John eat-PERF seafood]]])

...

(40) a. Did John break a finger?

$\rightsquigarrow_R$ Did John break his finger?

b. The judge believes that Jane caused the sheriff to die.

$\rightsquigarrow_R$ The judge believes that Jane unintentionally caused the sheriff to die.

c. Did Jane cause the sheriff to die?

$\rightsquigarrow_R$ Did Jane unintentionally cause the sheriff to die?

In words, since both the option ① and option ② that are possible for a biclausal utterance under the default intonation such as (36), namely (37) and (39), the utterance will encounter a conflict between the Q and R implicatures when there is no overt aspect marking on the embedded eventive predicate. That is why we observe incompleteness for the zero-marked embedded verbs there.

To facilitate the kind of update in which the actualization of the embedded event is not at-issue as in (41), a marked intonation is required to signal the givenness of the embedded content. For instance, the conversation in (42) makes the proposition that John ate seafood yesterday given, and the QUD is to figure out Dr. Lin's attitude towards this piece of information.

(41) The updating option in which $p$ is entirely not-at-issue requires a marked intonation:

| | At-issue update | QUD |
|---|---|---|
| ③ $p$ is entirely not at-issue | Regarding $p$, $x$ V(-ASP) it. | Regarding $p$, did (/does) $x$ V it? |

(42) A: *zenme huishi?* 'What happened?'

B: keneng zuotian Yuehan chi-le haixian
likely yesterday John eat-PERF seafood
'It is likely that John ate seafood yesterday'

A: *na yao gaosu Lin yisheng ma?* 'Should we inform Dr. Lin ? '

B: bu yong, ta ye renwei [zuotian Yuehan chi haixian]
no need she also think yesterday John eat seafood
'No need, she also thinks that John ate seafood yesterday'

We can formalize the discourse effect of B's second utterance in (43). Since the embedded content is given and is entirely not-at-issue, I propose that this part of the utterance is introduced as part of the not-at-issue update as in (43a) whose value is anaphoric to an existing dref. Let us further assume that B's first utterance in (43) already introduces a propositional dref $l$ into the Context Set as in (44). Based on the R principle 'Say no more you must', I argue that $l$ can be identified as the antecedent of $p$ even though their propositional contents are not exactly the same. I assume that the at-issue update concerns only the attitude part as in (43c). Since the content of the attitudinal predication is not at-issue, the alternatives with overt aspect marking on the embedded verb are not relevant and the contradictory Q implicatures such as those in (37) and (39) will not arise. For this reason there is no incompleteness in this case.

(43) Option ③: the embedded proposition is entirely not at-issue

a. Imposal: $[p] \wedge [i_1] \wedge \mathbf{yesterday}_p(i_1) \wedge [x] \wedge x = \mathbf{John} \wedge \mathbf{IMPF}^{p'}_{p,i_1}(\mathbf{eat\text{-}seafood}(x), i_1)$
$\rightsquigarrow_R p = l$

b. Proposal: $[m] \wedge m \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge \mathbf{now}_m(i_2) \wedge [y] \wedge y = \mathbf{Dr.Lin} \wedge [s_1] \wedge \mathbf{think}_m(s_1, y, p) \wedge \tau_m(s_1) \supseteq i_2$

d. QUD: Given the piece of information that John ate seafood, does Dr. Lin think it is true or not?

(44) Already in the Context Set: $[l] \wedge [i_1] \wedge \textbf{yesterday}_l(i_1) \wedge [x] \wedge x = \textbf{John} \wedge [e_1] \wedge \textbf{eat-seafood}_l(x, e_1) \wedge \tau_l(e_1) \subseteq i_1$

Secondly, I illustrate that the projective focus can salvage incompleteness of a zero-marked clausal complement with the example in (45). The focus on the subject indicates that the Question Under Discussion could be 'Who ate seafood?' (or 'Who does the doctor think ate seafood'), which presupposes someone ate seafood (or the doctor thinks that someone ate seafood).

(45) Lin yisheng renwei [zuotian YUEHAN chi haixian] (bu shi MALI).
Lin doctor think yesterday John eat seafood not be Mary
'Dr. Lin thinks that [John]$_F$ ate seafood yesterday, not [Mary]$_F$.'

Let us work with the easier case first, in which it is taken for granted that someone ate seafood yesterday, and the QUD is 'Who ate seafood?' as in (46a). In this case, the embedded content with projective focus contributes the at-issue proposal as in (46c-d), while the matrix content is imposed (46b, e). Just like the case with projective focus in the matrix clause discussed in Chapter 4, here the at-issue proposal can be strengthened with the R principle 'Say no more than you must' – in particular, since the occurrence of the eating seafood event is presupposed, it needs not be asserted. As in (46e), the aspectually zero-marked attitude complement in (45) indeed can give rise to an episodic interpretation via this R implicature.

(46) a. Presupposed: $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge [x] \wedge \textbf{person}_{p^{cs}}(x) \wedge [e_1] \wedge \textbf{eat-seafood}_{p^{cs}}(e_1, x) \wedge \tau_{p^{cs}}(e_1) \subseteq i_1 \wedge$

b. Imposal: $[y] \wedge y = \textbf{Dr.Lin} \wedge [i_2] \wedge \textbf{now}_{p^{cs}}(i_2) \wedge$

c. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

d. Issue: $[z] \wedge z = \textbf{John} \wedge \textbf{IMPF}^{p'}_{p,i_1}(\textbf{eat-seafood}(z), i_1) \wedge$

e. Imposal: $[s_1] \wedge \textbf{think}_{p^{cs}}(s_1, y, p) \wedge \tau_{p^{cs}}(s_1) \supseteq i_2 \wedge$

f. QUD: Who ate seafood?

$\rightsquigarrow_R [e_2] \wedge \textbf{eat-seafood}_p(e_2, z) \wedge \tau_p(e_2) \supseteq i_1$ (R implicature)

$\rightsquigarrow_R e_2 = e_1 \wedge x = z = \textbf{John}$ (Anaphora resolution)

For the slightly more complicated case in which it is presupposed that the doctor thinks that someone ate seafood, and the QUD is 'Who does the doctor think ate food?', I formalize the relevant update of the Context Set as in (47). Here I consider the entire proposition denoted by the biclausal sentence constitutes as the at-issue proposal, as in (47c). I argue that a stereotypicality-based R implicature is calculated locally, namely the John ate seafood event was instantiated in the possible worlds compatible with Dr.Lin's knowledge as in (47d). The meaning of the at-issue proposal is then enriched into 'Dr. Lin thinks that John ate/was eating seafood yesterday' via this R-implicature, which makes it possible to identify that the thinking state $s_2$ is the same as $s_1$, the content of $s_2$, $l$, is the same as $q$, and eventually the event $e_3$ is the same as $e_1$.

(47) a. Presupposed: $[x] \wedge x = \textbf{Dr.Lin} \wedge [q] \wedge [i_1] \wedge \textbf{yesterday}_q(i_1) \wedge [y] \wedge \textbf{person}_q(y) \wedge [e_1] \wedge \textbf{eat-seafood}_q(e_1, y) \wedge \tau_q(e_1) \subseteq i_1 \wedge [i_2] \wedge \textbf{now}_{p^{cs}}(i_2) \wedge [s_1] \wedge \textbf{think}_{p^{cs}}(s_1, x, q) \wedge \tau_{p^{cs}}(s_1) \supseteq i_2 \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[s_2] \wedge [l] \wedge \textbf{think}_p(s_2, x, l) \wedge z = \textbf{John} \wedge \textbf{IMPF}^{l'}_{l,i_1}(\textbf{eat-seafood}(z), i_1) \wedge$

d. QUD: Who does Dr. Lin think ate seafood?

$\rightsquigarrow_R [e_3] \wedge \textbf{eat-seafood}_l(e_3, z) \wedge \tau(e_3) \supseteq i_1$ (Local R implicature)

$\rightsquigarrow_R s_2 = s_1 \wedge l = q \wedge e_3 = e_1 \wedge z = y = \textbf{John}$ (Anaphora resolution)

Since the QUD only concerns the agent of the sea-food-eating event in the possible worlds compatible with Dr.Lin's knowledge, the alternatives to (45) in which the embedded verbs

are overtly marked are not relevant here, thus no mandatory Q implicatures like those in (39) arise. For this reason, no incompleteness appears.

Thirdly, I show that forming a narrative can salvage incompleteness of a zero-marked clausal complement with the example in (48). I consider that in this case, the proposition denoted by the first sentence is imposed on the Context Set as in (49a), and only the second sentence in the utterance contributes to the at-issue proposal as in (49c). The episodic interpretation of the embedded clause is made possible by a locally calculated R implicature as in (49d). Since the QUD does not directly concern the imposed information, the null imperfective in the embedded clause will not evoke its overt alternatives, and no Q implicatures will arise.

(48) Lin yisheng renwei [zuotian Yuehan chi haixian]. ta hen danxin.
Lin doctor think yesterday John eat seafod she very worried
'Dr. Lin thinks that John ate seafood. She is worried.'

(49) a. Imposal: $[x] \wedge x = \textbf{Dr.Lin} \wedge [q] \wedge [i_1] \wedge \textbf{yesterday}_q(i_1) \wedge [y] \wedge y = \textbf{John} \wedge \textbf{IMPF}^{q'}_{q,i_1}(\textbf{eat-seafood}(y), i_1) \wedge [i_2] \wedge \textbf{now}_{p^{cs}}(i_2) \wedge [s_1] \wedge \textbf{think}_{p^{cs}}(s_1, x, q) \wedge \tau_{p^{cs}}(s_1) \supseteq i_2 \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[s_2] \wedge \textbf{worried}_p(s_2, x) \wedge \tau_p(s_2) \supseteq i_2 \wedge$

d. $\rightsquigarrow_R [e_1] \wedge \textbf{eat-seafood}_q(e_1, y) \wedge \tau_q(e_1) \supseteq i_1$ (Local R implicature)

In sum, this section shows that the potential incompleteness of the aspectually zero-marked clausal complements of attitude or speech verbs can be formally captured under the current pragmatic account.

## 5.4 Other kinds of non-root clauses

This section turns to the non-root clauses including relative clauses, noun complements, certain adjunct clauses. I put them into one class since their behaviors are straightfor-

wardly captured by the current analysis: overt aspect marking is optional there, because the content of these non-root clauses are generally unable to be at-issue.

### 5.4.1 Relative clauses

It is well observed that overt aspect marking is generally optional in relative clauses for episodic interpretations (Smith and Erbaugh 2005; Lin 2006; Sun 2015), as shown (50).

(50) a. Mali renshi na-ge [({zai}) chi ({-le}) pangxie] de nanhai
Mary know that-CL PROG eat PERF crab DE boy
'Mary knows the boy that {was eating, ate} crabs.'

b. na-zhi [Yuehan ({zai}) chi ({-le})] de pangxie feichang da
that-CL John PROG eat PERF DE crab very big
'The crab that John {was eating, ate} was very big.'

This is expected since the information expressed by the relative clauses are conventionally encoded as not at-issue content, which can be shown by the relative clauses' inability of addressing the QUD. For the context in (51), while the proposition expressed by the relative clause in (50), namely 'A boy was {eating/ate} crabs', or 'John was {eating/ate} crabs' in principle entails an answer of the QUD, since the information is conventionally packaged as the not-at-issue content due to the properties of relative clauses, the sentences in (50) fail to serve as a felicitous answer to the QUD, even when the embedded verbs are marked by overt progressive or perfective markers.

(51) Q: you ren {zai} chi {-le} pangxie ma?
have person PROG eat PERF crab YNQ
'Any person {was eating/ate} crabs?'

A1: #(50a) (Regardless of the presence of overt aspect marking)

A2: #(50b) (Regardless of the presence of overt aspect marking)

I illustrate the discourse effect of a sentence with a zero-marked relative clause with the example in (52), as in (53). I argue that the sentence with the episodic interpretation

is naturally uttered in a context in which it is taken for granted that there is a boy who ate crabs during the topic time, as in (53a). The at-issue proposal concerns that Mary knows that boy, so that the content of the relative clause is not asserted but is just used to identify the relevant dref $x$ as the antecedent of the theme of Mary's knowing eventuality. Since the proposition expressed by the relative clause is not at-issue, (52) will not evoke the alternatives with the overt progressive/perfective marking on the embedded verb, so that no Q implicatures will rise.

(52) Mali renshi na-ge [zuotian chi pangxie] de nanhai
Mary know that-CL yesterday eat crab DE boy
'Mary knows the boy that ate crabs yesterday.'

(53) a. Already in the Context Set: $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge [x] \wedge \textbf{boy}_{p^{cs}}(x) \wedge [e_1] \wedge \textbf{eat-crabs}_{p^{cs}}(x, e_1) \wedge \tau_{p^{cs}}(e_1) \subseteq i_1$

b. Proposal: $[m] \wedge m \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge \textbf{now}_m(i_2) \wedge [y] \wedge y = \textbf{Mary} \wedge [s_1] \wedge \textbf{know}_m(s_1, y, x) \wedge \tau_m(s_1) \supseteq i_2$

d. the QUD: Anything new about Mary?

In short, since the information expressed by the relative clauses generally cannot be at-issue, no incompleteness is observed with zero-marked eventive predicates within them.

### 5.4.2 Noun complement clauses

For noun complement clauses, we find overt aspect marking is also optional for episodic interpretations, as in (54). The reason is that the content of such non-root clauses, just like that of relative clauses, is conventionally encoded as not at-issue. This is shown by noun complements clauses' inability of addressing the QUD, as in (55).

(54) a. Mali xiangxin [Yuehan ({zai}) chi ({-le}) pangxie] de xiaoxi
Mary believe John PROG eat PERF crab DE news
'Mary believes the news that John {was eating, ate} crabs.'

b. Mali tingshuo-le [Yuehan ({zai}) chi ({-le}) pangxie] zhe-ge xiaoxi
Mary hear-PERF John PROG eat PERF crab this-CL news
'Mary heard the news that John {was eating, ate} crabs.'

(55) Q: zuotian you ren {zai} chi {-le} pangxie ma?
yesterday have person PROG eat PERF crab YNQ
'Any person {was eating/ate} crabs yesterday?'

