Becoming perfect

Definiteness effects and competition in tenses and aspects

Ruoying Zhao

A thesis submitted for the degree of Doctor of Philosophy in Linguistics at University College London
Declaration

I, Ruoying Zhao, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.
Abstract

This dissertation explores the semantics and pragmatics of tense and aspect constructions in three groups of languages: I. English; II. French, Italian, German; III. Mandarin Chinese.

The basic claims of this dissertation are: (i) the English past tense is lexically ambiguous between an anaphoric and a uniqueness reading; (ii) the different properties of the present perfect construction in English versus French, Italian and German follow from the competition between the present perfect with the alternative past tense and the different set of alternatives available in these languages; (iii) the distribution of the Mandarin Chinese perfective particles reflects asymmetry in their presuppositions, such as anaphoricity and anti-resultativeness; (iv) Mandarin Chinese differs from the languages in group I and II in that it establishes anaphoric dependency in the domain of eventualities, not times; (v) the crosslinguistic distribution of perfect-like tense-aspectual constructions follows from similar semantic-pragmatic strategies, namely the competition between alternatives from a set of general categories (anaphoric, unique, neutral, and antiresulative).
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Empirically, I aim to contribute to the following areas: (i) our understanding of the English past tense and the data that pose difficulties for both the existential analysis with domain restriction and the pronominal (i.e. anaphoric) analysis; (ii) the source of the various readings and inferences that are typically associated with the English present perfect, and an analysis which enables us to predict the crosslinguistic variation thereof; (iii) the semantic and pragmatic properties of the various perfective particles in Mandarin Chinese. Theoretically, this work contributes to our understanding of the basic semantic building blocks in the domain of tenses and aspects, as well as the role of semantic markedness, concepts of definiteness, and competition in deriving the universals and variations in the semantics and pragmatics of past narrative contexts.

Finally, this thesis will provide insights to future fieldwork as well as fields such as second language instruction and natural language processing.
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Chapter 1

Introduction

1.1 Overview

This dissertation explores the semantics and pragmatics of tense and aspect constructions in three groups of languages: (i) English; (ii) French, Italian, German; (iii) Mandarin Chinese.

Empirically, I aim to contribute to the following areas: (i) our understanding of the English past tense and the data that pose difficulties for both the existential analysis with domain restriction and the pronominal (i.e. anaphoric) analysis; (ii) the source of the various readings and inferences that are typically associated with the English present perfect, and an analysis which enables us to predict the crosslinguistic variation thereof; (iii) the semantic and pragmatic properties of the various perfective particles in Mandarin Chinese. Theoretically, this work contributes to our understanding of the basic semantic building blocks in the domain of tenses and aspects, as well as the role of semantic markedness, concepts of definiteness, and competition in deriving the universals and variations in the semantics and pragmatics of past narrative contexts.

These three particular groups of languages are chosen because they each represent a category regarding the above research questions. In particular, English is a language where the present perfect has a range of inferences associated with it that are known as the ‘perfect readings’ in Matthewson et al. (2017); Bertrand et al. (2017), among others. There are also certain puzzling constraints such as the lack of narrative progression and the Present Perfect Puzzle Klein (1992). The English past tense is also known to pose difficulties to a strictly anaphoric analysis. On the other hand, the second group of languages have in common that the present perfect has wider usage than its English counterpart and is labeled as a ‘general purpose past perfective’ by Bertrand et al. (2017, a.o.). The past tense in these
languages also shows a narrower distribution than the English past tense (Krator, 1998). Finally, Mandarin Chinese has a morphologically null tense, with a wide range of perfective particles that are often compared with the English perfect and past tenses.

1.2 Perfect and perfect readings

Many tense-aspectual constructions in the world’s languages have been labelled as the ‘perfect’. While there are many previous analyses focused on the English present perfect (McCawley 1971; McCoard 1978; Inoue 1979; Klein 1992, 1994; Iatridou et al. 2003; Portner 2003, 2011, to name a few) and other crosslinguistic studies comparing forms labelled as the ‘perfect’ (Schaden (2009); Grønn and von Stechow (2017), among others), as the recent literature points out, the term ‘perfect’ itself may have several definitions (Bertrand et al., 2022). There is the morphological definition: a tense-aspectual construction with an auxiliary and a past participle; and there is the semantic-pragmatic definition: a tense-aspectual construction that shares some of the same set of interpretations, inferences, and restrictions as the English present perfect.

For most Indo-European languages, the perfect construction consists of a tensed auxiliary and a perfect participle (i.e. ‘analytic’ perfect). For languages with the analytic perfect such as English, the basic architecture assumed in most contemporary works is that there is a perfect operator above aspect (Iatridou et al., 2003; Pancheva and von Stechow, 2004, a.o.):

(1) \[
\text{TP TENSE [Perf PERFECT [Asp ASPECT [VP some verb ] ] ] ]}
\]

In English, the perfect may combine with either the perfective or the imperfective (progressive) aspect, but in languages like French and Italian, the perfect is only perfective. The architecture above will also be assumed in this dissertation.

The main focus of this dissertation is the present perfect. It is one of the most controversial constructions in the study of temporal semantics. Intuitively, it expresses some sort of anteriority meaning, which is reflected in some major groups of analyses. In English, it is also characterized by the numerous inferences and constraints. Some of these inference have been labeled as ‘current relevance’, but there is no consensus in the literature about the definition or the nature of these inferences. The generally accepted classification of ‘perfect’ readings in the literature includes:
Different kinds of ‘perfect’-like readings

a. Experiential/existential
Mary has visited the Louvre.
⇒ There is at least one instance of Mary visiting the Louvre prior to the speech time. Also felicitous without a contextually salient past time.

b. Resultative
Mary has arrived.\(^1\)
⇒ The result state holds.

c. Recent past/hot news
The Orioles have won the game!
⇒ A past event presented as new information, often recent.

d. Universal Perfect/Continuative
Mary has been studying since this morning.
(Mary is still studying.)

e. Present Perfect Puzzle
*Mary has arrived yesterday.
⇒ Prohibited with a definite past temporal adverbial.

f. Lifetime effect
#Einstein has visited Princeton.
⇒ Prohibited with dead subjects.

g. No narrative progression
#(This morning) Mary has woken up. Then she has gotten dressed.
⇒ Cannot be used in narration of a series of past events taken place back to back.

The nature of these perfect readings and how to account for them are the main focus of the literature on the present perfect. Some previous analyses, such as the Extended Now analysis (Iatridou et al., 2003, a.o.), are successful in accounting for some of these readings but not others. There are also attempts of a unified account of all of these perfect readings, such as Portner (2003) and Nishiyama and Koenig (2004); Nishiyama (2006). It is also possible that some of these readings

\(^1\)It has been noted in the literature that under the resultative perfect reading, the result state cannot be cancelled: #I’ve lost my keys, but then I found them again. See Bertrand et al. (2017); Matthewson et al. (2017). However, this only applies to the resultative reading, and not to the present perfect in general.
reflect not the inherent properties of the present perfect, but the result of some kind of competition with the semantically similar past tense (Pancheva and von Stechow, 2004; Schaden, 2009).

There is also the issue of crosslinguistic variation. It has been noted that the present perfect construction in several other languages such as French, behaves differently from its English counterpart with respect to the perfect readings in (2). In particular, the present perfect construction in French, as well as other tense/aspect constructions in some other languages, seem to fall into a more general category labeled as ‘general-purpose past perfective’ in the literature (Bertrand et al., 2017; Matthewson et al., 2017). The general-purpose past perfective is characterized by a set of features that is somewhere between a strictly anaphoric past perfective (which requires a contextually salient reference time and is in general infelicitous in out-of-the-blue contexts), and a (English-like) present perfect. They share some of the perfect-like readings such as existential/experiential, recent past, and resultative readings, but differ from the English present perfect in other respects:

(3) The general-purpose past perfective (Bertrand et al., 2017)
   a. Has the experiential/existential reading, but does not show the lifetime effect
   b. Has the resultative reading, but not required
   c. Recent past/hot news possible
   d. Felicitous out of the blue
   e. Definite past adverbials allowed
   f. Narrative progression allowed

There is a debate in the literature about how to interpret the different properties of the French present perfect as a general-purpose past perfective. While some linguists believe that it simply reflects a different form-meaning correspondence in these languages (Kratzer, 1998), some other linguists have proposed unified analyses of the present perfect construction, most of which are based on competition with different alternatives (Pancheva and von Stechow, 2004; Schaden, 2009).

It has also been noted in the literature that the present perfect is special comparing to the other perfect constructions: past and non-finite perfects do not have similar inferences and constraints as the present perfect. The present perfect seems to be special in that its semantics is too similar to that of the past. Indeed, we see some overlaps between the perfect-readings in (2) and those of the general-purpose past perfective (3), suggesting that they may have some common semantic
components and can function as alternatives for the same meaning. As mentioned earlier, several authors, including Schaden (2009) and Pancheva and von Stechow (2004), having taken into account the crosslinguistic variation, argue that the special properties of the English present perfect result from the competition with the past tense. I believe that this line of research is on the right track, but neither of the two previous analyses listed above has a satisfactory solution (these proposals will be discussed in Chapter 5).

In addition, in languages that do not have the same kind of analytic perfect as in English, tense/aspect constructions with one or more of these perfect-readings in (2) are sometimes labeled or compared to a perfect in the semantic-pragmatic sense, including the perfective particles in Mandarin Chinese. In Mandarin Chinese, in particular, the experiential reading is separated from the existential, hot news and the resultative reading in that the former is usually associated with the particle *guo*, while the latter ones are associated with a different perfective particle, the sentence-final *-le*, although neither of these particles are subject to the Present Perfect Puzzle or the lifetime effect. In addition, *guo* also strongly rejects the resultative reading (Iljic, 1990; Pan and Lee, 2004; Lin, 2007, a.o.). These observations suggests that we may need more fine-grained semantic building blocks that make up the perfect readings, and that different perfect readings may have different sources and therefore be subject to intra- and inter-language variation, depending on how the semantic space is split up and spelled out.

Mandarin Chinese also differs from English and French in that it is morphologically tenseless. This also leads to the question of whether languages use different strategies in establishing temporal and event reference in narration. Do the different observations regarding the perfect-like readings of *guo* and *le* follow from the fact that they are aspectual particles and not tenses?2

The goal of this dissertation, like its many predecessors, is to understand the nature of the perfect-readings, and the crosslinguistic variation thereof. In particular, why does the present perfect construction in languages like French behave like a general-purpose past perfective? Also, what is the nature of the general-purpose past perfectives to begin with? Is it possible to maintain the same analysis (or with slight modifications) of the analytic present perfect construction in languages like English as well as languages like French, accounting for both the perfect readings and the general-purpose past perfective readings? For languages like Mandarin Chinese where there is no analytic perfect but perfective particles

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2Some of the previous accounts associate *guo* and *le* with not just the aspectual semantics but also temporal semantics (Lin, 2006, 2007). They will be discussed in Chapter 7.
with the same kind of perfect-readings as English, what is the source and nature of these readings? Do these perfect-like readings suggest a common semantic feature or pragmatic strategy?

1.3 Roadmap

In this dissertation, I will explore the idea that the competition between different alternatives compatible with the past perfective reading is responsible for the various perfect readings and the general-purpose past perfective readings that we observe.

Chapters 2, 3, 4 5 The first part of this study concerns the different behaviours of the present perfect in English and languages like French, German, and Italian. I propose that the differences follow from the competition with the past tense in the languages. It then follows that we cannot have an adequate analysis of the present perfect without fully understanding the past tense.

In particular, the previous literature has noted that there is a group of data regarding the English past tense which poses difficulties for a pure pronominal (i.e. anaphoric) analysis, which also differentiates the English past tense from the past tense in languages like German. In addition, the general availability of the simple past tense (which is the morphology for the past perfective in these languages) also depends on various factors such as register and temporal remoteness. In Chapter 2, I will argue that these data suggest a uniqueness presupposition of the English past tense, which is non-existent in languages like German. I also propose a lexical ambiguity analysis of the English past tense based on the results of lexical ambiguity tests. A paper-version of this chapter has been accepted by Glossa (Zhao, pear).

Chapter 3 consists of two parts: the comparison of the past tense and the present perfect, and the comparison of the temporal and nominal domains. In the first part, I will briefly summarize the major groups of analyses of the English present perfect, and compare its distribution with the past tense. I will conclude that the present perfect and the past tense follow the typical patterns of alternatives with different presuppositions like all and both, and that we should allow the present perfect to function as an indefinite past. In the second part of this chapter, I will compare the two readings of the English past tense with the two readings of the definite article. Following the recent developments in the study of DP definiteness, I explore ways of separating the uniqueness and the anaphoricity
presuppositions, and allowing definites to compete with indefinites. The same process will carry over to the present perfect and the past tense.

In Chapter 4, I will present one possible formalization of the above idea. I adopt the dynamic semantics system proposed in Chierchia (1995), and modify it slightly to accommodate the idea of separating uniqueness and anaphoricity. I follow Schwarz (2009) and the subsequent literature on the two readings of definites, and propose that the anaphoric past tense has an additional index argument, and that the anaphoric reading is achieved by dynamically binding the index by an indefinite. I also propose an analysis of the present perfect that captures its behaviour in both English-like (with the various perfect-readings) and French-like languages (as a general-purpose past perfective). In particular, whenever the reference time is a past interval, the English past tense (under both readings) is a presuppositionally stronger alternative to the present perfect, and by Maximize Presupposition, the former must be preferred.

In Chapter 5, I will discuss the various perfect-readings in detail and how my analysis accounts for these readings. I will also discuss the previous literature along the way.

Chapters 6, 7 In this part of the dissertation, I turn my attention to Mandarin Chinese. Mandarin Chinese is an interesting language to study since it is superficially tenseless, but possesses several perfective aspect particles which share some features with the English perfect. I will make two assumptions: (i) the language has a null nonfuture tense (Sun, 2014), in the sense of Matthewson (2006); (ii) the perfective -le has standard perfective semantics.

The goal of Chapter 6 is to contribute to our understanding of the semantics and pragmatics of the perfective aspect particles in the language, and of the perfect readings in general. I will propose that Mandarin Chinese possesses three distinct perfective particles: the verbal -le, -guo, and the perfective sentence-final -le. In particular, the perfective sentence-final -le has not been listed as a separate particle in the previous literature. I will discuss the previous analyses and show that we have good reasons to make this distinction.

I will also show that the three perfective particles in Mandarin Chinese differ in their presuppositions: the verbal -le requires an event antecedent; -guo presupposes that the result state of the event does not answer the topic question; the perfective sentence-final -le does not have any presuppositions. I will show how this analysis derives the distribution of these perfective particles, and how they split up the semantics space of the various perfect-like readings, comparing
them to languages like English. In particular, the resultative and the hot news reading in Chinese share the common source as their English counterparts, but the experiential reading with -guo specifically follows from its presupposition, and differs from its English counterpart.

Chapter 7 deals with the background assumptions of Mandarin Chinese tenses and aspects. In particular, some previous proposals, such as Lin (2006), among others, actually give the perfective particles not only aspect semantics but also tense semantics, and there is a lot of debate on how temporal readings in Mandarin Chinese are achieved. I will review the previous literature and conclude Sun’s (Sun (2014)) proposal is the most empirically accurate one. I will also discuss the previous literature on the ‘non-culminating’ and ‘inchoative’ readings in Mandarin Chinese, which some previous literature attribute to the semantics of the perfective, but recent studies have shown that it is possible to maintain the standard perfective semantics of the perfective particles in the language.

Chapter 8 This chapter concludes the dissertation. The main message to take away is that the various perfect readings observed across languages come from a sort of ‘neutral’ past perfective (4) and its competition with presuppositionally stronger alternatives.

(4) The neutral past perfective
   a. Can combine with a past reference time
   b. Perfective
   c. Does not have other presuppositions.

The presuppositionally stronger alternatives may be anaphoric (for times: English anaphoric past; for events: Mandarin Chinese verbal le), unique (English unique past), or having other presuppositions (Mandarin Chinese guo). The variation in the alternatives themselves, as well as the set of alternatives, derive the different tense/aspect constructions with various perfect-like readings in different languages. The only perfect reading in (2) excluded from this competition analysis will be the Universal Perfect reading, which has been shown by the previous literature to require the imperfective aspect.
Chapter 2

Extending the presuppositions of the English past

2.1 Introduction

Historically, there are two major groups of analyses for the (English) past tense, the pronominal analysis (Partee, 1973; Abusch, 1994; Heim, 1994; Kratzer, 1998; Sharvit, 2014; Chen et al., 2020, a.o), and the existential analysis (Partee, 1984; Ogihara, 1995b, 2011, a.o.). In the literature on this topic, ‘pronominal’ means that (i) the past tense is a variable of type i, receives its value from the assignment function g, and infelicitous without a salient antecedent in the context; (ii) the possible values of the past tense are presupposed to precede the speech time;i (iii) it can be bound like a pronoun. While we can find many instances of the English past tense that fit these criteria, there are also data that cannot be fully covered by this analysis. These involve the (obligatory) use of the English simple past without any salient antecedent in certain contexts, as the following sentences illustrate.

(1) (Pointing at a church:)  
Who built this church?  
Borromini built this church.

(2) Mary, my colleague, was born in New Zealand.

To explain these data, previous authors have proposed two major groups of anal-

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iThe past tense morphology may not denote a past time if embedded under a future operator, such as were in the following sentence: John decided a week ago that in ten days he would say to his mother that they were having their last meal together. These instances of embedded past are beyond the scope of this dissertation, since our focus is the use of the (matrix) past tense in the narration of past events.
yses: (i) the English past tense is lexically ambiguous between a pronominal past tense and a sort of present perfect reading; (ii) the English past tense is lexically ambiguous between a pronominal past and an existential past tense. In any case, examples such as (1)-(2) and the vast amount of data suggesting the English past is pronominal create a dilemma for a unified semantic analysis.

In this chapter, I argue that uses of the past tense which poses difficulties for a strict pronominal (i.e. anaphoric) analysis, such as in (1)-(2), can be explained if we allow the English past tense to also presuppose existence and uniqueness of the reference time. In other words, the English past tense is more similar to the definite article the than typical pronouns.

This chapter is organized as follows: In Section 2.2, I discuss data that are difficult to explain under a pure pronominal analysis of the English past, and show that the previous solutions are not sufficient. In Section 2.3, I will present evidence that these data follow from a uniqueness presupposition, and show that the distribution of these data is predictable. There are two kinds of contexts where the uniqueness presupposition can be satisfied: when the context entails a change-of-state event, and when there is an event which the speakers assume to have taken place. In Section 2.4, I will briefly discuss Sharvit’s (2014) observation about the crosslinguistic distribution of the pronominal past tense, where she argues for the pronominal analysis of the English past tense. I will summarize her points and just emphasize that allowing the English past tense to have a uniqueness presupposition is compatible with the observations made in that paper. In Section 2.5, I will argue that the two readings of the English past tense reflect a lexical ambiguity, parallel to similar patterns observed with definite DPs.

In this chapter, I will only argue that the English past tense indeed has a uniqueness presupposition. The actual definition of the unique past tense will be given in Chapter 3.

The data in this chapter are obtained from three speakers mostly: one speaker from New Zealand, one from the UK, and one Australian. The speakers are given the context provided in the examples, and two different tasks: (i) produce sentences under the intended reading and context; (ii) compare the past tense and present perfect in a given sentence. In particular, the first task is used to determine the distribution of the past tense and whether it is the most natural choice for speakers in contexts with and without a salient past reference time (e.g. we are talking about what Mary did at yesterday’s party, and the speaker is invited to describe the situation; we are looking at an open window with no contextually salient past reference time, and the speaker asks about that opening event).
It is motivated by the observation in Kratzer (1998), that a strictly anaphoric past tense should be prohibited in contexts without a salient antecedent, where the present perfect is preferred. The second task compares the past tense and the present perfect directly, and helps distinguish some subtle differences in cases where both forms are possible (see Section 2.3.2). Throughout this chapter, the examples will be given in both the past tense and the present perfect.

2.2 Challenges to the pronominal tense theory and previous solutions

Partee (1973) first noted that there are parallels between the English past tense and pronouns. She noted that a simple quantificational approach cannot capture the correct reading of the following sentence.

(3) I didn’t turn off the stove.

Regardless of the scoping choices, treating the past tense as the simple existential quantifier \( \exists \) derives the wrong readings: either \( \exists t [ \text{the speaker does not turn off the stove} (t) ] \), or \( \neg \exists t [ \text{the speaker turns off the stove} (t) ] \). Partee (1973) points out that the correct reading of the sentence seems to be a deictic one: the speaker is making an assertion about the time before (s)he left the house, that (s)he did not turn off the stove at that time.

Although Partee (1973) labels this as the ‘deictic’ use of tense, there does not seem to be a fundamental difference between the deictic use and the typical anaphoric use of pronouns with an explicit antecedent because in both cases, the antecedent is either explicitly given by an adverbial (4), or salient in the context (5). As we can see, this property distinguishes the English past from the present perfect. We will go back to this point in the later chapters.

(4) Yesterday, John played catch/has played catch with his dog in the park.

(5) (Mary and Sue are planning to go to the gym, but Sue has to cancel last minute. Mary goes alone and comes back after an hour.)

   Sue: So, how was your workout/has your workout been?

These observations motivate the analysis that the English past tense behaves like

\(^2\)An example of a pronoun being deictically is: (Pointing at a man) What is he doing?

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a pronoun. It denotes a contextually salient time interval, in a way just like pronouns denote contextually salient individuals.

2.2.1 The perfect aspect

Kratzer (1998) noted that there are instances of the English past tense that are surprising under the pronominal account. These are out-of-the-blue uses of the past tense when there is no contextually salient past time in the context (6).

(6) (Pointing at a church. There is no contextually salient past time when the following question comes up:)
Who built this church? Borromini built this church.

Like the crosslinguistic variation of the present perfect we mentioned earlier, this kind of use of the past tense also varies across languages. Kratzer (1998) noted that the German simple past tense behaves as one expects from a pronominal tense, being unacceptable in this context (7). In the absence of a contextually salient past time, the present perfect is used (8).

(7) #Wer baute diese Kirche? Borromini baute diese Kirche.
Who built this church Borromini built this church.

Who has this church build Borromini has this church built.
‘(Lit.) Who has built this church? Borromini has built this church.’

Kratzer also refutes the idea that maybe this contrast is a matter of terminology. She argues that (8) is indeed a perfect because it is the form used when no contextually salient past time is available. She also points out that the German past tense is strictly anaphoric, quoting the following contrast:

(9) a. We will answer every letter that we got.
✓ in context: Uttered without a contextually salient past time.
✓ in context: Referring to the letters we received over a salient past interval.

\footnote{Kratzer (1998) noted that ‘at best, it sounds like the hypercorrect utterance of a South German speaker’. In Southern German, the simple past is not used, ‘except with a few stative verbs (the old preteropresents).’ Southern German speakers tend to over-correct themselves when speaking standard German, hence will use the simple past where standard German speakers won’t. Since Kratzer speaks Southern German, I also consulted Northern German speakers. They report that (7) is fine, especially in writing, but when speaking it is slightly more marked than (8).}
b. Wir werden jeden Brief beantworten, den wir bekamen. We will every letter answer that we got. 'We will answer every letter that we got.'
# in context: Uttered without a contextually salient past time.
✓ in context: Referring to the letters we received over a salient past interval.

c. Wir werden jeden Brief beantworten, den wir bekommen haben. We will every letter answer that we gotten have. 'We will answer every letter that we got.'
✓ in context: Uttered without a contextually salient past time.
✓ in context: Referring to the letters we received over a salient past interval.

In (9-a), the English past tense can be used without previously mentioned or contextually salient past times. This contrasts with its German counterpart: the German simple past can only be used if there is a contextually salient past time. If this time is not available, the present perfect is obligatory.

In order to account for the English data, Kratzer proposes that the English simple past morphology can spell out not just a pronominal past tense, but also a perfect aspect with present reference time \( t_c \), as in (10). In other words, the English simple past morphology is lexically ambiguous.

\[
\begin{align*}
\text{(10) a. } & \quad \text{[Perfect]} = \lambda P. \lambda t. \lambda w. \exists e [\tau(e) < t \land P(e)(w) = 1] \\
\text{b. } & \quad \text{[Borromini built this church]} = \lambda w. \exists e [\text{B.build-church}\tau(e) < t_c]
\end{align*}
\]

After saturating \( \lambda t \) with \( t_c \), the church example will have the meaning in (10-b). Hence, the 'out-of-the-blue' uses of the past tense such as (6) are not counterexamples to the pronominal past tense analysis, because they do not actually contain a past tense in the semantic sense. The apparent 'past' reading is due to the fact that the event is located prior to the speech time.

Regarding the German data, Kratzer (1998) proposes that languages can vary in what tense-aspect combinations the past tense morphology spells out. In (standard) German, the simple past is restricted to spelling out a pronominal past tense, hence past reference times that are contextually salient, while the combination of the present reference time with the perfect aspect can only be spelled out by the present perfect construction.

One shortcoming of this analysis is pointed out by Matthewson et al. (2019), that explaining the acceptability of (6) 'via a present perfect reading of the past tense form runs into the complication that the English present perfect is itself
infelicitous in (6) (Matthewson et al., 2019, p.1). Matthewson et al. (2019) propose that (6) instead shows that the English past tense is ambiguous between a pronominal and an existentially quantified tense.

2.2.2 Domain restriction of the existential past

The idea of restricting the domain of an existentially quantified past tense has also been previously explored in the literature. The central idea is that Partee's (1973) stove sentence (11) only shows that the English past tense needs salient contextual domain restriction. Authors who adopt this view (Ogihara, 1995b, 2011, a.o.) argue that the stove sentence should have the semantics in (11-b). In particular, Ogihara adopts a quantificational analysis of the simple past, with a domain restrictor $C$ (von Fintel, 1994) restricting the domain of quantification to a contextually salient time interval, such as the time before the speaker leaves the house.\footnote{It is important to distinguish a pronominal tense and a quantificational tense with contextually salient domain restriction (Chen et al., 2020). Pronominal tenses, like pronouns, are type e/i variables that can be free or bound, and their values depends on the assignment function. A quantificational tense with domain restriction is similar to an existential quantifier with domain restriction, which roughly means \textit{there is a time such that I turn off the stove} with the existential domain restricted to a certain interval of time. We should make this distinction because in general the two meanings are not the same. For example, in the nominal domain, a sentence like \textit{She left} does not mean the same thing as \textit{There is a woman who left}.}

\begin{align*}
(11) & \quad a. \quad \text{I didn't turn off the stove.} \\
& \quad b. \quad \neg \exists t \subseteq \text{the 20 minutes before I left the house} \\
& \quad \quad \text{s.t.}[\text{I-turn-off-stove}(t)]
\end{align*}

This idea of domain restriction has been applied to those uses of the English past problematic for the pronominal analysis. A recent account along these lines is Matthewson et al. (2019). They propose that (6) is indeed an instance of the existential past tense.

They note that a simple existential analysis runs into the obvious problem that the existential reading of the simple past is not always available in contexts without a salient past time. This is illustrated in the following contrast noted by Matthewson et al. (2019).

\begin{align*}
(12) & \quad (\text{I am curious which of my friends has read } \textit{Emma} \text{ at some point in their life:)}) \\
& \quad \# \text{Who read } \textit{Emma}? \text{ Julia read } \textit{Emma}.
\end{align*}
There has been confusion about what our book club's chosen book was this month. Some of us read *Emma* and some read *Persuasion.*

Who read *Emma*? Julia read *Emma.*

In (12), there is no contextually salient past time, hence the past tense is infelicitous. This contrasts with (13), where there is a salient reference time in the context. Matthewson et al. point out that this contrast would follow if the English past were purely pronominal, but this would leave the church example (6) unexplained. This leads to the question of why domain restriction works in some cases but not others. In other words, there needs to be some kind of restriction in the existential use of the English past tense.

In order to reconcile the existential past analysis for (6) with the many other sentences where the past tense is infelicitous without salient reference times, Matthewson et al. (2019) propose that the English simple past on its existential reading must have non-vacuous domain restriction. In particular, (13) can be analysed as an existential past with the domain restricted to the times within the past month. On the other hand, (12) is infelicitous because there is no non-vacuous domain restriction.

The resulting reading is similar to Ogihara’s (2011) semantics for the existential past. Ogihara’s analysis would lead to the following semantics (14).

(14) \[ \exists t [ t \subseteq \text{the past month} \land \text{read(Julia, } \text{Emma}, t) ] \]

More specifically regarding examples like *Borromini built this church,* Matthewson et al. (2019) argue that the past tense's domain restriction can be provided by a specific event, even if the exact time of the event needs not be known. This is crucial because in the discourse in the Borromini example, the speakers need not know when exactly the church was built at all. All that is needed is the fact that ‘there was clearly at some point a particular building event of that church’.

Matthewson et al. (2019) also noted similar patterns with several other predicates, where the knowledge of a specific event licenses the use of the past tense (15)-(16).

(15) (I bought a brand new copy of *Emma* and now I see the pages are creased.
I ask:)
Who read *Emma*?

(16) Who littered?

\# in the context: I am curious about who has ever done anti-social
things in a forest.

**OK in the context:** I am walking in the forest and notice a piece of litter on the ground.

I believe that simply requiring the event to be specific seems to both over- and undergenerate this use of the past tense, since Matthewson et al. (2019) do not define the criterion for specificity. In (17), there is a specific losing event involving Mary, Sue and a chess game. However, without a contextually salient past time (e.g. the sentence is about what happened at a tournament that they both participated in), the past tense still seems infelicitous.

(17) (Uttered without any contextually salient past time:)

??Mary lost a chess game against Sue.

For states too, we cannot tell the difference between (18-a) and (18-b). The former is about a specific state of Sheldon being a child prodigy, and the latter about a specific state of Sheldon Cooper being sick.

(18) (Uttered without any contextually salient past time:)

a. Sheldon Cooper, the physicist over there, was a child prodigy.

b. #Sheldon Cooper, the physicist over there, was sick.

A remaining problem is whether a domain restricted existential past can be distinguished from a pure pronominal past. Matthewson et al.’s analysis differs from Ogihara’s analysis in that they treat the English past tense as ambiguous between an existential reading and a pronominal reading. Since we can just analyze the ‘pronominal’ past examples along the lines of (11-b) and (14), it seems that the pronominal analysis would be unnecessary without further evidence.