A1: #(54a) (Regardless of the presence of overt aspect marking)

A2: #(54b) (Regardless of the presence of overt aspect marking)

The discourse effect of a sentence containing an aspectually zero-marked noun complement such as (56) can be illustrated in (57). The reason why (56) can have an episodic interpretation for the noun complement is that this sentence can be naturally uttered in a context which presupposes the existence of a piece of news, whose content is that John ate crabs yesterday (56a). While the noun complement is zero-marked, since its content is not asserted as the at-issue proposal (56c), it obtains the episodic interpretation due to the anaphoric link between the salient news dref $x$ and the entity that stands in a believing relation with Mary. Since the content of the noun complement is not at-issue, it does not trigger the alternative in (58) and give rise to contradictory Q implicatures. For this reason no incompleteness is observed with (56).

(56) Mali xiangxin [zuotian Yuehan chi pangxie] de xiaoxi
Mary believe yesterday John eat crab DE news
'Mary believes the news that yesterday John ate crabs.'

(57) a. Already in the Context Set: $[x] \wedge \mathbf{news}_{p^{cs}}(x) \wedge [q] \wedge [i_1] \wedge \mathbf{yesterday}_q(i_1) \wedge [y] \wedge y =$ $\mathbf{John} \wedge [e_1] \wedge \mathbf{eat\text{-}crabs}_q(y, e_1) \wedge \tau_q(e_1) \subseteq i_1 \wedge \mathbf{content}_{p^{cs}}(x) = q \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge \mathbf{now}_p(i_2) \wedge [z] \wedge z = \mathbf{Mary} \wedge [s_1] \wedge \mathbf{believe}_p(s_1, z, x) \wedge \tau_p(s_1) \supseteq i_2$

d. the QUD: Anything new about Mary?

(58) Mali xiangxin [zuotian Yuehan chi-**le** pangxie] de xiaoxi
Mary believe yesterday John eat-PERF crab DE news

'Mary believes the news that yesterday John ate crabs.'

### 5.4.3 Adverbial clauses

We have shown in Section 5.2 that some adverbial clauses in Chinese can admit certain overt aspect markers. However, such overt aspect marking is optional, as in (59), and episodic interpretations are still available there.

(59) a. [Yuehan (zai) chi pangxie] de shihou, Mali zou-le jinlai
John PROG eat crab DE time Mary walk-PERF in
'During the time when John was eating crabs, Mary walked in'

b. [Yuehan chi (-le) pangxie] zhihou, Mali zou-le jinlai
John eat PERF crab after Mary walk-PERF in
'After John ate crabs, Mary walked in'

Following the claim that the content of temporal adverbial clauses is generally not at-issue (Jasinskaja 2016), I argue (59) without overt aspect marking in the adverbial clauses are fine because the content of those adverbial clauses also cannot be at-issue in Chinese. We can again use the test in (60) and (61) to confirm this: while the sentences in (59) indeed express a proposition that is semantically relevant to the QUD in (60) and that in (60) respectively, they fail to stand as a felicitous answer to them.

(60) Q1: gangcai you ren zai chi pangxie ma?
just.now have person PROG eat crab YNQ
'Any person was eating just now?'

A1: #(59a) (Regardless of the presence of overt aspect marking)

(61) Q1: gangcai you ren chi-le pangxie ma?
just.now have person eat-PERF crab YNQ
'Any person ate crabs just now?'

A1: #(59b) (Regardless of the presence of overt aspect marking)

I illustrate the discourse effect of a sentence containing an aspectually zero-marked

adverbial clause with (62), as in (63). I argue that the content of the temporal clause is imposed on the Context Set as in (63a), but is not part of the at-issue proposal in (63c). I consider the imposal part can be strengthened by the R principle 'Say no more than you must' (in particular, 'What is stereotypical needs not be said'), and since the content of the zero-marked adverbial clause is not at-issue, it will not trigger the Q implicatures calculated from the overtly marked alternative (64) to (62).

(62) [Yuehan chi pangxie] zhihou, Mali zou-le jinlai
John eat crab after Mary walk-PERF in
'After John ate crabs, Mary walked in'

(63) a. Imposal: $[i_1] \wedge \textbf{yesterday}_{p^{cs}}(i_1) \wedge [x] \wedge x = \textbf{John} \wedge \textbf{IMPF}^{q}_{p^{cs},i_1}(\textbf{eat-crabs}(x), i_1) \wedge$

b. Proposal: $[p] \wedge p \subseteq p^{cs} \wedge$

c. Issue: $[i_2] \wedge i_2 > i_1 \wedge [y] \wedge y = \textbf{Mary} \wedge [e_1] \wedge \textbf{walk-in}_p(e_1, y) \wedge \tau_p(e_1) \subseteq i_2$

d. $\rightsquigarrow_R [e_2] \wedge \textbf{eat-crabs}_{p^{cs}}(e_2, x) \wedge \tau_{p^{cs}}(e_2) \supseteq i_1$

e. the QUD: Anything new about Mary?

(64) [Yuehan chi**-le** pangxie] zhihou, Mali zou-le jinlai
John eat-PERF crab after Mary walk-PERF in
'After John ate crabs, Mary walked in'

For this reason, zero-marked eventive predicates in adverbial clauses do not exhibit incompleteness effects.

## 5.5 Summary

This chapter provides further support for my pragmatic account of temporal incompleteness by showing that it can extend to the distribution of overt aspect marking (for episodic readings) in non-root clauses including clausal complements of attitude and speech verbs, relative clauses, noun complements, and certain temporal adverbial clauses. For the clausal complements of attitude and speech verbs, overt aspect marking is generally re-

quired for episodic interpretations, unless with projective focus or within narratives. While at first sight it is puzzling that the factivity of the matrix predicates and the biclausal structure cannot salvage incompleteness, I argue that the pragmatic account can ultimately capture the data by showing that (i) the factivity of clause-embedding predicates do not determine the not-at-issueness of the proposition expressed by its clausal complement; and that (ii) the asymmetry between the matrix and embedded eventive predicates in terms of dropping overt aspect marking is due to the asymmetric proper-subpart relation between the embedded sentence and matrix sentence. For the latter three kinds of non-root clauses (relative clauses, noun complements, and certain temporal adverbial clauses), overt aspect marking is optional for episodic interpretations. I argue that it straightforwardly follows from my account because the content of those non-root clauses is conventionally encoded as not-at-issue, as is evidenced by the inability of those clauses to address the QUD.

# CHAPTER 6

# DEGREE INCOMPLETENESS

## 6.1 Degree incompleteness for positive readings

This chapter turns to another case of incompleteness – degree incompleteness, which mainly concerns whether sentences with zero-marked gradable adjectives as main predicates can obtain positive readings in Mandarin. While I show that the Question Under Discussion also plays a crucial role in degree incompleteness (following Niina Zhang 2021), which makes a pragmatic account desirable, I will argue that a different pragmatic mechanism is at stake here mainly based on the parallel between degree incompleteness and how habitual sentences sometimes need frequency phrases. I will propose a presuppositional account of degree incompleteness, which attributes its QUD-sensitivity to whether the lexical presupposition of a covert POS in those zero-marked sentences can be satisfied or not when different questions are under discussion.

Since in Chinese there is no reliable morphological evidence to distinguish between a verbal predicate and an adjectival one, I follow the existing literature (Zhu 1982; Huang et al. 2009; Chen-Sheng Liu 2010) in diagnosing the category of gradable adjectives in Chinese based on the two tests in (1) :

(1) a. Gradable (adjectival or verbal) predicates can directly take degree modification such as *ting* 'quite', *feichang* 'extremely';

b. Adjectives do not take objects as complements, unlike verbs.

The first test distinguishes gradable predicates such as (2) from non-gradable ones in (3).

(2) a. zhe-jian dayi feichang chang.
this-CL coat extremely long
'This coat is extremely long' (Gradable adjectives)

b. Yuehan feichang {gao /ai /mang /xian}
John extremely tall short busy idle
'John is extremely {tall /short /busy /idle}' (Gradable adjectives)

c. Yuehan feichang xihuan shige.
John extremely like poetry
'John likes poetry very much' (Gradable verbal predicates)

(3) a. *zhe-jian dayi feichang zi.
this-CL coat extremely purple
Int: 'This coat is extremely purple'

b. *Yuehan feichang chouyan
John extremely smoke
Int: 'John smokes a lot'

While gradable adjectives in Chinese can directly serve as predicates (without copula) just like verbs as in (2), they differ from verbs in that they cannot take objects as complements, c.f. (2a-b) and (2c). For some gradable adjectives that can have a transitive use semantically, the second argument besides the subject must be introduced with the preposition *dui* as in (4), but not as objects in (5).

(4) a. Yuehan dui zhe-jian shi feichang jingya.
John to this-CL affair extremely surprised
'John is extremely surprised about this affair'

b. Yuehan dui Lisi feichang naixin
John to Lisi extremely patient
'John is extremely patient to Lisi'

(5) a. *Yuehan feichang jingya zhe-jian shi.
John extremely surprised this-CL affair
Int: 'John is extremely surprised about this affair'

b. *Yuehan feichang naixin Lisi
John extremely patient Lisi
Int: 'John is extremely patient to Lisi'

While we have seen that gradable adjectives (GAs) in Chinese can directly serve as predicates, one puzzle is that leaving those GAs unmarked without intensifiers like *ex-*

*tremely* often causes the sentences to be degraded as in (6). Even when a neutral positive interpretation is intended, the sentence generally needs to take an unstressed intensifier *hen* (i.e. degree incompleteness), which is often translated as "very" but is claimed to have a bleached meaning so that the sentences in (7) are translated as the unmodified positive sentences in English (Gu 2007; Chen 2010; Grano 2012; Liu 2010, 2018; Linmin Zhang 2019; Niina Zhang 2021; but see different views in Krasikova 2008 and Fang 2017) [1] [2].

(6) a. ??Yuehan {gao /ai}. (individual-level)
John tall short
'John is {tall /short}.'

b. ??Yuehan {mang /xian}. (stage-level)
John busy idle
'John is {busy /idle}.'

(7) Yuehan hen {gao /ai /mang /xian}.
John HEN tall short busy idle
'John is {tall /short /busy /idle}'

I label this kind of degradedness as "incompleteness" not only because native speakers also often describe it as 'as if the speaker hasn't finished their utterance' [3], but more importantly, it shares one important feature with the temporal incompleteness discussed in the previous chapters, namely that the requirement is consistently exempt when certain focus is added (Gu 2007; Liu 2010, 2018), among other licensing contexts:

(8) a. Yuehan gao, Lisi shou
John tall Lisi slim
'$[\text{John}]_{CT}$ is $[\text{tall}]_F$, $[\text{Lisi}]_{CT}$ is $[\text{slim}]_F$'

1. For now I will just follow the mainstream literature in assuming that the sentence involving the unstressed *hen* roughly has a neutral positive reading but there are exceptions: Krasikova (2008) proposes that *hen* is a weak intensifier and Fang (2017) considers *hen* to be a subjectivity marker.

2. Since Chinese does not have overt comparative morphology such as English *-er*, those zero-marked sentences cam give rise to comparative readings, if that there is a contextually salient individual in the context, see Linmin Zhang (2021).

3. We've seen that this kind of intuition is not reliable in diagnosing whether an 'incomplete' sentence is in the scope of this dissertation.

b. shi YUEHAN ai (bu shi LISI)
be John short not be Lisi
'It is [John]$_F$ who is short, not [Lisi]$_F$'

The main goal of this chapter is to show that, while the distribution of degree incompleteness is also sensitive to the QUD just like the case of temporal incompleteness, it has a different source of degradedness. The unmarked sentences in (6) are degraded in out of the blue contexts because they must resort to a covert POS morpheme to obtain positive readings, which encodes an anaphoric domain restriction of degree quantification in its lexical semantics. By contrast, the unstressed degree adverb *hen* has almost the same semantic contribution as POS (following Liu 2010, 2018; Grano 2012, among others) except that it does not presuppose the restrictor of degree quantification to be discourse-familiar. Crucially, I show that such a lexical difference in the familiarity of domain restriction is not an ad-hoc assumption but can be found with other kinds of quantifiers in natural languages as well, for instance the quantifiers over temporal intervals and the quantifiers over possible worlds (Klecha 2010, 2011).

The plan of the chapter is as follows. In the rest of this section, I give an overview of the contexts in which the degree incompleteness is absent (Section 6.1.1) and demonstrate that the puzzle cannot be reduced to a general syntactic issue that zero-marked non-verbal phrases fail to be main predicates (Section 6.1.2). Section 6.2 reviews the existing accounts of degree incompleteness and points out the challenges each of them faces. Section 6.3 establishes a novel QUD-based generalization of degree incompleteness. Section 6.4 shows that a parallel of degree incompleteness can be found in zero-marked habitual sentences, which motivates a presuppositional account. Section 6.5 extends the presuppositional account to degree incompleteness. Section 6.6 concludes.

### 6.1.1 Overview of when degree incompleteness is absent

It is well observed that *hen* is not always required for positive meanings of gradable adjectives. This section reviews the existing observations on when the degree incompleteness is absent (Gu 2007; Liu 2010, Liu 2018; Grano 2012; Jo-Wang Lin 2020; Niina Zhang 2021; Linmin Zhang 2021; Cong 2021), many of which are similar to when temporal incompleteness is absent (though not identical). I will keep the presentation neutral without making any further generalizations and postpone a detailed examination into the data until Section 6.3. [4]

Firstly, as mentioned, degree incompleteness can be salvaged by the addition of focus as in (9), which is quite similar to temporal incompleteness (repeated in (10)).

(9) a. Yuehan gao, Lisi shou
John tall Lisi slim
'[John]$_{CT}$ is [tall]$_F$, [Lisi]$_{CT}$ is [slim]$_F$' (Contrastive focus)

b. shi Yuehan ai (bu shi Lisi)
be John short not be Lisi
'It is [John]$_F$ who is short, not [Lisi]$_F$' (Identificational focus)

c. (zhe-xie ren zhong) zhiyou Yuehan gao.
this-PL person among only John tall
'(Among these people) only [John]$_F$ is tall' (Focus-sensitive operator)

d. zuijin lian Yuehan dou mang.
recently LIAN John DOU busy
'Recently even [John]$_F$ is busy' (Focus-sensitive operator)

(10) a. gangcai TANGMU he kafei, JIERUI he hongjiu
just.now Tom drink coffee Jerry drink wine
'Just now [Tom]$_{CT}$ drank [coffee]$_F$, [Jerry]$_{CT}$ drank [wine]$_F$.'

b. gangcai shi TANGMU he kafei
just.now be Tom drink coffee
'It is [Tom]$_F$ who drank coffee just now.'

4. That means, while I list five cases in which *hen* is optional observed in the existing literature, it is possible that they can be reduced to fewer factors.

c. gangcai zhiyou TANGMU he kafei
just.now only Tom drink coffee
'Just now only [Tom]$_F$ drank coffee'

d. gangcai lian TANGMU dou he kafei
just.now even Tom DOU drink coffee
'Just now even [Tom]$_F$ drank coffee'

Secondly, when the sentence is transformed into polar questions or *wh*-questions, or is uttered as answers to those questions, *hen* is optional, as in (11) - (12).

(11) a. Yuehan gao ma?
John tall YNQ
'Is John tall?'

b. Yuehan gao bu gao?
John tall NEG tall
'Is John tall or not?'

c. ta {gao, bu gao}
He tall NEG tall
'He is {tall, not tall}' (As answers to (11-a),(11-b))

(12) a. zhe-xie ren zhong, na-xie ren gao?
this-CL$_{PL}$ person among which-CL$_{PL}$ person tall
'Among those people, which of them are tall?'

b. Yuehan he Lisi gao
John and Lisi tall
'John and Lisi are tall' (As answers to (12-a))

While Zhao (1968) and Liu (2010) claim that a *wh*-question like (13) cannot license a positive reading such as 'Who is tall?' but only a comparative reading, it has been pointed by Shi-Zhe Huang (2016) and Liu (2018) that (13) is actually ambiguous between the positive and comparative readings. The comparative reading is just more salient when (13) is uttered in a context within only two people (probably because in this case it is clear which two people we are comparing), but the positive reading becomes the salient one in a context with a lot of people (e.g. more than 5) such as (12) in which case the comparative reading

is less available because it is unclear how to compare within this group. Further evidence that (13) can have the positive reading can be shown by the dialogue in (14). In this case, the *wh*-question can be naturally answered by 'They are all tall', which is not a good answer to a potential comparative reading such as 'Who is taller (than others)?'

(13) she gao (ne)?
who tall SFP
'Who is taller?' or 'Who is tall?'

(14) a. zhexie ren zhong, shei gao?
those people among who tall
'Among those people, who is tall?'

b. tamen dou gao.
they DOU tall
'They are all tall'

The situation is slightly different with temporal incompleteness: I showed in Chapter 2 that temporal incompleteness is absent in *wh*-questions (because of the existence of projective focus) but not polar questions repeated in (15). The reason is that in the latter the actualization of the matrix event is at-issue.

(15) a. gangcai Tangmu zuo ??(-le) kafei ma?
just.now Tom make PERF coffee YNQ
'Did Tom make coffee just now?'

b. gangcai shei zuo kafei?
just.now who make coffee
'Who made coffee just now?' (That someone made coffee is taken for granted)

Thirdly, when the sentences is embedded as the antecedent of conditionals, *hen* is optional for positive readings, as in (16). This strategy does not work for temporal incompleteness though, as in (17).

(16) a. yaoshi Yuehan gao dehua, wo jiu rang ta jiaru lanqiu dui
if John tall PRT I then let him join basketball team

'If John is tall, I'll let him join the basketball team'

b. yaoshi ta mang jiu zao le
if he busy then bad LE
'It'll be bad if he is busy'

(17) yaoshi gangcai Yuehan he ??(-le) jiu dehua, wo jiu bang ta kaiche
if just.now John drink PERF wine PRT I then help him drive
'If John drank alcohol just now, I'll help him to drive the car'

Fourthly, it has been claimed that when the zero-marked sentence occurs as a small clause (Gu 2007; Grano 2012), degree incompleteness also disappears, as in (18). This condition is irrelevant for temporal incompleteness since the truncated size of small clauses often makes the episodic readings unavailable in the first place.

(18) a. wo juede [Yuehan gao]
I think John tall
'I consider John tall.'

b. laoban ma [Yuehan ben]
boss scold John stupid
'The boss scolded John as being stupid'

Finally, coordinating a gradable predicate with other (gradable) predicates also makes *hen* optional (Jo-Wang Lin 2020), as in (19).

(19) a. Yuehan gao, shou, (erqie) jieshi
John tall slim and fit
'John is tall, slim and fit'

b. Yuehan gao, (erqie) hui da lanqiu
John tall and able play basketball
'John is tall and can play basketball'

For some coordination construction such as *you...you...*, it can only take the zero-marked gradable predicate as in (20). And the positive reading is available there.

(20) Yuehen you *(hen) gao you *(hen) shou
John again HEN tall again HEN slim
'John is not only tall but also slim'

Recall that for temporal incomplete sentences, coordinating zero-marked predicates also improve it (by forming an advancing narrative), as in (21).

(21) gangcai Mali xi beizi, he cha, (ranhou) qu sanbu
just.now Mary wash cup, drink tea, then go walk
'Just now Mary washed cups, drank tea, and went for a walk'

In words, while the contexts that make the degree incompleteness disappear are not exactly the same as the contexts that make the temporal incompleteness disappear (see Chapter 2), one reason to treat it as a kind of incompleteness phenomena is that adding focus consistently salvages the degradedness in both. In Section 6.3 I will show that the other licensing conditions, either shared by the two kinds of incompleteness, or differing between them, essentially play the same role as focus, namely making a certain set of alternatives salient in the context.

### 6.1.2 Some apparently similar phenomena

One immediate response to degree incompleteness is that it is an issue of predication: it is almost unsurprising that the zero-marked gradable predicate in Chinese alone cannot be a predicate of the sentence – in English and many other languages, a nonverbal predicate needs a copula in its predicative use, unlike a verbal one, c.f. (22), (23).

(22) a. Mary *(is) tall.

b. This liquid *(is) water.

c. John *(is) in the yard.

(23) John smoked.

Indeed, the counterparts of many English adjectives and nouns in Chinese generally fail to stand alone as main predicates without the copula *shi* as in (24) or *shi...de* as in (25) (Huang et al. 2009; Paul 2014).

(24) Yuehan ??(shi) xuesheng.
John be student
'John is a student'

(25) a. Yuehan ??(shi) nan ??(de).
John be male DE
'John is male'

b. zhe-tiao yu ??(shi) huo ??(de)
this-CL fish be alive DE
'This fish is alive'

It is likely that those phenomena are related to each other, but I would like to justify that the degree incompleteness in (6) should not be reduced to a pure predication issue (contra Tang 2001, Jo-Wang Lin 2020). It should be noticed that the degradedness in (24) and (25) cannot be consistently salvaged by focus: at most contrastive focus can improve them, but not other kinds of focus:

(26) a. ?Yuehan xuesheng, Mali laoshi
John student Mary teacher
'[John]$_{CT}$ is a student, [Mary]$_{CT}$ is a teacher'

b. YUEHAN ??(shi) xuesheng, bu shi MALI
John be student not be Mary
'[John]$_F$ is a student, not [Mary]$_F$'

c. zhiyou YUEHAN *(shi) xuesheng
only John be student
'Only [John]$_F$ is a student'

d. lian YUEHAN dou *(shi) laoshi
LIAN John DOU be teacher
'Even [John]$_F$ is a teacher'

(27) a. ??zhe-tiao yu huo, na-tiao yu si
this-CL fish alive that-CL fish dead

'[This fish]$_{CT}$ is [alive]$_F$, [that fish]$_{CT}$ is [dead]$_F$'

b. zhe-zhang zhuozi ??(shi) FANG ??(de), bu shi YUAN ??(de)
this-CL table be square DE not be circle DE
'This table is [square]$_F$, not [circle]$_F$'

c. zhiyou ZHE-zhang zhuozi ??(shi) fang ??(de)
only this-CL table be square DE
'Only [this table]$_F$ is square'

d. lian ZHE-zhang zhuozi dou ??(shi) fang ??(de)
LIAN this-CL table DOU be square DE
'Even [this table]$_F$ is square'

In addition, those sentence cannot be salvaged by being transformed into questions ((28), (29)), nor can it be salvaged by being embedded in a conditional antecedent (30), small clause (31), or coordination (32), unlike the case of degree incompleteness.

(28) a. ??Yuehan xuesheng ma?
John student YNQ
Int: 'Is John a student?'

b. ??Yuehan nan ma?
John male YNQ
Int: 'Is John male'

c. ??zhe-tiao yu huo ma?
this-CL fish alive YNQ
Int: 'Is this fish alive?'

(29) a. ??na-xie ren xuesheng?
which-CL person student
Int: 'Which of those people are students?'

b. ??na-ge ren nan?
which-CL people male
Int: 'Which person is male?'

c. ??na-tiao yu huo?
which-CL fish alive
Int: 'Which fish is alive?'

(30) a. ruguo Yuehan ??(shi) xuesheng, wo jiu rang ta jiaru
if John be student I then let him join

Int: 'If John is a student, I'll let him join in'

b. ruguo zhe-tiao yu ??(shi) huo ??(de), wo jiu mai ta
if this-CL fish be alive DE I then buy it
Int: 'If this fish is alive, then I'll buy it'

(31) a. wo juede [Yuehan ??(shi) xuesheng]
I think John be student
'I consider John a student'

b. wo juede [zhe-tiao yu ??(shi) huo ??(de)]
I think this-CL fish be alive DE
'I consider this fish alive'

(32) a. Yuehan ??(shi) nanxing, daxuesheng, (he) zuqiu-dui duizhang
John be man undergraduate and football-team leader
Int: 'John is a male, an undergraduate, and the leader of the football team'

b. Zhe-ge zhuozi ??(shi) fang ??(de), erqie ??(shi) mutou ??(de).
this-CL table be square DE and be wood DE
'This table is square and wooden'

Last but not least, leaving aside the degree incompleteness issue, gradable adjectives like *tall* are in fact more like verbal predicates in that direct predication such as (33) is more neutral and default than the copula strategy of predication as in (34). The sentences in (34) are not ungrammatical but they are not the natural way of expressing 'John is (not) tall' and 'John smokes/does not smoke'.

(33) a. Zhangsan {hen /chaoji} gao.
John HEN extremely tall
'John is tall/extremely'

b. Zhangsan chou-le yan.
John smoke-PERF cigarette
'John smoked'

(34) a. ?Zhangsan (bu) shi gao de.
John not be tall DE
lit: 'John is (not) the tall kind'

b. ?Zhangsan (bu) shi chouyan de
John not be smoke DE

lit 'John is (not) the kind who smokes'

This forms a contrast with the predicates in (24) and (25), which almost always apply the copula strategy of predication.

## 6.2 Previous accounts and their problems

This section reviews two representative kinds of approaches of degree incompleteness. Both kinds of approaches argue that in Chinese the positive reading can be achieved with either a covert POS morpheme (/type-shifting) or the unstressed *hen*. The first kind (Liu 2010, 2018; Grano 2012) proposes that the distribution of the covert POS and *hen* is regulated by some syntactic rule, while the second kind (Krasikova 2008; Linmin Zhang 2019, 2021; Cong 2021) argues that such distribution is regulated by some pragmatic principle.

### 6.2.1 Syntactic approaches

#### 6.2.1.1 Chen-Sheng Liu (2010, 2018)

Chen-Sheng Liu (2010, 2018) argues that *hen* is the overt realization of the positive morpheme (i.e. POS, see Cresswell 1976; Bierwisch 1989; Kennedy 1999) and in those cases in which *hen* is optional, the covert allomorph of POS ($\varnothing_{\text{POS}}$) is available there. In other words, the incompleteness puzzle can be reduced to the question what factor decides the distribution of the overt and covert allomorphs of POS. Two different answers have been proposed: Liu (2010) argues that the covert POS must be licensed by a predicate-accessible operator$_{[\text{-wh}]}$ and *hen* is required when such licensing is impossible; Liu (2018) proposes that $\varnothing_{\text{POS}}$ can only occur in a focus-sensitive domain where the gradable predicate is focused due to Nonhead Stress rule (Duanmu 2000) and the Constraint on Multiple Foci (Tang 2001).

According to Liu (2010), $\varnothing_{\text{POS}}$ is a kind of polarity item which must occur in the domain of a predicate-accessible operator$_{\text{[-wh]}}$. Such licensing condition is elaborated in (35).

(35) $\varnothing_{\text{POS}}$ can be license iff it is in the smallest clause that contains the adjectival predicate and the operator with a structure like [Op$_{\text{[-wh]}}$ ... $X^0_{\text{[-wh-operator]}}$ [$_{\text{DegP}}$ $\varnothing_{\text{POS}}$ [$_{\text{AP}}$ ... ]]], where the head $X^0$ introduces a predicate-accessible operator$_{\text{[-wh]}}$ and licenses the occurrence of a degree phrase headed by the covert positive morpheme (i.e., $\varnothing_{\text{POS}}$). (Liu 2010: 1012)

In other words, adding negation, contrastive focus, or changing the sentences into polar interrogatives/small clauses/conditionals all introduce a predicate-accessible operator$_{\text{[-wh]}}$ that can license $\varnothing_{\text{POS}}$. When the gradable predicate is zero-marked as in (36), no such predicate-accessible operator$_{\text{[-wh]}}$ is available and $\varnothing_{\text{POS}}$ cannot be licensed. Instead, the overt allomorph of POS, *hen*, must be used to obtain the positive reading.

(36) Yuehan ??(hen) gao.
John very tall
Int: 'John is tall'.

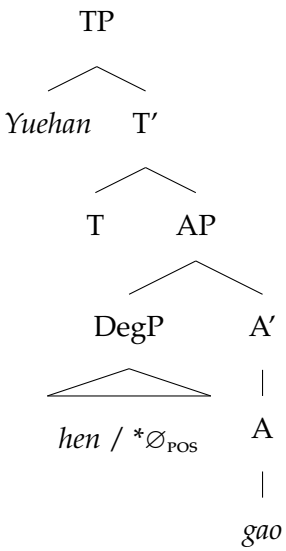
One major problem of Liu (2010) is that the so-called predicate-accessible operator feature (i.e. [-wh-operator]) is not independently motivated in the grammar of Chinese. It is almost as puzzling as the original degree incompleteness phenomena that a class of syntactically and semantically heterogeneous items such as negation, the yes-or-no-question particle *ma*, and contrastive focus somehow all have this feature, and no other expressions besides $\varnothing_{\text{POS}}$ are sensitive to this feature.

In addition, Grano (2012) points out that Liu (2010) fails to explain why the zero-marked form in (36) can felicitously give rise to the comparative reading, when the positive reading is not available. Of course, it is possible for Liu to argue that there is a covert comparative morpheme in such a case which occupies the Deg head position and such a comparative

morpheme needs not be licensed, but it is suspicious that in the Chinese grammar, only the covert POS morpheme happens to be a polarity item while the covert comparative morpheme does not have any similar constraints.