In fact, Matthewson et al.’s examples of the specific event seem to have in common that they involve a change-of-state predicate and a context which entails the existence of that change-of-state event (although this does not seem to be the entire picture, given the existence of sentences like (18-a)). In Section 2.3, I will argue that those instances that Matthewson et al. (2019) take to be the existential past are instances of the past tense presupposing existence and uniqueness of a past time. The specific event speakers are aware of does not provide the domain restriction for an existential past tense, but provides enough contextual information to satisfy these presuppositions. In addition, the unique past tense can indeed be distinguished from the typical pronominal past tense as well as the existential...
past tense by the projection patterns of their presuppositions.\footnote{Assuming that the temporal adverbial provides domain restriction gives rise to readings that are too weak, and results in unwanted entailments. This is known as the Bäuerle-von Stechow problem in the literature (Grønn and von Stechow, 2016), illustrated in (i).}

To summarize, Matthewson et al. (2019) see the English past as ambiguous between an existential reading with domain restrictions that follow from specific events and a pronominal reading. However, their definition of specificity is not very clear.

2.2.3 Indefinite past tense

A previous account based on the notion of definiteness is Grønn and von Stechow (2016). They propose that the past tense in English is ambiguous between a definite and an indefinite reading, with the meaning of ‘definiteness’ being one of familiarity.

In particular, the data considered problematic for a pure pronominal tense approach are taken to be the indefinite (i.e. discourse new as in Heim (1982, 1983a), among others) reading of the past tense. This is achieved by adding a covert indefinite article. On the other hand, a covert definite article is present for the typical pronominal past. The definite and indefinite articles presuppose familiarity/novelty of the discourse referent for tense, respectively.

(i)  
   a. John coughed exactly twice yesterday.
   b. John coughed exactly once yesterday.
   c. $\exists t [t < t_c \wedge t \subseteq \text{yesterday} \wedge \text{John-cough-exactly-twice}(t)]$
   d. $\exists t'[t' < t_c \wedge t' \subseteq \text{yesterday} \wedge \text{John-cough-exactly-once}(t')]$

If yesterday only provides domain restriction for a quantificational simple past, then John coughed exactly twice yesterday is true if there exists an interval $t$ within yesterday and John cough exactly twice is true of that interval $t$. However, since time is dense, we can always take a smaller interval $t'$, also contained in yesterday, for which John cough exactly once is true for $t'$, and this is sufficient for the sentence John coughed exactly once yesterday to be true under this analysis. Hence, (i-a) is predicted to entail (i-b), contradicting the meanings of exactly once and exactly twice.

On the other hand, if we take yesterday as providing an antecedent (namely, the interval ‘yesterday’) for the time variable denoted by the simple past, we can avoid this problem and derive the correct reading of the sentence (ii). However, the existential quantification of the past tense will then be vacuous in effect, and the existential past tense with domain restriction will be indistinguishable from a pure pronominal one ($\exists t'[t' = \text{yesterday}]$ means exactly the same thing as $t' = \text{yesterday}$).

(ii) $\exists t'[t' < t_c \wedge t' = \text{yesterday} \wedge \text{John-cough-exactly-once/twice}(t')]$

This problem follows from the scoping choices with exactly and existential quantifiers in general. The only solution is to make temporal adverbials not restrict the domain of quantification, but denote the entire interval, but then the existential past with domain restriction becomes indistinguishable from a pure pronominal one.
The tense architecture of Grønn and von Stechow (2016)

One problem with this analysis is that there is no restriction on the distribution of the covert definite and indefinite articles. From the discussion in Matthewson et al. (2019), we see that the ‘indefinite’ past tense is not freely available. There is clearly a difference between certain event predicates that almost always require the use of the past tense despite not having an antecedent time in the context (e.g. change of state events), and other predicates that only allows the past tense with an antecedent. While we can analyze all the past tenses with an antecedent as ‘definite’ and all the ones without an antecedent as ‘indefinite’, doing so seems too descriptive.

Another problem is, it is not clear the data problematic for the pronominal analysis should really be labeled as ‘indefinite’ and discourse new. In particular, regardless of whether the past tense is anaphoric, the reference time seems to be presupposed in some way and cannot be viewed as new information. Consider the following contrast:

(20) a. (Looking at some new books on the shelf:)
   Who bought these?
   Bill bought these.

   b. (Telling my friend my life experiences:)
   My roommate has bought/\#bought a new TV.7

(21) a. (Looking at some new books on the shelf:)
   It wasn’t Bill who bought them/Bill didn’t buy these. I did.

   b. (Telling my friend about my life experiences:)

6Grønn and von Stechow (2016) also distinguish between the temporal relation and the temporal center (T-center). In their system, the former is optional, while the latter is an obligatory temporal pronoun. I omit those because they are not relevant to the discussion here.

7The past tense sentence here may be felicitous in a context where two friends catch up after some time. In that case, while there may not be an explicit past time in the context, it seems that the reference time is assumed to be ‘the time since we last met’. In this case, it is not very different from Partee’s (1973) stove example, where the speaker utters ‘I didn’t turn off the stove’ after they come to work, and the reference time is taken to be the ‘20 minutes before they left the house’.

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In (20-a), although there is no contextually salient past time, the past tense is obligatory if we are looking at the new books, presumably this is because the existence of new books suggests that somebody must have bought them (at some point in the past). The new information cannot be the past time or event. Rather, the new information is the agent of the known event. On the other hand, in a context where the past time/event is actually novel, such as (20-b), the past tense is infelicitous, and the present perfect is obligatory.

The judgement becomes more obvious with negation. In (21-a), the speaker is denying neither the existence of the buying event nor the past interval, but only the information that the agent of the event was Bill. We can also test this with the cleft structure, which is known to distinguish the old and new information in a sentence. Here, the felicity of the cleft structure and the past tense also suggest that both the event and the past time are old information.

In general, when the cleft construction adds information to a known past event, the past tense is obligatory (e.g. It was/has been Bill who opened the door). This observation suggests that if an event is old information, the reference time is always automatically considered old information as well. Likewise, if the past tense has an indefinite reading whereby it introduces a new discourse referent, the oddness of (21-b) is unexpected, because it would just function like There isn’t a cat in the nominal domain.

All of these judgements are opposite to what Grønn and von Stechow (2016) would predict: since (20-a) involves the indefinite past tense, the past time should be discourse novel, and in (20-b), the indefinite past tense should be felicitous since we are actually dealing with a novel past reference time. In (21-a), with the indefinite reading of the past tense, they would predict the sentence should have a scope ambiguity, with one meaning being ‘there does not ever exist a time which contains an event of Bill buying books’. The same applies for (21-b) as well. They would predict that the past tense should be felicitous, as long as the negation scopes above the tense.

2.2.4 The past tense is semantically unmarked for anaphoricity

Michaelis (1994) compares the simple past and the present perfect in English, and believes that the non-anaphoric use of the simple past indeed requires an existential analysis of tense. In order to allow the English simple past to be used this way, she argues that it is unmarked for anaphoricity.
Michaelis (1994) argues that the unmarkedness of the English past tense distinguishes it from the present perfect. In particular, she notes that the present perfect seems to lack the anaphoric reading. This property manifests itself in the Present Perfect Puzzle as well as the lack of narrative progression with a contextually salient past reference time (cf. Section 1.2). She argues that the past tense and the present perfect have similar semantics but contrast in markedness, in a way parallel to the singular-plural morphology (where the singular morphology is specifically marked as singular while the plural morphology is unspecified, see Sauerland et al. (2008, a.o.)). While the past tense is unmarked for anaphoricity, the present perfect is explicitly marked for non-anaphoricity.

I believe that the markedness relationship between the past tense and the present perfect should be the other way around: the past tense should be more marked in the sense that it has stronger presuppositions. If, as in Michaelis' analysis, the present perfect is specifically marked for non-anaphoricity, then in the absence of any explicit (or implicit) antecedent, the present perfect will be the most appropriate form to use (either with the help of principles such as Maximize Presupposition (Sauerland, 2008, a.o.) or similar strategies in the morphology spell-out process). Using the past tense in this case may give rise to pragmatic inferences due to not using the present perfect. This prediction is not borne out. The actual observation is that, for those ‘existential’ uses of the past tense, the present perfect is prohibited (22).

(22) (Pointing at a church. There is no contextually salient past time when the following question comes up:)

#Who has built this church? Borromini has built this church.

As noted in the previous subsections, it has been noted that for these ‘existential’ past tense examples, the present perfect is typically infelicitous, unless the context allows for inferences such as ‘hot news’ or some kind of repeatability (Portner, 2003). Portner’s examples are illustrated in (23).

(23) a. (There is no contextually salient past time when the following question comes up:)

Gutenberg discovered/#has discovered the art of printing.

b. (There is a demon orchestrating important discoveries in human history; observing the humans, he says:)

Now that Gutenberg has discovered printing, it’s time to lead these humans to do the next thing... (Portner, 2003, adapted)
In usual contexts where the speakers know that humans have the technology of printing already, the past tense is obligatory in (23-a), similar to the Borromini church example. Portner (2003) notes that the present perfect here only becomes acceptable if it has a ‘hot news’ inference, illustrated in (23-b). Portner notes that from the perspective of the demon, the time of Gutenberg’s discovery would be quite a recent progress, generating the ‘hot news’ reading.

The repeatability inference is illustrated in (24). Given that Mary is already an adult (being the speaker’s colleague), it cannot be that the speaker is announcing the recent birth of a baby. To the extent that the sentence can be interpreted, the only interpretation seems to be that Mary has been born several times, each time at a different place, and now she is born in New Zealand, which is of course impossible.

(24) (Uttered without any contextually salient past time:)
??Mary, my colleague, has been born in New Zealand.

These observations are unexpected under Michaelis’s 1994 analysis. Since the present perfect is the most appropriate form for the non-anaphoric reading, it should be the default choice whenever there is no contextually salient past time.

Hence, I conclude that Michaelis’s (1994) analysis is not tenable: the past tense cannot be unspecified for anaphoricity (with the present perfect being specified for non-anaphoricity), since their distribution does not align with the pattern in typical semantic markedness contrasts.

2.3 Uniqueness presuppositions

As the preceding section shows, there is a group of data that challenges a pronominal (i.e. anaphoric) analysis of the English past tense, where it is used without a contextually salient past reference time. Previous analyses can be roughly grouped into three categories: (i) the English past tense is lexically ambiguous between the anaphoric reading and a ‘present perfect’ reading (Kratzer, 1998); (ii) the English past tense is lexically ambiguous between an anaphoric reading and an existential reading (Matthewson et al., 2019; Grønn and von Stechow, 2016; Michaelis, 1994). The discussion above also concludes that the previous analyses all fall short in some ways.

There are several points I would like to make. First, in the examples of the non-anaphoric past tense discussed, the past tense is not just allowed, but also
obligatory. In addition, the present perfect is infelicitous (except for certain contexts that give rise to additional inferences (23)-(24)), despite the fact that it is known to have the ‘existential’ reading (Iatridou et al., 2003, a.o.), where the event is located somewhere prior to the speech time. As Matthewson et al. (2019) point out, there is no obvious reason why the present perfect cannot be used for the intended reading in the examples. This means that we need to not only account for the use of the past tense in these examples, but also successfully rule out the present perfect for the same reading.

Secondly, as I mentioned in 2.2.3, the group of data with the non-anaphoric past tense seems to have one thing in common: the reference time, despite not having an explicit antecedent, does not seem to be new information, but rather presupposed to exist and be unique.

In addition, in the contexts where the ‘non-anaphoric’ past tense shows up, it is not only obligatory in assertions but also in embedded environments such as negation. In (25), if we want to assert that there does not exist an event of Borromini building this church, the negated present perfect sentence should simply be true. However, even in this case, the past tense is obligatory:

(25) (Pointing at a church:)
   a. #Borromini hasn’t built this church.
   b. #This church hasn’t been built by Borromini.
   c. Borromini didn’t build this church./This church wasn’t built by Borromini. It was built by Michelangelo.

It seems that the building event of this church is presupposed, and the assertion is not about its existence, but rather who the agent is. Since this is a typical presupposition projection environment, a reasonable conjecture is that apart from anaphoricity, the English past tense has an additional presupposition. In particular, I will show in this section that this is indeed an existence and uniqueness presupposition. It has similar projection patterns as unique definites, which distinguishes it from the anaphoric past tense.

In Sections 2.3.1, 2.3.2 and 2.3.3, I will show that the distribution of the non-anaphoric past tense is predictable and is limited to contexts where the reference time satisfies uniqueness. In particular, the data discussed in the previous section only constitute one subcategory of this uniqueness reading. I will show in this section that the unique reference time can be determined in several ways: (i) as the time span of the unique change-of-state event that brings about a contextually
salient state, especially when the object undergoing change is definite; (ii) the unique past time interval in which a certain event is assumed or expected to have taken place; (iii) the lifetime or time span of the topic entity.

Since time is dense, in order to uniquely identify the past interval with respect to different temporal properties, I use the idea of Maximal Informativeness from von Fintel et al. (2014).

In Section 2.3.6-2.3.7, I will discuss the presupposition projection patterns and compare the non-anaphoric past tense to the anaphoric one.

### 2.3.1 Perceivable change-of-state events

Previously, Matthewson et al. (2019) observe that the out-of-the-blue uses of the English past tense are not universally available and they seem to be restricted to certain predicates in certain contexts. For example:

(26) (Pointing at a church:)  
Who built this church?  
Borromini built this church.

(27) (Mary enters the office. She opened the window an hour ago, but now it is closed. She asks:)  
Who closed the window?

(28) (Mary is looking at a huge mess in her kitchen. She asks her roommates angrily:)  
Who did this?

(29) (Uttering the sentence knowing that we already have the technology of printing:)  
The art of printing was discovered by Gutenberg.

While Matthewson et al. (2019) take such data to reflect domain restriction with specific events, I argued earlier that this is not an accurate description. Instead, I argue that these data share the feature that the Common Ground entails a state which is brought about by a unique change-of-state event. When uttering these past tense sentences, the speakers presuppose the existence of that unique change-of-state event which leads to the current state in the context. I propose that this is equivalent to presupposing a unique past interval, which licenses the past tense in these sentences.

For the change-of-state event to be unique, the result state of that event,
which is part of the Common Ground, must be unique. It follows that the entity undergoing the change should be definite, or the speaker needs to see the result of the change of state, knowing that it wasn’t the case earlier, and can infer that a change-of-state event must have taken place. For example:

(30) a. (Looking at a car, without any contextually salient past time:) Mary bought this car.
   b. (Without any contextually salient past time or looking at any car. There is no other contextual information regarding whether Mary used to have a car.) ?Mary bought a car.

(31) a. (Bill, who is wearing a cast on his arm, runs into Sue. There is no contextually salient past time:) Sue: Oh my god! You broke your arm!
   Bill: Yeah, I crashed my bike into a tree.
   b. (Without any contextually salient past time or looking at Bill. There is no other contextual information regarding the state of Bill.) ?Bill broke his arm.
   You know what? Bill has broken his arm so he can’t come.

Compare (30-a) with (30-b). While the former is completely felicitous without a contextually salient past time, (30-b) is degraded. They differ in that in (30-a), the result of the change of state is known in the context (looking at a car and knowing someone must have bought it at some point in the past), which is not the case in (30-b). The same applies to (31-a) and (31-b). Sue can directly use the past tense for the breaking arm event in (31-a), due to the result of this event being part of the Common Ground. In (31-b), this is not the case, and the past tense becomes less acceptable. The present perfect is preferred and gets a sort of ‘hot news’ or ‘resultative’ reading.

It is possible to find contexts where (30-b) and (31-b) would be good. For example, (30-b) is fine if I’ve just heard that Mary bought a car on the phone and I get off the phone and tell my roommate who hasn’t seen Mary in a while, or if it’s exciting because Mary has never had transport before, or because we had assumed she can’t afford a car. It seems that these are cases where there is a contextually salient past time or an implicit change-of-state assumption. The former would be in a way similar to the utterance I didn’t turn off the stove after coming to the office, with the reference time being the time before the speaker leave the house.
The latter would be one in which we assume that Mary didn’t use to have a car, or that Bill didn’t have his arm broken before (which is a natural assumption).

To summarize, the reference time in these examples is the time span of the unique change-of-state event that leads up to the current state.

2.3.1.1 Determining the unique interval

I will now show how this time interval is determined. We want to say that the reference time is an interval that contains the unique change-of-state event. However, since time is dense, there can be infinitely many large intervals like this. In order to guarantee uniqueness, I adopt von Fintel et al.’s (2014) idea of maximally informativeness. While von Fintel et al. (2014) deals with objects in the nominal domain, I adopt a version of their idea in the temporal domain.

(32) Maximal informativeness
For a temporal property \( q_{\text{tst}} \), a time interval \( t \) is maximally informative w.r.t. \( q \) in \( w \) iff

a. \( q(t)(w) = 1 \), and

b. For all other \( t’ \)’s such that \( q(t’)(w) = 1 \), we have \( \{w’|q(t)(w’)=1\} \subseteq \{w’’|q(t’)(w’’)=1\} \).

i.e. \( t \) is maximally informative if \( q(t)(w) = 1 \), and the proposition \( q(t) \) entails the proposition \( q(t’) \) for any other \( t’ \).

For the data discussed above, we can say that the reference time is the unique maximally informative interval \( t \) with respect to the following property in the actual world \( w_0 \):

(33) Perceivable change-of-state event \( (cos) \)
\[
\lambda t. \lambda w. \exists e [\tau(e) \subseteq t]
\]
where \( e \) is the unique change-of-state event which gives rise to the current state.

The speakers do not need to know when exactly the change-of-state event takes place. It is sufficient that this unique interval exists and we will be able to pick out that interval with Maximal Informativeness.

In other words, the first group of contexts where the presupposition of the unique past tense can be summarized as:

(34) Unique reference time for change-of-state events
If the context satisfies:

a. There is a unique change-of-state event $e$ which gives rise to some state in the context;
b. The event under discussion is that change-of-state event;

then the reference time is the (unique) maximally informative time interval with respect to: $\exists e [ \tau(e) \subseteq t]$ in the actual world $w_0$, where $e$ is the unique change-of-state event, satisfying the uniqueness presupposition of the past tense.

### 2.3.2 Expected events and states

Although most of the data discussed in the literature on non-anaphoric past tenses involve perceivable change-of-state events, there are other instances of the non-anaphoric past tense in English. These are illustrated in (35), where the sentences are uttered without a contextually salient past time or the result of a change-of-state event, yet the past tense is still obligatory.

(35) (Uttered without contextually salient past times:)

a. (Knowing that Sheldon is an adult:)
   Sheldon was raised in Texas.
b. (Knowing that Leonard has a PhD:)
   Leonard went to Princeton.
c. (Penny is currently in her late twenties and we assume that she could have gone to university at some point in the past:)
   Penny didn’t go to college.
d. (Bill is currently in his late twenties and we assume that he could have graduated from high school at some point in the past:)
   Bill didn’t finish high school.

(Zhao, 2019, modified)

These examples suggest that we need a different mechanism to derive the reference time in these sentences. First, let us consider what the reference time may be: we know that there must have been such a time during which Sheldon was a child. In (35-b) and (35-c), the reference time is the past time in which they were supposed to or expected to be in university.\(^8\) In (35-d), the reference time is the time in

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\(^8\)Note that (35-b) is ambiguous between a 'going to Princeton for his degree' reading and a 'physically going to Princeton' reading. Under the latter reading, (35-b) is infelicitous unless there is a salient past reference time. See the discussion below.
which Bill was supposed to finish high school, expect that he did not actually finish. They all have in common that the speakers are assuming that the event under discussion is expected to have taken place at a certain past time (but may or may not actually have).

The following example further confirms that the reference time should be presupposed rather than asserted:

(36) Mary is 12. #She didn't go to university.

In (36), if the past tense here is simply existential, the sentence should be just true: there isn't a past interval in which Mary goes to university. However, native speakers judge (36) to be infelicitous (instead of simply true or redundant). I believe this is because, since Mary is only 12, under normal assumptions, our world knowledge tells us that we probably cannot find a past interval in which she was supposed to be in university.

(38) shows that if the context entails information that licenses this assumption, the past tense improves.

(37) (Mary is a twelve-year-old child prodigy. Her school usually recommends children like her to attend university classes by the end of the fourth grade.)

But Mary didn’t go.

Again, we can compare the past tense with the present perfect for this reading. The present perfect version of (36) here is fine, without the oddness of (36):

(38) Mary is 12. (Of course) she hasn't been to university.

The contrast between (36) and (38) further suggests that the present perfect here actually has the simple existential reading, without the presupposition of the past tense sentence. We will go back to the present perfect in later chapters.

For the examples in this subsection, the past reference time can be more easily accommodated than the change-of-state examples, and whether accommodation takes place also affects the felicity of the present perfect. (39) illustrates the subtle difference between the present perfect and the past version of the same sentence.

(39) (I’m introducing my friend Alex to another friend. There is no contextually salient past time:)

a. This is Alex. She didn’t go to university.
b. This is Alex. She hasn’t been to university.

(39-a) sounds a bit more condescending, because the speaker has an assumption that there is a past time in which Alex could/should have gone to university, but she did not for some reason. The listener, who does not know anything about Alex, has to accommodate this information. (39-b) does not have this assumption. This judgment is further confirmed by the following example, where the past tense is felicitous without a contextually salient past time, but the present perfect is also possible.

(40) (Bill, who is 25, comes from a family that greatly values education. All his siblings have a degree.)

a. Unlike his siblings, Bill didn’t go to university.

b. Unlike his siblings, Bill hasn’t been to university.

In (40), since Bill is already 25 years old, given what we know about his family, he was probably expected to enroll in college when he was about 18. The sentence then asserts that he did not actually go during that time. The present perfect sentence, on the other hand, does not make an assertion about that past interval, and simply asserts that Bill hasn’t been to university (yet).

We can further test this analysis by constructing some new examples, shown below.

(41) (It is required by law that every child receives the polio vaccine before the age of 7. There is no contextually salient past time when the following is uttered:)

---

9A reviewer for the paper version of this chapter points out that the following discourse is judged odd:

(i) (Penny is currently 50. She started working right after high school. But she went back to school when she was 45, and now she has a degree from Yale.)

??Penny didn’t go to university. But then she got a degree from Yale.

The reviewer believes that the oddness suggests an existential analysis of the past tense. However, I believe that (35-d)-(36) strongly suggest that we are indeed dealing with a presupposition here. While I do not have a satisfactory explanation for the oddness of (i), I suspect that it has to do with the context update and the liberal choices of the possible expectations: after the utterance of the first sentence, with the assumption that there is a unique interval in which Penny was meant to go to university, then the common ground would be updated to one in which she missed her only chance, and the second sentence would be a contradiction; alternatively, if Penny did not go back to school until she was 45, then probably the (unique) best time for her to go to university would be taken to be around that time (e.g. when she is financially stable and has free time), and then it would contradict the assumptions made earlier in the first sentence, that the best time for her to study was when she was younger.
Mary (walking with her friend, passing a hospital): I was/#have been vaccinated for polio at this Hospital.

(42) (Assuming that we have all received the covid vaccine. All people are expected to have taken two shots already, but not necessarily the third shot yet:)

a. I got/#have gotten Pfizer for my first two shots.
b. I didn't get the third shot./I haven't gotten the third shot yet.

As expected, in (41) and (42-a), the past tense can be used without any contextually salient antecedent time. In (42-b), using the past tense involves the accommodation of the speaker’s assumption that there is a time during which she could have gotten the third shot, but did not actually get it. The present perfect version of the same sentence does not have this inference.

To summarize the discussion so far, the reference time also satisfies uniqueness in the following case: let P be the main event predicate denoted by the VP, in these examples, the Common Ground entails that a P-event is expected or assumed to have taken place during a unique past interval (but may not have taken place in the actual world), and the reference time is that past interval.

2.3.2.1 Uniqueness and boundedness

Since it is not necessary that a P-event actually takes place in the actual world \( w_0 \) (e.g. *Bill did not actually finish high school although there was a time interval in which he should have*), we will need to use ordering sources which enables us to rank how well a world complies with the rules, illustrated below.

(43) Ordering source and the set of best worlds

a. The ordering source is a function that assigns to any evaluation world \( w \) a set of propositions \( S \), namely the rules/laws/the stereotypical expectations, etc. in \( w \).
b. For a set of worlds \( W \) and any pair of worlds \( w_1, w_2 \) from \( W \), we say that \( w_1 \) is ‘better’ than \( w_2 \) iff \( w_1 \) makes more propositions from \( S \) true than \( w_2 \) does. This defines a partial order \( <_S \) on \( W \):
\[
\forall w_1, w_2 \in W, w_1 <_S w_2 \iff \{ p \in S \mid p(w_2) = 1 \} \subseteq \{ p \in S \mid p(w_1) = 1 \}.
\]
c. For any set of worlds \( W \), the set of the ‘best worlds’ according to the set of rules \( S \) is
\[
\text{MAX}_S(W) = \{ w \in W \mid \neg \exists w' \in W[w' <_S w] \}.
\]

Note that even if the evaluation world is the actual world \( w_0 \) and the set of rules
are the rules in $w_0$, $w_0$ itself may not actually be in the set of the best worlds according to this criterion. For the purpose of our proposal, the set of rules are inferred from our world knowledge, social convention, as well as information available in the Common Ground: if the speaker believes that a $P$-event should have taken place during some past time, according to the information available in the Common Ground, then we can say that any world in which a $P$-event has indeed taken place at that time is better than the worlds in which this is not true. For example, in (35-c), any world in which Penny actually went to university during her late teens/early twenties is better than one in which she did not.

We can now say that the reference time is the unique Maximally Informative interval with respect to the following temporal property.

\[ \text{(44) Temporal property to determine the unique reference time for an expected P-event/state (} \text{exp} \text{)} \]
\[ \lambda t. \lambda w. \forall w' \in \text{max}_S(V), \exists e/s[P(e/s) \land \tau(e/s) \subseteq t] \text{ in } w' \text{ and } t \text{ is connected,} \]
where:

a. $S$ is the set of propositions that satisfy the stereotypical expectations and other Common Ground information in $w$; and
b. $V$ is the Context Set in the sense of Stalnaker (2002);
c. an interval $t$ is connected iff for any two points $a, b$ in $t$, we can find a connected path between $a$ and $b$.

The unique maximally informative interval with respect to this temporal property will be the unique minimal time interval that would envelop all the possible $\tau(e/s)$’s in those worlds in which $e$ or $s$ did happen in the past according to the speaker’s stereotypical expectations and other Common Ground information.

For example, if Penny was expected to attend university at any point between her late teens to her early twenties (according to our world knowledge about what most people do), this interval will be that entire interval. Penny may not have actually gone to university during that time in the actual world $w_0$, but in the best worlds (where she actually did), that event would have fallen into that interval. Hence, we can use the past tense in a sentence like *Penny did not go to college* since the reference time would be unique.

Let us illustrate it with an example.

\[ \text{(45) Let } w \text{ be a world in the Context Set.} \]
\[ \text{a. Suppose the best possible worlds according to the speakers’ expecta-} \]
tions about Penny’s education in \( w \) are:

\( w_1 \): Penny goes to university from 2015-2019

\( w_2 \): Penny goes to university from 2010-2014

\( w_3 \): Penny goes to university from 2017-2021

(We actually don’t know if she actually went to university in \( w \) or when exactly the time was, but we know that she had a chance and it would be sensible for her to go.)

b. \( \text{exp} \)

\[
\lambda t. \lambda w. \forall w' \in \text{MAX}_S(V), \exists e[P(e) \land \tau(e) \subseteq t] \text{ in } w' \text{ and } t \text{ is connected}
\]

The unique maximally informative \( t \) with respect to \( \text{exp} \) in \( w \), will be the interval 2010-2021.

In the analysis above, it is important that the \( P \)-event or state is bounded (i.e. \( \tau(e/s) \subseteq t \)). To see this, consider the temporal property if the event or state is unbounded:

(46) \textbf{Unbounded version of } \text{exp}

\[
\lambda t. \lambda w. \forall w' \in \text{MAX}_S(V), \exists s[P(s) \land t \subseteq \tau(s)] \text{ in } w' \text{ and } t \text{ is connected}
\]

In this case we would not be able to find a unique maximally informative time interval with respect to this property. For instance, suppose we do not know if the state of Sheldon being a boy has ended or not, and suppose in some world in the Context Set \( w_1 \), he was born in 1980, in \( w_2 \) he was born in 2010 (so that his boyhood hasn’t ended by the speech time). Both worlds comply with the world knowledge in the actual world \( w_0 \) that Sheldon would be a child before he turns 18, and hence both are in \( \text{MAX}_S(V) \). It turns out that we cannot find any time interval which is maximally informative with respect to \( q \) in \( w_0 \). This is because the \( \tau(s) \)'s of Sheldon's boyhood would be disjoint in \( w_1 \) and \( w_2 \), and there cannot be a connected \( t \) which satisfies \( \forall w' \in \text{MAX}_S(V) \exists s[\text{Sheldon-boy}(s) \land t \subseteq \tau(s)] \).

I believe this is a good prediction because in all of the examples with expected event/states, the event or state is assumed to have taken place and completed/terminated.

We can summarize the second case of uniqueness as:

(47) \textbf{Unique reference time for events assumed to have taken place}

If the context satisfies:

a. There is a set of stereotypical expectations and Common Ground information, according to which some event or state should have taken
place and completed/terminated in the past;
b. The event/state under discussion is such an event/state;
then the reference time is the (unique) maximally informative time interval with respect to (33) above.

2.3.3 Past lifetime as reference time

The third scenario where the past tense is obligatorily used even without an antecedent is illustrated by the following example:

(48) (Talking about Einstein today without any contextually salient past time:)
Einstein visited Princeton.
(Chomsky, 1971, p212-13)

The past tense in (48) is obligatory despite the lack of a contextually salient antecedent. Interestingly, the present perfect is prohibited in the same context.

(49) (Talking about Einstein today without any contextually salient past time:)
#Einstein has visited Princeton.
(Chomsky, 1971, p212-13)

These observations pose the same kind of problems as the examples we saw with Who built/#has built this church? There is no obvious reason why the present perfect in (49) cannot get the simple existential reading, and why the past tense is felicitous if it is strictly anaphoric.

This observation is related to the general observation known as the lifetime effect. In particular, in the absence of a contextually salient past time, using the past tense to describe an individual (especially with an individual-level predicate) has an inference that the individual no longer exists (50-a). However, this inference is not generally available when there is an antecedent for the reference time. In (50-b), the listener does not infer that Mary is dead.

(50) a. (Uttered without any contextually salient past time:)
Mary was very beautiful.
Inference: Mary is dead.
b. (Talking about the party from last weekend:)
Mary was very beautiful.

One possible analysis would be to attribute this observation to the competition
of the past tense with the present tense: that (50-a) only has the inference that Mary is dead because we could have used the present tense in (51) to describe a living person (Sauerland, 2002; Magri, 2011, a.o.).

(51) (Uttered without any contextually salient past time:)

Mary is very beautiful.

However, this analysis is insufficient, because it only solves part of the puzzle, which is where the ‘Mary is dead’ inference comes from. The puzzle actually has another part, that is, why would the past tense even be considered an alternative here? Assuming that the past tense is strictly anaphoric, whether the speaker fails to use the present tense in this context should not change the fact that there is no antecedent for the reference time. We would expect (50-a) to be out regardless, simply due to the fact that the anaphoric past cannot be licensed.

In addition, this analysis does not explain the infelicity of the present perfect either. For example, suppose that we cannot use the present tense to describe a dead person such as Einstein, there is no obvious reason why (52) should be bad under the existential reading of the present perfect. There is clearly a state of Einstein being a physicist located in some time span up till now. We will also need to derive the infelicity of the present perfect. In addition, as Matthewson et al. (2019) point out, simply allowing the English past tense to spell out a perfect aspect as in Kratzer (1998) will not be helpful.

(52) (Talking about Einstein today:)

#Einstein has been a physicist.

I would like to argue that examples like (48) involve the unique past tense, with the reference time automatically taken to be the lifetime of the person or entity under discussion. In this case, uniqueness is always satisfied since for each individual, we can find the unique time interval identified as its lifetime. The only additional requirement is that the past tense also presupposes pastness. Therefore, using the past tense this way is possible only if the lifetime or time span of that entity is a past interval, i.e. the entity does not exist anymore.

It has been noted in the literature that the topic actually affects the felicity of the tenses. Compare the following sets of sentences.

(53) (Talking about Einstein. There is no contextually salient past time.)

a. Einstein visited Princeton.
b. #Einstein has visited Princeton.

(54) (Talking about Princeton. There is no contextually salient past time.)
   a. #Princeton was visited by Einstein.
   b. Princeton has been visited by Einstein.

In both examples, there is no contextually salient past time that would license the anaphoric use of the past tense. However, in (53), given the common knowledge that Einstein is no longer alive, the past tense is chosen over the present perfect. In (54) where the topic is Princeton (which still exists), we observe the opposite pattern. There are various proposals in the literature on the present perfect that try to derive this pattern, such as Inoue (1979), Michaelis (1994), Katz (2003), Portner (2003, 2011). These two examples are particularly difficult to explain, due to the fact that the events described are exactly the same (Einstein visiting Princeton).

We will see in later chapters that analyzing the past tense as having a uniqueness presupposition also successfully derives the infelicity of the present perfect in these examples, since the unique past tense would still be presuppositionally stronger than the present perfect and should be preferred.

I argue that the past tense is obligatory in all the examples above because the uniqueness presupposition is satisfied. The reference time is taken to be the lifetime or the time span of the person/entity under discussion, which is a unique interval.

In this case, the relevant temporal property for (53)-(54) is:

(55) Temporal property to determine the unique lifetime (life)

\[ \lambda t. \lambda w. \exists s [\text{Einstein-alive}(s) \land t \subseteq \tau(s)] \]

The unique maximally informative interval \( t \) is then the largest possible interval such that Einstein is alive throughout \( t \) (i.e., \( t \subseteq \tau(s) \)), namely, the entire span of Einstein’s life \( \tau(s) \).

Since the past tense should also presuppose pastness, it follows that we can find such an interval only if Einstein is no longer alive. We can summarize the third case of unique reference time as:

(56) Unique reference time as lifetime

If the context satisfies:

a. The person or entity under discussion no longer exists;
then the reference time when talking about that person/entity is the (unique) maximally informative time interval with respect to (55) above.

2.3.4 Regarding identification and other data points

There is a group of data worth mentioning. It has been noted by Heny (1982) and Partee (1984) that the speakers do not need to identify the past reference time to utter the following sentences.

(57) How did Cicero die?
He was executed by Marcus Antonius.

(58) Shakespeare said ‘In many’s looks the false heart’s history is writ.’

Partee (1984, p296) comments that ‘[the hearer does] not have to know when it happened to know who did it, given that it could only have happened once if it happened at all. In [this] case, the reference time could potentially be the whole of the past.’ These examples are later used by Michaelis (1994) as evidence that the English past tense is unmarked for anaphoricity. She comments that ‘when a sentence has a reference time equated with the whole of the past, the sentence in essence lacks a reference time.’

Under my analysis, both (57) and (58) would be instances of the uniqueness reading. Both the reference times are unique (the lifetime of Cicero or Shakespeare), and the asserted events are located in that time.

There seems to be an implicit assumption in these previous accounts that if the reference time cannot be identified, then it is not an anaphoric reading. However, it seems that identification is not necessary in general, even for the anaphoric reading. The classic stove example in Partee (1973) is felicitous in contexts like the following:

(59) (At the office, Bill suddenly tells his friend:)
I didn’t turn off the stove!

The sentence is naturally interpreted as about the ‘20 minutes before Bill left the house this morning’. The speakers do not need to first have that interval in mind (or as a topic), since this interval should be easily accommodated given the speakers’ world knowledge. The speakers also do not need to know when exactly Bill left the house.

Similarly, a sentence like (60) sounds perfectly natural, despite the absence of
an explicit past time.

(60)  (Two friends meet up after a long time.)
     How are you?
     I bought a new car!

The reference time of the past tense sentence is naturally interpreted as about ‘the past interval since we last saw each other’. Again, the speakers do not need to identify the exact date they last met. This example does not seem so different from the stove example above in this sense. In the stove example, there are (infinitely) many intervals in the past during which the speaker did not turn off the stove. In (60), likewise, the speaker could have bought a car many times before they last met, but the assertion is really only about ‘the past interval since the friends last saw each other’. A simple existential analysis without appropriate domain restriction will not be able to capture this reading. I take examples like this to reflect the anaphoric reading of the past tense just like the stove example, and it also illustrates a typical way of accommodating the antecedent time: when the speakers catch up with each other after a certain period of absence, they will be able to use that interval as the reference time.

2.3.4.1  Already and the past tense

There is one group of data that cannot be subsumed under the uniqueness analysis, however. It involves the use of already, and has been noted to be more prevalent in American English.

(61)  (There is no contextually salient past time:)
     a. I already told you, I’m not interested!
        (Michaelis, 1994)
     b. Can you clean the kitchen?
        I already did. (...and I mowed the lawn too.)

The use of the past tense in these examples seems indistinguishable from the resultative use of the present perfect. Unlike the earlier examples such as (59) and (60), in (61-b), it is difficult to come up with an appropriate past interval that would serve as the antecedent for the past tense. The reference time does not seem to satisfy any kind of uniqueness either.

Since these examples with already is limited to American dialects of English, I take these data as reflecting a dialectal variation or possibly a change in progress,
where the past tense would have both the unique and anaphoric readings observed in the earlier sections, as well as this use with *already*.

### 2.3.5 Comparison with von Fintel et al. (2014)

The use of Maximal Informativeness to derive uniqueness and the relevant smallest and largest intervals is similar to the proposal of von Fintel et al. (2014) for entities. They give the following definition of the definite article:

\[(62)\]

(a) $[the \, \phi]$ is defined in $w$ iff there is a unique maximal object $x$, based on the ordering $\geq_\phi$, such that $\phi(w)(x)$ is true.

When defined, the reference of *the* $\phi$ is this maximal element.

(b) For all $x, y$ of type $\alpha$ and property $\phi$ of type $\langle s, (\alpha, t) \rangle$, $x \geq_\phi y$ iff $\{w|\phi(w)(x)\} \subseteq \{w'|\phi(w')(y)\}$.

(von Fintel et al., 2014)

If $\phi$ is an upward monotone property, the maximally informative object will be the ‘biggest’ possible object. An example is (63).

\[(63)\]

(a) the height of this tree

(b) $\phi = \lambda w. \lambda d.\text{this tree is } d\text{-tall in } w$

(63-a) refers to the maximally informative measure with respect to $\phi$, namely, the biggest possible measure $d$ such that this tree is $d$-tall in $w$.

On the other hand, if $\phi$ is a downward monotone property, the maximally informative object will be the ‘smallest’ possible object. This is the case in (64).

\[(64)\]

(a) the number of people sufficient to lift this piano

(b) $\phi = \lambda w. \lambda n.\text{it is sufficient for } n\text{ people to lift this piano in } w$

We can see that (64-a) refers to the smallest possible number of people who can lift the piano in $w$.

This result is similar to our analysis in the previous subsections. In Section 2.3.1 and 2.3.2, the unique past tense denotes the smallest possible interval $t$ with respect to the relevant properties, and in Section 2.3.3, it is the largest possible interval $t$.
2.3.6 Presupposition projection tests

The previous three subsections illustrate three groups of contexts where the reference time satisfies some sort of uniqueness criterion, which then requires the use of the unique past tense over the purely existential present perfect. In this subsection, I will show that the uniqueness inference is indeed a presupposition by applying projection tests.

Some of the typical presuppositions projection environments include negation and yes-no questions. For if-clauses in English, the past tense morphology is interpreted as subjunctive. For this reason, I omitted the test for projection out of the antecedent of if-clauses.

The uniqueness inference indeed projects out of both of these environments in all three cases of uniqueness.

(65) Perceivable change-of-state events
(There is no contextually salient past time. The speakers are looking at a church:)

a. This church wasn't built by Borromini./It is not the case that this church was built by Borromini.
   Inference: There is a unique maximally informative past interval that contains the building event of this church.

b. Was this church built by Borromini?
   Inference: There is a unique maximally informative past interval that contains the building event of this church.

(66) Expected events or states
(There is no contextually salient past time. We know that people in general should finish high school around their late teenage years. We also know that Bill is in his 20s:)

a. Bill didn’t finish high school.
   Inference: There is a unique maximally informative past interval in which Bill was expected/supposed to finish high school.

b. Did Bill finish high school?
   Inference: There is a unique maximally informative past interval in which Bill was expected/supposed to finish high school.

(67) Lifetime as reference time
(There is no contextually salient past time, but we know that Einstein is
no longer alive. Talking about Einstein’s achievements:)

a. Einstein did not win the Nobel Prize for his theory of relativity.
   **Inference:** There is a unique maximally informative past interval during which Einstein was alive.

b. Did Einstein win the Nobel Prize for his theory of relativity?
   **Inference:** There is a unique maximally informative past interval during which Einstein was alive.

I conclude that the existence and uniqueness inference is indeed a presupposition.

2.3.7 Comparison with the anaphoric past

Having established that the English past tense has a uniqueness presupposition, I will now discuss one feature that distinguishes it from the typical anaphoric past that has not been previously noted in the literature. This concerns the presupposition projection pattern in quantified sentences.

In particular, in a sentence of the form *every* $A B$, with $B$ containing an anaphoric pronoun, the sentence overall still presupposes the antecedent of the pronoun (68), unless the antecedent is introduced in $A$ (the donkey anaphora reading of (69)).

(68) Every student likes it₁.
   **Presupposition:** There is some contextually salient (or previously mentioned) individual serving as the antecedent of *it*.

(69) Every student who has a₁ cat likes it₁.
   **Presupposition:** none.

The same applies to an anaphoric definite. For example, the German strong article (as opposed to the weak article) has been shown to be strictly anaphoric (Schwarz, 2009), and we can see that it follows the same pattern as anaphoric pronouns. In particular, in (70), the situations quantified over can be presumed to be one in which uniqueness does not hold. The uniqueness-only weak article is ruled out, yet the strong article is fine due to the presence of an indefinite antecedent in the restrictor. The sentence overall does not presuppose a contextually salient antecedent for the anaphoric strong article.

(70) In jeder Bibliothek, die ein Buch über Topinambur hat, sehe ich in every library that a book about topinambur has look I
In every library that has a book about topinambur, I check in the book whether one can grill topinambur.’

(\textit{Schwarz}, 2009, p.242)

On the other hand, if $B$ contains a unique definite, the presupposition projection pattern will depend on how the uniqueness is evaluated. If the uniqueness is evaluated in some situation involving $A$, then every $A B$ overall presupposes that in every such situation for each $A$, there is a unique $B$.\footnote{\textit{Usually, this is a situation exemplifying $A$, see Schwarz (2009); Kratzer (2004, a.o.).}} Hence, the unique definite in $B$ has a covarying reading with respect to $A$.

(71) In every car, the steering wheel is on the left.

\textit{the steering wheel} is a unique definite, evaluated in each car.

\textbf{Presupposition:} every car has a unique steering wheel.

If the unique definite is a larger situation definite, whose uniqueness is evaluated globally (i.e. not relative to each $A$), then the sentence does not have a covarying reading regarding the unique definite.

(72) In this company, everyone hates the boss.

\textit{the boss} is a larger situation definite, its uniqueness is not relative to each person, but evaluated with respect to the entire company.

\textbf{Presupposition:} This company has a unique boss.

Before we proceed, I will first address a theoretical issue: can this contrast justify the separation of the two definite readings?

Under a familiarity-based analysis of definiteness, such as \textit{Heim} (1982, 1983a), the contrast between the non-covarying and the covarying readings has been attributed to global vs. local accommodation of the antecedent for the anaphoric-only definite. However, I argue that this contrast reflects an actual difference between the anaphoric and the unique readings, for the following reasons:

(i) For a sentence of the form $\textit{Every} A B$, the observation with pronouns is that without an explicitly introduced antecedent in $A$, the pronoun $\textit{it}$ in $B$ cannot possibly have the covarying reading, even if the description of $A$ strongly suggests an antecedent that should be easily inferred (73);
(73) Everyone who’s married loves him/her.

(ii) the sentence (69) under the covarying reading does not have a presupposition any more, while (71) with the unique definite still has a presupposition that each A must satisfy the uniqueness presupposition. If the covarying reading is simply a result of locally accommodating the antecedent, this difference is unexpected;

(iii) The antecedent-anaphor relationship between an indefinite and an anaphoric element seems to be special, and cannot be simply captured by uniqueness-only accounts with domain restriction. and it is related to the problem of the formal link in the literature (Heim, 1990, a.o.), which I will discuss in the next chapter. In the next chapter, we will also see that the recent literature on definiteness suggests that there are languages that separate the anaphoric and unique definites and use different morphology for them. It turns out that the anaphoric and unique definites in those languages display exactly the non-covarying and the covarying readings listed above.

For the purpose of this chapter, the crucial observation is that under the non-anaphoric reading of the past tense, the presupposition projection patterns with the covarying reading of unique definites in (71), which would be unexpected if the past tense is strictly anaphoric.

In particular, the past tense in the following sentences can be uttered without a previously mentioned antecedent, illustrated in the (a) sentences below, for both perceivable change-of-state events (74-a), expected events (75-a), and lifetime as reference time (76-a). The (b) sentences show that when we put the past tense under every, it gets a covarying reading: in (74-b), each church may have been built at different times in the past, but for each church this time is unique and is in the past, and we see that the reference of was covaries with each church.

(74) (Looking at churches in a town. There is no contextually salient past time.)

a. This church was built by an Italian.
b. Every church in this town was built by an Italian.

Presupposition: For each church, we can find a unique building event (and hence past interval) associated with it. (Satisfied.)

Similarly, in (75-b), the context is such that we can assume each person at the gathering has a past time when they graduated from an American university, although this time is probably different for each of them.
(75) (At a gathering of alumni from several American universities. There is no contextually salient past time.)

a. This woman here graduated from an American university.
b. Every person here graduated from an American university.

Presupposition: For each person, we can find a unique past interval in which the expected graduation event is located. (Satisfied.)

In (76-b), we have a group of (dead) people from different eras. Without a contextually salient past time, we can still easily get the covarying reading for the past tense: each of these people made important scientific discoveries during their lifetime.

(76) (Talking about dead famous people from different eras–Marie Curie (20th century), Michael Faraday (19th century), Antoine-Laurent de Lavoisier (18th century); Archimedes (ancient Greece). There is no contextually salient past time.)

a. Marie Curie made several important scientific discoveries.
b. Each of these people made important scientific discoveries.

Presupposition: For each person, we can find a unique interval identified as his/her lifetime. (Satisfied.)

Like (71) in the nominal domain, the (b) sentences all have an overall presupposition that each of the A’s has a unique past interval associated with it that serves as the reference time. In other words, the past tense in these sentences does not refer to a single past interval, in which all of the relevant events took place, but rather, the past interval is different for each of the individuals quantified over and it can be uniquely determined for each of them.

To compare, under the strictly anaphoric interpretation of the past tense, we will not be be able to get the covarying reading. This is illustrated in (77). (77) on its non-habitual interpretation, strongly suggests a non-covarying, anaphoric reading that every boy danced during the same salient past interval (e.g. at the party last Friday).11 This patterns with the observation in (68) with pronouns.

(77) Every boy danced with Mary.

Presupposition: The utterance is about a contextually salient past in-

11Of course, if the context contains enough information for the speaker to assume that each boy was expected to have danced with someone, then (77) can also get the covarying reading, with the past tense licensed by uniqueness.
terval which serves as the antecedent of the past tense.

Before we go into a detailed discussion of the present perfect in the next few chapters, I would like to point to one observation. The present perfect seems to be able to provide an antecedent for the anaphoric past (78).

(78) (There is no contextually salient past time:)
Mary has been to this mall. She found a nice sweatshirt there.

The second sentence in (78) with the past tense is interpreted as anaphoric to the time of Mary’s visit to the mall. This general pattern leads to another similarity with anaphoric pronouns: we may introduce an antecedent in the restrictor of every with the present perfect, and the antecedent presupposition will not project, just like what we observed earlier with pronouns.

(79) a. Every girl who has been to this club danced.
   Presupposition: None.
   b. Every boy who has visited Paris also went to Marseilles on the same trip to France.
   Presupposition: None.

I conclude that the English past tense indeed has both an anaphoric presupposition and a uniqueness presupposition.

2.3.8 Comparison with previous accounts

We can examine the previous accounts reviewed in Section 2.2 and see if they can account for the observations in the previous subsection. In particular:

The past tense as present perfect analysis (Heim and Kratzer, 1998) does give us the covarying readings in quantified sentences. Recall that Kratzer’s perfect aspect has the semantics in (80-a), and she argues that the non-anaphoric reading of the past tense is actually a present tense with the perfect aspect. Plugging in the present tense and the meaning of every, we get (80-b): for every church, its building event is located at some point in the past, and presumably these events need not overlap in time.

(80) a. $[\text{PERFECT}] = \lambda P. \lambda t. \lambda w. \exists e[\tau(e) \prec t \land P(e)(w) = 1]$
   b. Every church was built by an Italian.
   $\lambda w. \{ x \mid \text{church}(x) \} \subseteq \{ x \mid \exists e[\tau(e) \prec t_c \land \text{built-by-an-Italian}(e)(w)]\}$
However, this analysis cannot control the distribution of the anaphoric and non-anaphoric readings of the past tense. In other words, if the English simple past is lexically ambiguous between a present perfect reading and an anaphoric past reading, it is not clear why the former reading is not generally available and is restricted to certain contexts and events. Adopting the known constraints of the present perfect does not help here, since the non-anaphoric past shows up exactly in cases where the present perfect is prohibited. This leads to more puzzles: why does the same reading (present tense plus perfect aspect) must be spelled out with different morphology (simple past and the present perfect), and what controls the morphology spell-out?

The domain restriction analysis (Matthewson et al., 2019; Ogihara, 1995b, 2011, a.o.) may derive the covarying reading if it allows the domain restrictor C to covary under every. For example, we can let C to have the structure $f(x)$, where the $x$ is bound by the quantifier, and $f$ is maps individuals to the appropriate time intervals in which the existential past tense is evaluated. For example:

(81)

\[
S \quad \exists t[\exists e[x\text{-being-built}(e) \land \tau(e) \subseteq t \land t \subseteq f(x)]
\]

\[
\text{Every church}_x \quad f(x) \quad \exists t[\exists e[x\text{-being-built}(e) \land \tau(e) \subseteq t]]
\]

\[
x \text{ built by an Italian}
\]

This analysis seems to miss the inference about uniqueness. The judgement is that this covarying reading isn’t available unless for each individual quantified over, there is a way of finding an appropriate past interval that is unique in some ways (the unique building time of a building, the unique time when a person was born, etc.), which is the reason why certain verb predicates always allow this reading and others in general do not (unless the context is rich enough to support this inference, see the discussion of (77)). If we can freely insert the domain restrictor in the structure, the analysis won’t be restrictive enough.

Analyzing the non-anaphoric past as existential also faces the general issue that it does not actually fit the criteria for the existential past. Chen et al. (2020) provide several diagnostics for pronominal vs. existential past tenses. ‘The pronominal analysis of past tenses predicts that they are scopeless, allow deictic,
anaphoric, and bound uses, and are infelicitous without a contextual reference time. The existentially quantified analysis predicts the opposite: they have scope interactions, no deictic, anaphoric or bound uses, and are felicitous in out-of-the-blue contexts’ (Chen et al., 2020, Section 4). Applying these tests to the non-anaphoric English past tense, we can see that it does not fit the criteria for the existential tense, in that it does have the bound use (e.g. compare (71) and (74-b)) and it is also scopeless, like the pronominal past. For example:

(83) This church wasn’t built by an Italian.

where the interpretation of the tense is independent of the negation, just like in I didn’t turn off the stove in Partee (1973). I take this to be a piece of evidence that both uniqueness and anaphoricity are presuppositions, see the previous subsection.

Inserting definite and indefinite articles above the tense node (Grønn and von Stechow, 2016) is not restrictive enough to derive the distribution of the two kinds of readings. Like the domain restriction analysis, analyzing the unique past tense as indefinite misses the presupposition it carries.

The analysis that the past tense being unspecified for anaphoricity cannot derive the covarying reading, at least not in version proposed in Michaelis (1994). Michaelis (1994) treats anaphoricity as a feature, and the non-anaphoric reading of the past tense is analyzed as [-anaphoric]. This may be compatible with a number of analyses, including the existential analysis and the indefinite article analysis.

2.4 A remark on Sharvit (2014)

Sharvit (2014) points out that the licensing of past tense in before-clauses can be used as a test for whether a language has a pronominal tense or a quantificational tense. She further shows that the English past tense must be pronominal, since otherwise it will lead to presuppositional failures in before-clauses.\(^{12}\)

In this subsection, I will briefly summarize her observation, and show that my analysis does not violate the constraints observed in Sharvit (2014).

2.4.1 Embedded tenses under attitude verbs and before

Briefly, English allows past-under-past in before-clauses (84-a), while present-under-past is ungrammatical (84-b).

\(^{12}\)The reader can also refer to Aonuki (2021) for a more recent discussion, where she argues that it is possible to maintain a pronominal tense analysis for Japanese.
a. John left the meeting before Mary arrived.

b. *John left the meeting before Mary arrives.

In Japanese, past-under-past in before-clauses is ungrammatical (85-a) and only present-under-past is allowed (85-b).

(85) a. *Taroo wa [Hanako-ni at-ta mae-ni] denwa-o si-ta
Taro TOP Hanako-DAT meet-PAST before phone-ACC do-PAST
‘(Intended:) Taro phoned before meeting Hanako.’

   ‘(Lit: Taro phoned before he met Hanako.)’

b. Taroo wa [Hanako-ni au mae-ni] denwa-o si-ta
Taro TOP Hanako-DAT meet-PRES before phone-ACC do-PAST
‘Taro phoned before meeting Hanako.’

   ‘(Lit:) Taro phoned before he meets Hanako.’

Polish before-clauses pattern with English: past-under-past is allowed (86-a) and present-under-past is ungrammatical (86-b).

(86) a. Ania przy-sz-ła na przyjęcie [zanim Marcin przy-szedł]
Ania PRF-come-PAST to party before Marcin PRF-come-PAST
‘(Lit:) Ania came to the party before Marcin came.’

b. *Ania przy-sz-ła na przyjęcie [zanim Marcin przy-chodzi]
Ania PRF-come-PAST to party before Marcin PRF-come-PRES
‘(Lit:) Ania came to the party before Marcin comes.’

   (Sharvit, 2014)

Since both Polish and Japanese are classified as non-sequence-of-tense (SOT from now on) languages (87)-(88) and English is an SOT language (89), the patterns in before-clauses cannot be account for with the SOT parameter.

(87) a. Ania powiedziała że Marcin jest chory.
Ania say-PRF-PAST that Marcin be-PRES sick
Ania: Marcin is sick.

b. Ania powiedziała że Marcin był chory.
Ania say-PRF-PAST that Marcin be-PAST sick
Ania: Marcin was sick.

(88) a. Taroo-wa [Hanako-ga byooki-da] to it-ta
Taro-TOP Hanako-NOM be-sick-PRES that say-PAST
Taro: Hanako is sick.

b. Taroo-wa [Hanako-ga byooki-datta] to it-ta
Taro-TOP Hanako-NOM be-sick-PAST that say-PAST
Taro: Hanako was sick.
Sharvit (2014) argues that the pattern in *before-clauses* can be explained, if we assume that [before p] contains a definite description equivalent to the earliest p-time (Beaver and Condoravdi, 2003)\(^{13}\), and that English and Polish have a pronominal past tense while Japanese has a quantificational past tense. The pattern in (84)-(86) follows from the fact that with a quantificational past tense, it is impossible to find the earliest p-time, resulting in presupposition failure.

Sharvit adopts the temporal ontology in (90) that allows her to pick out instantaneous moments from intervals.

(90)   a. M is the set of all moments, homomorphic to \((-\infty, +\infty)\), and \(D_i\) is the set of all closed sub-intervals of M.

   b. For any \(S \subseteq M\), \(\min(S)\) is the unique \(m \in S\) such that \(\forall m' \in S, m \preceq m'\), and undefined if this unique \(m\) does not exist.

The semantics of before is defined in (92), where the **earliest** operator (91) picks out the first p-time. She also assumes that for sentences of the form \(q \text{ before } p\), there should be a contextually supplied interval \(C\) that serves as a domain restrictor. For example, in *(Today), John didn’t sing before Mary danced*, the implicit \(C\) should be the interval today, even if *today* may not be pronounced. In a context where only ‘today’ is relevant, the sentence is judged true when there is only one singing event by John and one dancing event by Mary, and the latter precedes the former. It doesn’t matter, for example, if yesterday Mary didn’t dance but John sang.

(91)   For any interval \(t \in D_i\) and set of intervals \(P \subseteq D_i\),

   let \(P^t = \{t' \subseteq t | t' \in P\}\), namely, the members of \(P\) that are also sub-intervals of \(t\).

   Then

   \[\text{earliest}_t(P) := \min(\bigcup P^t).\]

(92)   For any contextually supplied interval \(C \in D_i\), any \(t \in D_i\), and any

---

\(^{13}\)This particular version of *before* \(p\), meaning ‘before the first p-time’, is chosen over the ‘before some p-time’ semantics in Ogihara (1995a), because it correctly predicts that *before*-clauses are Strawson downward entailing: if a time \(t\) precedes the first p-time, and if \(p'\) entails \(p\), then \(t\) precedes the first \(p'\) time (if it exists).
\[ p \in D_{(t,t)}, \]

\([\text{before}]^{C,g} p(t)\) is defined iff:

a. \(t \subseteq C\); and

b. \(\text{EARI}^{C}_p\{t' \in \text{dom}(p) | p(t') = 1\}\) is defined; and

c. \(\text{MIN}(C) \prec \text{EARI}_p\{t' \in \text{dom}(p) | p(t') = 1\}\).

When defined, \([\text{before}]^{C,g} p(t) := 1\) iff 
\(t < \text{EARI}_p\{t' \in \text{dom}(p) | p(t') = 1\}\)

(Sharvit, 2014)

In other words, \(\text{EARI}\) picks out the leftmost moment belonging to an element of the set of intervals denoted by the complement of \(\text{before}\) (von Stechow, 2009). And \(\text{before}\) presupposes that there is such a leftmost moment (92-b), and that it should follow the leftmost moment of the contextually supplied domain restrictor interval \(C\) (92-c).

2.4.2 Quantificational tense with \(\text{before}\)

The standard quantificational past is shown in (93). It is of type \(\langle it, it \rangle\), and its external argument is taken to be the speech time \(t_c\).

(93) Quantificational past

For any \(t \in D_i\) and \(p \in D_{(t,t)}\), \([\text{PAST}_{qu}^\text{quan}] p(t)\) is defined iff 
\(\exists t' \in D_i\) such that \(t' < t\) and \(p(t')\) is defined.

When defined, \([\text{PAST}_{qu}^\text{quan}] p(t) := 1\) iff \(\exists t' \in \{t'' < t | p(t'')\text{ is defined}\}\) such that \(p(t') = 1\).

A matrix clause with a quantificational past has the LF below, where \(t_0\) is the external argument of \(\text{PAST}_{qu}^\text{quan}\).

(94) a. \([t_0 \text{ [PAST}_{qu}^\text{quan} \text{ [John water the plant]}}]\)

b. Whenever defined, \([((94-a))^{g[t_0 \rightarrow t_c]}] = 1\) iff 
\(\exists t < t_c\) such that John waters the plant at \(t\).

The structure of a \(\text{before}\)-adjoined sentence is given in (95), with the matrix \(\text{PAST}_{qu}^\text{quan}\) having the widest scope, and the embedded \(\text{PAST}_{qu}^\text{quan}\) scoping over \(it\) \(\text{die}\).

(95) a. John watered the plant before it died.

b. \([t_0 [\text{PAST}_{qu}^\text{quan} \text{ [John water the plant]} [\text{before} \text{ [PAST}_{qu}^\text{quan} \text{ [it die]]}}]]\)
Plugging in the meaning of before, we get:

\[ (96) \quad \exists t \prec t_c \text{ such that:} \]

John waters the plant at t; and
\[ t \prec \text{EARLIEST}_C(\{ t' | \exists t'' \prec t' \text{ such that the plant dies at } t'' \}) \]
which is only defined if:

a. \( t \subseteq C \) and
b. \( \text{MIN}(C) \prec \text{EARLIEST}_C(\{ t' | \exists t'' \prec t' \text{ such that the plant dies at } t'' \}) \).

In other words, the sentence asserts that there is an interval t that precedes the speech time, John waters the plant at t, and that t precede the earliest moment in C such that there is a time before that moment when the plant dies (due to the embedded past), for some contextually salient interval C that contains t. This sentence is defined only if the earliest moment of C precedes the earliest moment in C such that there is a time before that moment when the plant dies.