Liu (2018) makes several improvements on Liu (2010). Firstly, he reduces the cases in which $\varnothing_{\text{POS}}$ is licensed into one single case, namely it is licensed iff it occurs in a focus-sensitive domain in which the gradable predicate is focused. Secondly, he derives the restricted distribution of $\varnothing_{\text{POS}}$ from an independently motivated prosodic-syntactic rule in Chinese. The main idea is that degree is a non-head modifier of AP as in (37), thus under the default intonation it should receive greater stress than the head according to (38). For (36), the overt allomorph *hen* must occur since its covert counterpart, as a phonologically null element, cannot bear any stress.

(37)




(38) **Nonhead Stress rule** (Duanmu 2000):

In a syntactic head-nonhead (or a nonhead-head) relation, the nonhead has greater stress than the head.

When the gradable predicate is focused, Liu (2018) argues that the covert allomorph rather than the overt *hen* must occur because in the latter case both the degree modifier

and the adjective are focused, which is subject to another independently rule 'Constraint on Multiple Foci' (39). According to Liu, the meaning of *hen* is vague and not 'definite' enough, thus the covert $\varnothing_{\text{POS}}$ must occur avoid the violation of (39).

(39) Constraint on Multiple Foci (Tang 2001)
In Chinese, a construction with multiple foci requires each of the foci to be 'definite' enough.

There are several implicit assumptions in the paper, for instance, bearing stress (under a default intonation) for a constituent is equivalent to being focused, and the definition of "definiteness" for non-nominal phrases can be decided based on whether its meaning is vague or not. I will leave a detailed evaluation of those assumptions for future studies, and instead focus on some empirical challenges to this account.

Firstly, as pointed by Linmin Zhang (2021), the new generalization of the licensing conditions undergenerates because in some cases, such as (40), the gradable predicate is clearly not focused, but the positive reading is available without *hen*.

(40) zhe-qun haizi li, jiu MALI gao.
this-group child in, only Mary tall
'Among this group of children, only [Mary]$_F$ is tall'

Secondly, prohibiting the occurrence of any overt modifier of AP when the adjective is focused seems too strong. We can easily find sentences with a focused gradable predicate, and with an overt degree modifier that has "vague" semantics, which is considered to be "indefinite" by Liu (2018):

(41) (wo shuo) Yuehan ting SHOU, bushi ting GAO
I say John quite slim not quite tall
'John is quite [slim]$_F$, not quite [tall]$_F$'

While facing some challenges, Liu (2010, 2018) makes a lot of interesting observations

and especially the latter points to a new direction for the degree incompleteness puzzle by identifying focus as a crucial factor in licensing the positive reading of unmarked gradable adjectives. Interestingly, his proposal can be re-written in a way similar to the Generalized Anchoring Principle proposed by Tang and Lee (2000) for temporal incompleteness:

(42) **The distribution of *hen* and $\varnothing_{\mathbf{POS}}$:**

The positive reading of gradable adjectives needs *hen* or focus in the sentence.

In Section 6.3, I will build on Liu's intuition that the distribution of focus correlates with degree incompleteness by showing that *hen* is required for positive readings only when the Question Under Discussion concerns how tall John is.

#### 6.2.1.2 Grano (2012)

Grano (2012) argues that the positive reading of gradable adjectives can be obtained via a covert type-shifting $\overrightarrow{\text{POS}}$ defined as in (43), and the fact that (44) needs *hen* is due to a syntactic constraint on T node as in (45): those zero-marked gradable adjectives project adjectival phrases, while T head must take a verbal projection as it complement.

(43) If $G$ is a type $\langle d, et \rangle$ relation denoted by a gradable predicate, then $\overrightarrow{\text{POS}}(G) = \lambda x.\exists d[G(d)(x) \wedge d > d_c]$ (where $d_c$ is a contextually determined threshold $d_c$)

(44) Yuehan hen gao.
John HEN tall
'John is tall'

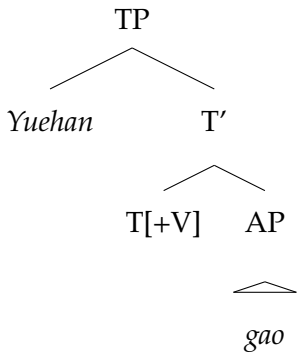
(45) The T[+V] constraint:

The direct complement to T(tense) node in Mandarin must either be (an extended projection of) a verb or a functional morpheme that can in principle combine with (an extended projection of) a verb.

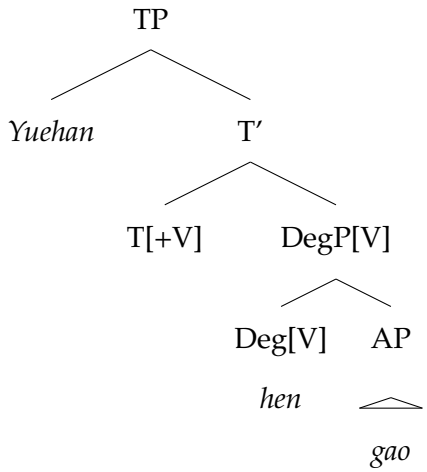
For convenience I will describe those appropriate complements to T node as carrying a

[V] feature. Since a zero-marked adjective does not carry the [V] feature as in (46), *hen* must be inserted in (47) to project a DegP (carrying [V] feature) for syntactic reasons.

(46)




(47)




The cases in which *hen* is not required can be sorted into two. In the cases of negation, focus-sensitive contexts and conditional antecedents, some functional projections (carrying [V] feature) intervene between AP and T and satisfy the T[+V] constraint. In the cases of small clauses, no T node is projected above AP and for this reason no additional projection is needed to satisfy the T[+V] constraint.

Grano's account nicely captures the tendency to interpret a sentence with an unmarked gradable adjectival predicate as a comparative. He argues that the null comparative morpheme $\varnothing_{\text{COMP}}$, which carries a [V] feature as a Deg head just like *hen*, is inserted as a last resort to satisfy the T[+V] constraint. Moreover, the analysis can account for why *hen*, which can have a mild intensifying meaning roughly as 'very', has a bleached meaning in those cases in which it is required. Grano points out an interesting parallel between the bleached use of the intensifier *hen* and the bleached use of the emphatic auxiliary *do*: when English auxiliary *do* is required for grammatical reasons, it loses the emphatic flavor as well, cf. (48-a), (48-b).

(48) a. John *(does) not swim.

b. John does swim.

Grano's account is appealing except for two problems. The first is that it yields wrong predictions for Mandarin possessive predication (Li 2019; Zhang 2020). A possessive predication such as (49) in Chinese still prefers to have *hen* in an out-of-the-blue context, as confirmed by Niina Ning Zhang (2021) and Yiwen Zhang (2020), and sounds familiarly incomplete without *hen*. However, a possessive *you* passes the typical tests for stative verbs, so it should in principle satisfy the T[+V] constraint.[5] As in (50-a), the possessive phrase *you zhiwei* can only be negated by *mei* but not *bu*, which patterns with an uncontroversial verbal use of *you* 'own' as in (50-b).

(49) a. Yuehan ??(hen) you zhihui.
Tom very have wisdom
'Tom is wise'

b. Mali ??(hen) you limao.
Mary very have politeness
'Mary is polite'

(50) a. Yuehan {mei /*bu} you zhihui.
John $\text{NEG}_2$ $\text{NEG}_1$ have wisdom
'John doesn't have wisdom'

b. Yuehan {mei /*bu} you na-ben shu.
John $\text{NEG}_2$ $\text{NEG}_1$ have that-CL book
'John does not have that book'

In addition, *hen* becomes optional for the possessive predication in almost the same cases as with the gradable adjectives (see Niina Ning Zhang 2021):

(51) Yuehan mei you zhihui.
John $\text{NEG}_2$ have wisdom
'John doesn't have wisdom'

5. See more tests in Niina Ning Zhang (2021).

(52) Yuehan you zhihui ma?
John have wisdom YNQ
'Does John have wisdom?'

(53) zhe xie xiaohai dangzhong na xie xiaohai you zhihui?
this $CL_{PL}$ kid among which $CL_{PL}$ kid have wisdom
(Int:) 'Which kid has wisdom?'

(54) yaoshi Yuehan you zhihui dehua, Mali jiu bu hui ma ta le.
if John have wisdom DE-say Mary then $NEG_1$ will scold him SFP
'If John [had wisdom]$_F$, then Mary would not have scolded him'

Secondly, the example with focus on the subject which allows the absence of *hen* also challenges Grano's analysis. Assuming a standard analysis of focus, (55) should not add any functional projection between the T head and the gradable predicate. It is unclear what brings in the [V] feature.

(55) zhe-qun haizi li, jiu MALI gao.
this-group child in, only Mary tall
'Among this group of children, only [Mary]$_F$ is tall'

### 6.2.2 Pragmatic approaches

#### 6.2.2.1 *hen* for being more informative

Krasikova (2008) proposes that a sentence without *hen* such as (56-a) denotes a 'neutral' positive reading – it entails that John's height exceeds a contextually-salient threshold of 'standing out' in terms of height. For its counterpart with *hen* such as (56-b), it has a mildly stronger semantics: John's height exceeds a degree that is equal to the contextually-salient threshold of height plus a contextually restricted amount.

(56) a. ??Yuehan gao
John tall
Int: 'John is tall'

b. Yuehan hen gao
John very tall

'John is tall'

Krasikova argues that *hen* is required in upwarding-entailing contexts such as (56) because the speaker prefers to make a stronger claim (i.e. Gricean Maxim of Quantity). This nicely captures why *hen* is optional in downward-entailing contexts such as negation and conditionals, as in (57): in those contexts, the *hen*-marked form results in a weaker meaning compared to the unmarked form.

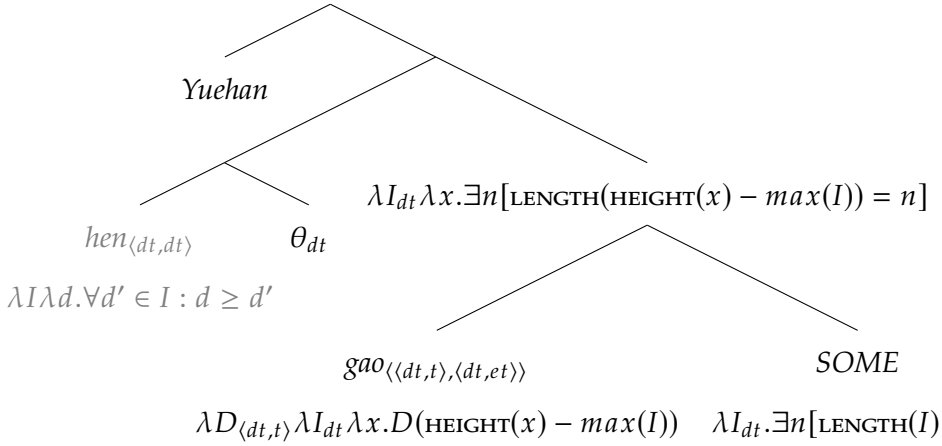
(57) a. Yuehan bu gao.
John not tall
'John isn't tall'

b. yaoshi Yuehan gao dehua, wo jiu rang ta jiaru lanqiu dui
if John tall PRT I then let him join basketball team
'If John is tall, I'll let him join the basketball team'

The formal implementation (which has simplified since some details are irrelevant to the current discussion) is illustrated as in (58). Krasikova adopts an interval-based approach and takes the lexical semantics of gradable adjectives to encode the meaning of comparison. In particular, a gradable predicate denotes a relation between the measurement of an individual (which is a type $\langle d, t\rangle$ interval) and a standard $\theta$ (which is also a type $dt$ interval), and the difference between those two intervals (which is modeled as a property of intervals, type $\langle dt, t\rangle$). When there is a discourse-salient individual, the sentence is interpreted as a comparative; when there is no such individual, Krasikova assumes that the standard argument is saturated by a contextually salient threshold $\theta$. For (56-a), the difference argument is existentially bound by a silent quantifier over intervals, which yields a positive reading (e.g. there is a (positive) difference between John's height and the contextually-salient threshold). For (56-b), *hen* modifies the contextually-salient threshold and raises its upper bound by some amount.

(58) With *hen*: $\exists n[\textsc{length}(\textsc{height}(j) - max(\lambda d.\forall d' \in \theta : d \geq d')) = n]$

Without *hen*: $\exists n[\textsc{length}(\textsc{height}(j) - max(\theta)) = n]$




The main concern about this pragmatic analysis is that it is not clear why the failure of uttering the *hen*-marked form will ever be problematic. The unmarked form under this analysis is completely grammatical and meaningful, so even if we adopt a strong implementation of Gricean theory (for instance a grammatical theory of scalar implicatures in Chierchia et al. 2012), for the best we might say uttering the unmarked form mandatorily invites a scalar implicature that John's height does not exceed a degree that is equal to the contextually-salient threshold of height plus a contextually restricted amount. In other words, we should predict (56-a) to be felicitous and express a meaning roughly as 'John's height just exceeds the contextual standard, but not much'. However, it is quite clear that (56-a) does not have this reading and is plainly degraded.

Moreover, according to this analysis, degree incompleteness should simply correlate with the monotonicity of the environments in which the gradable adjectives occur. But it does not seem to be the case. For a sentence with contrastive focus such as (59), the predicate position should be upward-entailing as shown by the entailment pattern in (59). However, *hen* is optional for positive readings in (59-b).

(59) (a) $\Rightarrow$ (b); (b) $\not\Rightarrow$ (a).

a. Yuehan tebie gao, Lisi tebia shou.
John particularly tall Lisi particularly slim
'[John]$_{CT}$ is particularly [tall]$_F$, [Lisi]$_{CT}$ is particularly [slim]$_F$'

b. Yuehan gao, Lisi shou.
John tall Lisi slim
'[John]$_{CT}$ is [tall]$_F$, [Lisi]$_{CT}$ is [slim]$_F$'

#### 6.2.2.2 *hen* for disambiguation

Linmin Zhang (2019, 2021) adopts Krasikova (2008)'s analysis of gradable adjectives.[6] She argues that the zero-marked form of gradable adjectives is underspecified between the positive and comparative uses (depending on whether there is a discourse-salient standard), and *hen* is used to disambiguate the positive use. Zhang attributes the requirement of using *hen* for positive readings as a case of Rational Speech Act (Frank and Goodman 2012): A rational interlocutor should prefer the unambiguous form in (60b) to convey the positive reading.

(60) a. Yuehan gao.
John tall
'John is taller/??John is tall' (Ambiguous)

b. Yuehan hen gao
John HEN tall
'John is tall' (Unambiguous)

Based on Linmin Zhang (2019, 2021), Cong (2021) further discusses the specific assumptions about the cost and competing alternatives, and proposes a detailed competition-based disambiguation model which attributes the preference of having *hen* for positive readings as following the Maxim of Manner ('Avoid ambiguity').