It turns out that for any interval C, \( \text{EARLIEST}_C(\{ t' | \exists t'' \prec t' \text{ the plant dies at } t'' \}) \) is either undefined, or equals \( \text{MIN}(C) \), and both result in a presuppositional failure. The derivations are shown below.

\[ (97) \quad \text{Let } P = \{ t' | \exists t'' \prec t' \text{ such that the plant dies at } t'' \}, \text{ and let } P^C = \{ t \subseteq C | t \in P \}. \]

a. **Case I:** If the plant doesn’t die at all, or the plant dies but not prior to C (\( \{ t \prec C | \text{the plant dies at } t \} = \emptyset \)).

Since C is dense, for every \( t \in P^C \), we can find another \( t' \in P^C \) such that \( t' \prec t \).

Hence, \( \text{EARLIEST}_C(P) \) is undefined, violating the presupposition of before (92-b).

b. **Case II:** The plant dies prior to C.
\( \{ t \prec C | \text{the plant dies at } t \} \neq \emptyset \).

By definition of P, \( C \in P^C \).

Then, \( \text{MIN}(C) = \text{EARLIEST}_C(P) \), violating the presupposition of before (92-c).\(^{14}\)

Since Japanese prohibits past-under-past in before-clauses, it has the quantificational past.

\(^{14}\)Sharvit (2014) shows that it is necessary to maintain this presupposition: since \([\text{before}]^C.g(p)(t) = 1 \text{ iff } t \prec \text{EARLIEST}_C(\{ t' | p(t') = 1 \})\), if we allow \( \text{MIN}(C) = \text{EARLIEST}(C) \), it turns out that t must both be contained in C and precedes C, a contradiction.
2.4.3 Pronominal tense with before

A pronominal tense, on the other hand, does not run into the problem above. The standard version of the pronominal tense (Partee, 1973; Kratzer, 1998, a.o.) is given in (98), where \(g(j)\) is by convention taken to be the speech time \(t_c\).

\[
(P_{\text{past}}) \text{ is defined iff } g(k), g(j) \in D_i, \text{ and } g(k) \prec g(j).
\]

When defined, \(\left[ P_{\text{past}} \right]_i^j := g(k)\).

Sharvit (2014) assumes that (transitive) verbs are of type \(\langle i, \langle e, \text{et} \rangle \rangle\), with the temporal argument being their first argument. For the purpose of modification by AdvP (type \(\langle i, t \rangle\)), a syntactic existential closure \((99-b)\) of the temporal argument takes place to create a type \(\langle i, t \rangle\) node, which combines with AdvP by Predicate Modification \((99)\).

\[
(99)\ a. \text{XP} \quad \text{(Sharvit, 2014)}
\]

\[
\exists \text{XP}_{(i,t)} \quad \text{XP}_{(i,t)} \quad \text{AdvP}_{(i,t)}
\]

\[
\lambda_1 \quad \ldots \text{PAST/PRES}_{\text{pro}} \ldots
\]

\[
b. \quad \exists \alpha \text{ is defined iff } \exists y \text{ such that } \left[ \alpha \right](y) \text{ is defined.}
\]

When defined, \(\exists \alpha = 1\text{ iff } \exists x \in \{y \mid \left[ \alpha \right](y) \text{ is defined} \} \text{ such that } \left[ \alpha \right](x) = 1\).

With the pronominal past, the English sentence *John watered the plant before it died* has the following LF, with the *before* -clause being an AdvP. Assuming that the index 0 is reserved for the speech time, we get the reading in \((100-b)\).

\[
(100)\ a. \quad \exists [[\lambda_3 [\text{John water-}P_{\text{past},3} \text{ the plant}]] \text{ [before } [\lambda_2 [\text{it die-}P_{\text{past},2}]]]]]
\]

\[
b. \quad (100-a) \text{ is true iff } \exists t < t_c \text{ such that:}
\]

(i) \quad John waters the plant at \(t\); and

(ii) \quad \(t \prec \text{Earliest}_C([t' < t_c \mid \text{the plant dies at } t'])\)

where \(t \subseteq C\) and \(\text{Min}(C) \prec \text{Earliest}_C([t' < t_c \mid \text{the plant dies at } t'])\).

Since there is no existential quantifier in the scope of *before*, the presuppositional

\(^{15}\)In principle, both indices could be bound when in the scope of a temporal shifter (Sharvit, 2014).

\(^{16}\)Note that even when bound by \(\exists\), \text{PAST/PRES}_{\text{pro}}^1\) is not a quantifier, it is of type \(i\).
failure problem is avoided. Hence, Sharvit (2014) predicts that any language with the pronominal past allows past-under-past in before-clauses, while any language with the quantificational past does not.

Since both English and Polish allow past-under-past in before-clauses, they must have the pronominal past.

2.4.4 Discussion

As Sharvit points out, Partee’s (1973) stove example by itself does not provide significant evidence for either the pronominal or the existential past tense, since recent works on domain restrictors also propose that the restrictor itself can be pronominal. Such combination of an existential past tense with a pronominal domain restrictor is proposed in several papers on tense, such as Bäuerle (1979); Ogihara (2007); von Stechow (2009), among others. Matthewson et al. (2019), which is discussed in Section 2.2.2, also falls into this category.

The embedding of the past tense in before-clauses, however, shows that the two accounts, the pronominal past analysis and the existential past with domain restrictions, are not equivalent. Sharvit’s (2014) analysis provides extra evidence that the English past tense cannot be a quantificational tense with domain restriction.

While this dissertation does not focus on embedded tenses, this generalization is also important for us. Note that for Sharvit, it is crucial that the English past tense is of type i. Considering the observations made earlier, whether the English past tense is pronominal in the sense that it is anaphoric, or it is equivalent to a unique definite, it must be of type i. Hence, Sharvit’s observation does not pose problems for my analysis in Section 2.2.

In addition, instead of letting the embedded past in the before-clause be a pronominal past as in (100), we may even take a more radical approach. That is, the embedded past in before p is actually a unique past, since the earliest past p-time (in a given domain restrictor C) should be a unique time. Empirically, this analysis will not make a difference for English since the morphology is the same.

2.5 Lexical ambiguity vs. underspecification

In the previous sections, we established that there are data which cannot be satisfactorily explained with a pure pronominal (i.e. anaphoric/familiar) analysis of the English past tense, and we found evidence that these instances of the past
tense are similar to unique definites.

This observation also relates to the study of definite DPs in the literature. Historically, there are two major groups of analyses of definites: familiarity and uniqueness. The former treats all instances of definites as presupposing an antecedent, parallel with the analysis of pronouns (Kamp, 1988; Kamp and Reyle, 1993; Kamp et al., 2011; Heim, 1982, 1983a, a.o.), while the latter treats all definites as presupposing uniqueness (Heim, 1990; Elbourne, 2005, 2013, a.o.).

In the recent literature, linguists have also explored the possibility that both familiarity and uniqueness are actually sub-concepts of definiteness, and it has been shown that some languages may express the two concepts using different morphology (Ebert, 1971; Schwarz, 2009, 2013; Arkoh and Matthewson, 2013; Jenks, 2015, 2018, a.o.). Following these recent developments, we may suggest that the English past tense behaves more like the definite article the than pronouns.

This hypothesis, along with the conclusion of the previous sections, opens up several new options for the analysis of the English past tense, parallel to the analysis of the definite article: (i) the English past is lexically ambiguous between an anaphoric definite and a unique definite (i.e. the past tense morphology can spell out two different lexical items); (ii) the English past tense is marked as ‘definite’, but it is underspecified for the type of definiteness.17

The difference between option (i) and (ii) is subtle and is not addressed in the previous discussion on this topic (cf. Grønn and von Stechow (2016); Matthewson et al. (2019)). In this section, I will test these two hypotheses using the generally accepted lexical ambiguity tests in the literature.

Some commonly used tests for lexical ambiguity include: conjunction, ellipsis, and contradiction, illustrated below (Zwicky and Sadock, 1975; Kennedy, 2011).

(101)  
a. The colours are light.  
b. The feathers are light.  
c. ??The colours and feathers are light.

(102) I saw his duck and swallow under the table and I saw hers too.

(103) The bank isn’t a bank.

(101) tests the two senses of the adjective light. In general, a conjunction construction does not allow two readings at the same time, hence the weirdness of (101-c) shows that there is indeed a lexical ambiguity here.18 (102) distinguishes

17 Since in the previous chapters, we already showed that the past tense cannot be only anaphoric, that option will be eliminated here.

18 One exception to the conjunction test is a construction known as the zeugma, where the
the bird reading and the action reading of the words *duck* and *swallow*: the elided part can only have the same reading (either birds or actions) as the previous one. 

(103) shows that *bank* is lexically ambiguity between the financial institution and the land around a river. The fact that there is no contradiction shows that this word is indeed lexically ambiguous.

If a word is underspecified, however, these tests would give us the opposite results: the conjunction would be allowed, the elided part may have the other reading, and we would observe a contradiction. For example, in English, *child* is underspecified for gender, and we have:

(104) a. John has a son.
   b. Mary has a daughter.
   c. Both John and Mary have a child.
      (Can be true if John has a son and Mary has a daughter.)

(105) Mary likes her child, and John does too.
      (Can be true if John has a son and Mary has a daughter.)

(106) a. #John's child isn't a child.
      (Where the first instance of *child* specifically means a boy.)
   b. #John has a boy, and he doesn't have a child.

Similarly, NPs in classifier-languages, such as Mandarin Chinese, are underspecified for number. We have the same test results:

(107) a. Zhangsan you yi zhi mao.
      Zhangsan has one CL cat
      ‘Zhangsan has a cat.’
   b. Lisi you liang zhi mao.
      Lisi has two CL cat
      ‘Lisi has two cats.’
   c. Zhangsan he Lisi dou you mao.
      Zhangsan and Lisi all have cat
      ‘Both Zhangsan and Lisi have cats.’
   d. Zhangsan xihuan ziji de mao. Lisi ye shi.
      Zhangsan likes self GEN cat Lisi two COP
      ‘Zhangsan likes his cat, and Lisi does too.’
      (Can be true in a context where Zhangsan has a single cat and Lisi has multiple cats.)

Speaker intentionally conjoins two senses of the same word, such as in *She broke his car and his heart*. However, its distribution is limited and does not affect the validity of the conjunction test in general.
The general patterns of lexical ambiguity and underspecification with respect to the tests are summarized below:

<table>
<thead>
<tr>
<th></th>
<th>Lexical ambiguity</th>
<th>underspecification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjunction</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ellipsis</td>
<td>same interpretation only</td>
<td>different interpretations allowed</td>
</tr>
<tr>
<td>Contradiction</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

2.5.1 Conjunction test

Testing the English past tense for the two readings can be tricky, because even if we have conjoined NPs as an argument of the VP, there is still one tense in the sentence. However, we can still construct some examples, such as the following. Imagine that we are in Florence, and the speaker is pointing at the famous dome of the Florence Cathedral. The facts happen to be that both Brunelleschi and Ghiberti were involved in the project in 1418, but Ghiberti was only briefly involved and Brunelleschi eventually got all the credit for the construction of the dome:

(109) (Pointing at the dome of the Florence Cathedral:) Who built this dome? And what did Ghiberti do in 1418? Ghiberti and Brunelleschi built this dome.

(110) Answering two questions at the same time What did Penny do Monday night? And what about Leonard? They both hung out with Sheldon (on Monday night).

Here, it is impossible for the past tense to both be unique (as in Brunelleschi built this dome) and anaphoric to the antecedent 1418 (Ghiberti built this dome in 1418). Note that the oddness cannot be due to answering two questions at once, which is allowed (with the same information structure) see (110). The only possible issue here is that maybe the building event of the dome lasted many
years and not just in 1418, so the unique reference time may be a longer time interval. To avoid this complication, let us construct an example that involves a smaller time interval.

Consider the following example. Here the background information is that Marie Curie and Pierre Curie were both involved in the discovery of radium in 1898.


Here, the sentence is again odd despite the fact that there is nothing wrong with the statement itself. Again, I take it to be a clash between the two senses of the past tense, in particular, their different presuppositions. From the discussion in the previous sections, we conclude that sentences with the unique past tense in general presuppose the existence and the uniqueness of a past interval (but crucially not which interval it is exactly). This presupposition is satisfied when the speakers talk about the discovery of a substance known today. Hence, (111) with the unique past tense has the discovery event (and the unique reference time) as old information, and both Marie Curie and Pierre Curie and in 1898 as new information. On the other hand, the same sentence as an intended answer to the second question, requires the past tense to be interpreted anaphorically, where the old information now is the (exact identity of the) reference time in 1898 and one of the agents Pierre Curie, and both the discovery event and the additional agent of that event Marie Curie are now new information. As a result, (111) is judged as infelicitous because having the two senses of the past tense in one sentence requires something to be both old and new information at the same time.

A related point here is that even without the conjunction, a sentence like Marie Curie discovered radium cannot answer both a question with a unique past tense (Who discovered radium?) and an anaphoric one (What did Marie Curie achieve in 1898?). This is because the different presuppositions and assertions will trigger two conflicting stress patterns:

(112) a. Who discovered radium?
     MARIE CURIE discovered radium.

     b. What did Marie Curie achieve in 1898?
     Marie Curie discovered RADIUM.

In fact, if we take away the temporal adverbial in 1898 from the answer in (111), speakers judge it to be only answering the first question, despite the fact that
Pierre also appears as the agent of the event, so in principle, the sentence should be able to answer the second question. I take this as another piece of evidence that a single instance of the past tense cannot get both the uniqueness and the anaphoric readings at the same time.

A reviewer points out that in (113-a), by letting both answers have subject-oriented focus, the sentence becomes acceptable. However, since it involves a past temporal adverbial, the past tense is already automatically anaphoric to that time, regardless of the fact that the first question involves a unique past tense. Let us compare it with (113-b) without the adverbial. Unlike (113-a), (113-b) sounds more like the speaker is only answering the first question (i.e. with a unique past tense). Likewise, (113-c) with elided TP(s) also seems to suggest that the speaker is only answering on of the questions. Both pattern with the lexical ambiguity ellipsis examples (i.e. same interpretation only).

(113) Who discovered radium? And who was involved in a significant achievement in 1898?

a. Marie Curie and Pierre Curie discovered radium in 1898.
b. Marie Curie and Pierre Curie discovered radium.
c. Marie Curie and Pierre Curie.

We may also try to conduct the test with expected events. For example:

(114) (At a gathering of alumni from several American university:)

Everyone here went to college in the US.

Here, the context is rich enough to admit the presupposition that we can find a unique past interval during which they went to university. This reference time is the old information, and covaries with each person. The new information seems to be the adjunct in the US. Hence, we observe the same pattern as the unique past tense reading: no explicit antecedent for the reference time is needed, and the past tense may get the covarying reading under every.

Without such contextual information, went to college only goes with the anaphoric past tense, such as:

(115) Last fall, Mary’s younger sister went to college.

\[19\] In fact, having in 1898 in the answer actually seems like the speaker is really trying to force the past tense to have both readings, since the anaphoric past tense in general does not require repeating the contextually salient reference time in the sentence.
Given the contextual information above, we may try the conjunction test again:

(116) (Introduce Mary and her younger sister.) Mary’s younger sister started college last year. She and Mary have something in common: they both went to college in the US.

(116) seems a little odd. There may be multiple reasons behind this judgement: (i) given that if Mary’s younger sister only started college last year, she should still habitually goes there and we will not be able to find a suitable unique interval that is in the past; (ii) this means that went to college will have to be anaphoric to last year for Mary’s sister instead of being unique as for Mary. In addition, they both went to college in the US strongly suggest that both Mary and her sister have graduated already (under the uniqueness interpretation of the past tense), contrary to the contextual information.

Now let us consider lifetime as reference time. Assume that Sheldon is a physicist who is still alive, and he got a grant in 2010 to work on quantum mechanics. Max Planck, who is no longer alive, was one of the founding fathers of quantum mechanics.

(117) What did Sheldon do in 2010? And who was Max Planck?

They both worked on quantum mechanics.

Again, the utterance in (117) seems odd, and I suggest it follows from the clash of the two interpretations of the past tense.

Based on the observations above, I believe that the conjunction test results suggest an ambiguity analysis of the two readings of the English past tense.

2.5.2 Ellipsis test

To apply the ellipsis test, we need TP ellipsis where one of the tenses is elided. It seems that the interpretation of the explicit tense determines the interpretation of the elided tense, just as what we expect with a lexical ambiguity analysis.

Let us consider the following scenario with perceivable change-of-state events. We are looking at two windows, one of them is John’s and the other Bill’s. We know that every night, they both keep their windows closed. John’s window is half open now, which means he must have opened it at some point. We also know that once Bill gets up, every half an hour he opens his window completely for five minutes and closes it after getting a good ventilation.
(118) (Looking at John's half open window and Bill's now closed window.)

??John opened his window narrower than Bill.

(118) is odd in this situation because as we see, John's window is half open while Bill's window is currently closed, and the sentence would only be appropriate and true if the elided tense were anaphoric to the last time Bill opened his window. The oddness suggests that this reading is not available. Trying to interpret the elided tense as unique is odd because given what we see and what we know, we cannot find a unique maximally informative past interval that would serve as the reference time for the elided TP.

Alternatively, suppose we know that both John's and Bill's windows were closed at night and both are open now. The following utterance will be felicitous event without a contextually salient past time.

(119) (Looking at both open windows.)
John opened his window narrower than Bill.

The contrast between (118) and (119) suggests a pattern parallel to that of lexical ambiguity.

2.5.3 Contradiction test

The contradiction examples are easy to construct. For example, we may consider a context that satisfies the uniqueness presupposition only, such as:

(120) (Everyone in the department has a PhD.)

a. Professor Snape got his PhD from Harvard.
b. Professor Snape got his PhD from Harvard, but he did not get it last year.

In (120-a), we do not need a contextually salient past time to use the past tense, because the context satisfies the uniqueness presupposition. (120-b) shows that if we have an anaphoric past in the second conjunct, the overall sentence is not contradictory, which patterns with typical lexical ambiguities.

For perceivable change-of-state events, we may construct the following sentence:

(121) (Looking at a sand castle. There is no contextually salient past time:)
Mary built this sand castle. However, she didn’t build it yesterday.
Again, the first past tense has the uniqueness reading, since it does not require a contextually salient antecedent. The second past tense is anaphoric to *yesterday*.

One complication with this test is that the result does not hold if we put the anaphoric past tense in the first conjunct and then try to deny it with the unique past tense, for instance:

(122) (Looking at a new book.)
Leonard bought this book yesterday, but he didn't buy it/it wasn't bought by him.

Unlike the earlier examples, (122) is indeed a contradiction. However, I do not take this result to be suggesting the underspecification analysis. The reason is that in order to construct contradiction test examples, we need the two conjuncts to differ only in the kind of past tense reading they have, and it follows that we must use the same VP, so the asserted event will be the same event. In a sentence like (122), the first conjunct already entails that Leonard was the person who bought this book, which happens to be the assertion of the unique past tense (because it can be uttered without an antecedent) in the second conjunct that is negated.

We can avoid this problem by switching the order of the negation. For example:

(123) (Looking at a new book.)
Leonard did not buy this book yesterday, but he was the person who bought it.

In (123), the past tenses in the second conjunct are not anaphoric to any contextually salient time, but they are still felicitous because this context satisfies the uniqueness presupposition: there is a new book, so it must have been bought by someone in a unique past buying event (and the corresponding maximally informative past interval).

The conclusion of this section is that the two readings of the English past tense pattern with lexically ambiguous words regarding the three tests. I will conclude that the English past tense is indeed lexically ambiguous between an anaphoric past tense and a unique past tense, with different presuppositions.

### 2.6 Conclusion

In conclusion, I believe that the English past tense is lexically ambiguous between an anaphoric past tense and a past tense that presupposes only the existence
and uniqueness of the reference time. The unique past tense analysis provide a more satisfactory explanation of the puzzling data regarding the English past tense than previous proposals.
Chapter 3

Definiteness in the temporal and nominal domains

3.1 Comparing the past with the present perfect

Having established that the English past tense is lexically ambiguous between an anaphoric and a uniqueness reading, we can now go back to the issue of the present perfect. The basic observation that motivates this dissertation is the fact that the present perfect construction in different languages behaves differently: while in English, the present perfect is characterized by the various perfect (sometimes labeled ‘current relevance’) readings (1), it behaves like a general-purpose past perfective in the sense of Bertrand et al. (2017) in languages like French, German, and Italian (and to some extent, Dutch) (2).

(1) Perfect readings

a. Experiential/existential
   Mary has visited the Louvre.
   *i.e.* There is at least one instance of Mary visiting the Louvre prior to the speech time.

b. Resultative
   Mary has arrived.
   Inference: Mary is here now.

c. Recent past/hot news
   The Orioles have won the game!
   *i.e.* The event is unknown to the addressee, and most likely took place recently.

d. Universal Perfect/Continuative
   Mary has been studying since this morning.
Inference: Mary is still studying.

e. Present Perfect Puzzle
   *Mary has arrived yesterday.

f. Lifetime effect
   (Talking about Einstein, who is dead now:)
   #Einstein has visited Princeton.

g. No narrative progression
   (Narrating a series of past events that take place one after another:)
   #(This morning) Mary has woken up. She has gotten dressed.

(McCawley, 1971; McCoard, 1978; Portner, 2011, a.o.)

(2) The general-purpose past perfective
   a. Has the experiential/existential reading, but does not show the lifetime
      effect
   b. Has the resultative reading, but not required
   c. Recent past/hot news possible
   d. Felicitous out of the blue
   e. Definite past adverbials allowed
   f. Narrative progression allowed

(Bertrand et al., 2017)

Note that the general-purpose past perfective shares many of the perfect readings
with the English present perfect, with the exception of allowing definite past
adverbials and narrative progression, and that it appears in contexts where the
English present perfect would be prohibited, such as the lifetime effect sentences.

Given the observation that the English past tense has an additional uniqueness
presupposition, which is not observed in languages like German, a plausible
hypothesis is that the English present perfect has narrower distributions than
languages like German because the past tense has a wider distribution.

The premise of this hypothesis, however, is that the present perfect and the
past tense are indeed alternatives (for the past perfective reading) and have a com-
petition based on their different presuppositions. Indeed, it has been noted in the
literature that in English, the present perfect is differentiated from the non-present
(past, infinite) perfects in that the latter do not have the various perfect readings
and constraints (Portner, 2011). Intuitively, this is due to the fact that the present
perfect is semantically too similar to the past tense and the various inferences and
constraints of the present perfect result from the competition between the two.

In this section, I will first briefly summarize the previous analyses of the present
perfect, the semantics assigned to it and how it compares with the past tense. Then, I will present evidence that the present perfect and the past tense do compete, in both English and French/German-like languages. In particular, I will discuss the possibility of the present perfect functioning as an indefinite past (which competes with the 'definite'–anaphoric and unique past tenses), in a way parallel to indefinites and definites in the nominal domain.

3.1.1 Assumptions about the underlying aspect

In English, the present perfect construction has two basic forms: the present perfect with progressive morphology, and the present perfect with the 'simple' morphology. While the former uncontroversially contains an underlying imperfective/progressive aspect, the latter does not explicitly mark aspect, just like the English simple past morphology. I will summarize them below.

The underlying aspect for the English simple past form may interact with the Aktionsart of the eventuality. In general, statives in the simple past (e.g., *was*) are interpreted as imperfective, and eventives in the simple past (e.g., *hit, opened the door*, etc.) are interpreted as perfective. This is illustrated in the examples below.

(3) Mary turned the handle. The door opened. The room was dark. She turned on the light.

We can see that the first two simple past sentences with eventive predicates present the eventuality as completed, and they also engage in narrative progression, where the turning-handle event and the door-opening event are interpreted as having taken place back to back, in the order of narration. On the other hand, the third simple past sentence with a stative predicate presents the state of the room being dark as ongoing at its reference time. It also does not 'move the narration forward' in the above-mentioned sense.

There are some exceptions to the general pattern above, especially with statives. For example:

(4) (A speaker talks about the conference from yesterday:)

a. I was nervous, and then I wasn’t anymore.

b. The first talk was boring. The second one was very nice.

We can see that the states are interpreted as terminated, and they can move
the narration forward. This suggests that the underlying aspect is perfective.

There can also be exceptions that may be related to the discourse coherence relations in the broader sense. For example, a stative simple past may also be interpreted as 'just after' the previous event if it describes the result of the former.

(5) Mary turned off the light. The room was pitch dark.

There are several other possible relations, such as simultaneity (*Chris had a fantastic meal. He ate salmon.*) and precedence *Max fell. John pushed him.*, which may also follow from discourse coherence relations such as elaboration and explanation, respectively (*Kamp et al., 2011*). Non-stative verbs may also be interpreted as on-going in certain contexts, such as *sang* and *flowed* in *I sat down in the woods. The birds sang. The river flowed.*

The underlying aspect in the (non-progressive) present perfect interacts with the Aktionsart of the VP in the same way: in general, stative verbs in their simple form tend to prefer an imperfective reading and non-statives in their simple form is perfective, and in general need progressive marking for an imperfective reading.

It has been noted by *Iatridou et al. (2003)* that (6) is ambiguous between an existential and a Universal Perfect reading. They argue that the former results from an underlying perfective aspect, while the latter has an underlying imperfective aspect. The Universal Perfect reading follows from the reference time being an Extended Now interval (\(t \subset \tau(e) \land t_c \subset t \Rightarrow t_c \subset \tau(e)\)).

(6) Mary has been sick.

a. **Existential:** There is a state of Mary being sick, which is over, before the speech time.

b. **Universal Perfect:** There is a state of Mary being sick which spans from the past and overlaps with the speech time (she's still sick).

For the purpose of this chapter, I take this as evidence that both the simple past form and the simple form of the present perfect in English have the same ambiguity regarding their underlying aspects. Therefore, when the two forms compete, the only difference should be the status of the reference time.

In other words, the speakers will not be computing the enriched meaning based on the following sets of alternatives:

(7) a. \{**simple present perfect + imperfective**, **simple past + perfective**\);
b. \{\textsc{simple present perfect} + \textsc{perfective}, \textsc{simple past} + \textsc{imperfective}\};

Consider the stative predicate \textit{understand} in sentences like \textit{Mary} \{\textit{understood/has understood}\} \textit{the reason why Bill stayed at home}. This sentence is ambiguous between having an underlying perfective (i.e. \(\exists e [\text{Mary-coming-to-understand}(e) \land \tau(e) \subseteq t]\), where the verb \textit{understand} with the perfective aspect is coerced into an inchoative reading, cf. \cite{de Swart, 1998}) and an underlying imperfective (i.e. \(\exists s [\text{Mary-understand}(s) \land t \subseteq \tau(s)]\)). If the participants have to take into account the underlying aspect, let’s say the combination in (7-a), then suppose someone utters \textit{Mary has understood}..., we would expect a reading like:

\[(8) \exists s [\text{Mary-understand}(s) \land t \subseteq \tau(s)] \land \neg \exists e [\text{Mary-coming-to-understand}(e) \land \tau(e) \subseteq t] \text{ for some } t, \text{ and } t \text{ cannot be anaphoric since the simple past would have been used.}

I have not found any evidence that such a reading exist. It seems that the speakers will only compute the enriched meanings based on alternatives that are morphologically explicit. This seems to be a correct assumption, given that we also do not have evidence that speakers compute the enriched meaning of the simple past based on the possible ambiguous aspects:

\[(9)\begin{align*}
\text{a. Utterance: The birds sang.} \\
\{\textsc{simple past} + \textsc{perfective}, \textsc{simple past} + \textsc{imperfective}\} \\
\text{b. Interpretations:} \\
(i) \quad &\exists e [\text{birds-sing}(e) \land t \subseteq \tau(e)] \land \neg \exists e [\text{birds-sing}(e) \land \tau(e) \subseteq t] \\
(ii) \quad &\exists e [\text{birds-sing}(e) \land \tau(e) \subseteq t] \land \neg \exists e [\text{birds-sing}(e) \land t \subseteq \tau(e)]
\end{align*}\]

The readings in (9) do not exist.

I conclude that the competition between the simple present perfect and the simple past forms must be ‘blind’ to the ambiguity of the underlying aspect. In other words, the alternatives should be:

\[(10)\begin{align*}
\text{a. } &\{\textsc{simple present perfect} + ?, \textsc{simple past} + ?\}; \\
\text{b. } &\{\textsc{simple present perfect} + ?, \textsc{simple past} + ?\};
\end{align*}\]

where ? indicates an aspect value, which the speakers will have to infer based on contextual information such as discourse relations.
Now, German differs from English that the ambiguity in aspect is observed across all Aktionsarten (unlike in English where it is mostly along the stative/non-stative split). I will assume that in German, the underlying aspect does not enter the computation of the enriched meaning either. This is based on the observation that German does not have the reading in (9) either, which would exist if the speakers compute the enriched meaning of the sentence based on all the possible combinations of tenses and aspects.

Unless otherwise indicated, when I mention ‘present perfect’, I mean the simple form (without progressive morphology).

3.1.2 Theories of the perfect

The various perfect, or current relevance readings associated with the English present perfect have motivated many groups of analyses. In general, they have in common that the event is located prior to the speech time (if the underlying aspect is perfective, then the present perfect gives rise to the ‘existential perfect’ reading, cf. Iatridou et al. (2003)). The differences lie in the following areas: (i) what the reference time (in the Reichenbachian/Kleinian sense) should be—a past interval, the present, or an Extended Now interval; (ii) the nature of the perfect readings—presupposition, entailment that follows from a present state, or a pragmatic implicature.

3.1.2.1 Anteriority

In the Reichenbachian/Kleinian analysis, the perfect has an anteriority semantics in the sense that it locates the event before the reference time. There are two ways of formalizing this, either as an aspect, or as a relative past tense.

The perfect as an aspect has been proposed by Klein (1994) and later Kratzer (1998):

\[(\text{Perfect aspect}) \quad [\text{PERFECT}] = \lambda P_{(v,t)}. \lambda t. \exists e[\tau(e) < t \land P(e)]\]

There is a debate about the relationship between the morphology and the actual structures involved. For Klein (1994), the present perfect involves a present reference time (given by tense), and the perfect aspect above. For Kratzer (1998), the combination of a present reference time and a perfect aspect can be spelled out by the simple past morphology in English. Kratzer’s analysis is meant to account for a group of data problematic for a pronominal (i.e. anaphoric) analysis.
of the English past tense, which I discussed in Chapter 2. However, Kratzer leaves open why the English present perfect morphology cannot spell out this (perfectly reasonable) combination. Regarding the crosslinguistic variation, we will have to assume that languages simply have different morphological rules, which is acceptable but somewhat arbitrary.

For Klein (1994), tense relates the ‘topic time’ to the utterance time, and for the present perfect, the topic time is given by the present tense (also see Portner (2011)). For Klein, the intuitions about current relevance and perfect-readings follow from the fact that the assertion is always about the tense time (hence the term ‘topic time’).

However, it is tricky to make this intuition formally precise, given that the current relevance readings can be very context-dependent (Grønn and von Stechow, 2017). One such example is the resultative reading in (12), where the result state must hold in the context in (a) but not in (b).

(12) a. Can I borrow the key to the print room?
   I’ve lost the key.
   Inference: the key is gone now.

   b. (Talking about Mary’s experiences:)
   She has once lost the key to the print room.
   Yeah, but didn’t they find it in the end?

There is also the issue of how the perfect aspect interacts with the lower perfective or imperfective aspects, since for Klein, the perfect is an aspect that shares the same location as the perfective and imperfectives (11). This may not be a problem per se, but Klein does not spell out the analysis (possibly with two layers of aspects) explicitly.

In fact, it has been pointed out by Grønn and von Stechow (2017) that other than the ontological commitment to events, Klein’s analysis is virtually indistinguishable from a relative past operator embedded under a present tense. In other words, we may adopt the following analysis:

(13) \[ \text{[PERFECT}_{\text{relative past}}] = \lambda p_{(i,t)} \cdot \lambda t . \exists t' [t' < t \land p(t')] \]

This analysis allows the combination with an AspP. For example, assuming that the present tense saturates the temporal argument with \( t_c \), we have:

(14) a. \[ [\text{TP \ PRESENT} \ [\text{PerfP PERFECT} \ [\text{AspP PERFECTIVE} \ [\text{VP Mary arrive}] ]]] \]
b. \( \exists t' \exists e [ \tau(e) \subseteq t' \land \text{Mary-arrive}(e) \land t' < t_c] \)

This analysis straightforwardly accounts for the absence of the Present Perfect Puzzle in languages like French, Italian, and German, under standard assumptions of temporal adverbial modification. With the assumed semantics in (13) and (15) and the structure in (14), we simply let the temporal adverbial modify AspP and the result will serve as an argument to the \( \text{PERFECT}_{\text{relative past}} \) operator, which then combines with the present tense, and this gives the result in (16).

\[
\begin{align*}
(15) \quad &a. \quad [\text{yesterday}]_c = \lambda p_{(t,c)} \lambda t. t = \text{yesterday}_c \land p(t) \\
&\text{where the subscript } c \text{ indicates that the time yesterday is interpreted } \\
&\text{relative to the context it is uttered in.}

&b. \quad [[\text{AspP PERFECTIVE}_{\text{VP Mary-arrive}}]] = \lambda t. \exists e [ \tau(e) \subseteq t \land \text{Mary-arrive}(e)]

(16) \quad &\exists t'[t' < t_c \land t' = \text{yesterday}_c \land \exists e [ \tau(e) \subseteq t' \land \text{Mary-arrive}(e)]
\end{align*}
\]

However, for English, it is not clear why we cannot have the same analysis, and if we do, how to rule out the Present Perfect Puzzle sentences. Klein (1994) adopts an independent pragmatic principle regarding temporal modification, that assuming the tense time (speech time) is already ‘definite’, it will be overly informative to further specify the lower temporal parameter. In other words, Klein views the Present Perfect Puzzle as a general pragmatic result following from the Gricean informativeness principle. This leads to the additional question of why this principle is not active in languages like French (assuming that Gricean principles should be universal). I will discuss this analysis in detail in Chapter 5.

3.1.2.2 Perfect state

The perfect state analysis is mainly motivated by the resultative reading of the present perfect: that the result state of the event holds at the utterance time. This idea is generalized to include all ‘current relevance’ inferences, so that a present perfect sentence asserts that some kind of state holds at the present time. However, there is no consensus in the literature about the nature of the perfect state (Portner, 2011). While for the resultative reading, we may take the perfect state to be the result state of the event (if it has one), this is not the case in general. Some linguists propose an abstract state of ‘the event’s having occurred’ (Parsons, 1990), and some others simply do not have a clear definition and leave it to pragmatics to determine the nature of this state (Nishiyama, 2006; Schaden, 2009).
In many of the Discourse Representation Theory (DRT) analyses (Kamp, 1988; Kamp and Reyle, 1993; Kamp et al., 2011; Kamp and Reyle, 2011; de Swart, 1998, a.o.), the present perfect is treated as introducing a state variable $s$, which is related to the event $e$ by the $\supset\subset$ ‘abut’ (i.e. just after, back-to-back) relation. This state overlaps with the reference time $t$.

(17) a. Mary has met the president.

\[
\begin{array}{|c|}
\hline
n, e, s, t, x, y \\
\hline
t = n \\
Mary(x) \\
president(y) \\
s \circ t \\
e \supset\subset s \\
e : x \text{ meet } y \\
\hline
\end{array}
\]

where $n$ is the speech time (‘now’), and $\circ$ is the ‘overlap’ relation.

(de Swart, 1998)

In general, perfect state analyses have in common that the reference time is taken to be the present, as in Klein (1994). However, note that in terms of temporal ordering, the perfect state analyses are equivalent to the anteriority analyses in that the event is placed before the speech time. In addition, as noted by Grønn and von Stechow (2017), the state variable poses a potential problem to this analysis since we need to rule out adverbial modification of it. For example, (18-a) cannot mean that the state of Mary having met the president lasted two hours, and likewise, the temporal adverbial today in (18-b) necessarily places the meeting event in the interval today, and not its perfect state.

(18) a. Mary has met the president for two hours.

b. Mary has met the president today.

On the other hand, in order to derive the Present Perfect Puzzle in English, these analyses will have to make sure that the past adverbial is indeed modifying the reference time (which is taken to be the speech time/the present) or the perfect state, so that the Present Perfect Puzzle follows from the contradiction derived (i.e. a past adverbial can’t modify current states/times). This leaves us with a dilemma regarding what the adverbials can modify in general.

Despite these issues, the biggest challenge faced by perfect state analyses is the vague definition of the perfect state. These analyses attempt to account for
all of the perfect readings with one perfect state. However, this will mean that all
the perfect readings are of the same nature, namely, an assertion that this perfect
state holds at the speech time. This is also debatable and the literature does not
agree on this issue. For now, we have at least some evidence that some of the
perfect readings should not be assertions. For example:

(19) Mary hasn’t arrived yet.
     It’s not the case that Mary has arrived.

(19) still has a current relevance reading despite the negation.

In addition, these analyses cannot account for the crosslinguistic data. For
languages like French, where the present perfect behaves like a ‘general-purpose
past perfective’ in the sense of (3), we will have to arbitrarily argue that the perfect
state in these languages has different semantics so that it has some overlaps with
the English perfect readings but not others. For other perfect-like particles like the
Mandarin Chinese perfective, we will need different analyses for different perfect
readings.

3.1.2.3 Extended Now

The most influential group of theories of the perfect is the Extended Now the-
ory (McCoard, 1978; Dowty, 1979; Iatridou et al., 2003; Portner, 2003; Pancheva
and von Stechow, 2004, a.o.). The idea is that the perfect introduces an interval
whose right boundary is identified with the tense time. For the present perfect,
this is an interval that starts somewhere in the past and whose final endpoint is the
speech time (including the speech time). The Extended Now analysis straightfor-
wardly derives the Present Perfect Puzzle by the semantic contradiction of trying
to modify the Extended Now with a past temporal adverbial. It also successfully
derives the Universal Perfect reading, which is an entailment whenever the present
perfect takes an imperfective aspect (t ⊂ τ(e)/τ(s) and the right boundary of t is
the speech time) (Iatridou et al., 2003).

However, linguists who take this approach differ in how the other perfect read-
ings are derived. Some people, such as Portner (2003), propose that the present
perfect presupposes that there is a state that follows from the event which answers
the topic question.\footnote{For Portner (2003), the Extended Now is associated with the present tense in general, instead of the perfect operator.} Others, such as Pancheva and von Stechow (2004), leave the
status of other perfect readings open. With the exception of Pancheva and von

Stechow (2004), the crosslinguistic data is also out of reach for this group of analyses: since the Present Perfect Puzzle is a contradiction that directly follows from the Extended Now semantics, we will have to (somewhat) arbitrarily assume that languages like French do not have the Extended Now. Pancheva and von Stechow’s proposal will be discussed in detail in Chapter 5. I will also go over Iatridou et al.’s (2003) point about the Universal Perfect, as well as Portner’s (2003; 2011) proposal regarding current relevance and the topic question.

3.1.2.4 Previous proposals based on competition

As I mentioned earlier, it has been noted in the literature that the present perfect combination is special compared to the other perfect constructions: past and non-finite perfects do not have similar inferences and constraints as the present perfect. The present perfect seems to be special in that its semantics is too similar to that of the past and the competition between the two is responsible for the special perfect readings that we see.

Several accounts, including Schaden (2009) and Pancheva and von Stechow (2004), having taken into account the crosslinguistic variation, argue that the special properties the English present perfect result from the competition with the past tense. I believe that this line of research is promising, but neither of these two previous analyses listed above have a satisfactory solution.

In particular, Schaden (2009) argues that the present perfect and the simple past compete, but they differ in markedness, with the marked construction having the additional inferences. Schaden (2009) argues that in languages like English, the simple past is unmarked, and the present perfect is marked. In languages like French, German, and Italian, it is the other way round. This will explain why the present perfect in these other languages does not get the additional inferences the English present perfect has, and behaves like a ‘general-purpose past perfective’. However, Schaden (2009) offers no insights into how the special perfect readings arise other than that it is ‘marked’.

Pancheva and von Stechow (2004) on the other hand, base their analysis on the difference between the English and German present perfects. They argue that in both languages, the present perfect has a compositional meaning, and competes with the past tense. The two languages differ in their semantics of the present tense, which results in slightly different present perfect semantics. In English, the result of the competition is that the present perfect is a scalar alternative to the simple past and is strengthened to an Extended Now semantics, while in German,
there is no scalar relationship between the present perfect and the simple past and no Extended Now semantics arise. This analysis essentially predicts that languages with and without the Present Perfect Puzzle can be distinguished based on their semantics of the present tense. However, it has been noted by Rothstein (2008) that this is not true: in particular, Swedish has a present tense which behaves like German, but its present perfect behaves like its English counterpart. In addition, it is not clear if the English present perfect is in a scalar relationship with the past tense in the first place, a point which I will address in Chapter 5.

There will be more detailed discussion of these previous accounts in Chapter 5.

3.1.2.5 Weak Extended Now

Based on the reasoning above, Grønn and von Stechow (2017) stipulate that we may benefit from a weaker version of the Extended Now, where the present perfect may function as either a past tense, or have the Extended Now semantics:

\[
[\text{Perfect}] = \lambda p. \lambda t. \exists t'[t' \leq t \land p(t')]
\]

where \( t' \leq t \) iff \( \neg \exists t''[t'' \subseteq t' \land t'' > t] \)

This seems to be the appropriate compromise between the Extended Now analysis and the observation in languages like French, where the present perfect does behaves like a past tense. However, Grønn and von Stechow (2017) only briefly mention this possibility, and leave the derivation of the English perfect readings and the crosslinguistic data given this version of the perfect to future research.

To summarize the discussion so far, it seems that the weaker version of the Extended Now will allow for the necessary flexibilities of the present perfect readings in both English and languages like French. The crucial feature of this proposal is that the reference time of a present perfect sentence may either be an Extended Now interval, or a past interval. In the latter case, it will be an alternative to the past tense, and some kind of competition mechanism determines the distribution of the two alternatives. The next few sections will present evidence that supports this analysis.

3.1.3 English data

In the list of perfect-readings in (1), we can see that the first four readings (experiential/existential, resultative, recent past/hot news) all have in common in that they assert the existence of a (possibly recent) past event. This is known as
the existential perfect (21) (as opposed to the ‘Universal Perfect’) reading in the terminology of Iatridou et al. (2003).

(21) The existential perfect
Mary has been to Paris.
\[ \exists t \exists e [ t \leq t_c \land \text{Mary-go-to-Paris}(e) \land \tau(e) \subseteq t ] \]

As summarized in the previous subsection, the available groups of analyses all have in common that an event is asserted to have taken place prior to the speech time. The present perfect construction in languages like French, despite their differences with the English present perfect, always has at least the existential reading along the lines of (21). This suggests that the existence of a past event may be part of the basic semantics of this construction. This reading is close enough to the (existential) past tense reading along the lines of (22), with only minor ontological differences (and as Section 3.1.2.1 shows, there is really no particular reason for the particular choices of relative past or perfect aspect representations).

(22) \[ \exists t'[t' < t_c \land \exists e [ \tau(e) \subseteq t' \land \text{Mary-arrive}(e) ] \]

In addition, once we accept that the English past tense has either anaphoric or unique presuppositions, it is clear that whenever these presuppositions are satisfied, the present perfect is infelicitous, and the past tense is obligatory. First, consider the cases where the past tense is licensed by uniqueness.

(23) (Talking about what happened yesterday:)
   a. #Mary has attended the semantics lecture.
   b. Mary attended the semantics lecture.

(24) (Pointing at a church. There is no contextually salient past reference time.)
   a. #Who has built this church?
   b. Who built this church?

Importantly, the present perfect is judged infelicitous in (23)-(24) despite the possible perfect readings that would be reasonable in these contexts. In particular, (23) may have the current relevance reading that because Mary attended the lecture yesterday, she has the necessary understanding of the subject to be useful to the interlocutors. Likewise, (24) is uttered with the interlocutors looking at the result of the building event, and hence should qualify for the resultative reading.
that the result of the event still holds. In any case, (23)-(24) should at least qualify for the existential perfect reading in (21). However, in both examples, the present perfect must give way to the past tense because the context satisfies the presuppositions of the past tense. This observation poses difficulties for analyses that treat these perfect readings as something inherent to the present perfect, since they have no obvious way of ruling out the present perfect in these examples.

Similarly, for the anaphoric past reading, note that whenever the sentence contains an explicit past adverbial, the past tense is always felicitous (25), and the present perfect is always prohibited.

(25) (There is no contextually salient past time:)
   a. Yesterday Mary ran/#has run a marathon.
   b. Mary ran/#has run a marathon yesterday.

Assuming that temporal adverbials can provide the reference time for the anaphoric past, this observation would suggest that the Present Perfect Puzzle is really reflecting the fact that the presuppositionally stronger anaphoric past should be used.²

(26) a. #Mary has arrived yesterday.
   b. Mary arrived yesterday.

The patterns in (23)-(26) are very similar to the typical observation when two alternatives with different presuppositions compete. Some examples include:

(27) (We know that John has two kids.)
   a. #All of John's kids play hockey.
   b. Both of John's kids play hockey.

   both is a presuppositionally stronger alternative to all

(28) (We know that the Earth is round.)
   a. #The geology professor believes that the Earth is round.
   b. The geology professor knows that the Earth is round.

   know is a presuppositionally stronger alternative to believe

It follows that a reasonable assumption would be that the present perfect (in

²Recall from Chapter 2 that Michaelis (1994) proposes that the English present perfect is explicitly marked as non-anaphoric. These observations mean that we can analyze the apparent non-anaphoricity as a side effect that follows from the competition with the anaphoric past.
English as well as in languages like French) is actually compatible with a past tense reading in terms of assertion (as in the existential reading), but it does not have the same kind of anaphoricity and uniqueness presupposition that the past tense has. We should be able to apply whatever mechanism that rules out *all* and *believe* in (27)-(28) to the tense domain.

We can compare English with German in this respect. Recall that Kratzer (1998) shows that the German past tense behaves exactly like what we expect from an anaphoric past tense, being infelicitous in the following context:

(29) (Pointing at a church:)

#Wer baute diese Kirche?
who built this church

In this context, German must use the present perfect, unlike in English where the present perfect is infelicitous. This further suggests that the different distribution of the present perfect in the two languages may be due to the distribution of the past tense. Since the German past is strictly anaphoric (cf. Kratzer (1998) and Chapter 2), in examples like (29), the present perfect does not have a presuppositionally stronger alternative.

In fact, the only perfect reading not compatible with the past tense is the Universal Perfect reading, where the event or state is asserted to start in the past and last all the way to the speech time. It has been shown by Iatridou et al. (2003) previously that this reading requires: (i) the reference time is an interval that starts in the past and ends at the speech time (i.e. the Extended Now); (ii) the underlying aspect is imperfective/progressive, which satisfies the Subinterval Property. Given that the past tense requires a past reference time, it follows that there is no competition in this case. In languages like French and Italian, the present perfect is also associated with an underlying perfective aspect (the event or state is asserted to have completed), which may explain the fact that in these languages, the Universal Perfect reading is expressed with the present tense (30).

(30) I bambini guardano la TV dalle cinque.
the children watch.3RD.PL.PRESENT the TV since-the five
'The children have been watching TV since 5.'

While Iatridou et al. (2003) successfully account for the Universal Perfect reading, they also propose that the reference time of a present perfect sentence must be the Extended Now. Taking into account the observations above, it seems that
we need to adopt a weaker version of the present perfect, so that the reference
time of a present perfect sentence can be either an Extended Now interval, or a
past interval. In doing so, we can still account for the Universal Perfect reading,
as well as allowing for the possibility of the present perfect having a past reading.

As I mentioned in the previous section, this option has been stipulated by
Grønn and von Stechow (2017), where they have the following definition of the
perfect operator.

\[
\text{PERFECT} = \lambda p. \lambda t. \exists t' [t' \leq t \land p(t')]
\]

where \( t' \leq t \) iff \( \neg \exists t'' [t'' \leq t' \land t'' > t] \)

In this case, when the temporal argument is saturated by the present tense, the
reference time can either be an Extended Now interval or a past interval. This
seems to be the appropriate compromise between the Extended Now analysis and
the observation in languages like French, where the present perfect does behave
like a past tense.

To further support this view, we also have previously unnoticed data that
require the present perfect to be able to provide a past reference time. These are
cases where the present perfect provides an antecedent to the anaphoric past. For
example:

\[(32)\]

Mary has been to the British Museum. She saw the Rosetta Stone there.

If the present perfect always introduces an Extended Now interval, we will need
some kind of intermediate accommodation process to account for the felicitous use
of the anaphoric past in the subsequent sentence. However, this kind of examples is
so prevalent that it is more likely that they simply reflect the antecedent-anaphor
relationship between the reference times of the two sentences. In fact, we can
construct sentences parallel to the donkey anaphora sentences in the nominal
domain, such as:

\[(33)\]

Everybody who has been to the British Museum saw the Rosetta Stone there.

The past tense in the nuclear scope of (33) is anaphoric to the time in the re-
strictor, namely, the time that each person visits the museum. It does not need a
contextually salient past time to be felicitous, and the sentence overall does not
have such as presupposition. This is exactly the pattern we observe with donkey
anaphora, where the antecedent is provided by an indefinite in the restrictor. For
tenses, we may conclude that the present perfect in the restrictor functions as an ‘indefinite’ past and provides an antecedent for the anaphoric past in the nuclear scope.

I argue that we need an analysis along the lines of Grønn and von Stechow’s (2017) hypothesis where the reference time of a present perfect sentence is allowed to be either an Extended Now interval, or a past interval. In the latter case, it has the past tense as a presuppositionally stronger alternative. For English, this will derive the patterns in (23)-(26) and (32)-(33).

3.1.4 Crosslinguistic data

As I mentioned earlier, the present perfect constructions in many other languages do not behave the same way as the English present perfect. In particular, while they share certain properties with the English present perfect, such as the resultative reading, the existential/experiential reading, the recent past reading, and are felicitous without a contextually salient reference time, they also share properties with the English past tense in that they can engage in past narratives with a contextually salient past reference time, and are not subject to the Present Perfect Puzzle constraint.

Some of the data cited below are taken from the Parasol, the Oslo Multilingual Corpus, and the RuN-Euro corpus, as in Grønn and von Stechow (2017).

In (34), we see that the present perfect construction in French, German and Italian has the experiential/existential reading, where it is asserted that (at least) one event of Mary visiting the Louvre has taken place in the past.

(34) The experiential/existential reading

a. Mary hat das Louvre besucht.
   Mary AUX the.ACC Louvre visited.PP
   ‘Mary has visited the Louvre.’ (German)

b. Mary a visité le Louvre.
   Mary AUX visited.PP the Louvre
   ‘Mary has visited the Louvre.’ (French)

c. Mary ha visitato il Louvre.
   Mary AUX visited.PP the Louvre
   ‘Mary has visited the Louvre.’ (Italian)

In (35), we see that a telic event brings about a result state which holds at the speech time. In this case, there is an inference that the key is still lost, as a result of the asserted losing event.
The resultative reading

a. Ich habe den Schlüssel verloren.
   I AUX the key lost.PP
   ‘I have lost the key.’ (German)

b. J’ai perdu la clé.
   I-AUX lost.PP the key
   ‘I have lost the key.’ (French)

c. Ho perso la chiave.
   AUX.1SG lost.PP the key
   ‘I have lost the key.’ (Italian)

In addition, the inference that the key is still lost is not obligatory, since it depends on the context in which the sentence is uttered. The sentences above are also felicitous as answers to the question *What happened yesterday?* (see below) and may be continued with an assertion such as *but I found it again*.

The ‘hot news’ and the ‘recent past’ readings in these languages also use the present perfect construction. This reading is also closely related to the existential and the resultative readings, in that it also asserts the existence of a past event (often recent). There seems to be little difference between the same reading in these languages and its English counterpart.

Hot news/recent past

a. Gryffindor hat das Spiel gewonnen!
   Gryffindor AUX the game won.PP
   ‘Gryffindor has won the match!’ (German)

b. Gryffindor a gagné le match!
   Gryffindor AUX won.PP the match
   ‘Gryffindor has won the match!’ (French)

c. Gryffindor ha vinto la partita!
   Gryffindor AUX won.PP the match
   ‘Gryffindor has won the match!’ (Italian)

Finally, the present perfect construction in German, French and Italian can occur with a past temporal adverbial, and can also be used when there is a contextually salient past reference time.

No Present Perfect Puzzle

a. Harry Potter hat letztes Jahr einen Nimbus Zweitausend
   got.PP
   bekomen.
   Harry Potter AUX last year a two-thousand Nimbus two-thousand
   bekommen.
'Harry Potter got a Nimbus Two Thousand last year.' (German)

b. Harry Potter, lui, a eu un Nimbus 2000 l’année dernière.
   'Harry Potter got a Nimbus Two Thousand last year.' (French)

   'Harry Potter got a Nimbus Two Thousand last year.' (Italian)

Grønn and von Stechow (2017, (17))

(38) Salient past reference time
   (Talking about yesterday’s trip to the park.)

   a. Wir haben die Tauben gefüttert.
      we AUX the pigeons fed.PP
      'We fed the pigeons.' (German)

   b. Nous avons nourri les pigeons.
      we AUX fed.PP the pigeons
      'We fed the pigeons.' (French)

   c. Abbiamo dato da mangiare ai piccioni.
      AUX given.PP to eat the pigeons
      'We fed the pigeons.' (Italian)

Interestingly, these languages also share the feature that the past tense (the simple past) form is not used in general. In particular, in German, this is the case except for certain statives, auxiliaries and modals. In French and Italian, at least in the standard variety, the simple past form is reserved mostly for formal writing.

For the Italian simple past, traditional grammarians label it as the ‘remote past’ (il passato remoto), in contrast to the present perfect, which is called the ‘recent past’ (il passato prossimo). However, as (39) shows, temporal remoteness by itself does not require the use of the simple past or prohibit the present perfect construction, and register still plays a major role.

(39) Temporal remoteness (Italian)

   a. Vespasiano iniziò la costruzione del Colosseo.
      Vespasiano started the construction of-the Colosseum
      'Vespasiano started the construction of the Colosseum.'
      (from the Italian wikipedia on Vespasiano)

   b. Vespasiano ha iniziato la costruzione del Colosseo.
      Vespasiano AUX started.PP the construction of-the Colosseum
      'Vespasiano started the construction of the Colosseum.'
      (colloquial, or casual writing)
In light of the discussion of the English past tense, we also note that the past tense in the standard varieties of French, German and Italian (in registers where it is available) seems to be only anaphoric: uniqueness of the reference time does not license the use of the past tense, and the present perfect is used instead.

(40) **Uniqueness**
(Pointing at a church:)

a. Wer hat diese Kirche gebaut?
   who AUX this church built.PP
   ‘Who built this church?’ (German)

b. Qui a construit cette église?
   who AUX built.PP this church
   ‘Who built this church?’ (French)

c. Chi ha costruito questa chiesa?
   who AUX built.PP this church
   ‘Who built this church?’ (Italian)

(41) (Pointing at a church:)

a. #Wer baute diese Kirche?
   who built this church
   ‘(Lit.) Who built this church?’ (German)

b. #Qui construisit cette église?
   who built this church
   ‘(Lit.) Who built this church?’ (French)

c. #Chi costruì questa chiesa?
   who built this church
   ‘(Lit.) Who built this church?’ (Italian)

The fact that the present perfect is prohibited in the uniqueness contexts in English and allowed (in fact, the only choice) in these other languages, suggests that we may be dealing with some kind of (absence of) competition here. In addition, the absence of the anaphoric past in the colloquial register of the latter group of languages may also explain the wider distribution of the present perfect as in (38)-(37), under the assumption that the present perfect construction can indeed function as a past perfective in these languages, and the anaphoric simple past, if it were an option, would be presuppositionally stronger like its English counterpart.

Putting the competition story together, our hypothesis is then that the English present perfect should have the weaker version of the Extended Now semantics as in Grønn and von Stechow (2017) and actually allows the reference time to be a past interval. It only behaves the way it does in English due to two factors: (i) the
availability of the presuppositionally stronger alternative in the same register, the past tense; (ii) the fact that the English past tense morphology not only spells out an anaphoric past, but also a unique past. The former contributes to the fact that the present perfect construction in languages like French, where the simple past is not generally available, behaves like a ‘general purpose past perfective’ in the sense of Bertrand et al. (2017), where the present perfect fills in for the anaphoric reading and narrative progression. The latter derives the fact that the English present perfect is subject to further restrictions where the uniqueness of the past reference time is satisfied.

In other words, we would like to be able to conclude that the English present perfect gets its special inferences and distribution as antipresuppositions that follow from this competition with the past tense. If this is the case, we do not need to propose a separate category of ‘general purpose past perfective’ for the French present perfect as in Bertrand et al. (2017), since its features simply reflect what the present perfect should behave like in the absence of competition.

In order to account for these data, and spell out the competition analysis in detail, it is necessary to have a thorough understanding of the parallel phenomena in the nominal domain. In the next few sections, I will first discuss the study of DP definiteness and the way of achieving dynamic binding and accounting for the indefinite-definite competition. Then I will propose an analysis for the tenses.

3.2 Comparison with the nominal domain

3.2.1 Anaphoric vs. unique definites

The analysis that the English past tense has both the anaphoric and the uniqueness presuppositions that should be separated from each other is reminiscent of the analyses of the definite article in the recent literature. While traditionally, the analysis of definites fall into two categories: anaphoricity (familiarity) and uniqueness, it has been noted in the recent literature that there are languages which possess both an anaphoric definite article and a unique definite article, suggesting that we should separate the two concepts. One example is the German strong and weak articles (Schwarz, 2009).

Schwarz (2009) shows that in German, the definite article may phonologically reduce when combined with a preposition (known as the weak article), or it may not (the strong article). Schwarz (2009) shows that the weak article differs from the strong article in that it presupposes uniqueness, while the strong article is
anaphoric. The strong article is also chosen over the weak article in other instances where uniqueness is not met. For example, in (42), *in dem Buch* ‘in the book’ has the strong article, since the context is one where there is obviously no unique book in each library.

(42) In jeder Bibliothek, die ein Buch über Topinambur hat, sehe ich in dem Buch nach, ob man Topinambur grillen kann.

‘In every library that has a book about topinambur, I check in the book whether one can grill topinambur.’

(Schwarz, 2009, p.242)

In (43), I summarize the cases where anaphoric definite shows up. I use English to illustrate the fact that the English definite article also has the anaphoric reading.

(43) **Anaphora with the strong article**

antecedent...anaphor

a. **Anaphora with different descriptions, epithets**
   - a semanticist ... the person/the idiot

b. **Non-uniqueness**
   - one of the rooms in the hotel ... the room
   - a book about potions ... the book

c. **Relational anaphora**
   - a married woman ... the husband (compare: *the man, *him)

d. **Bishop anaphora**
   - a bishop meets another bishop...the bishop blesses the (other) bishop

In addition, Schwarz notes that there seems to be something special about the relationship between an indefinite antecedent and an anaphoric definite that goes beyond the notion of contextually supplied domain restriction relations. This resonates with earlier observations about the formal link between the antecedent and the anaphoric pronoun (see Heim (1990, a.o.)). For example:

(44) **The formal link**

a. a married woman...#the man/#him

b. a woman married to a man...✓ the man
In a uniqueness-only analysis of the definite (as well as a D-type analysis of pronouns where they are treated as reduced unique definites) with contextually supplied domain restrictor (the variable C in the literature, see von Fintel (1994), among others), the relation of marrying should be easily available in (44-a) to license the man/him, contrary to fact. This starkly contrasts with the man with an explicit indefinite antecedent in (44-b), as well as with definites with relational headnouns such as the husband in (44-c). Schwarz takes these as evidence that the anaphoric definite needs to have anaphoricity directly built into its semantics, in a more restrictive way than contextually supplied domain restrictor relations. His proposal achieves this effect by letting the anaphoric definite article have an additional index argument (see (45)).

Schwarz’s analysis has motivated similar proposals for other languages in the subsequent literature, with the idea of separating uniqueness and familiarity as sub-concepts of definiteness. This idea has been proposed for many similar contrast in various languages, such as the German strong and weak articles, the personal and demonstrative pronouns in several languages³, as well as definites in Fering, Akan, Chinese, Thai, American Sign Language, among others (Schwarz, 2009, 2013, 2019; Irani, 2016; Jenks, 2015, 2018; Arkoh and Matthewson, 2013; Patel-Grosz and Grosz, 2017, a.o.).⁴

Assuming that the English past tense, like the definites in these languages, has both an anaphoric version and a unique version, as the data in Chapter 2 suggests, we may be able to carry over the analysis for the two readings of definites into the temporal domain. Let us first see how this group of proposals analyzes the two readings.

In these proposals, unique and anaphoric definites are structurally different and they involve a weak and a strong definite articles respectively. The latter has an additional index argument of type e (y in (46)).