However, those accounts do not explain why in some cases, the disambiguation by *hen* is not needed. One possible response is that in those cases *hen* is not needed because

6. The implementation is slightly different since a degree-based instead of an interval-based approach is used in Zhang's papers, but the difference does not matter here.

the comparative use is independently blocked there so no disambiguation is needed. But this is not true: in most of those cases such as conditionals and small clauses in (61), the comparative reading is no less available than an out-of-the-blue case like (66a).

(61) a. yaoshi Yuehan gao dehua, wo jiu rang ta jiaru qiu dui
if John tall PRT I then let him join ball team
'If John is taller (than a discourse-salient individual), I'll let him join the ball team'

b. wo juede [Yuehan gao]
I think John tall
'I think John is taller (than a discourse-salient individual).'

## 6.3 The distribution of *hen*: QUD-sensitivity

This section establishes that zero-marked gradable adjectives generally can obtain positive readings, and *hen* is required only when the Question Under Discussion concerns how tall (/short, stupid, etc.) John is, or alternatively speaking, when the degree of the subject's measure along the relevant dimension is at-issue. I argue that all the apparently heterogeneous cases in which *hen* is optional for positive readings (briefly summarized in (62)) share one feature: the QUD in those cases is either whether John is tall or not (i.e. polar alternatives), what property John has, or who is tall, but never involves a set of degree alternatives (i.e. how tall John is).

(62) Degree incompleteness: ??*Yuehan gao* 'John is tall' (out-of-the-blue)

a. Adding focus: 'Only [John]$_F$ is tall.'

b. Interrogatives and answers to them:

Q: 'Is John tall?' A: 'Yes, he is tall/No, he isn't tall'.

Q: 'Which of them are tall?' A: 'John and Bill are tall'

c. Conditional: 'If John is tall, ...'

d. Coordination: 'John is tall, slim, and fit'

e. Small clause: 'I consider John tall'

This is immediately supported by (63). When we explicitly make the QUD in the context concern John's degree of height (i.e. {John is $d$-tall | $d \in D_d$}), *hen* is required.

(63) A: Yuehan duo gao? /Gen wo shuoshuo Yuehan de shengao.
John much tall to me tell John POSS height
'How tall is John? /Tell me about John's height'

B: ta ??(hen) gao /ai.
he very tall short
'He is tall/short'

Examples with some other gradable adjectives are shown in (64)-(65).

(64) A: ni liaojie na-tiao he de kuandu ma?
you know.about that-CL river DE width YNQ
'Do you know about that river's width?'

B: ta ??(hen) kuan /zhai.
it very wide narrow
'It is wide /narrow'

(65) A: na-ge xinshenger de tizhong zenmeyang?
that-CL newborn.baby DE weight how
'How's the weight of that newborn baby?'

B: ta ??(hen) qing /zhong.
s/he very light heavy
'S/he is light /heavy'

The rest of the section shows that how each of the condition in (62) makes salient a set of alternatives (i.e. the QUD) that is different from {John is $d$-tall | $d \in D_d$} so that the zero-marked sentences improve.

Firstly, when focus is added to the subject or the gradable predicate (either with intonation or focus-sensitive operators) as in (66), by Question-Answer-Congruence we can represent the salient QUD in each context informally in (67).

(66) a. Yuehan gao, Lisi shou
John tall Lisi slim
'[John]$_{CT}$ is [tall]$_F$, [Lisi]$_{CT}$ is [slim]$_F$' (Contrastive focus)

b. shi Yuehan gao (bu shi Lisi)
be John tall not be Lisi
'It is [John]$_F$ who is tall, not [Lisi]$_F$' (Identificational focus)

c. (zhe-xie ren zhong) zhiyou Yuehan gao.
this-PL person among only John tall
'(Among these people) only [John]$_F$ is tall'

(67) a. 'Which person has which property?'

b. 'Which person is tall?'

c. 'Who (else besides John) is tall?'

Turning to the interrogatives and their answers, the salient QUD in those cases does not involve degree alternatives either. For yes-or-no questions and their answers to them in (68), the QUD involves polar alternatives such as {John is tall, John is not tall}. For the *wh*-question and its answers in (69), the QUD can be represented as $\{x \text{ is tall} \mid x \in D_e\}$.

(68) a. Yuehan gao ma?
John tall YNQ
'Is John tall?'

b. Yuehan gao bu gao?
John tall NEG tall
'Is John tall or not?'

c. ta {gao, bu gao}
He tall NEG tall
'He is {tall, not tall}'

(69) a. zhe-xie ren zhong, na-xie ren gao?
this-CL$_{PL}$ person among which-CL$_{PL}$ person tall
'Among those people, which of them are tall?'

b. Yuehan he Lisi gao
John and Lisi tall
'John and Lisi are tall'

For the conditional such as (70), what is under discussion in this context is intuitively whether John is tall or not instead of how tall he is: if he is tall, then I'll let him join the basketball team; if he is not tall, then I might do something else. This intuition can be supported by the strong tendency of strengthening the literal meaning with a scalar implicature 'If John is not tall, I will not let him join the basketball team'. Since the salient QUD involves polar alternatives (i.e. {John is tall, ¬(John is tall)}) instead of degree alternatives, *hen* is optional there.

(70) yaoshi Yuehan gao dehua, wo jiu rang ta jiaru lanqiu dui
if John tall PRT I then let him join basketball team
'If John is tall, I'll let him join the basketball team'

In a coordination example such as (71), the QUD can be paraphrased as 'What property does John have?', which involves alternatives of individual properties.

(71) Yuehan gao, shou, (erqie) jieshi
John tall slim and fit
'John is tall, slim and fit'

In fact, if we make the QUD to be explicitly 'What property does John have?', even without coordination the unmarked sentence can be acceptable, as in (72).

(72) Q: Yuehan (yangmao shang) you shenme tedian?
John appearance on have what feature
'What feature does John have (on appearance)?'

A: ta GAO.
he tall
'He is tall'

Finally, for the case of small clauses such as (73), I disagree with the existing literature (Gu 2007; Liu 2010; Grano 2012) that the 'non-finite' structure per se licenses the omission of *hen*; instead it is the presence of the focus on *gao* that licenses the omission: in a context

in which the sentence (73) is uttered, a set of polar alternatives (i.e. whether John is tall or not tall) or a set of property alternatives (i.e. what property John has) is made salient in the context.

(73) wo juede [Yuehan gao]
I think John tall
'I consider John tall.'

The evidence is that when we explicitly set up a context such that we are interested in not only whether John's height exceeds the threshold or not, but also a more precise measure of John's height, the small clause without *hen* becomes degraded on the positive reading as well, as in (74). This forms a contrast with a context in which the salient set of alternatives involve property alternatives but not degree ones, as in (75).

(74) A: Yuehan de shengao zenmeyang?
John DE height how
'How is John's height?'

B: wo juede [ta ??(hen) gao]
I think he very tall
Int: 'I think he is tall'

(75) A: ni weishenme xiang xuan Yuehan zuo duizhang?
you why want choose John do leader
'Why do you want to choose John to be the leader?'

B: wo juede [ta (hen) gao]
I think he very tall
'I think he is tall'

One immediate question is, why *hen* tends to be required in an out-of-the-blue context? In other words, why does the default QUD in an out-of-the-blue context concern the degree of John's height? Can't one just accommodate a question such as 'Is John tall or not?' or 'What property does John have?' upon hearing (76)? At least in English, uttering 'John is tall' with a default intonation can felicitously answer all of the three questions in (77).

(76) Yuehan ??(hen) gao.
John very tall
'John is tall'

(77) Q: What is John's height?/Is John tall?/What is John like?

A: John is tall.

Ideally, we should set up experiments to elicit what are the most likely/plausible QUDs for native speakers after hearing *Yuehan hen gao* 'John is tall', but I have to leave this empirical issue for future studies. One thing I would like to point out is that, intuitively, it makes sense to say the degree question is more default than the polar one because the latter presupposes more: it presupposes the existence of a positive threshold and the QUD concerns whether it exceeds (/meets) the threshold or not.

In words, I argue that the degree incompleteness for positive readings is not always mandatory but is sensitive to the QUD, as in (78).

(78) The *hen*-for-degree-alternatives generalization:
*hen* is required for positive sentences only when the QUD involves degree alternatives.

Finally, I would like to compare the current generalization in (78) to a generalization proposed by Niina Zhang (2021) which similarly involves the reference to the QUD. Zhang argues that *hen* must occur only when the content of a gradable property directly answers the QUD, and it is optional for positive readings in the other cases, as in (79).

(79) The generalization in Niina Zhang (2021: 223 (15))

a. If the QUD is to provide the content of a gradable property, *hen* must occur.

b. If the QUD is about a comparison between individuals with respective to a gradable property, *hen* does not occur.

c. If the QUD is not about either of the above two, *hen* can be optional.

While the current generalization agrees with Zhang (2021) that the QUD indeed plays a crucial role in the distribution of *hen*, I argue that (79) fails to capture the optionality of *hen* in (71)-(72), as repeated in (80)-(81), in which the property of being tall is exactly addressing the QUD.

(80) a. Yuehan gao, shou, (erqie) jieshi
John tall slim and fit
'John is tall, slim and fit'

(81) Q: Yuehan (yangmao shang) you shenme tedian?
John appearance on have what feature
'What feature does John have (on appearance)?'

A: ta GAO.
he tall
'He is tall'

In words, the current generalization in (78) captures the QUD-sensitive optionality of *hen* better than Zhang's.

## 6.4 The parallel with bare habitual sentences

This section first establishes a parallel between how degree adverbs (e.g. the bleached *hen* and non-bleached ones like *feichang* 'extremely') are sometimes required for (intensified) positive sentences and how adverbs indicating frequency (e.g. *jingchang* 'often', *zongshi* 'always') are sometimes required for habitual sentences, which I term as *frequency incompleteness*. Based on the rich literature on habitual sentences and adverbs of quantification (Lawler 1973; Johnston 1994; Cohen 2004; Ferreira 2005, among many others), I propose a presuppositional account of frequency incompleteness, which prepares us for a similar account of degree incompleteness. In Section 6.5, I will extend this presuppositional account to degree incompleteness.

### 6.4.1 The parallel

This section turns to bare habitual sentences in Chinese such as (82) and shows that its regular occurrence interpretation is similarly constrained as the positive interpretation of (83) – both are not available in out-of-the-blue contexts, but become more available when a certain set of alternatives are made salient by focus or question, etc.

(82) ??Yuehan paobu.
John run
Int: 'John runs (regularly).'

(83) ??Yuehan gao.
John tall
Int: 'John is tall.'

First of all, note that (82) in fact sounds fine on the so-called dispositional reading of habitual sentences (Lawler 1973; Dahl 1995), which can be roughly paraphrased as 'Running is not the kind of thing John does not do'. This reading is usually not the salient one for activities such as running, but if we change the predicate into those in (84), it becomes more salient, which explains that those sentences sound perfect out of the blue (see similar observations about the English equivalents in Cohen 2004; Ferreira 2005).

(84) a. Yuehan chouyan.
John smoke.cigarette
'John smokes' (≈ 'Smoking is not the kind of thing John does not do')

b. Yuehan chi rou.
John eat meat
'John eats meat' (≈ 'Eating meat is not the kind of thing John does not do')

For (82), it sounds odd (out of the blue) because the dispositional reading is almost always too weak to be useful so that it is usually not the salient reading. Instead, the intended meaning of uttering that sentence is more likely to be 'John has a habit of running' (the regular occurrence reading), which is stronger than the dispositional reading since it requires John to do running with sufficient frequency.

By contrast, adding frequency-indicating adverbs to the bare sentences in (82) improves their acceptability in out-of-the-blue contexts and they can give rise to the regular

occurrence readings, as in (85).

(85) *Hei, wo gen ni shuo...* 'Hey, let me tell you something...'

a. Yuehan yizhi paobu.
John always run
'John always runs.'

b. Yuehan jingchang paobu.
John often run
'John often runs.'

Now can we just conclude that the regular occurrence reading is only available with those frequency-indicating adverbs? The answer is clearly negative, since we do find in many cases bare habitual sentences such as (82) give rise to the reading roughly as 'John runs regularly', and the tendency of specifying the frequency of the relevant habit in (85) disappears in almost exactly the same contexts discussed in Section 6.3 in which degree incompleteness is absent. For instance, when the salient QUD in the context is a polar question, the bare habitual sentence is fine either as the question or as the positive/negative answer to the question, as in (86).

(86) Q: Yuehan paobu ma?
John run YNQ
'Does John run?'

A: ta {paobu /bu paobu}.
he run not run
'He {runs / doesn't run}'

Frequency incompleteness also disappears when the salient QUD involves individual alternatives as in (87), or alternatives along the content of the predicate as in (88).

(87) Q: zhe-xie ren zhong, shei paobu?
those people among who run
'Among those people, who runs?'

A1: Yuehan he Lisi dou paobu.
John and Lisi DOU run
'Both John and Lisi run'

A2: zhiyou YUEHAN paobu.
only John run
'Only JOHN runs'

(88) Q: Yuehan you shenme xiguan?
John have what habit
'What habits does John have?'

A: ta paobu, lvxing, huahua.
he run travel paint
'He runs, travels, and paints'

The parallel between the restricted regular occurrence reading of bare habitual sentences and the restricted positive reading of bare gradable sentences is summarized as follows:

(89) Out-of-the-blue:

??Yuehan gao.
John tall
Int: 'John is tall.'

(90) Q: Yuehan gao ma?
John tall YNQ
'Is John tall?'

A: ta {gao /bu gao}.
he tall not tall
'He {is tall /isn't tall}.'

(91) Q: shei gao?
who tall
'Who is tall?'

A: YUEHAN gao.
John run
'JOHN is tall'

(92) Out-of-the-blue:

??Yuehan paobu.
John run
Int: 'John runs (regularly).'

(93) Q: Yuehan paobu ma?
John run YNQ
'Does John run (regularly)?'

A: ta {paobu /bu paobu}.
he run not run
'He {runs /doesn't run}.'

(94) Q: shei paobu?
who run
'Who runs?'

A: YUEHAN paobu.
John run
'JOHN runs'

(95) Q: Yuehan you shenme tedian?
John have what feature
'What feature does John have?'

A: ta gao, shou, (erqie) anjing
he tall slim and quiet
'He is tall, slim and quiet'

(96) Q: Yuehan you shenme xiguan?
John have what habit
'What habits does John have?'