(45) Unique definites

³Some examples include German er/der, Portuguese ela/esta, French elle/celle-ci, Hebrew hi/ha-hi, see Patel-Grosz and Grosz (2017).
⁴In Jenks (2015, 2018), Chinese and Thai bare nouns and demonstratives are analyzed as unique and anaphoric definites, but later literature suggests that this may not be the case, see Dayal and Jiang (2020) for a counterargument for Mandarin Chinese.
a. DP
   /\   /
  D   NP
  the\  s_r
weak  some noun phrase
where the\ is the weak definite article, and NP is a nominal property.

b. \[\text{the}_{\text{weak}}\] = \(\lambda s_r.\lambda P_{(e, st)} : \exists! x[P(x)(g(s_r))] . tx. P(x)(g(s_r))\)

c. \[\text{NP}\] = \(\forall x. [\text{NP}]^g(x)(g(s_r))\)

Anaphoric definites

a. DP
   /\   /
  y   DP
  D   NP
  the\  s_r
strong  some noun phrase
where the\ is the strong definite article, and NP is a nominal property.

b. \[\text{the}_{\text{strong}}\] = \(\lambda s_r.\lambda P_{(e, st)} \cdot \lambda y : \exists! x[P(x)(g(s_r)) \land x = y] . tx. P(x)(g(s_r)) \land x = y\)

c. \[\text{NP}\] = \(\forall x. [\text{NP}]^g(x)(g(s_r)) \land x = y\)

In a static semantics framework such as Heim and Kratzer (1998), the context has to provide a value for the index via the assignment function. In Schwarz (2009) and the subsequent literature with two kinds of definites, it is assumed that this index may be dynamically bound (see below). In addition, note that the anaphoric definite is built on the basis of the unique definite. This is motivated by the fact that in languages that make this distinction, the unique definite usually has simpler morphology than its anaphoric counterpart. The structures of the two kinds of definites are shown in (45) and (46). We can see that both have a situation argument \(s_r\), which is known as the resource situation in which the uniqueness is evaluated. The partiality of situations with respect to possible worlds will resolve the issue of domain restriction (Kratzer, 2004, 2007, a.o.). In the case of definites, Schwarz (2009) shows that the resource situation may be determined in several ways: it may be bound to the exemplifying situation of the NP in the restrictor scope of the quantifier, otherwise, it may be contextually supplied, or be identified.
with the topic situation.

This group of analyses is in general open about how the index is bound and about the analysis of the indefinite. This is a technical issue, since the familiarity and the uniqueness analyses of definites historically tend to fall into two different formalization choices: Discourse Representation Theory (DRT) in the generalized sense (Kamp, 1988; Kamp and Reyle, 1993; Kamp et al., 2011; Heim, 1982, 1983a, a.o.)\(^\text{6}\), where definites are treated as familiar variables, and the E-type analysis (Heim, 1990; Elbourne, 2005, 2013, a.o.), where definites have uniqueness presupposition.\(^\text{8}\) The two groups of formalizations also correspond to different treatments of indefinites: the former analyzes indefinites as variables with a novelty presupposition, while the latter treats indefinites as generalized existential quantifiers (see next subsection). In addition, the former is a dynamic system in the sense that the semantics of sentences are treated as context update potentials, namely, mappings from a context prior to the utterance to a context updated with the asserted information. The latter group of analyses is typically static, in the sense that the semantics of the sentences are truth conditions, and we do not care too much about how the context changes as the conversation goes. This difference will also lead to different approaches to anaphora and how anaphora is represented in the system. Both groups of analyses face certain difficulties in deriving all the relevant readings: DRT has the property of ‘unselectively’ binding the variables under the scope of a quantifier and this will lead to issues such as the ‘Propor- tion Problem’ (see Heim (1990, a.o.)); static semantics, on the other hand, does not have much to say about phenomena such as cross-sentential anaphora and presupposition projection.\(^\text{78}\).

3.2.2 Indefinites vs. definites

Regarding the formal system, a related issue is the relationship between definites and indefinites, which are treated differently in DRT and E-type analyses. Since Heim (1991), the literature has generally accepted the idea that indefinites

\(^\text{6}\)DRT in generalized sense refers to formal systems where definites, pronouns, and indefinites are treated as variables. In particular, indefinites are not inherently existential. Quantificational determiners and conditional operators may simultaneously bind multiple variables in their scope. This includes not just DRT in the strict sense, but also Heim’s File Change Semantics. The reader can refer to Heim (1990) for a discussion.

\(^\text{8}\)But see Kadmon (1987) for a version of DRT where definites must satisfy a kind of uniqueness condition.

\(^\text{7}\)With the exception of Schlenker (2009), where a non-dynamic system is proposed for presupposition projection.

\(^\text{8}\)There are also other versions of dynamic semantics that do not assume a variable-analysis of definites and indefinites, such as Chierchia (1995)
and definites are distinguished by their presuppositions. Their distribution follows the typical patterns between alternatives with different strengths of presuppositions. In particular, Heim (1991) observes that whenever the presupposition of the definite article is satisfied, the indefinite article is infelicitous:

\[(47) \quad \begin{align*} 
  a. & \quad \#A \text{ biological father of Bill is here.} \\
  b. & \quad \#A \text{ weight of these shoes}
\end{align*}\]

In addition, when the context is not clear about whether the presupposition of the definite article is satisfied, using the indefinite also generates certain inferences, such as:

\[(48) \quad \text{Last night Richard listened to the Beaux-Arts Trio, and he drank with a pianist afterwards.} \quad \text{(Heim, 1991, translated from German)}\]

Given that there is exactly one pianist in the trio, using the indefinite *a pianist* suggests that Richard drank with some other pianist.

However, we cannot simply argue that indefinites presuppose non-uniqueness. For example:

\[(49) \quad \begin{align*} 
  a. & \quad \text{A pathologically curious neighbor of mine is gossiping again.} \\
  b. & \quad \text{Of course Mary has a child. In fact, she has two.}
\end{align*}\]

\[(49-a)\] does not seem to presuppose that there is more than one pathologically curious neighbor. The continuation in \((49-b)\) is not redundant either. In general, using the indefinite does not suggest non-uniqueness. Instead, the general pattern is that the indefinite is prohibited whenever the definite can be used.

Based on these observations, Heim (1991) and subsequent linguists suggest that the distribution of definites and indefinites follows from the fact that the definite article is a presuppositionally stronger alternative to the indefinite one. The two alternatives have the same meaning otherwise. Heim proposes an independent pragmatic rule, Maximize Presupposition!, to regulate the distribution of the articles.

\[(50) \quad \text{Maximize Presupposition! as defined in Heim (1991)}\]
\[\quad \text{Presuppose as much as possible!}\]

It follows from this rule that whenever there are two alternatives with different
presuppositions, the speaker should use the one with stronger presuppositions whenever it is possible to do so. The infelicity of (47) then follows from failing to follow this rule, given that the biological father of Bill and the weight of a particular pair of shoes should always be unique. The inference of (48) follows from the listener’s assumption that the speaker is following Maximize Presupposition, and reasons that if there were exactly one pianist, the speaker would have used the pianist. Later, Heim (2011) also stipulates that DPs in languages that appear to be ambiguous between the definite and the indefinite readings (e.g. bare DPs in Slavic languages) are simply indefinites with a wider range of felicitous uses due to the absence of such competition.

In the temporal domain, this corresponds to the observation made in the previous section, that the present perfect and the past tense are in a similar competition relationship, with the past tense being presuppositionally stronger. The indefinites that appear ambiguous due to the absence of competition correspond to the present perfect as a ‘general-purpose past perfective’ and the absence of competition with the simple past in languages like French. In particular, the indefinite-like present perfect in those languages shows properties of both the anaphoric past (narrative progression, anaphoric use) and the indefinite past (existential, experiential, felicitous out of the blue).

The literature since Heim (1991) has noted many similar inferences that result from the competition with presuppositionally stronger alternatives. They are known as antipresuppositions (or implicated presuppositions) (Heim, 1991; Sauerland, 2008; Percus, 2006; Singh, 2011, a.o.). There are several ways to implement the competition idea, either as an independent principle (as in (50)), or to derive it from general principles of implicature computation (Magri, 2011; Marty, 2017). For the purpose of this dissertation, the particular implementation of this process does not make a difference. In this dissertation, I will simply refer to this phenomenon as ‘Maximize Presupposition’.

I follow Katzir (2007) and assume that a structure only competes with structurally equally or less complex alternatives. For indefinites and definites, this will mean that neither anaphoric nor unique definites can be structurally more complex than indefinites, in order to ensure that the indefinites can have them as presuppositionally stronger alternatives.

In addition, it has been noted in the literature that indefinites can act as antecedents of the anaphoric definites (and pronouns). For example:

\[(51) \quad \text{a. Mary has a cat. It is calico.}\]
b. At the book fair, everybody who purchased a book got a signature from the author.

In the DRT analyses of definites and indefinites, people like Heim (1982) have proposed the Discourse Novelty (indefinites represent new variables) and Familiarity (definites represent old variables) principles that captures the intuition that there may be a competition relationship, but they do not treat indefinites as presuppositionally weaker than definites. On the other hand, in uniqueness-based analyses of definites, definites like the NP are analyzed as denoting the unique individual that is NP, and indefinites are treated on par with generalized existential quantifiers. In these analyses, there is little discussion about how to derive the observations made by Heim (1991). This discussion is also absent in the recent literature that accepts both anaphoric and unique definites.

Taking these issues into account, for our analysis of the tenses, I believe that a desirable proposal should be a system in which: (i) indefinites have definites as presuppositionally stronger alternatives; (ii) indefinites are semantically similar to definites so that they can fill in for definite readings in the absence of competition; (iii) indefinites are able to bind the index of anaphoric definites in a dynamic fashion (cf. the discussion of formal systems in the previous subsection).

In the next chapter, I will illustrate how we can modify Heim's (1982) File Change Semantics, taking into account of both anaphoric and unique definites, and carry over the analysis to the tenses.
Chapter 4

An analysis in update semantics

In this chapter, I will illustrate a way of modifying the Heimian File Change Semantics (Heim, 1982, 1983a), taking into account both uniqueness and familiarity, as well as the Maximize Presupposition idea. I will first illustrate this with definites and indefinites, and then extend it to tenses.

4.1 Versions of dynamic semantics

For the purpose of this dissertation, we need dynamic semantics for the same reasons that it is developed for: the various kinds of anaphora which involve binding mechanisms not provided by static semantics, as well as the presupposition projection patterns observed. In particular, we would like to capture the observations that: (i) many languages have an anaphoric past tense that behaves like a pronoun and can be used for readings such as cross-sentential anaphora and donkey anaphora; (ii) the English past tense has an additional uniqueness version, which is not present in languages like German, and the anaphoricity-uniqueness split is parallel to the pattern observed with definite articles; (iii) the intra- and cross-linguistic distribution of the presuppositionally weaker present perfect parallels that of the indefinite; (iv) the distribution of the alternatives and the corresponding inferences and antipresuppositions are regulated by a Maximize Presupposition-like principle.

Each of the previous versions of dynamic semantics and context update has focused on one or more of the issues listed above (Heim, 1982, 1983b; Kadmon, 1987; Groenendijk and Stokhof, 1991; Nouwen, 2003; Stalnaker, 2002; Ciardelli et al., 2018, a.o.). In general, they have in common that sentences have Context Change Potentials (CCPs), which are functions from information states to information states. Information states roughly correspond to our generic use of the word ‘context’. More precisely, an information state is a set of possibilities, which
can be a set of assignments, worlds, or assignment-world pairs, depending on the purpose (see Nouwen et al. (2010); Rothschild and Yalcin (2016); Sudo (2021, a.o.) for a summary). The CCP of a sentence may be either its semantic value (in compositionally dynamic systems), or be computed from additional pragmatic rules (e.g. as in Stalnaker (2002)). The choice here does not make a difference for the purpose of this dissertation.

In this dissertation, I will adopt a version of Heim’s File Change Semantics (Heim, 1982, 1983b), due to its versatility and simplicity. In this chapter, I will illustrate how sentences with different tense alternatives update the context and how the alternatives compete. The compositional details will be ignored for the purpose of this dissertation.

4.2 Basics

In File Change Semantics, the context is defined as in (1).

(1) **Context**

The context $c$ is a set of assignment function-world pairs $\langle f, w \rangle$ such that:

a. $\{w \mid \exists f (\langle f, w \rangle \in c)\}$ is the Stalnakerian Context Set, and

b. $\forall f, f' \text{ s.t. } \exists w (\langle f, w \rangle \in c)$, $\text{dom}(f) = \text{dom}(f')$, written as $\text{dom}(c)$.

There are two parts of this definition: the worlds (1-a) reflect the Stalnakerian Context Set, and each assignment function has the same domain, reflecting the idea that all the participants have access to the same set of discourse referents.

The definition of the Stalnakerian Context is given below.

(2) **The Stalnakerian Context**

$\cap \{p \mid p \text{ is a mutual belief of the conversation participants}\}$

In other words, this is a set of worlds that serve as candidates for the actual world, where each world is consistent with the mutual belief of the speakers. In Stalnaker (2002), each assertion of a proposition $\phi$ is a suggestion to update this set of worlds, by eliminating those worlds where $\phi$ is false. The world parameter in File Change Semantics (roughly) reflects this idea.

For now, I assume that assignments are partial functions from $\mathbb{N}$ to $D_e \cup D_i \cup D_v$ (the union of the domains of individuals, intervals and events).

(3) **Some shorthands**

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a. For two assignment functions \( f \) and \( f' \) and a variable \( x \), \( f[x]f' \) stands for 'f' is just like f except that \( \text{dom}(f') = \text{dom}(f) \cup \{x\} \).

b. For two assignment functions \( f \) and \( f' \) and a set of variables \( V \), \( f[V]f' \) stands for 'f' is just like f except that \( \text{dom}(f') = \text{dom}(f) \cup V \).

When a proposition \( p \) is uttered, the updated context is written as \( c + p \). The CCP associated with \( p \) (can also be written as \( +p \)) is a partial function from contexts into contexts.

(4) **Context Update**

If \( p \) does not contain any variable, and \( c + p \) is defined, 
\[
\text{c + p} = \{ \langle f, w \rangle \in c \mid p(w) \}.
\]

(5) \( c + \text{'It's raining'} \)
\[
= \{ \langle f, w \rangle \in c \mid \text{it's raining in } w \}.
\]

If a sentence has a presupposition, the context update will be defined iff the presupposition is defined by the context, or accommodated. In the simple variable-free cases, this means that the context entails the presupposition. I provide an example in (8) (ignoring tense).

Now we are ready to define context entailment and presupposition satisfaction in these simple cases.

(6) **Context entailment**

Let \( p \) be a proposition. A context \( c \) entails \( p \) iff \( \{w\langle f, w \rangle \in c \mid \text{for some } f \} \subseteq p \).

(7) **Presupposition satisfaction (variable-free)**

Let \( c \) be a context. Let \( p \) be a variable-free sentence with presupposition \( \phi \) (a variable-free proposition).

Updating the context \( c \) with \( p \), written as \( c + p \), is defined iff \( \forall \langle f, w \rangle \in c, \phi(w) = 1 \).

(8) \( \text{'It's not raining anymore'} \)

**Presupposition:** it was raining earlier.

\( c + \text{ '+It’s not raining anymore'} \) is defined iff:

a. \( \forall \langle f, w \rangle \in c, \text{ it was raining earlier in } w. \)

If defined, \( c + \text{ '+It’s not raining anymore'} = \{ \langle f, w \rangle \in c \mid \text{it’s not raining in } w \} \).
4.3 Indefinites and definites in the nominal domain

Without any commitment to the compositional details, I will illustrate how sentences containing indefinites and definites update the context, ignoring tenses and aspects for now. I assume that definite and indefinite DPs are labeled with an index, as are predicates. Indices are variables that are predicated by the constituents they label. For example, given the assignment \( f \) and world \( w \), ‘cat\(_1\)’ is treated as applying the predicate ‘cat’ to \( f(1) \), which will be true in \( w \) iff \( f(1) \) is a cat in \( w \).

I argue that indefinites are open about the status of the variable: they can either add information to familiar variables (9-a), or add a new variable to the context (9-b).

(9) Update example for indefinites
Let \( p \) be the LF ‘[a cat\(_1\)] \_came\(_1\)’.

a. if \( 1 \in \text{dom}(c) \):
   \[
   c + p = \{ (f,w) \in c | f(1) \text{ is a cat in } w \land f(1) \text{ came in } w \}\]

b. else:
   \[
   c + p = \{ (f',w) \mid \text{for some } (f,w) \in c, f[1]f' \text{ and } f'(1) \text{ is a cat in } w, \text{ and } f'(1) \text{ came in } w \}.
   \]

Anaphoric definites, in contrast, require that the variable is already in \( \text{dom}(c) \). This is illustrated by the example in (10).

(10) Update example for anaphoric definites
Let \( p \) be the LF [the cat\(_1\)] \_meowed\(_1\).
\[
\begin{align*}
  c + p \text{ is defined iff:} \\
  a. \quad & 1 \in \text{dom}(c), \text{ and} \\
  b. \quad & \text{for all } (f,w) \in c, f(1) \text{ is a cat in } w. \\
  \quad \text{if defined}, \\
  c + p = \{ (f,w) \in c | f(1) \text{ is a cat and } f(1) \text{ meowed in } w \}.
\end{align*}
\]

On the other hand, I propose that unique definites have new indices, for the following reasons: (i) definites licensed by uniqueness do not need an antecedent to be felicitous in general, illustrated in (11-a); (ii) Schwarz (2009) shows that in languages that distinguish unique and anaphoric definites, only the anaphoric
definite is allowed for the anaphoric reading; this is illustrated by the German weak (unique) and strong (anaphoric) articles in (11-b), taken from Schwarz (2009, p.239); (iii) in German the weak article is prohibited even if it (happens to) satisfy uniqueness (11-c), which differs from (11-b) in that the antecedent is ‘the unique ornithologist’.

(11) a. (There is no previously mentioned or contextually salient antecedent:)
The sun just rose.

b. Maria hat einen Ornithologen ins Seminar eingeladen. Ich halte #vom/von dem Mann nicht sehr viel. ‘Maria has invited an ornithologist to the seminar. I don’t think very highly of the man.’

c. Maria hat den einzigartigen Ornithologen an der Uni ins Seminar eingeladen. Ich halte #vom/von dem Mann nicht sehr viel. ‘Maria has invited the unique ornithologist at the university to the seminar. I don’t think very highly of the man.’

In particular, (11-c) suggests that we should not let the unique definite be open about the status of the index. If so, Maximize Presupposition-like principles would not be able to derive the obligatory use of the strong article here, since the unique and the anaphoric definite articles would have independent presuppositions.

For a language like English, where we do not distinguish unique and anaphoric definites morphologically, we may need the definite article in general to be open about the status of the index so that it can cover both the uniqueness and the anaphoric readings. However, we may as well easily analyze the definite article as lexically ambiguous between the two readings. Data-wise it will not make a difference since both definites share the same morphology in English and both are presuppositionally stronger than the indefinite article. Since it will make the competition patterns easier, I will assume a lexical ambiguity analysis for the English definite article.

An update example is given in (12).

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1This is treated as having a familiar index in File Change Semantics, although it is debatable whether ‘familiar index’ is the same thing as ‘anaphoric reading’ or vice versa. See Section 4.6.3.3.
Update example for unique definites

Let $p$ be the LF ‘[the King of France] is bald’.

$c + p$ is defined iff:

a. $1 \not\in \text{dom}(c)$, and

b. for each $\langle f, w \rangle \in c$, there is a unique King of France in $w$.

if defined,

c + p = \{ \langle f', w \rangle \mid \text{for some } \langle f, w \rangle \in c, f[1]f' \land f'(1) \text{ is the unique King of France in } w \land f'(1) \text{ is bald } w \}.

4.4 Logical operators

For the purpose of accounting for presupposition projection and anaphora patterns in sentences, File Change Semantics employs the idea of global and local contexts. Complex sentences update the context in an incremental fashion. In particular, the entire sentence is interpreted against the global context, resulting in an updated Common Ground. On the other hand, a clause may be interpreted against its local context, which results from (sometimes temporary) updates by a previous clause.

For the purpose of this dissertation, we will be concerned with mostly the following patterns.

Presupposition projection and anaphora patterns

a. Conjunction

Mary has stopped smoking presupposes that Mary used to smoke.

Mary used to smoke and she has stopped smoking.

Presupposition: None.

b. Negation

know $p$ presupposes that $p$.

Mary doesn’t know that Bill smokes.

Presupposition: Bill smokes.

c. Conditionals

Bill needs to stop $p$ presupposes that $p$.

If Bill smokes, then he needs to stop smoking.

Presupposition: None.

The definitions of these operators are worked out in the previous literature already, but File Change Semantics as in Heim (1983a, 1982) treats all definites as
anaphoric. In this section, I will illustrate these logical operators with the addition of unique definites.

4.4.1 Negation

Recall from earlier sections that when updating the context with a sentence containing an anaphoric definite or pronoun, we checks all the \((f, w)\)'s and see if the assertion holds in those worlds with the corresponding assignment. If yes, then we keep that pair, otherwise we discard that pair.

Indefinites and unique definites may extend \(\text{dom}(c)\) with some new variable, and for each \((f, w)\), we let \(f\) assign that variable to a suitable individual in the corresponding \(w\). If it is possible to do so, then we check each of the updated \((f', w)\)'s. This results in a context with extended \(\text{dom}(c)\) (i.e. each of the \(\text{dom}(f)\)'s.)

The basic observation regarding negation and indefinites is that the discourse referent introduced by the indefinite is not available to subsequent anaphoric elements.\(^2\)

(14) Mary doesn't have a cat. #It is black.

Unique definites, on the other hand, seems to always have the wide scope. (15) shows that it is possible to refer back to the individual denoted by the unique definite under the scope of negation.

(15) Mary hasn't met the new semanticist yet. But Bill has met him already.

(16) Context update rule for negation

a. Let \(c\) be a context, let \(p\) be an LF of the form [not \(q\)] for some LF \(q\) (not containing any unique definites), and let \(V\) be the set of variables that appear in \(q\).

\[
c + p = \{(f, w) \in c | \neg \exists (f', w)' [f[V]f' \land (f', w) \in c + q] \};
\]

b. Let \(c\) be a context, let \(p\) be an LF of the form [not \(q\)] for some LF \(q\), and let \(V\) be the set of variables of the unique definites in \(q\).

\[
c + p = \{(f', w) \in c | f[V]f' \land (f', w) \not\in c + q) \};
\]

(16-a) captures the observation in (14), that the discourse referent added by the indefinite under the scope of negation is ‘trapped’ inside the negation. (16-b) captures the observation in (15), where the unique definite under the scope of negation can set up a new discourse referent that is available outside the negation.

\(^2\)We are ignoring cases like wide scope/specific indefinites.
In addition, in both (16-a) and (16-b), we can see that in order to compute \( c + \text{not } q \), we must first compute \( c + q \), and this derives the fact that presuppositions project out of negation: \( c + \text{not } q \) is defined iff \( c + q \) is.

For example, treating Mary doesn’t have a cat as \( \text{not } [\text{Mary has a cat}] \), the updated context will be the \( (f, g) \in c \) that do not have a counterpart \( (f', g) \in c + \text{Mary has a cat} \), where \( f'[x]f \) and \( x \) is the variable on the indefinite. In other words, the updated context will be one in which no new variable has actually been added, and the subsequent pronoun it will not be able to use a cat as its antecedent.

Now let us consider the sentence The King of France isn’t bald, with the LF: \([\text{not } [\text{the King of France}]_1 \text{ is bald}]_1\). To update \( c \) with this sentence, we must first make sure that the update with \([\text{the King of France}]_1 \text{ is bald}]_1\) is defined. Namely, for each \( (f, w) \in c \), it is possible to extend \( f \) to an \( f' \) such that \( f'(1) \) is assigned to the unique King of France in \( w \). Then, we take out all the \( (f', w) \) pairs where \( f'(1) \) is bald in \( w \). The prediction is that The King of France isn’t bald still presupposes that there is a unique King of France, and that by uttering this sentence, the speaker sets up a new discourse referent for the King of France, and can continue with something like He has very nice hair where the pronoun refers to the King of France.\(^3\)

4.4.2 Conjunction

In File Change Semantics, conjunction will update the context in a sequential manner.

\[(17)\] Context update rule for conjunction

Let \( c \) be a context, let \( p \) be an LF of the form ‘q and r’.  
\[c + p = c + q + r.\]

In other words, we first update the context with the first conjunct, and then update the resulting context with the second conjunct. This accounts for the following observations regarding presuppositions and anaphora:

\[(18)\]
a. It is raining outside and Mary knows that it is raining.  
b. A cat appeared and it jumped over the fence.

\(^3\)Some speakers may accept The King of France isn’t bald/It’s not the case that the King of France is bald—because there is no King of France. Heim (1982) treats these judgements as instances of local accommodation. I will ignore these cases for simplicity.
In (18-a), the second conjunct (with the verb know) presupposes that it is raining outside. This presupposition is satisfied in its local context, which is c + it is raining outside. Overall, the conjoined sentence in (18-a) does not have that presupposition, and the standard term in the literature is that the presupposition in the second conjunct is ‘filtered out’ (i.e. disappears from the sentence-level) if the first conjunct entails that presupposition.

On the other hand, in (18-b), the anaphoric pronoun it in the second conjunct gets its antecedent from the indefinite a cat in the first conjunct. Again, the sentence overall does not need an antecedent to be felicitous in the context.

Both of these observations are correctly predicted by the definition of conjunction in (17).

4.4.3 Conditionals

The basic observations regarding conditionals of the form ‘if p, then q’ for propositions p and q are: (i) indefinites in p can antecede anaphoric elements in q (19-a), and (ii) presuppositions of q are ‘filtered out’ if they are entailed by p (e.g. the uniqueness presuppositions of the knave in (19-b)). Otherwise, the presuppositions of both p and q projects out of the entire sentence (e.g. the uniqueness presuppositions of the palace and the ring in (19-b)).

(19) a. If I see a cat, I pet it.
   b. If there is a unique knave in the palace, then the knave stole the ring.
      
      Presupposes: There is a unique palace; there is a unique ring.

In general, it is not possible for an indefinite inside the conditional to antecede an anaphoric element in the subsequent sentence.

(20) If I see a cat, I pet it. #It runs away.

The infelicity of the continuation above suggests that the indefinite a cat in the conditional does not actually add a new variable to the global context, but only tentatively in the local context of the nuclear scope of the conditional. The same pattern is observed with presupposition satisfaction. We can see that Bill smokes in the antecedent clause of the conditional does not license Mary knows that Bill smokes in a subsequent sentence:

(21) If Bill smokes, he should stop smoking. #Mary knows that Bill smokes.
In other words, while the antecedent clause does not update the context globally, it
does tentatively update the context for the purpose of interpreting the consequent
clause.

The context update rule for conditionals is given below.

(22) Context update rule for conditionals
Let \( c \) be a context, \( p \) be an LF of the form ‘if \( q \), then \( r \)’.
\[
c + p = \{ (f, w) \in c \mid (f, w) + q + r \neq \emptyset \}
\]

In (22), we tentatively update the context \( c \) with \( q \) first, and then check if the
resulting context \( c + q \) would ‘survive’ with further updating with \( r \). We do this
by checking if each \( (f, w) \in c \) survives \( +q + r \). This means that \( c + q \) must be
declared, and \( +r \) should be defined in \( c + q \). Since the computation of \( +r \) is always
computed on top of \( c + q \), an indefinite in \( p \) will be able to antecede anaphoric
elements in \( r \). Since this is a tentative update, the presupposition of \( r \) will not
project out (i.e. the sentence overall does not presuppose it) if it is entailed by \( q \).

Quantificational determiners such as every and most are traditionally defined
in a similar way, with the quantifier binding every variable under its scope. This
is the strategy adopted in earlier versions of File Change Semantics (Heim, 1982,
1983b) and earlier DRT analyses, motivated by Donkey Anaphora examples such
as (23).

(23) Context update example for quantificational determiners
Let \( c \) be a context, \( p \) be the LF ‘every [girl\(_1\) who has cat\(_2\)] [likes it\(_2\)]’.
\[
c + p = \{ (f, w) \in c \mid (f, w) + a_1girl_1 + a_2cat_2 + she_1likesit_2 \neq \emptyset \}
\]

In effect, the update rule above checks for every possible girl-cat ownership pairs
in the context, and sees if the girl likes the cat. It has been noted by the literature that
this may lead to the Proportion Problem with most (Kadmon, 1987; Heim, 1990,
a.o.), and that anaphoric dependencies such as Donkey Anaphora behaves slightly
differently in conditionals than quantificational sentences. Several solutions have
been proposed for these problems. For the purpose of this dissertation, I will not
go into the details of this issue since any proposal for the nominal domain should
easily carry over to the temporal/eventualities domain.
4.5 Maximize Presupposition

In the original version of File Change Semantics (Heim, 1982, 1983b), the distribution of indefinites and definites is derived via the Novelty and the Familiarity Conditions. Briefly, updating a context $c$ with an indefinite with the index $i$ is defined iff $i \notin \text{dom}(c)$, and for definites, $i \in \text{dom}(c)$. However, it has been shown in the subsequent literature that we want indefinites to be presuppositionally neutral regarding the relevant properties that distinguish them from definites (e.g. discourse new, non-uniqueness). We can derive the correct distribution of indefinites and definites by Maximize Presupposition (MP), and the Novelty Condition will be derived as an antipresupposition (Heim, 1991; Sauerland, 2008; Percus, 2006; Singh, 2011).

There are several ways of deriving MP and antipresupposition effects. For the purpose of this dissertation, we need a local version of MP as in Singh (2011), and alternatives that are structurally derived (Katzir, 2007).