A: ta paobu, lvxing, huahua.
he run travel paint
'He runs, travels, and paints'

In next section, I present a formal analysis of frequency incompleteness, which makes use of the previous discussion of habitual sentences and adverbs of quantification (Lawler 1973; Lewis 1975; Johnston 1994; Cohen 2004; Ferreira 2005, 2016; Deo 2009).

### 6.4.2 Accounting for frequency incompleteness

The main idea of my proposal is that the regular occurrence meaning of bare habitual sentences is realized by a covert operator HAB which encodes quantification over temporal intervals (Ferreira 2005, 2016), and this operator contains an anaphoric variable for domain restriction in its lexical semantics. In an out of the blue context such as (97), there is no discourse-familiar set of intervals to provide a value for that variable and that is why it sounds incomplete. When there is a set of certain alternatives made salient by focus or questions, the contexts in those cases can provide the domain restriction for HAB, and the regular occurrence reading becomes available.

(97) *Hei, wo gen ni shuo...* 'Hey, let me tell you something...'

??Yuehan paobu.
John run

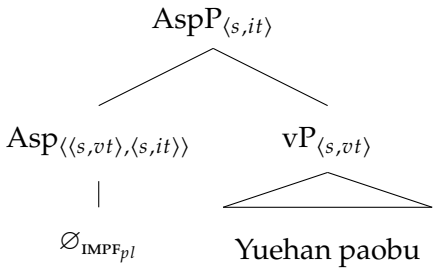
Int: 'John runs (regularly)'

Now I turn to elaborate on each component of the analysis.

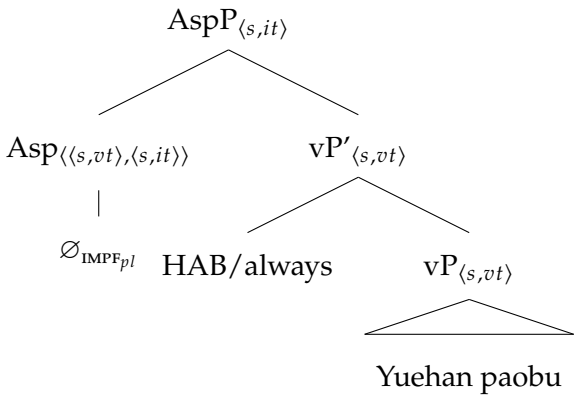
I first motivate the presence of the covert operator HAB for the regular occurrence reading of habitual sentences. In Chapter 3, I argued that habitual (/generic) sentences typically involve the zero-marked imperfective aspect. Following Ferreira (2005, 2016)

and many others, I assume that the dispositional reading is solely contributed by this imperfective morpheme (the plural version) as in (98), while the regular occurrence reading involves both the imperfective morpheme and a silent operator HAB, which occupies the same position as overt adverbs of quantification such as *always* and *often*, as in (99).

(98) Dispositional reading:




(99) Regular occurrence reading:




The evidence for the presence of HAB is that habitual sentences without overt adverbs of quantification (AQs) can often give rise to quasi-universal flavor of quantification, as if the sentence contains some overt AQs. For habitual sentences in (100), when they contain temporal adjuncts such as *on Sundays* or *when*-clauses, they express quantification over occasions, and the determination of restriction and nuclear scope seems sensitive to the focus placement (Vallduví 1990; Rooth 1992; Johnston 1994).

(100) a. John [runs]$_F$ on Sundays.

≈ 'For all Sundays (exceptions tolerated), John runs.'

b. John runs [on Sundays]$_F$.

≈ 'For all events of John running (exceptions tolerated), they are on Sundays'

The pattern in (100) is quite similar to the habitual sentences with the overt AQ *always* in (101), if we leave aside the difference in whether exceptions are allowed (i.e. homogeneity) for now.

(101) a. John always [runs]$_F$ on Sundays.

≈ 'For all Sundays, John runs.'

b. John always runs [on Sundays]$_F$.

≈ 'For all events of John running, they are on Sundays'

By contrast, the dispositional reading of a habitual sentence has a quasi-existential flavor, which does not relate the events of John running to any other kinds of occasions (Cohen 2004; Ferreira 2005). For this reason, I assume there is no HAB operator there.

I propose the following lexical entries for HAB and overt AQs such as *always* (based on the more or less standard quantificational analysis in Lewis 1975; Johnston 1994; Cohen 2004), as in (102) and (103). They have the semantic type of modifiers so that by combining with the denotation of *v*P, they return a semantic object that has the right type to further combine with the imperfective aspect. In addition, they both encode a universal quantifier over temporal intervals in the denotation, **EVERY**.[7]

(102) $[\![\text{HAB}]\!]^c = \lambda P_{\langle s,vt\rangle}\lambda w\lambda E.\textbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[P(e,w) \wedge \tau(e,w) \subseteq i']]$ defined if $C_a \in Dom(c)$;

(103) $[\![\text{always}]\!]^c = \lambda P_{\langle s,vt\rangle}\lambda w\lambda E.\textbf{EVERY}[\lambda i.C(i), \lambda i'.\exists e \sqsubseteq E[P(e,w) \wedge \tau(e,w) \subseteq i']]$

7. To be more precise, the universal quantifier involved in the denotation of the HAB operator differs from that in the denotation of *always* in that it is *homogeneous*, which allows exceptions when they are irrelevant to the topic under discussion (Ferreira 2005; Križ 2016). I will not go into the details of this difference between the two operators since all it matters for the current discussion is that both are quantifiers over temporal intervals.

Crucially, HAB differs from *always* in that it contains an anaphoric variable $C_a$ to restrict the domain of the quantification, while *always* contains a free variable $C$ for domain restriction which is determined by the context. The difference between the two is that, the former imposes a felicity requirement on the input context such that it must contain an appropriate antecedent for the variable in the domain, while the latter does not and can always be assigned some value salient in the context. An example of the latter is that, the domain of a nominal quantifier such as *every* is often claimed to be restricted by some free variable $C$ as in (104). But the presence of this variable does not require the input context to specify a familiar set of students, and it can be assigned whatever value salient there.

(104) Every student passed the exam.
$[\![(104)]\!] = \lambda w.\forall x[\textbf{student}(x, w) \wedge C(x) \rightarrow \textbf{passed.the.exam}(x, w)]$

In contrast, English pronouns such as *it* can be an example of the former, because it introduces some anaphoric variable that cannot be resolved contextually in the way how $C$ is resolved in (104). Take the famous example in (105), even though there is a salient value that could be assigned as the interpretation of *it*, the sentence is infelicitous because the domain of the input context of uttering the second sentence in (105) does not contain an appropriate antecedent for the pronoun *it*.

(105) Nine of the ten stones Mary collected were on the table. #Later I found it was under the sofa.

Now I will show that how this lexical difference between HAB and overt AQs such as *always* explain the puzzle why bare habituals sound incomplete out of the blue while habituals without overt AQs are fine, as repeated in (106).

(106) *Hei, wo gen ni shuo...* 'Hey, let me tell you something...'

a. ??Yuehan paobu
John run
Int: 'John runs (regularly)' ≈ 'For all contextually salient intervals (exceptions tolerated), John runs'

b. Yuehan yizhi paobu
John always run
'John always runs' ≈ 'For all contextually salient intervals, John runs'

The semantic compositions of (106a) and (106b) until the AspP level are illustrated in (107) and (108) respectively. In both cases, the AspP denotes a property of temporal intervals $i$ such that in the inertia continuations of $i$, there is a plural event of John running, $E$, whose running time includes $i$, and in addition, for every contextually salient interval, a subpart of $E$ that is an atomic event of John running, is actualized within the interval.

(107) LF: [$_{\text{TP}}$ NONFUT [$_{\text{AspP}}$ $\varnothing_{\text{IMPF}_{pl}}$ [$_{vP'}$ HAB [$_{vP}$ Yuehan paobu ] ] ] ]

a. $[\![vP]\!] = \lambda w \lambda e.\mathbf{run}(e, w) \wedge \mathbf{Ag}(e, w) = j$

b. $[\![vP']\!]^c = [\![\text{HAB}]\!]^c\,([\![vP]\!]^c)$
$= \lambda w \lambda E.\mathbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[\mathbf{run}(e, w) \wedge \mathbf{Ag}(e, w) = j \wedge \tau(e, w) \subseteq i']]$
defined if $C_a \in Dom(c)$

c. $[\![\varnothing_{\text{IMPF}_{pl}}]\!] = \lambda P_{\langle s,vt\rangle} \lambda w \lambda i.\forall w' \in \text{INERT}(w, i) : \exists E[P(E, w') \wedge \tau(E, w') \supseteq i]$

d. $[\![\text{AspP}]\!]^c = \lambda w \lambda i.\forall w' \in \text{INERT}(w, i) : \exists E[\mathbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[\mathbf{run}(e, w')$
$\wedge \mathbf{Ag}(e, w') = j \wedge \tau(e, w') \subseteq i']] \wedge \tau(E, w') \supseteq i]$ defined if $C_a \in Dom(c)$

(108) LF: [$_{\text{TP}}$ NONFUT [$_{\text{AspP}}$ $\varnothing_{\text{IMPF}_{pl}}$ [$_{vP'}$ yizhi [$_{vP}$ Yuehan paobu ] ] ] ]

a. $[\![vP']\!] = [\![\text{yizhi}]\!]\,([\![vP]\!])$
$= \lambda w \lambda E.\mathbf{EVERY}[\lambda i.C(i), \lambda i'.\exists e \sqsubseteq E[\mathbf{run}(e, w) \wedge \mathbf{Ag}(e, w) = j \wedge \tau(e, w) \subseteq i']]$

b. $[\![\text{AspP}]\!] = \lambda w \lambda i.\forall w' \in \text{INERT}(w, i) : \exists E[\mathbf{EVERY}[\lambda i.C(i), \lambda i'.\exists e \sqsubseteq E[\mathbf{run}(e, w')$
$\wedge \mathbf{Ag}(e, w') = j \wedge \tau(e, w') \subseteq i']] \wedge \tau(E, w') \supseteq i]$

If the presupposition of (107) is satisfied, both sentences in (106) can have a universal quan-

tificational reading, namely 'On all contextually salient intervals, John runs'. However, in an out of the blue context such as (106), there is no appropriate discourse-familiar referent to provide a value for the anaphoric $C_a$ in (106a), and I consider that is the reason why it cannot obtain this regular occurrence reading. In a nutshell, the HAB operator cannot occur there because the requirement of having a discourse-familiar domain restriction of quantification cannot be satisfied.

In fact, such a difference in terms of whether the domain restriction is anaphoric or not is not uncommon in the family of quantifiers in natural languages. Klecha (2010, 2011, 2014) argue that English *will* and *gonna* are both modal expressions which quantify over possible worlds, and he observes that while both can give rise to implicit conditional readings due to contextual domain restriction as in (109), the modal subordination is obligatory for *will* but optional for *gonna*.

(109) a. Don't go near that bomb. It'll explode. (Obligatory modal subordination)
Modal subordination reading: 'If you go near that bomb, it'll explode'

b. Don't go near that bomb. It's gonna explode. (Optional modal subordination)
Modal subordination reading: 'If you go near that bomb, it's gonna explode'
Plain reading: 'It's gonna explode'

Klecha proposes that the modal sentence involving *will* takes obligatory contextual domain restriction because *will* presupposes a discourse-familiar modal base, as in (110a). By contrast, *gonna* does not encode such a presupposition, as in (110b).

(110) a. $[\![\text{will}]\!]^c = \lambda p_{\langle s,t\rangle} \lambda w. \forall w' \in m : p(w')$ iff $m \subset \textsc{Met}(w) \wedge m \in Dom(c)$

b. $[\![\text{gonna}]\!]^c = \lambda p_{\langle s,t\rangle} \lambda w. \forall w' \in m : p(w')$ iff $m \subset \textsc{Met}(w)$
in which MET is a metaphysical modal base.

Similarly, it has also been observed that the *will*-sentences uttered discourse initially

are odd, while the *gonna*-sentences are fine (Binnick 1971; Klecha 2011). This is expected since the anaphoric modal base cannot have any antecedent in such a context.

(111) Hey let me tell you something ...

a. ??That bomb will explode.

b. That bomb is gonna explode.

The connection between the habitual sentences in (106) and the phenomena in (111) can be further confirmed by two pieces of evidence.

One is that we do find bare habituals obligatorily take contextual domain restriction while overtly quantified habituals do not, which resembles the contrast in (109). Consider the conversation in (112) for instance. The question asked provides a salient set of temporal intervals, namely the intervals of weekends. For the bare habitual sentence in (112a), it has to take the contextual domain restriction and give rise to the meaning 'Joh swims on weekends'. But the overtly quantified sentence in (112b) does not have to take that contextual restriction (though it can), and it can give rise to a meaning in which the quantification is over a wider domain than the overtly mentioned one.

(112) Q: What does John do on weekends?

a. He swims.

b. He always swims. (✓ 'From Monday to Sunday, he always runs')

The other is that, while both the *will*-sentences and bare habituals sound odd discourse-initially, they can improve under almost the same conditions, namely when there is focus in the sentence, or the sentence is transformed into a question, as in (113)-(115).

(113) Hey let me tell you something...

a. Only THIS bomb will explode. (projective focus)

b. This bomb will not explode. (polar focus)

(114) Q: Will this bomb explode? (polar question)

A: Yes, it will explode.

A': No, it won't explode.

(115) Q: Which bomb will explode? (*wh*-question)

A: THIS bomb will explode.

But the ultimate question is, why can making salient some set of alternatives, either by narrow focus or questions, satisfy the presuppositional requirement of HAB and *will*? Intuitively, it makes sense that when a particular set of alternatives is made salient, the corresponding context has to be more specific than the out-of-the-blue context, and maybe in this way the anaphoric domain restriction can find an antecedent. But formally, as we will see, the salient set of alternatives does not always directly contribute to the resolution of the anaphoric variable introduced by HAB or *will*. Take the habitual sentence for instance. When it is transformed into a question or contains some focus as in (116)-(118), the set of alternatives made salient by the context (i.e. the QUD) formalized in each case.

(116) Q: Yuehan paobu ma?
John run YNQ
'Does John run (regularly)?'

A: ta {paobu /bu paobu}.
he run not run
'He {runs /doesn't run}.'

the QUD = $\{p, \neg p\}$ in which

$p = \lambda w.\exists i \supseteq \textbf{now}.\forall w' \in \text{INERT}(w, i) : \exists E[\textbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[\textbf{run}(e, w')$

$\wedge \textbf{Ag}(e, w') = j \wedge \tau(e, w') \subseteq i']] \wedge \tau(E, w') \supseteq i]$ defined if $C_a \in Dom(c)$

(117) Q: shei paobu?
who run
'Who runs?'

A: YUEHAN paobu.
John run
'JOHN runs'

the QUD = $\{x \in \{j, m, b, ...\} \mid \lambda w.\exists i \supseteq \textbf{now}.\forall w' \in \text{INERT}(w, i) :$

$\exists E[\textbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[\textbf{run}(e, w') \wedge \textbf{Ag}(e, w') = x \wedge \tau(e, w') \subseteq i']] \wedge$

$\tau(E, w') \supseteq i]\}$ defined if $C_a \in Dom(c)$

(118) Q: Yuehan you shenme xiguan?
John have what habit
'What habits does John have?'

A: ta paobu, lvxing, huahua.
he run travel paint
'He runs, travels, and paints'

the QUD = $\{P \in \{\textbf{run}, \textbf{swim}, ...\} \mid \lambda w.\exists i \supseteq \textbf{now}.\forall w' \in \text{INERT}(w, i) :$

$\exists E[\textbf{EVERY}[\lambda i.C_a(i), \lambda i'.\exists e \sqsubseteq E[\textbf{run}(e, w') \wedge \textbf{Ag}(e, w') = x \wedge \tau(e, w') \subseteq i']] \wedge$

$\tau(E, w') \supseteq i]\}$ defined if $C_a \in Dom(c)$

For the context in (118), it is relatively straightforward why it can provide a value for $C_a$ – since the QUD explicitly asks about John's habit, it presupposes some domain restriction of the quantifier **EVERY**, namely a set of intervals that are sufficiently intense for the activity that iteratively occurs in each interval to be considered as John's habits. However, for the contexts in (116) and (117), it is less clear how the set of alternatives there contributes to a value for $C_a$. For (116), the set of alternatives are polar alternatives, but the domain restriction provided seems to be a set of temporal intervals during which John does something (i.e. some sports). For (117), the set of alternatives are individual-based, but the again the domain restriction under the regular occurrence reading should be a set of intervals that are sufficiently intense involving John doing something. Unfortunately I have to acknowledge I do not have a good answer for why some of the contexts, without making explicit a set of temporal intervals, can still satisfy the anaphoricity of the contextual domain restriction in the semantics of HAB. All I can say is that compared to the out of the blue contexts, it does seem easier to accommodate that we are talking about John

or someone's habits in the contexts in (116)-(118), which probably also accommodates a value for $C_a$.

In sum, this section argues that the incompleteness of bare habitual sentences (on the regular occurrence readings) in out-of-the-blue contexts is caused by the lexical presupposition of the HAB operator contained in those sentences – HAB encodes a quantifier over temporal intervals just like overt adverbs of quantification but it additionally requires the domain restriction to be anaphoric to a discourse-familiar value. While left with some puzzles, I show with empirical evidence that such a lexical difference concerning the domain restriction is not uncommon in quantification phenomena in natural languages – it can be found with other kinds of quantifiers (e.g. modal expressions) as well.

## 6.5 Proposal for degree incompleteness

This section extends the presuppositional account of the incompleteness associated with bare habitual sentences to the degree incompleteness puzzle. I propose that the apparently bare positive sentence such as (119a) contains a covert POS operator, which involves quantification over degrees just like overt degree adverbs such as *hen* 'very$_{weak}$', except that it additionally requires the domain restriction of the degree quantification to be discourse familiar. This explains the degradedness of uttering (119a) in an out-of-the-blue context, and why (119a) improves under the same conditions as bare habitual sentences (which contains HAB) and *will*-sentences.

(119) a. ??Yuehan POS tall
John tall
Int: 'John is tall'

b. Yuehan hen gao
John HEN tall
'John is tall '

Section 6.5.1 goes through some basic assumptions on the syntax and semantics of

sentences involving gradable adjectival predicates. Section 6.5.2 proposes the analysis of POS and the overt degree adverb *hen* in Chinese.

### 6.5.1 The assumptions on gradable adjectives

In the existing literature, one standard analysis of gradable adjectives in Chinese such as *gao* 'tall' is to treat their semantics as relations between individuals and degrees (Chen-Sheng Liu 2010, 2018; Grano 2012), as in (120), following one of the degree-based analyses of their English counterparts (Cresswell 1976, von Stechow 1984, Bierwisch 1989, Kennedy 1999, 2005). Introduced internal to the gradable adjectives, $\mu_{\text{HEIGHT}}$ is a measure function which measures an individual to the maximal degree that individual is tall to.

(120) $[\![\text{tall/gao}]\!]_{\langle d,et\rangle} = \lambda d \lambda x.\mu_{\text{HEIGHT}}(x) \geq d$

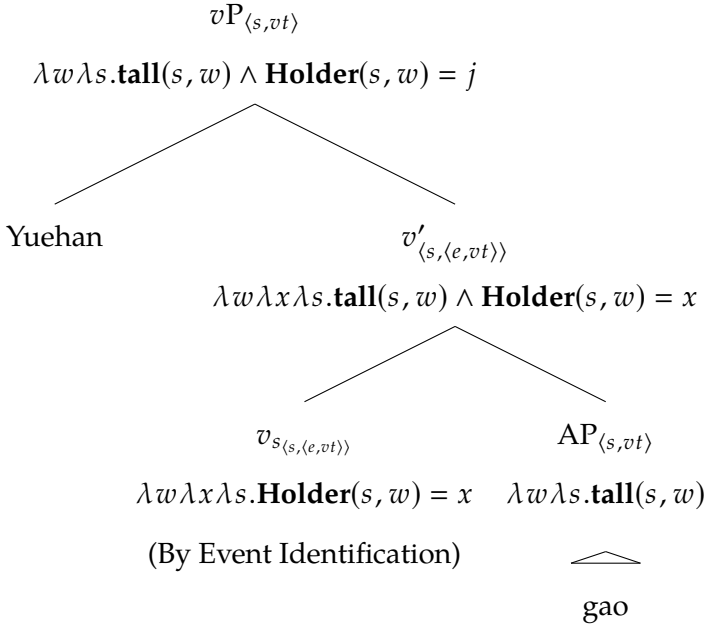
In order to capture their verb-like predication strategy and the parallel between degree incompleteness and frequency incompleteness, I deviate from this standard analysis and instead follow Wellwood (2015, 2019) in assuming that gradable adjectives in Chinese denote properties of neodavidsonian states.[8] For *gao* 'tall', it denotes a set of states of having height as in (121), and the gradability of the predicate is reflected by the domain of *gao* – it can be ordered by a non-trivial part-of relation (based on 'how much' height a state represents) and forms a mereology (Landman 2000; Fults 2006) so that they can be measured by some monotonic measure function. Crucially, under Wellwood's analysis, the measure function is not introduced by the gradable adjective itself, but is introduced externally by a (sometimes pronounced) *much*. We will get back to this point in Section 6.5.2 and show that the relevant measure function can be introduced by POS or degree adverbs in Chinese.

(121) $[\![\text{gao}]\!]_{\langle s,vt\rangle} = \lambda w \lambda s.\textbf{tall}(s, w)$

8. My analysis is implemented in an intensional framework for consistency with the previous chapters.

Following the neo-Davidsonian theory, eventualities, including states, are linked to individuals by thematic relations. I assume that the mopheme $v_S$ takes AP as its complement and introduces the Holder relation which links states with their bearers. $v_S$ and AP can compose via (the intensional version of) Event Identification (Kratzer 1996). The composition of a sentence radical *Yuehan gao* 'John tall' is illustrated in (122).

(122)

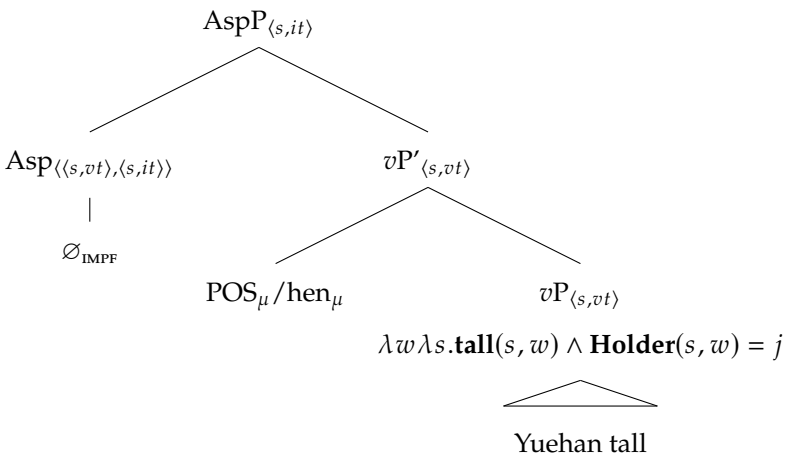



In words, under the current analysis, a sentence radical containing a (gradable) predicate denotes a property of states, just like a sentence radical containing an eventive predicate such as *Yuehan paobu* 'John run' denotes a property of events.

### 6.5.2 The anaphoric threshold associated with POS

To capture the fact that unmarked gradable adjectives in Chinese in many cases can obtain the positive readings, I assume that there is a covert POS morpheme which introduces the positive meaning, and it occupies the same position as overt degree adverbs as in (123), namely as adjuncts of $v$P.

(123)




I propose the following semantics in (124) for this covert POS morpheme and overt degree adverbs such as *hen* 'very$_{weak}$'. Similar to the HAB and *always*, they are both modifiers of properties of eventualities, and encode a quantification – in this case, it is a universal quantification over degrees. The parallel here is that, just like time interval is the measure of an event in its temporal dimension, degree is the measure of a state in a certain dimension (i.e. height, weight, etc). How does this quantification over degrees encode the positive meaning? I argue that the restrictor of the quantification is a set of degrees (in the relevant dimension of measure) that roughly corresponds to the positive threshold in the standard analysis of gradable adjectives. For the nuclear scope, it represents a set of degrees that are right-bounded by the degree of some state measured with a contextually-determined measure function. Following Wellwood (2015), I assume that POS and *hen* are indexed with a variable $\mu$, which is assigned a measure function which measures states to degrees in a certain dimension (type $\langle s, vd\rangle$) by the assignment function $A$. [9]

(124) a. $[\![\text{POS}_\mu]\!]^{A,c} = \lambda P_{\langle s,vt\rangle}\lambda w\lambda s.\textbf{EVERY}[\lambda d.C_a(d), \lambda d'.[P(s,w) \wedge A(\mu)(s,w) \geq d']]$
defined if $C_a \subseteq Range(A(\mu)(w)) \wedge C_a \in Dom(c)$

9. The choice of $A(\mu)$ is not completely free but subject to at least two constraints (Schwarzschild 2006; Solt 2015; Wellwood 2015). One is that $A(\mu)$ can only be measure functions that apply to domains of a non-trivial ordering. The other is that corresponding dimension associated with the measure function must be monotonic on the part-whole structure of the domain. For instance, $\mu_{\text{HEIGHT}}$ is monotonic on the part-whole relationship between states of having height, since for any states of having height $s_1, s_2$ such that $s_1$ is a proper subpart of $s_2$, the measure of $s_1$ relative to HEIGHT is strictly less than the measure of $s_2$.

b. $[\![\text{hen}_\mu]\!]^{A,c} = \lambda P_{\langle s,vt\rangle}\lambda w\lambda s.\textbf{EVERY}[\lambda d.C(d), \lambda d'.[P(s,w) \wedge A(\mu)(s,w) \geq d']]$
defined if $C \subseteq Range(A(\mu)(w))$

The universal quantification requires the restrictor to be a subset of the nuclear scope, that is equivalent to saying, the measure of the relevant state must at least meet the relevant threshold. The difference between $\text{POS}_\mu$ and $hen_\mu$ is that the variable for contextual domain restriction is anaphoric in the former while in the latter that variable is just contextually-determined.

Let us first illustrate the analysis with the zero-marked positive sentence in (125), namely the one involving POS. The composition using the lexical entry in (124a) until the AspP is elaborated in (126). In this case, since the states of having heights are ordered by a part-of relation in terms of 'how much' height is represented, $A(\mu)$ returns the measure function $\mu_{\text{HEIGHT}}$ (type $\langle s, vd\rangle$), as in (126b). (126d) describe a property of a temporal interval $i$ such that in its inertia continuations, there is a state of John having height and its measure relative to the HEIGHT dimension meets or exceeds a discourse-familiar threshold.

(125) ??Yuehan tall
John tall
Int: 'John is tall'

(126) LF: [$_{\text{TP}}$ NONFUT [$_{\text{AspP}}$ $\varnothing_{\text{IMPF}}$ [$_{vP'}$ $\text{POS}_\mu$ [$_{vP}$ Yuehan gao ] ] ] ]

a. $[\![vP]\!] = \lambda w\lambda s.\textbf{tall}(s,w) \wedge \textbf{Holder}(s,w) = j$

b. $[\![vP']\!]^{A,c} = [\![\text{POS}_\mu]\!]^{A,c}\ ([\![vP]\!]^{A,c}) =$
$\lambda w\lambda s.\textbf{EVERY}[\lambda d.C_a(d), \lambda d'.[\textbf{tall}(s,w) \wedge \textbf{Holder}(s,w) = j \wedge \mu_{\text{HEIGHT}}(s,w) \geq d']]$
defined if $C_a \subseteq Range(\mu_{\text{HEIGHT}}(w)) \wedge C_a \in Dom(c)$

c. $[\![\varnothing_{\text{IMPF}}]\!] = \lambda P_{\langle s,vt\rangle}\lambda w\lambda i.\forall w' \in \text{INERT}(w,i) : \exists e[P(e,w') \wedge \tau(e,w') \supseteq i]$

d. $[\![\text{AspP}]\!]^{A,c} = \lambda w\lambda i.\forall w' \in \text{INERT}(w,i) :$
$\exists s[\textbf{EVERY}[\lambda d.C_a(d), \lambda d'.[\textbf{tall}(s,w') \wedge \textbf{Holder}(s,w') = j \wedge \mu_{\text{HEIGHT}}(s,w') \geq d']]$
$\wedge \tau(s,w') \supseteq i]$ defined if $C_a \subseteq Range(\mu_{\text{HEIGHT}}(w)) \wedge C_a \in Dom(c)$

Due to the anaphoric variable $C_a$ in the semantics of (125), uttering (125) out of the blue is odd since there is no such discourse familiar referent to provide a value for it.