In addition, for reasons that will be made clear later (with tenses), we will need an MP-like principle which does not require contextual equivalence. I will adopt Spector and Sudo’s (2017) Presupposed Ignorance Principle (PIP) with slight modifications. The original version of this principle is given below.

\[(24)\quad \text{Presupposed Ignorance Principle (PIP)}\]
\[
\text{Let } p \text{ be the presupposition of sentence } \phi. \text{ Let } \psi \text{ be an alternative of } \phi \text{ with presupposition } q. \\
\text{If:} \\
a. \quad q \text{ asymmetrically entails } p; \\
b. \quad q \text{ is satisfied in context } c; \\
\text{then } \phi \text{ is infelicitous in context } c. \\
\text{(Spector and Sudo, 2017)}
\]

The definedness conditions of indefinites, and of unique and anaphoric definites (with the index $i$) are repeated below, assuming that they share the same NP.

\[(25)\]
a. Indefinites
None.

b. Unique definites
(i) $i \notin \text{dom}(c)$;
(ii) for each $(f, w) \in c$, there is only one possible value of $f(i)$ such
that \( f(i) \) is NP in \( w \).

\[ \text{c. Anaphoric definites} \]
\[ i \in \text{dom}(c). \]

In this particular case, the presuppositions, or definedness conditions are not propositions, so it does not make sense to talk about ‘asymmetric entailment’ for the presuppositions. for the purpose of applying PIP, we will restate the principle in the following way:

\[ (26) \text{ Presupposed Ignorance Principle (PIP) (modified)} \]
\[ \text{Let } \phi \text{ be a sentence, } \psi \text{ be an alternative of } \phi. \]
\[ \text{If:} \]
\[ \text{a. whenever } \psi \text{ is defined, } \phi \text{ is also defined;} \]
\[ \text{b. } \psi \text{ is defined in context } c; \]
\[ \text{then } \phi \text{ is infelicitous in context } c. \]

I will adopt a local version of PIP in the same manner as Singh (2011).

\[ (27) \text{ Local PIP} \]
\[ \text{For an LF } p \text{ uttered in } c, \text{ for each } S \text{ embedded in } p \text{ in its local context } c', \]
\[ \text{check that PIP is satisfied each time we execute } c' + S. \]

With the local version of PIP, together with our earlier definitions of the logical operators, we can now derive the distribution of definites and indefinites.

Since indefinites do not have definedness conditions, both anaphoric and unique definites will be presuppositionally stronger alternatives. By PIP, whenever a definite article can be used, the indefinite one is infelicitous:

\[ (28) \text{ The distribution of indefinites by PIP} \]
\[ \text{An indefinite will be infelicitous if its local context has one of the following:} \]
\[ \text{a. } i \in \text{dom}(c), \]
\[ \text{b. for all } (f, w) \text{ in the local context } c, \text{ there is only one possible value of } f(i) \text{ such that } f(i) \text{ is NP in } w. \]

In other words, whenever \( i \) is familiar in the local context, or there is a unique possible value for \( f(i) \), the indefinite article cannot be used. This seems to be the correct prediction. In particular, we can derive the observations about the inferences of using indefinites in the literature (Heim, 1991, a.o.). In particular, (29-a) illustrates the anaphoric use of English \textit{the}, while (29-b) shows that indefinites
superficially resist anaphoric construals.

(29) There were four chairs. John sat down on a chair. Then Mary
   a. knocked the chair over.
   b. knocked a chair over.

(Heim, 2011) modeled on materials from Maratsos (1976).

(30-a) shows that when the Common Ground satisfies uniqueness, the indefinite article is infelicitous. (30-b) shows that using the indefinite does not inherently require multiplicity (there being more than one pathologically curious neighbor), but simply that the speaker is not implicating the uniqueness.

(30) a. #A weight of this chair is 1kg.
   b. A pathologically curious neighbor of mine has broken into the attic.

It has been pointed out by Heim (2011) that this analysis also accounts for the cross-linguistic variation of (in)definites:

Many languages do not have a definite-indefinite distinction but use the same forms to translate an English definite and its indefinite counterpart...The answer suggested by our analysis of English is that the ‘ambiguous’ DPs in such languages are simply indefinites. They are semantically equivalent to English indefinites, but have a wider range of felicitous uses because they do not compete with definites and therefore do not induce the same implicatures. (Heim, 2011, p.11)

We can see that this crosslinguistic variation is very similar to the one we observe with the present perfect. The present perfect that behaves like a ‘general-purpose past perfective’ (Bertrand et al., 2017; Matthewson et al., 2017, a.o.) in some languages should be semantically equivalent to its English counterpart, with the only difference being the absence of the presuppositionally stronger alternatives (i.e. the past tenses).

4.6 The tense alternatives

Having outlined the necessary components of the formal system, I will illustrate how the tenses update the context. Again, the compositional details do not concern us at this point and will be ignored.
In English, the data in Chapter 2 suggest that we have three competing alternatives for the past tense reading: the anaphoric past, the unique past, and the present perfect. They update the context in a way parallel to the anaphoric definite, unique definite and indefinite articles in the previous section. Since the simple past and the simple form of the present perfect show similar ambiguity regarding the underlying aspect (cf. Section 3.1.1), for brevity, I will illustrate the examples in this section only with the perfective reading.

4.6.1 Anaphoric past

The anaphoric past with the index y will be abbreviated as $\text{PAST}_{\text{anay}}$ from now on. It can merge with AspP and saturate the temporal argument of the latter.

Without committing to compositional details, I argue that an LF of the form $[\text{PAST}_{\text{anay}} [\text{perfective [Mary come]]}]$ updates the context in the following manner.

(31) Let $c$ be a context, $p$ be the LF $[\text{PAST}_{\text{anay}} [\text{perfective [Mary come]]}]$. $c + p$ is defined iff:

a. $1 \in \text{dom}(c)$, and
b. for each $\langle f, w \rangle \in c$, $f(1) \prec t_c$, where $t_c$ is the speech time.

If defined, $c + p = \{ \langle f, w \rangle \in c | \exists e [\text{Mary-come} \land \tau(e) \subseteq f(1)] \text{ in } w \}$

The requirement that $1 \in \text{dom}(c)$ is the same as that of the anaphoric definite, with the pastness of the reference time analyzed as a presupposition.\(^4\)

4.6.2 Unique past

4.6.2.1 Evaluation of uniqueness

Recall from Chapter 2 that the unique past tense appears when the reference time in the sentence is unique with respect to a temporal property. Our earlier observations suggest that there are three cases, which are repeated below.

(32) Perceivable change-of-state event (cos)

$\lambda t. \lambda w. \exists e [\tau(e) \subseteq t]$,

where $e$ is the unique change-of-state event that gives rise to the contextually salient result state.

\(^4\)For the purpose of this dissertation, I will ignore sequence-of-tense and past under future readings of the past tense morphology.
(33) **Events expected to have taken place (exp)**
\[\lambda t.\lambda w. \forall w' \in \text{MAX}_S(V), \exists e | P(e) \land \tau(e) \subseteq t \mid \text{in } w' \text{ and } t \text{ is connected},\]
where S is the set of propositions that satisfy the world knowledge, social conventions and Common Ground information in w, and V is the Context Set in the sense of Stalnaker (2002) (see (2)); an interval t is connected iff for any two points a, b in t, we can find a connected path between a and b.

(34) **Time/life span of the individual under discussion (life)**
\[\lambda t.\lambda w. \exists s [\text{the person under discussion is alive}(s) \land t \subseteq \tau(s)].\]

Since time is dense, in order to ensure uniqueness, we will need the idea of Maximal Informativeness (von Fintel et al., 2014). The definition of maximal informativeness is repeated below.

(35) **Maximal Informativeness**
For a temporal property \(q_{(i,wt)}\), a time interval t is maximally informative w.r.t. \(q\) in w iff
a. \(q(t)(w) = 1\), and
b. For all other \(t'\)'s such that \(q(t')(w) = 1\), we have \(\{w | q(t)(w) = 1\} \subseteq \{w'' | q(t')(w'') = 1\}\).

In particular, the unique maximally informative interval t with respect to \(\text{cos}\) (32) in a world w will be the minimal interval t such that \(\tau(e) \subseteq t\), where \(\tau(e)\) is the time span of the change of state event e. On the other hand, the unique maximally informative interval t with respect to \(\text{exp}\) (33) in a world w will be the maximal interval that covers all the \(\tau(e)\)'s in each of the accessible worlds. The unique maximally informative t with respect to \(\text{life}\) (34) in w will be the largest interval that covers the lifetime of the individual under discussion in w.\(^5\)

While \(\text{cos}\) and \(\text{life}\) are relatively straightforward, I will illustrate \(\text{exp}\) with an example.

(36) **Let w be a world in the Context Set.**

a. Suppose the best possible worlds according to the speakers’ expectations about Penny’s education in w are:
\[w_1: \text{Penny goes to university from 2015-2019}\]

---

\(^5\)We could simply say ‘maximal’ or ‘minimal’, depending on the particular temporal property we are concerned with, but Maximal Informativeness covers all of these cases with a single criterion, which I believe is an advantage.
\[ w_2: \text{Penny goes to university from 2010-2014} \]
\[ w_3: \text{Penny goes to university from 2017-2021} \]
(We actually don't know if she actually went to university in \( w \) or when exactly the time was, but we know that she had a chance and it would be sensible for her to go.)

b. \( \text{exp} \)
\[ \lambda t. \lambda w. \forall w' \in \text{MAX}_s(V), \exists e[P(e) \land \tau(e) \subseteq t] \text{ in } w' \text{ and } t \text{ is connected} \]
The unique maximally informative \( t \) with respect to \( \text{exp} \) in \( w \), will be the interval 2010-2021.

4.6.2.2 Update examples

Having established a way of finding a unique interval as the reference time, I will now illustrate how a sentence with the unique past tense updates the context. The unique past tense with an index \( y \), will be abbreviated as \( \text{PAST}_{\text{uni}} \). I will use \( \text{MI}(\text{cos/exp/life})(t)(w) \) as a shorthand for ‘\( t \) is maximally informative with respect to the property \( \text{cos/exp/life} \) in \( w \).

(37) **Uniqueness evaluated with respect to \( \text{cos} \)**

*Borromini built this church.*

Let \( c \) be a context, \( p \) be the LF \( [\text{PAST}_{\text{uni}}1 \text{[perfective [Borromini build this church]]}] \)

\( c + p \) is defined iff:

a. \( 1 \not\in \text{dom}(c) \), and

b. for each \( \langle f, w \rangle \in c \), there is a unique interval \( t \) such that \( \text{MI}(\text{cos})(t)(w) \).

If defined,

\( c + p = \{ \langle f', w \rangle | \text{for some } \langle f, w \rangle \in c, f[1]f' \land f'(1) \text{ is the unique } t \text{ s.t. } \text{MI}(\text{cos})(t)(w) \land \exists e[\text{build}(e) \land \text{agent}(e) = \text{Borromini} \land \text{theme}(e) = \text{this church} \land \tau(e) \subseteq f'(1)] \} \}

(38) **Uniqueness evaluated with respect to \( \text{exp} \)**

*Bill did not graduate from high school.*

Let \( c \) be a context, \( p \) be the LF \( [\text{not [PAST}_{\text{uni}}1 \text{[perfective [Bill graduate from high school]]}] \)

where \( \text{PAST}_{\text{uni}}1 \) has the \( \text{exp} \) property.

\( c + p \) is defined iff:

a. \( 1 \not\in \text{dom}(c) \), and
b. for each $\langle f, w \rangle \in c$, there is a unique $t$ such that $m_l(\exp(t))(w)$.

If defined, $c + p$

$= \{ \langle f', w \rangle | \text{for some } \langle f, w \rangle \in c, f[1]f' \land f'(1) \text{ is the unique } t \text{ s.t. } m_l(\exp(t))(w) \land \neg \exists e [\text{graduate}(e) \land \text{agent}(e) = \text{Bill} \land \tau(e) \subseteq f'(1)] \}$

(39) Uniqueness evaluated with respect to life

*Einstein did not visit Princeton.*

Let $c$ be a context, $p$ be the LF $[\text{not } [\text{PAST}_{uni1} [\text{perfective } [\text{Einstein visit Princeton}]]]]$

where $\text{PAST}_{uni1}$ has the life property.

c + p is defined iff:

a. $1 \not\in \text{dom}(c)$, and

b. for each $\langle f, w \rangle \in c$, there is a unique $t$ such that $m_l(\text{life})(t)(w)$.

If defined, $c + p$

$= \{ \langle f', w \rangle | \text{for some } \langle f, w \rangle \in c, f[1]f' \land f'(1) \text{ is the unique } t \text{ s.t. } m_l(\text{life})(t)(w) \land \neg \exists e [\text{visit}(e) \land \text{agent}(e) = \text{Einstein} \land \text{theme}(w) = \text{Princeton} \land \tau(e) \subseteq f'(1)] \}$

As with unique definites, I will let the unique past tense have a novelty condition. For English, whether we have the novelty condition will not make a difference with respect to the data we observe, since the unique and anaphoric past tenses share the same morphology, and in any case, both will be presuppositionally stronger than the present perfect, which will be defined in the next subsection. Again, I choose to include the novelty condition for the sake of making the competition pattern simpler.

4.6.3 Present perfect

4.6.3.1 Basic update examples

For the present perfect, I follow Pancheva and von Stechow (2004) and argue that the present perfect operator is formed at $T$ and consists of a present tense and a perfect operator. A present perfect operator with the index $y$ will be abbreviated as $PP_y$ from now on.

(40) Update example for the present perfect

Let $c$ be a context, $p$ be an LF of the form $[PP_1 [\text{perfective } [\text{Mary dance}]]]$
a. if \( l \in \text{dom}(c) \):
   
   \( c + p \) is defined iff for each \( (f, w) \in c \), \( f(l) \preceq t_c \), where \( t_c \) is the speech time.

   if defined,
   
   \( c + p = \{(f, w) \in c | \exists e [\text{dance}(e) \land \text{Agent}(e) = \text{Mary} \land \tau(e) \subseteq f(l)] \text{ in } w\} \)

b. else:
   
   \( c + p = \{(f', w) \mid \text{for some } (f, w) \in c, f[1]f' \land f'(1) \text{ is some interval } t \text{ s.t. } t \preceq t_c \land \exists e [\text{dance}(e) \land \text{Agent}(e) = \text{Mary} \land \tau(e) \subseteq f'(1)] \text{ in } w\} \)

   where \( t \preceq t_c \) iff \( \neg \exists t'[t' \subseteq t \land t' \succ t_c] \).

A present perfect (with an index \( y \)) sentence updates the context in a way parallel to indefinites: it is open about whether \( y \in \text{dom}(c) \). The only requirement is that \( y \) is assigned to an interval \( t \) such that \( t \preceq t_c \).

The reference time of the present perfect in (40) is the weaker version of Extended Now as in Grønn and von Stechow (2017). In other words, the reference time may be either an Extended Now interval where the speech time is included (\( t \preceq t_c \land t \circ t_c \)), or a past interval.

We can see that both the anaphoric past and the unique past are presuppositionally stronger than the present perfect: whenever updating the context with a past tense sentence is defined (anaphoric past: \( l \in \text{dom}(c) \); unique past: \( l \notin \text{dom}(c) \), \( f(1) \prec t_c \), uniqueness), the same sentence with the present perfect is defined, but not vice versa. The present perfect in (40) does not inherently prohibit a past reference time, but in English, it is ruled out by PIP whenever one of the two past tenses can be used.

When the reference time \( t \) is actually an Extended Now interval, the assertion of the present perfect is not the same as its past alternatives. This is the reason why I adopt PIP instead of MP.

In general, we want the present perfect to always have the past tense as its alternative, even though when the reference time is an Extended Now interval, the presupposition of the past tense won’t be satisfied. The reason is there are some data where the context is not clear about what the reference time of the sentence may be, and depending on how the speakers accommodate that information, both the present perfect and the past tense may be possible. In this case the listener makes inferences based on whether the reference time is an Extended Now interval. One such example is given below.
(41) (Talking about a Monet exhibit at the local museum, which may or may not have ended. There is no previously mentioned past time in the context.)

a. Did you see the Monet exhibit?
   **Inference:** The exhibit is over.

b. Have you seen the Monet exhibit?
   **Inference:** The exhibit is still on.

Earlier in Chapter 2, I argued that the unique past tense is licensed when the reference time is taken to be the (unique) time span of the exhibit and if that time span is a past interval. In the example above, the Common Ground does not entail whether the exhibit is over. Therefore, regardless of whether the speaker uses the unique past tense in (41-a) or the present perfect in (41-b), upon hearing the sentence, the listener will have to accommodate the necessary information that will license the tenses. If they hear the unique past tense, they will infer that the exhibit is over. If they hear the present perfect, they infer that it must be that the unique past cannot be used, so the reference time is an Extended Now interval and it follows that the exhibit is still on.

In the rest of this section, I will illustrate how the present perfect competes with the past tenses in English, and how this analysis derives the crosslinguistic variation in the absence of competition.

4.6.3.2 Present perfect vs. anaphoric past

In Chapter 3, I concluded that the present perfect is not inherently incompatible with a past reference time, and that observations such as the Present Perfect Puzzle and the prohibition of the present perfect in past narration follow from the availability of the presuppositionally stronger anaphoric past tense.

Similar to an anaphoric definite, the anaphoric past tense has a sort of Familiarity Condition, which is absent for the present perfect (40). In terms of File Change Semantics, this means that the anaphoric past presupposes that the reference time variable is familiar in the context. When the speaker adds information to a familiar variable, PIP requires that they use the anaphoric past.

In order to derive the Present Perfect Puzzle, we will need to say something about temporal adverbials. First, there is the observation that whenever a sentence contains a past adverbial, the anaphoric past tense is always felicitous even if the initial context does not have a suitable antecedent.
(42) (Uttered without any contextually salient past time:)
Yesterday I went to the park, and I ran into Mary there.
I went to the park yesterday, and I ran into Mary there.

(42) shows whether the adverbial is fronted (i.e. uttered first) or not does not seem to make a difference: the anaphoric past tense is still felicitous, and the reference time is always taken to be the time denoted by the adverbial. For this reason (and for simplicity), I will treat all temporal adverbials as if they were fronted.

Second, note that even when the previous discourse is about some familiar reference time, as soon as a sentence with a temporal adverbial is uttered, the reference time of that sentence is automatically shifted to the time denoted by the adverbial.

(43) (John and Mary are talking about their trip to Yosemite last week. Bill joins the conversation.)
Oh, I love that place. My family went there last year!

In (43), the past tense in Bill’s utterance is obligatorily about last year, and not the reference time in the previous discourse (last week). This means that we want temporal adverbials to be able to introduce a new time, which the reference time in the sentence must be identified with.

In addition, it should be possible to repeat the temporal adverbial from the previous discourse, without adding a new reference time.

(44) What did you do yesterday?
I went to the zoo yesterday.

Putting these observations together, we come to the conclusion that temporal adverbials sort of functions like an indefinite: it may add a new reference time, but it does not need to. Regardless, the tense in the same sentence must be co-indexed with the temporal adverbial.

The following example illustrates how temporal adverbials update the context. A sentence $p$ of the form $\textit{yesterday} \ q$ essentially functions as if there is an implicit conjunction between $\textit{yesterday}$ and $q$.

(45) Let $c$ be a context, $p$ be the LF $[\textit{yesterday}, q]$ where $q$ is another LF.
$c + p$ is defined iff:
  a. The index on the tense in $q$ is also labeled as $i$. 

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If defined,

a. if \( i \notin \text{dom}(c) \):
   \[
   c + p = \{ \langle f', w \rangle | f'[i] \land f'(i) = \text{yesterday}_c, \text{for some } (f, w) \in c \} + q
   \]
   where yesterday\(_c\) is the interval ‘yesterday’ in the context \( c \).

b. if \( i \in \text{dom}(c) \):
   \[
   c + p = c + q.
   \]

Regardless of whether the temporal adverbial adds a new reference time, the tense variable in the sentence is always familiar in its local context. In other words, the rule in (45) ensures that in the local context of the TP that follows \textit{yesterday}, the presupposition of the anaphoric past is always satisfied. This captures the fact that whenever there is a past temporal adverbial, the anaphoric past tense is always felicitous (42). Then, PIP can apply and we can rule out the presuppositionally weaker alternative, the present perfect.

The following table summarizes the three competing tenses with an index \( i \).

<table>
<thead>
<tr>
<th>Presuppositions</th>
<th>present perfect(_i)</th>
<th>unique past(_i)</th>
<th>anaphoric past(_i)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None ( i \notin \text{dom}(c) ); ( i \in \text{dom}(c) ); ( \forall (f, w) \in c, f(i) \prec t_c ) (pastness)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>either old or new</td>
<td>new</td>
<td>old</td>
<td></td>
</tr>
</tbody>
</table>

Since the unique past tense is analyzed as having a Novelty Condition, it will always be excluded whenever there is an explicit past adverbial. This means that whenever there is a past adverbial, we treat the past tense as the anaphoric one.

In addition, in (47), we can see that even if we have a quantified subject and a context that strongly suggests a change-of-state reading (that would normally license the unique past tense), as long as there is an explicit past adverbial, the tense is obligatorily anaphoric to that time (instead of having the covarying reading).\(^6\)

\(^6\)Of course, it is possible to say that the exact change-of-state event time is something more specific than ‘last weekend’, but data-wise there is no difference since the event would still fall...
Looking at three open windows in the office on Monday. We know that all three were closed Friday night, and that only the cleaner, who comes over the weekend, has the key.

Every window here was opened over the weekend.

I conclude that whenever we have a past adverbial in a sentence, the past tense in the sentence will be an anaphoric past tense instead of the unique one.

Since both the present perfect and the anaphoric past tense allow co-indexing with the temporal adverbial, this means that in a sentence with a past adverbial, we have two alternative LFs.

\[(48)\]
\begin{align*}
\text{a. } & \text{Yesterday}_{\text{1}} \left[ \text{Past}_{\text{ana}} \left[ \text{perfective } [\text{Mary watered the plant}] \right] \right]. \\
\text{b. } & \text{Yesterday}_{\text{1}} \left[ \text{PP}_{\text{1}} \left[ \text{perfective } [\text{Mary watered the plant}] \right] \right].
\end{align*}

In the local context where the TP is processed, the presupposition of the anaphoric past is always satisfied. This means that local PIP will rule out the weaker alternative, the present perfect. Thus, we derive the Present Perfect Puzzle: whenever the sentence contains a past adverbial, the present perfect cannot be used.

For sentences without explicit temporal adverbials, I will simply assume that if there is a contextually salient past time \(t\) in \(c\), then for all \((f, w) \in c\), we have some index \(i \in \text{dom}(c)\) and \(f(i) = t\). We will derive the same pattern with PIP. This accounts for Portner's (2011) observation that if the reference time is familiar, we will have Present Perfect Puzzle-like effects without explicit past adverbials:

\[(49)\] (Talking about what happened yesterday:)

\(\#\text{Mary has watered the plants.}\)

Now let us consider those cases where an adjunct or an argument contains the (obligatory) reference time, such as the following.

\[(50)\] a. \(\#\text{Mary has arrived on yesterday's flight.}\)  
    b. \(\#\text{Mary has enjoyed last Friday's party.}\)  

(\text{Portner, 2011})

Since Mary can only arrive with the flight she takes, or enjoy a party during the party, we can say that these constituents update the context in the same way as past adverbials. The reference time is obligatorily anaphoric to the time within the same timeframe, and there is no evidence against treating the past tense here as just anaphoric to 'last weekend'.

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interval provided by those constituents. I assume that in this case, the speakers
will implicitly assume update rules like the following, where the context is first
updated with *yesterday* and then the rest of the sentence is processed.

(51) Let $c$ be a context, $p$ be an LF of the form $[ T \text{ [perfective [Mary arrive on}
\text{yesterday's} \text{ flight]]}]$ for some tense alternative $T$.

\[ c + p = c + \text{yesterday}_i + [T \text{ [perfective [Mary arrive on the (relevant) flight}
\text{from yesterday]]}] \]

(52) Let $c$ be a context, $p$ be an LF of the form $[ T \text{ [perfective [Mary enjoy}
\text{yesterday's} \text{ party]]}]$ for some tense alternative $T$.

\[ c + p = c + \text{yesterday}_i + [T \text{ [perfective [Mary enjoy the (relevant) party}
\text{from yesterday]]}] \]

4.6.3.3 Indexing alternatives?

If we treat LFs with different indices as alternatives available at the same time,
then PIP alone is sufficient for deriving the observed patterns (note that even
without the pastness presupposition, the anaphoric past will still be presupposi-
tionally stronger than the present perfect simply because it requires $i \in \text{dom}(c)$). However, if we choose the indices before generating the available LF alternatives,
then, if the speaker chooses a new index, the present perfect could win the com-
petition against the anaphoric past simply because the anaphoric past requires an
old index. If this is the case, in order to derive the Present Perfect Puzzle, we will
need additional constraints to regulate index use.\(^7\) I propose:

(53) **Index economy (IE)**

Avoid using new variables if there is an old variable in the local context
already assigned to the same individual/interval/event.

To see this, note that for a context $c$ and a sentence $p$ of the form $[\text{yesterday}_i,
[\text{TP}]]$, we have $c + p = c + \text{yesterday}_i + \text{TP}$, and we want the tense in TP to also
stand for the interval yesterday. The alternative LFs for the TP part are:

(54) **Same index for same interval**

a. $\text{PAST}_{\text{ana}} \text{ AspP}$

b. $\text{PP}_i \text{ AspP}$

\(^7\)I have not been able to find evidence that favours one of the two ways of generaing the
alternatives, so I will present the Index Economy principle just in case.
Different index allowed

a. \( PP \upharpoonright AspP \), where \( j \notin \text{dom}(c) \).

If we stick to the same indexing, then in the local context of TP, \( i \) is already a familiar index, and (54-a) will be preferred over (54-b) by PIP, since the anaphoric past has stronger presuppositions than the present perfect. However, if we allow using a different index for TP before choosing from the various tenses, the present perfect (55-a) will be the only possible choice and escapes PIP. Therefore, we will need the Index Economy principle to rule out (55-a).

The following comparison shows that PIP and Index Economy together derives the pattern in (56-b-i), which is not covered by PIP alone.

**PIP and Index Economy (IE)**

\[ A > B \] stands for ‘A wins the competition against B’

a. PIP-only ordering:

(i) \( i \notin \text{dom}(c) \), only uniqueness satisfied:

unique past \( i >_{\text{pip}} \) present perfect \( i \);

(ii) \( i \in \text{dom}(c) \), only pastness satisfied:

anaphoric past \( i >_{\text{pip}} \) present perfect \( i \);

(iii) \( i \in \text{dom}(c) \), pastness not satisfied, uniqueness not satisfied:

present perfect \( i \) is the only choice;

e.g. \( i \) is assigned to an Extended Now interval

(iv) \( j \notin \text{dom}(c) \), only pastness satisfied:

present perfect \( j \) is the only choice.

b. PIP + Index economy:

(i) \( i \in \text{dom}(c) \), \( j \notin \text{dom}(c) \), only pastness satisfied:

anaphoric past \( i >_{\text{pip,IE}} \) present perfect \( i >_{\text{pip,IE}} \) present perfect \( j \).

4.6.3.4 Present perfect vs. unique past

Now consider the case where the local context satisfies the uniqueness of the reference time with respect to some temporal property. We want to derive the following pattern where the present perfect is infelicitous.

(Pointing at a church, and there is no previously mentioned past time:)

a. Borromini built this church.

b. #Borromini has built this church.
With PIP, this is straightforward. In this case, the context $c$ is such that for each $\langle f, w \rangle \in c$, there is a unique interval $t$ such that $\text{MI}(\cos(t))(w)$. Therefore, the LF $[\text{past}_{\text{uni}} \text{[perfective [Borromoni build this church]]}]$ must be chosen over the LF with the present perfect $[\text{pp}_{1} \text{[perfective [Borromoni build this church]]}]$.

We will have the same result with the temporal properties $\text{exp}$ and $\text{life}$ as well.

4.6.3.5 In the absence of competition

Now I will show that this analysis will derive the crosslinguistic variation of the present perfect between English and languages like (the standard varieties of) French, German, and Italian. Let us look at German. Recall from Kratzer (1998) that the German past tense (if available in the register at all), is strictly anaphoric. Therefore, it is not available when only uniqueness is satisfied in the context.

(58) (59) (Pointing at a church, and there is no previously mentioned past time:)

a. Borromini hat diese Kirche gebaut.
   Borromini aux this church built.pp
   '(Lit.) Borromini has built this church.'

b. #Borromini baute diese Kirche.
   Borromini built this church
   '(Lit.) Borromini built this church.'

In this case, the present perfect with the same definition as in English (40) is the only choice for the speaker. The result of the update will simply be:

(60) $c + [\text{pp}_{1} \text{[perfective [Borromoni build this church]]}]$
    $= \{ \langle f', w \rangle | f'$ is just like $f$ except $f'(1)$ is some interval $t$ s.t. $t \preceq t_c$
    $\wedge \exists e[\text{build}(e) \wedge \text{agent}(e) = \text{Borromini} \wedge \text{theme}(e) = \text{this church}] \wedge \tau(e) \subseteq (f'(1)),$ for some $\langle f, w \rangle \in c \}$

In general (the standard variety and especially for southern speakers), the German past tense (with the exception of some statives and auxiliaries, and some limited cases, see (63)-(64)) is not available in the colloquial register. Therefore, it is not available as an alternative for the anaphoric reading even if there is a temporal adverbial. For example:

(61) a. #Gestern goss Maria die Pflanzen.
    yesterday watered Maria the plants
    '(Lit.) Yesterday Maria watered the plants.'
b. Gestern hat Maria die Pflanzen gegossen.
   yesterday aux Maria the plants watered
   ‘(Lit.) Yesterday Maria has watered the plants.’

If the past tense is not available as an alternative in this register, the present perfect again is the only choice. By index economy, if the reference time is ‘yesterday’, which is assigned to the index 1 in the local context c’ of the TP, then the speaker must use the same index on the tense. In other words, the update result will be:

\[
(62) \quad c’+\{\text{perfective [Mary water the plants]}\}
\]

is defined iff:

for each \( (f, w) \in c’, f(1) \leq t_{c’} \), where \( t_{c’} \) is the speech time.

This is satisfied since \( f(1) \) is yesterday.

\[
(62) \quad c’+\{\text{perfective [Mary water the plants]}\}
\]

= \{ (f, w) \mid \exists e [\text{water}(e) \land \text{agent}(e) = \text{Mary} \land \text{theme}(e) = \text{the plants}] \land \tau(e) \subseteq (f(1)) \}

The same result will apply to (the standard varieties of) French and Italian, where the simple past is not available in the colloquial register.

The German simple past does have limited distribution in the colloquial register. There are two cases:

\[
(63) \quad \text{a. Als ich die CD gebrannt habe, stürzte der Computer ab.}
\quad \text{when I the CD burned aux fell the computer off}
\quad \text{‘(Lit.) When I was burning the CD, the computer crashed.’}
\quad \text{(Löbner, 2002)}
\]

\[
(63) \quad \text{b. Wir werden jeden Brief beantworten, den wir bekamen.}
\quad \text{we will every letter answer that we got}
\quad \text{‘(Lit.) We will answer every letter that we got.’}
\quad \text{(Kratzer, 1998)}
\]

In both (63-a) and (63-b), the past tense has the anaphoric reading, with the antecedent being the reference time introduced by the when-clause in the former, and some contextually salient time in the latter. The two cases have a subtle difference. In (63-a), the sentence itself is unambiguous since the when-clause determines the reference time of the main clause so there is always only the anaphoric reading regardless of whether the past tense or the present perfect is used for the main clause. They are interchangeable. In (63-b), the reference time in the relative clause is free just like a main clause tense is. Therefore, we have the following judgements for the present perfect and the past tense versions of the
sentence.