For the sentence with unstressed degree adverb *hen* in (127), its truth condition is the same as (125) except that there is no anaphoric variable in the restrictor of the degree quantification involved, as in (128). It is felicitous when uttered out of the blue since the variable $C$ for contextual domain restriction is not anaphoric.

(127) Yuehan hen tall
John HEN tall
'John is tall'

(128) LF: [$_{\text{TP}}$ NONFUT [$_{\text{AspP}}$ $\varnothing_{\text{IMPF}}$ [$_{v\text{P}'}$ hen$_\mu$ [$_{v\text{P}}$ Yuehan gao ] ] ] ]

a. $[\![v\text{P}']\!]^{A,c} = [\![\text{hen}_\mu]\!]^{A,c}\ ([\![v\text{P}]\!]^{A,c}) =$
$\lambda w \lambda s.\textbf{EVERY}[\lambda d.C(d), \lambda d'.[\textbf{tall}(s,w) \wedge \textbf{Holder}(s,w) = j \wedge \mu_{\text{HEIGHT}}(s,w) \geq d']]$
defined if $C \subseteq Range(\mu_{\text{HEIGHT}}(w))$

b. $[\![\text{AspP}]\!]^{A,c} = \lambda w \lambda i. \forall w' \in \text{INERT}(w,i):$
$\exists s[\textbf{EVERY}[\lambda d.C(d), \lambda d'.[\textbf{tall}(s,w') \wedge \textbf{Holder}(s,w') = j \wedge \mu_{\text{HEIGHT}}(s,w') \geq d']] \wedge$
$\tau(s,w') \supseteq i]$ defined if $C \subseteq Range(\mu_{\text{HEIGHT}}(w))$

In words, the incompleteness of a zero-marked positive sentence out-of-the-blue is due to its failure of satisfying the presupposition concerning the domain restriction of the quantification, just like the case of bare habitual sentences and *will*-sentences.

Similarly, we can explain why zero-marked positive sentences (POS-sentences) improve with the presence of focus or when being transformed into questions, as repeated in (129)-(131). This is just the same case as how bare habitual sentences and the *will*-sentences can improve under those conditions. In fact, it is more intuitive why the contexts in (129)-(131) can provide a discourse-familiar domain restriction (i.e. a discourse-familiar positive threshold). In all those cases, the QUD concerns whether an individual has a property of being tall or not (instead of how tall that individual is), and by talking about

the property of being tall, it is necessarily the case that we are taking for granted the presence of a relevant positive threshold in the first place.

(129) Q: Yuehan gao ma?
John tall YNQ
'Is John tall?'

A: ta {gao /bu gao}.
he tall not tall
'He {is tall /isn't tall}.'

(130) Q: shei gao?
who tall
'Who is tall?'

A: YUEHAN gao.
John run
'JOHN is tall'

(131) Q: Yuehan you shenme tedian?
John have what feature
'What feature does John have?'

A: ta gao, shou, (erqie) anjing
he tall slim and quiet
'He is tall, slim and quiet'

On the other hand, when the QUD involves degree alternatives as in (132), the presence of the property of being tall, or alternatively the presence of a positive threshold, is not taken for granted. That is why the familiarity presupposition concerning the domain restriction is not satisfied and the POS-sentences are degraded there.

(132) A: Yuehan duo gao? /Gen wo shuoshuo Yuehan de shengao.
John much tall to me tell John POSS height
'How tall is John? /Tell me about John's height'

B: ta ??(hen) gao /ai.
he very tall short
'He is tall/short'

To sum up, I propose that degree incompleteness is essentially caused by the anaphoricity of the domain restriction of degree quantification involved in the semantics of the covert POS in Chinese. Both POS and the overt degree adverb *hen* can give rise to the positive meaning, just like both HAB and the overt frequency adverb *yizhi* 'always' can give rise to the regular occurrence meaning. The difference with each pair of expressions is that the covert expressions (POS and HAB) encode a discourse-familiar domain restriction while the overt expressions (*hen* and *yizhi*) do not encode such a presupposition.

## 6.6 Summary

This chapter provides a presuppositional account of the degree incompleteness phenomenon in Chinese. There are two motivations. The first is that quite similar to the temporal incompleteness we discussed in the previous chapters, degree incompletenss is sensitive to what is under discussion in the context. The unstressed degree adverb *hen* is not always required for the positive reading of a sentence involving a gradable adjective, but only when the QUD involves degree alternatives. Secondly, I point out a close parallel between the degree incompleteness and how habitual sentences (in English and Chinese) need frequency phrases (i.e. frequency incompleteness). The latter requirement is exempt in almost the same contexts as the former, namely when focus is added or the target sentence is transformed into a polar or *wh*-question. In the case of frequency incompleteness, it is more transparent that the context-sensitivity incompleteness can be attributed to the presupposition concerning the domain restriction of the quantification, which is not uncommon for quantifiers in natural languages.

Based on those motivations, I propose that the sentences with zero-marked gradable adjectival predicates involve a covert POS morpheme which can give rise to the positive meaning (following Liu 2010, 2018; Grano 2012), but it can do so in restricted contexts because POS encodes quantification over degrees and requires the restrictor of the quantification to be discourse-familiar. This explains why zero-marked positive sentences are

incomplete in the out-of-the-blue context or more generally when the QUD involves degree alternatives – those contexts fail to provide a discourse-familiar referent for the contextual domain restriction of degree quantification (which corresponds to the positive threshold). When the QUD involves polar alternatives or alternatives built based on individual or property alternatives, such a context takes for granted the presence of a positive property, and for this reason the discourse-familiar requirement is satisfied there. By contrast, the unstressed degree adverb *hen* basically has the same truth conditions as POS except that it does not encode such a presupposition concerning the domain restriction. That is why it can freely occur in all the contexts to give rise to the positive meaning.

To conclude, the proposed analysis can capture a wide range of empirical data concerning degree incompleteness, as well as a set of related phenomena on quantification in natural languages. It identifies a different source of incompleteness from the case of temporal incompleteness (which is derived from the conflict of conversational implicatures), namely the lexical presupposition of some covert operators, although the current account can still be considered as 'pragmatic' in the broad sense.

# CHAPTER 7

# CONCLUDING REMARKS

## 7.1 Summary of contributions

This dissertation revisits the so called incompleteness phenomenon in Mandarin Chinese, namely certain sentences that are zero-marked in aspect or degree may fail to stand alone as independent utterances, as in (1) and (2).

(1) Mali ??{zai} he ??{le} kafei.
Mary PROG drink PERF coffee
Int: 'Mary {was drinking /drank} coffee' (episodic reading)

(2) Mali ??(hen) gao.
Mary very tall
Int: 'Mary is tall' (positive reading)

The dissertation makes at least the following contributions.

First, it advances the novel generalization that incompleteness is sensitive to the set of salient alternatives in the context, namely the Question Under Discussion, as summarized in (3). This generalization not only captures the well-established observation in the literature that focus can salvage incompleteness (Tang and Lee 2000; Gu 2007; Chen-Sheng Liu 2018), but is further supported by a set of apparently heterogeneous incompleteness-free environments including sentences involving clause-embedding predicates, narratives, and certain non-root clauses such as relative clauses and noun complements, etc. In words, the QUD-based generalization can capture a wide range of data concerning the distribution of temporal/degree incompleteness in an explanatory way.

(3) *Incompleteness is sensitive to the QUD*

a. Overt aspect marking is required for the episodic reading when the QUD concerns the instantiation of the event.

b. The degree adverb *hen* is required for the positive reading only when the QUD involves degree alternatives.

Second, it relates incompleteness to phenomena in other languages and for the first time shows that incompleteness is *not* an exotic property of Chinese grammar. In particular, it argued that potentially incomplete, aspectually zero-marked sentences such as (1) are imperfective sentences which can express typical imperfective readings such as habitual readings, continuous readings, etc, and temporal incompleteness can be connected to the constrained use of imperfective sentences for episodic readings in many other languages, as repeated in Table 7.1.

Table 7.1: Constrained episodic uses of imperfectives across languages

| Imperfective form | Romance | Russian | Mandarin |
|---|---|---|---|
| Habitual, Continuous | ✓ | ✓ | ✓ |
| Event-in-progress | ✓ (Constrained in Spanish) | ✓ | Constrained |
| Event-in-completion | Constrained | Constrained | Constrained |

For degree incompleteness such as (2), I showed that its distribution is also not uncommon and a close parallel can be found with certain habitual sentences in both Mandarin and English, as repeated in (4)- (5).

(4) Bare positive sentences such as *Mali gao* 'Mary tall'...

a. ... sounds odd out-of-the-blue

b. ... improves under yes-or-no questions, negation, ...

(5) Bare habitual sentences such as *Mali paobu* 'Mary runs'...

a. ... sounds odd out-of-the-blue

b. ... improves under yes-or-no questions, negation, ...

Third, it provides a novel formal pragmatic account of incompleteness. While the main claim is that potentially incomplete sentences are both grammatical and meaning-

ful and are just degraded in some contexts for pragmatic reasons, I attribute temporal incompleteness and degree incompleteness to different pragmatic mechanisms. For the temporal case, incompleteness arises because of two incompatible R-based and Q-based implicatures, one is responsible for its episodic interpretation while the other contradicts the episodic interpretation due to the failure of uttering the more informative alternatives that actually entail the episodic interpretation. The QUD-sensitivity of temporal incompleteness can be naturally explained by the correlation between the QUD and the strength of Q-based implicatures (Cremers et al. 2021). Turning to the degree case, I argue that incompleteness arises due to a lexical presupposition of the covert POS morpheme in sentences such as (2), namely the restrictor of the degree quantification encoded in its denotation must be discourse-familiar. This presupposition is satisfied only in certain contexts (when the QUD does not involve degree alternatives) but not others. Crucially, I show that this is not an *ad hoc* assumption invented for this particular problem but is actually a reasonable one considering the presence of other kinds of quantifiers in natural language which encode a similar discourse-familiar requirement on the restrictor. This pragmatic account captures native speakers' intuition towards an incomplete sentence: they consistently report the feeling that one hasn't finished their utterance, instead of plain ungrammaticality. Under the current analysis, the degradedness is attributed to the failure of the current context to avoid the conflict of implicature or to satisfy the presupposition, which can be potentially salvaged when the utterance is continued due to the dynamic nature of the context.

I would like to end this section by briefly discussing some more general implications of the dissertation. The current discussion on incompleteness shows an effective cross-linguistic implementation of the notion of QUD and the related tools in formal discourse theories, and contributes to our understanding of the interaction between the QUD and alternatives, as well as the character of not-at-issue inferences. Moreover, it invites a new perspective to investigation on the issue of *assertability* across languages, which is often

considered to be related to morphosyntactic and semantic properties of sentences encoded by their *finiteness* (Nikolaeva et al. 2007; McFadden and Sundaresan 2014; Sybesma 2019). But our investigation of those apparently unassertable (i.e. incomplete) sentences in Chinese raises the novel possibility that in some cases the assertability of a sentence may correlate with the properties of discourse such as the QUD. The important lesson learnt here is that without a careful theory-neutral description of the data, it seems never a good idea to take for granted that the apparent unacceptability of a sentence is due to a certain constraint in the grammar, be it syntactic, semantic, or pragmatic.

## 7.2 Future directions

There are a few issues left open in this dissertation which I would like to investigate in the future studies.

One issue concerns whether the two different pragmatic mechanisms proposed for temporal incompleteness and degree incompleteness ultimately can be unified into one single pragmatic story. Despite of the differences, the two cases do share the following parts in the account: (i) a zero-marked form that is degraded only in certain contexts; (ii) a competing overt form that can express the same meaning as the zero-marked form but is "better" than it in some way (being more informative in the case of temporal incompleteness, or presupposing less in the case of degree incompleteness); and (iii) some pragmatic principle which regulates the competition between the zero-marked form and the overt form, capturing the QUD-sensitivity of incompleteness. One potential direction of achieving a uniform account is to re-examine the part (ii) in each case, since being more informative seems not entirely unrelated to the property of presupposing less. Recall that we say zero-marked imperfective sentences do not entail the episodic reading, but it can obtain this reading either because the event instantiation is the presupposed information or is the default stereotypical information (via the R-based reasoning). If there is more evidence to reduce the source of this R-based strengthening to the presupposition, then

it is possible to further unify the treatment of temporal and degree incompleteness by saying that they are essentially related to presuppositions. It could also be the other way around – for the case of degree incompleteness, the zero-marked form can survive in contexts in which certain presuppositions are satisfied not because it actually encodes such a requirement, but it is simply less informative than the overtly marked from and can only give rise to the positive reading via the R-based strengthening.

Another issue is whether the proposed pragmatic analyses can extend to some aspectually marked sentences involving certain bare noun objects such as (6), which are still considered to be mildly "incomplete" in the literature (Tang and Lee 2000; Guo 2015):

(6) ?Mali chi le fan.
Mali eat PERF meal
'Mary had her meal (already)'

I did not investigate this set of data in the dissertation because the judgment seems to vary about depending on the lexical choice of the bare noun and the degree of unacceptability is milder compared to the aspectually zero-marked sentences. But it does share some crucial character of the incomplete sentences investigated here – the sentence indeed can improve by adding focus as in (7a), though it can also be improved by adding expressions that further restrict the temporal location of the event such as sentence final *le* (see Guo 2015) or temporal adverbials as in (8).

(7) a. zhiyou MALI chi le fan.
only Mary eat PERF meal
'Only MARY had her meal.'

b. MALI chi le fan. YUEHAN mei chi.
Mary eat PERF meal John not eat
'MARY had her meal; JOHN did not.'

(8) a. Mali chi le fan le.
Mali eat PERF meal SFP
'Mary had her meal (already).'

b. gangcai Mali chi le fan.
just.now Mali eat PERF meal
'Mary had her meal just now.'

It will be interesting to see if (6) is also degraded for a pragmatic reason, especially if we can capture the gradient incompleteness feeling across different cases.

Lastly, I consider it is worthwhile to do some experimental investigation in terms of the so-called "default" Question Under Discussion for a certain sentence uttered in an out-of-the-blue context. In this dissertation, I follow the existing literature in assuming the default QUD is 'What happened?' (van Kuppevelt 1995; Roberts 1996/2012) for an episodic sentence such as 'Mary drank coffee', and intuitively it does seem to be the case that the information concerning the event actualization is at-issue in this case. However, what the default QUD is becomes less clear for out-of-the-blue utterances such as 'Mary is tall', and to my knowledge there is no particular assumption proposed about it in the literature. For this reason it will be fruitful to make use of experimental tasks such as the QUD elicitation task to investigate the question what the default QUD is, or even whether such default QUD actually exists among interlocutors in the first place.

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