(64)  

a. Wir werden jeden Brief beantworten, den wir bekamen.
we will every letter answer that we got
‘We will answer every letter that we got.

# in context: Uttered without a contextually salient past time.
✓ in context: Referring to the letters we received over a salient past interval.

b. Wir werden jeden Brief beantworten, den wir bekommen haben.
we will every letter answer that we gotten have
‘We will answer every letter that we got.

✓ in context: Uttered without a contextually salient past time.
✓ in context: Referring to the letters we received over a salient past interval.

(Kratzer, 1998)

In other words, the present perfect sentence can be used for both the anaphoric reading and for the temporal indefinite reading.

I argue that these limited uses of the German simple past suggest some sort of change-in-progress. For each speaker, the present perfect sentence and the past tense sentences are not alternatives in the strict sense, but reflect two parallel sets of grammar systems, one of them having the simple past as an alternative, while the other one does not.

In other words, the ‘interchangeable’ present perfect and the simple past in (63-a) reflect two parallel sets of alternatives: \{ present perfect, past ana \} and \{ present perfect \}. In the former case, the past tense wins the competition by PIP and in the latter case the present perfect is the only choice. Likewise, the two versions of the sentence in (64) reflect not a flexibility or failure of PIP but simply two sets of alternatives.
Chapter 5

Remaining issues of the present perfect

In the previous chapters, I proposed that the English present perfect is in a competition relationship with the past tense, with the past tense having stronger presuppositions under both the uniqueness and the anaphoric readings. I also showed how this analysis accounts for some of the basic facts such as: the Present Perfect Puzzle, the fact that the present perfect functions as a temporal indefinite in English and provides an antecedent for the past tense, as well as how this idea may be extended to cover some of the crosslinguistic data. However, there are many other data points regarding the English present perfect and its various perfect-readings. In this section, I will discuss some remaining issues in the literature, and how my analysis may answer some of these questions in comparison to previous proposals.

5.1 Additional issues with the Present Perfect Puzzle

Earlier, I proposed an analysis of the present perfect which does not inherently prohibit modification with past temporal adverbials. I argued that the Present Perfect Puzzle arises in English because the past tense is presuppositionally stronger and is required by PIP (or similar principles). Likewise, the present perfect does not inherently prohibit the anaphoric reading with respect to a contextually salient past time, but in English, the presuppositionally stronger past tense is always preferred according to PIP. In short, my proposal accounts for Present Perfect Puzzle effects observed both with and without an explicit temporal adverbial. I believe this is an advantage over some of the previous analyses, which I will summarized below.
5.1.1 Comparing with the Extended Now

The most influential group of analyses for the present perfect is the Extended Now theories (McCoard, 1978; Dowty, 1979; Iatridou et al., 2003; Grønn and von Stechow, 2016). These proposals argue that the reference time of a present perfect sentence is an interval known as the Extended Now that ranges from the speech time to some past time (1).

(1) The Extended Now semantics of the present perfect

\[ \text{PRES.PERF.} = \lambda p_{(t,t)}. \exists t[p(t) \land t \leq t_c \land t \circ t_c] \]

where \( t \circ t_c \) means \( t \) overlaps the speech time, and \( t \leq t_c \) means \( \neg \exists t'[t' \subset t \land t' > t_c] \).

Crucially, in these accounts, the Present Perfect Puzzle is derived as a semantic contradiction resulting from the modification of the Extended Now, an interval containing the present, with a past temporal adverbial, which requires the time to be fully in the past. This is illustrated below. The Extended Now cannot be modified by a past temporal adverbial, since it is impossible that \( t \) satisfies both \( t \subseteq \text{yesterday}_c \) and \( t \circ t_c \) (2-c).

(2) The Present Perfect Puzzle as a semantic contradiction

a. [Mary has jogged]
   \[ = \exists t \exists e[\text{Mary jog}(e) \land \tau(e) \subseteq t \land t \leq t_c \land t \circ t_c] \]

b. [yesterday]c = \( \lambda p_{(t,t)}. \exists t[t \subseteq \text{yesterday}_c \land p(t)] \)

c. [Mary has jogged yesterday]
   \[ \exists t \exists e[\text{Mary jog}(e) \land \tau(e) \subseteq t \land t \leq t_c \land t \circ t_c \land t \subseteq \text{yesterday}_c] \]

These proposals relying on semantic contradiction face the major problem that in English, Present Perfect Puzzle-like effects are observed even without overt temporal adverbials, noted by Portner (2011). A contradiction based theory cannot explain why the present perfect is ruled out even in the absence of adverbial modification. This is illustrated in (3) and (4). Although there are no overt temporal adverbials, the present perfect is still prohibited.

(3) I enjoyed/#have enjoyed yesterday’s party.

(4) Mary arrived/#has arrived on yesterday’s flight.

(Portner, 2011)

As Portner points out, since there is no direct modification of the reference time
with a temporal adverbial, there should not be a semantic contradiction. Hence, any contradiction-based analysis cannot account for these examples.

Portner also points out that these constraints only surface when the reference time is clearly implied by an argument. Compare (3)-(4) with (5), which does not require the reference time to be last year or yesterday, and the present perfect is acceptable.

\[(5) \quad \text{(In the absence of previous discourse:)}\]

\[\begin{align*}
\text{a.} & \quad \text{I have seen last year’s best rated film.} \\
\text{b.} & \quad \text{Mary has seen yesterday’s visitor.}
\end{align*}\]

I argue that in (3) and (4), since the reference time must coincide with yesterday, this automatically provides an antecedent for the anaphoric past tense. The present perfect is then ruled out in the same way as in other sentences with a contextually salient past reference time, such as:

\[(6) \quad \text{(Talking about what happened yesterday:)}\]

# Mary has enjoyed the party.

The Extended Now analysis also fails to account for the fact that the present perfect can provide an antecedent for the anaphoric past tense, as in (7).

\[(7) \quad \text{Mary has been to Paris. She saw the Eiffel Tower.}\]

If the present perfect introduces an interval which always overlaps with the speech time, this interval cannot be an antecedent to the subsequent anaphoric past tense. In fact, we have good reasons to think that the present perfect does not actually prohibit the reference time from being completely in the past, only that it is not already contextually salient. In a sentence like (8), the present perfect can be used even if Mary actually arrived yesterday.

\[(8) \quad \text{Mary has arrived.}\]

Possible continuation: She went straight to her grandmother’s house.\(^{1}\)

Under the Extended Now analysis, sentences like (8) can only have a reading like the following:

\[(9) \quad \exists t [t \preceq t_c \land t \circ t_c \land \exists e [M-\text{arrive}(e) \land \tau(e) \subseteq t]]\]

\(^{1}\)The use of the present perfect here also has the resultative reading, that Mary is still around. I will discuss this reading in later sections.
In order to explain why the anaphoric past tense is available in the possible continuation in (8), we would then need some kind of accommodation process. While this option is possible, I believe it fails to capture the obvious parallels between the temporal and nominal (in)definites and their behaviour regarding antecedents and anaphora. If we accept that tenses can behave like (anaphoric) pronouns, it is not surprising to have a temporal equivalent of indefinite antecedents.

Finally, the Extended Now analysis is difficult to apply to languages that do not exhibit the Present Perfect Puzzle. While it is possible that languages may simply use the same morphological form for different meanings, or express the same meanings with different morphology, we saw in Section 3.1.4 that the use of the present perfect form as a perfective past is correlated with the absence of the anaphoric past tense. This phenomenon is widespread enough to be addressed. In addition, it has been pointed out by Kratzer (1998) that the present perfect morphology in languages like German indeed spells out the present perfect with very similar semantics as its English counterpart. Putting these observations together, I believe we should reconsider the option of requiring the reference time of the present perfect to be an Extended Now interval.

5.1.2 Comparing with the scalar strengthening analysis

Pancheva and von Stechow (2004) propose that the present perfect and the past tense are indeed in a competition relationship, which also explains the crosslinguistic variation. They are aware of the issues of a ‘strict’ Extended Now approach (i.e. the reference time must overlap with the speech time), and their solution is scalar strengthening of the present perfect meaning. In particular, they propose that the basic meaning of the present perfect does allow past adverbial modification, but in English, it is strengthened to the Extended Now meaning because of the competition with a stronger scalar alternative, the past tense.

Their definitions of the present tense, past tense, and the perfect operator are shown in (10).

(10) Present, past and perfect in English (Pancheva and von Stechow, 2004)

a. \([\text{PRESENT}] = \lambda p_{(i,t)}. \forall t_1. [t_1 = t_c \land p(t_1)]\)

b. \([\text{PAST}] = \lambda p_{(i,t)}. \exists t_2 [t_2 < t_c \land p(t_2)]\)

c. \([\text{PERFECT}] = \lambda p_{(i,t)}. \forall t. \exists t'[t' \leq t \land p(t')]\)

where \(t' \leq t\) iff there is no \(t'' \subset t\) s.t. \(t'' > t\)
Pancheva and von Stechow (2004) argue that the perfect moves to the tense node, and forms a complex `PRESENT PERFECT` operator with the present tense (11).

(11) The present perfect operator

\[
\begin{array}{c}
\text{TP} \\
\downarrow \\
\text{T} \\
\downarrow \\
\text{PRESENT PERFECT} \\
\downarrow \\
\text{Perf} \\
\downarrow \\
\text{VP} \\
\end{array}
\]

\[
\begin{array}{cc}
\text{PerfP} & \\
\text{t} & \\
Alicia & \text{dance}
\end{array}
\]

The resulting `PRESENT PERFECT` operator then has the semantics in (12). In English, we get the meaning in (12-a). At this point, it allows the time \( t_2 \) to be either completely in the past, or an Extended Now interval. At this point, it will not lead to the Present Perfect Puzzle. However, Pancheva and von Stechow (2004) argue that in English, (12-a) must be strengthened to the complement of the past meaning (12-c) due to competition at T, and results in the Extended Now meaning as in the standard Extended Now theories (12-b).

(12) \[
[\text{PRESENT PERFECT}] = \lambda p_{(i,i)}.\text{PRESENT}_1(\text{PERFECT}(p))
\]

a. in English, this amounts to

\[
[\text{PRESENT PERFECT}] = \lambda p_{(i,i)}.\exists t_2[t_2 \leq t_c \land p(t_2)]
\]

(where \( t' \) \( \preceq t \) iff there is no \( t'' \subset t' \) s.t. \( t'' \not\succeq t \))

b. \[
[\text{PRESENT PERFECT}_{\text{strengthened}}] = \lambda p_{(i,i)}.\exists t_1[t_1 = t_c \land \exists t_2[t_2 \circ t_c \land t_2 \leq t_c]].
\]

c. \[
[\text{PAST}_2] = \lambda p_{(i,i)}.\exists t_2[t_2 < t_c \land p(t_2)].
\]

PAST entails the non-strengthened `PRESENT PERFECT`.

Then, the Present Perfect Puzzle can be derived as a semantic contradiction, just like in standard Extended Now theories.

The reason why Pancheva and von Stechow (2004) treat the Extended Now semantics as the result of strengthening, instead of the original meaning of the present perfect, is the crosslinguistic variation we discussed earlier. They argue that in German, the present perfect is not subject to the Present Perfect Puzzle constraint because the German present perfect is not strengthened, hence does not have the Extended Now semantics. This is illustrated below: they argue that
the German present tense differs from its English counterpart in that it allows the
time interval to also be in the future. This claim is based on the observation that
the German present tense can refer to non-planned future events (13). The past
tense and the perfect operator are the same as in English.

(13)  a. Fritz ist in 10 Tagen krank.
Fritz is in 10 days sick
‘Fritz will be sick in 10 days.’

b. Nächste Woche ist das Wetter schlecht.
next week is the weather bad
‘Next week the weather will be bad.’

(14) Present, past and perfect in German (Pancheva and von Stechow, 2004)

a. \[ \text{PRESENT} = \lambda p_{i,t}. \lambda t. [t \geq c \land p(t)] \]
where \( t \geq c \) iff \( -\exists t' \in t \land t' < c \]

b. \[ \text{PAST} = \lambda p_{i,t}. \exists t_2 [t_2 < c \land p(t_2)] \]

c. \[ \text{PERFECT} = \lambda p_{i,t}. \exists t'[t' \leq t \land p(t')] \]
where \( t' \leq t \) iff there is no \( t'' < t \) s.t. \( t'' > t \).

The result is that in German, the combined PRESENT PERFECT operator is not
scalarly ordered with the past tense, and is never strengthened to the Extended
Now.

(15) \[ \text{PRESENT PERFECT} = \lambda p_{i,t}. \text{PRESENT}_1(\text{PERFECT}(p)) \]

a. in German, this amounts to
\[ \text{PRESENT PERFECT} = \lambda p_{i,t}. \exists t_1 [t_1 \geq c \land \exists t_2 [t_2 \leq t_1 \land p(t_2)]] \]
and is not strengthened,

b. because the past tense is
\[ \text{PAST}_2 = \lambda p_{i,t}. \exists t_2 [t_2 < c \land p(t_2)], \]
which does not entail the PRESENT PERFECT.

Note that (15-a) allows modification with a past adverbial, because \( t_2 \) may in fact
be completely in the past.

It is important for Pancheva and von Stechow (2004) that this competition
and scalar strengthening is strictly local. If they allowed global competition be-
tween proposition-expressing LFs, then the German present perfect would also be
strengthened due to the existence of the past tense sentence as a competitor:

(16)  a. German present perfect
The location of $t_2$ with respect to the speech time $t_c$ is not directly specified: it either precedes it, follows it, or overlaps with it. Therefore, it is less informative than the past tense sentence. If the present perfect sentence (16-a) and the past tense sentence (16-b) compete globally, then (16-a) will have to be strengthened to something like a non-past, where the reference time either overlaps with the speech time, or is after the speech time:

\[(17) \exists t_1[t_1 \circ t_c \vee t_1 \succ t_c \wedge \exists e[A.dance(e) \wedge \tau(e) \subseteq t_1]]\]

which is not observed in German. Hence, they describe the competition and the semantic strengthening process as follows:

‘s semantic features realized at the same syntactic node compete with each other...given an intended meaning, a speaker chooses the most specified semantic feature available in the language, to express at a syntactic node...therefore, when a feature with less specified meaning is realized at a value of a syntactic node, it must be because its more highly specified competitor couldn’t appropriately be used. As a result, the meaning of the less specified feature is restricted: those aspects of the meaning that are shared between the competing features are no longer available’ (Pancheva and von Stechow, 2004, p.6).

In particular, they follow the local computation of scalar implicatures in Kratzer (2003) and Chierchia et al. (2004), who propose that ‘the lexical meaning of two is two or more, (and) direct competition with e.g. more than two restricts the meaning of two to exactly two’ (Pancheva and von Stechow, 2004). While Pancheva and von Stechow (2004) do not spell out the details in the paper, this amounts to having an exhaustification operator EXH locally applied to the tenses. In other words, only in English, the present perfect operator and the past tense operator are scalar alternatives to each other, and the present perfect is locally strengthened by EXH. In German, since the present perfect and the past tense are not in a scalar relationship to begin with, there is no local exhaustification, and the German perfect retains its original meaning.

However, Pancheva and von Stechow’s (2004) scalar ordering of the present...
perfect and the past tense is based on the assumption that both the present perfect and the past tense have existential temporal semantics. We have already seen criticism of the existential analysis of the English past tense. If Sharvit (2014) is right, then Pancheva and von Stechow’s analysis of the English past tense will have to be revised and this may affect its scalar relationship with the present perfect.

In fact, even if we assume existential semantics for both the present perfect and the past tense, it is not clear if the present perfect and the past tense are really scalar alternatives to each other in English. To see this, consider (18)-(19), which illustrate the reversal of a scale under negation (assuming that any is the NPI version of some). This is the phenomenon where the original weaker scalar item becomes the stronger one instead.

In the positive sentences, (18-a) entails (18-b), hence the some in (18-b) is strengthened to some but not all. In the negative sentences, however, (19-a) entails (19-b). As a result, (19-b) has the reading that ‘Mary read some books, but she didn’t read all the books’, where (19-a) is false. This is a general pattern observed with scalar items.

Can we observe the same phenomenon with the present perfect and the past tense? Let’s consider the following example. For now, we can assume that the present perfect and the past tense have the existential reading as in Pancheva and von Stechow (2004).

If the past tense were actually a stronger scalar alternative to the present perfect, then with scalar reversal under negation, the present perfect will become stronger instead. Hence, (20-b) would get an inference that (20-a) is false, that Mary has
indeed been to the Louvre at some point, in particular, during an interval that can only be expressed with the present perfect—an Extended Now interval. Given the perfective semantics \( (τ(e) ⊂ t) \), this means it must be the case that Mary's visit ends exactly at the speech time (since otherwise, (20-a) would be true). This is obviously not consistent with our judgements.

Hence, I conclude that we should not treat the present perfect and the past tense as scalar alternatives to one another. In addition, given the discussion in Sharvit (2014), the English past tense cannot be existential, and the scalar relationship does not arise in the first place.\(^2\)

5.1.3 Comparing with the present tense based theories

Pancheva and von Stechow's (2004) analysis of the English and German present perfect also falls into another group of analyses: the present-tensed-based theories, which are based on the idea that maybe the Present Perfect Puzzle follows from a property of the present tense. Other analyses in this category include Portner (2003) and Giorgi and Pianesi (1997).

In particular, Portner's (2003) analysis is similar to the Extended Now theories, except that he argues that the Extended Now is presupposed by the present tense. Portner (2003) also assigns additional pragmatic components to the perfect, which account for its various other inferences. Since his account for the Present Perfect Puzzle is based on the Extended Now, I will omit the discussion here.

Giorgi and Pianesi (1997) have a syntactic view: the so-called ‘present tense’ in languages that do not show the Present Perfect Puzzle, such as Italian, is morphosyntactically an agreement marker, and hence the ‘present tense’ is essentially tenseless in those languages.

A major weakness of these present-tense-based analyses is that they predict that languages with and without the Present Perfect Puzzle will have two different types of present tenses, but this prediction is not borne out, as shown by Rothstein (2008). One example is Swedish. Rothstein (2008) points out that the Swedish present tense patterns with German in that the reference time may succeed the speech time, but it nevertheless shows the Present Perfect Puzzle (21).

(21) *Sigurd har kommit igår.
Sigurd has come yesterday
‘(Intended:) Sigurd came yesterday.’
(Rothstein, 2008)

\(^2\)But see Aonuki (2021) for a counterargument to Sharvit (2014).
5.1.4 Comparing with Klein’s (1992, 1994) P-definiteness

Klein (1992) has a different analysis of the present perfect. To Klein, the present perfect construction spells out the present topic/reference time (TT in Klein’s terminology), with a perfect aspect. Aspects express a relation between the TT and the situation (event) time $\tau(e)$ (TSit in Klein’s terminology). The perfect aspect under this definition (22-a) is equivalent to Kratzer’s (1998) perfect aspect discussed in Section 2.2.1.

(22) Klein’s definition of aspects
   a. Perfect: TT after TSit
   b. Perfective: TT including the end of TSit and the beginning of time after TSit
   c. Imperfective: TT properly included in TSit
   d. Prospective: TT before TSit

Unlike the analyses we just discussed, Klein (1992) takes the temporal adverbial to specify the situation time, rather than modifying the reference time. He takes the Present Perfect Puzzle to be a consequence of a temporal modification constraint, shown in (23).

(23) The P-Definiteness constraint
   In an utterance, the expression of TT and the expression of TSit cannot both be independently p-definite.

(24) P-definiteness
   An expression whose lexical content explicitly specifies the position of a time span in relation to the utterance time (TU) is $p$-definite.
   (Klein, 1992, (43))

For Klein (1992), the lexical content of the VP in (25) is Chris leave at six, hence the situation time is p-definite. Klein assumes that the reference time of the present perfect is always the speech time, which is p-definite. It follows that whenever a temporal adverbial is used to specify the situation time, the P-definiteness constraint is violated.

(25) #Chris has left at six.

On the other hand, the English past tense is not p-definite in Klein’s system (26), because it simply says that the reference time is before the speech time,
without specifying exactly when.

(26) **Klein’s definition of the past tense**

**PAST:** TT before TU (utterance time)

It then follows that a sentence in the past tense allows the specification of TSit by temporal adverbials.

The P-definiteness constraint is pragmatic for Klein. In a sentence like (27), the assertion is that there is a past event of John leaving at four, and the topic time is after the time of John’s leaving. Since any time after four o’clock must be after four o’clock, and the topic time in (27) is the speech time, Klein concludes that it is unnecessarily informative to specify TSit when the topic time is already clear.³

(27) #John has left at four.

For Klein’s analysis to account for the crosslinguistic variation of the Present Perfect Puzzle, however, we need to assume either that in languages like French, the present perfect morphology does not spell out the semantic present perfect (so that the TT is not the speech time, i.e. not already p-definite), or that the P-definiteness constraint does not apply for some reason. Given that Klein considers the constraint to be a pragmatic principle that follows from the Gricean Maxim of Quantity (be as informative as needed, and no more), it is not clear why this principle would not apply in languages other than English.

5.1.5 Present adverbials

Another remaining issue with the Present Perfect Puzzle is the ‘present’ adverbials, which are temporal adverbials that denote a time interval that includes the speech time, such as *today*, *this month* and *this year*. It has been noted in the literature that the Present Perfect Puzzle disappears with these adverbials (Portner, 2011).

(28) a. Mary has paid her bills this month.
    b. I have taken my medicine today.

³Klein argues that (27) contrasts with the following sentence with the past perfect:

(i) At seven Chris had left.

(27) says that by seven o’clock, Chris had already left. Because the time of leaving is not specified, it makes sense to specify the topic time as seven o’clock.
Under my analysis, this phenomenon straightforwardly follows from the semantics of the present perfect and the past tense. Since the adverbial denotes a time interval that overlaps with the speech time, the past tense cannot be anaphoric to that time, because it requires the reference time to precede the speech time: $t < t_c$. The present perfect, allowing $t \preceq t_c$, is the only option.

A related problem is the use of the past tense with present adverbials (29).

(29) a. Mary paid her bills this month.

   Inference: There is a time, which is over by now, at which Mary is supposed to pay her bills each month.

b. I took my medicine today.

   Inference: There is a time, which is over by now, at which the speaker is supposed to take the medicine.

If the temporal adverbial modified the reference time, (29) would violate the Extended Now presupposition of the present tense, resulting in infelicity, contrary to fact. However, these sentences seem to come with an inference, indicated in the examples. I argue that they are acceptable exactly because the reference time is not the time denoted by the adverbial, unlike in (28).

Closer examination shows that the reference time in (29) seems to be a presupposed and more specific time than this month or today. The inferences indicated above are presuppositions. Consider the following observation:

(30) (Mary has a recurring bill which is paid on the first day of each month, which is over by now.)

   a. Mary paid the bill this month.

   b. ??Mary paid the bill this year.

(31) (This medicine is taken once per day at a fixed time, which is over by now.)

   a. I took the medicine today.

   b. ??I took the medicine this week.

In each of the (a)-sentences, it is true that there is a fixed time, which precedes the speech time, in which the event is supposed to take place, and this time is also presupposed to be unique within a certain period. The (a)-sentences assert that this event has indeed taken place at that time.

In other words, the past tense in these sentences is actually the unique past
tense. This is also confirmed by the (b)-sentences: if the time interval denoted by
the temporal adverbial is too big such that it undermines the uniqueness of the
event time, then the sentence becomes odd (unless the event is interpreted as the
collection of all such events during that period).

Furthermore, we can use presupposition projection tests to show that the ref-
ERENCE time is indeed presupposed because the inference survives environments
such as negation.

(32) (There are no previously mentioned past times when the following are
uttered:)
   a. Mary didn't pay her bills this month.
      Inference: There is a time, which is over by now, at which Mary is
               supposed to pay her bills each month.
   b. I didn't take the medicine today.
      Inference: There is a time, which is over by now, at which the
               speaker is supposed to take the medicine.

(33) (There are no previously mentioned past times when the following are
uttered:)
   a. Did Mary pay her bills this month?
      Inference: There is a time, which is over by now, at which Mary is
               supposed to pay her bills each month.
   b. Did you take the medicine today?
      Inference: There is a time, which is over by now, at which the
               addressee is supposed to take the medicine.

I conclude that the past tense here is the unique past tense, which is licensed
because the contextual information is such that in the best accessible worlds, the
event in the sentence has taken place. In addition, under the intended reading of
sentences like (29), the presuppositions of the unique past tense are satisfied, and
they are stronger than that of the present perfect. Again, PIP rules out the use
of the present perfect in this case. This is confirmed by the observation that the
present perfect versions of the sentences are only allowed when the presupposition

4This reading is illustrated in the following context: Alex and Mary are spouses and somebody
is talking to them assuming that Alex pays their joint phone bill. But actually, they alternate
years: one year, Alex pays the phone bill every month, and the next year, Mary does so. They
reply 'No, Mary paid the bill this year'. The sentence means Mary paid it every month. In (31-b),
such reading would be one where the medicine receives a kind reading, so the speaker is asserting
that he or she took the same kind of medicine every day this week.

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of the unique past tense is not satisfied:

(34)  a. Mary has paid her bills this month.
      b. Has Mary paid her bills this month (yet)?
      Inference: We don’t know if there is a fixed date, which is over by
                 now, on which Mary was supposed to pay the bills.

(35)  a. I have taken my medicine today.
      b. Have you taken your medicine today (yet)?
      Inference: We don’t know if there is a fixed date, which is over by
                 now, on which the speaker was supposed to take the medicines.

5.2  Competition with the unique past

In the previous section, we concluded that the different inferences in (29) and
(34)-(35) follow from the competition between the present perfect and the unique
past tense. Given that the present perfect is presuppositionally weaker than the
unique past tense, the prediction is that it is restricted to contexts where the
presuppositions of the latter are not satisfied. In this section, I will discuss some
classic data points in the previous literature on the present perfect which I believe
follow from this competition.

Recall that the unique past tense occurs in two kinds of contexts: (i) when the
reference time is the event time of a perceivable change-of-state event; (ii) when
the context presupposes the existence and uniqueness of a past interval in which
the event is assumed or expected to have taken place.

The first group of contexts leads to the prohibition of using the present perfect
in those contexts, such as:

(36)  (Pointing at a church:)
       #Borromini has built this church.

(37)  ??Gutenberg has discovered the art of printing.
       (McCoard, 1978; Portner, 2003, 2011)

In particular, the use of the unique past tense in (37) requires the knowledge
of the fact that the art of printing is already discovered—given this knowledge,
we presuppose that there is a change-of-state from not knowing how to print to
knowing. This knowledge may be accommodated, or it may not be. In the latter
case, the present perfect may be acceptable. This has been noted by Portner
Imagine a context in which ‘a demon who has directed the development of information technology says: Now that Gutenberg has discovered printing...it’s time to lead these humans to the next thing...’ (Portner, 2003, 2011). In this case, the context is one in which we do not presuppose the change-of-state (the discovery), the presuppositions of the unique past tense are not satisfied, and the present perfect may be used to present it as new information.

The Extended Now theories of the present perfect treat sentences like (36) and (37) as violating the ‘pragmatically-determined nature’ of the Extended Now (Portner, 2011). The idea is that the Extended Now interval usually should be recent, and something like the 15th century is too far away from the speech time to meet that criterion. This pragmatic nature is hard to pin-point and there has not been a clear definition of how ‘recent’ something has to be to license the Extended Now interval.

In addition, this analysis faces difficulties with the Italian data discussed in Section 3.1.4, where the present perfect can be used to describe historical events. In my analysis, in contrast, we do not face these problems, since the present perfect only requires the reference time to not succeed the speech time. In Italian, whether the presuppositionally stronger simple past is available as an alternative is regulated by the register. In informal writing, the simple past is not used, so the present perfect is the only available option and is felicitous in these contexts describing historical events. In English, the infelicity of (36) and (37) follows from the fact that the English past tense is an available alternative and must be used in these contexts.

The other groups of contexts which require the unique past tense are more flexible. For expected events and lifetimes, the acceptability of the past tense or the present perfect is more dependent on contextual information and very often accommodation, as in (29) and (34)-(35). In the remaining part of this section, I will discuss some more relevant data and compare my analysis with previous ones.

5.2.1 Future possibility and the lifetime effect

For certain events, sometimes both the unique past tense and the present perfect are allowed, but they lead to different inferences. This reflects the heavy influence of accommodation for satisfying the presuppositions of the unique past tense. For example, consider the contrast in (38):

(38) (There is no contextually salient past time, and we don’t know if the Monet exhibit is still open:)
a. Have you been to the Monet exhibit?
   **Inference:** It is still possible to go to the exhibit.

b. Did you go to the Monet exhibit?
   **Inference:** The exhibit is over.

Since there is no contextually salient past time, the past tense here cannot be anaphoric. We are not presupposing any change of state or an expected past event either. If no additional information is accommodated, the present perfect is the only felicitous choice, shown in (38-a). However, in (38-b), the past tense is felicitous too, but comes with an additional inference that the exhibit is over by the speech time.

On the other hand, if the context entails the information that the exhibit is over, only the past tense is allowed:

(39) (There is no contextually salient past time, but we know that the Monet exhibit is over:)
   a. #Have you been to the Monet exhibit?
   b. Did you go to the Monet exhibit?

In Katz (2003), this contrast is taken to be evidence that the present perfect presupposes future possibility. However, we will see below that it is hard to maintain future possibility for a range of events.

Related to this issue is what has been labeled as the lifetime effect in the literature on the present perfect. The idea is that the present perfect cannot be used for things that no longer exist (especially when the entity is the subject). The data that the lifetime effect covers also includes the following contrast:

(40) a. ?Einstein has visited Princeton.
    b. Princeton has been visited by Einstein.
   *(Chomsky, 1971)*

(40-a) differs from (40-b) in that Einstein is no longer alive, and cannot visit Princeton (or any place) any more, but Princeton still exists. The felicity of (40-b) also depends on the topic and intonation (with stress indicating the focus), as noted by the previous literature (Inoue, 1979; Portner, 2003, a.o.). In particular, (40-a) is particularly bad when the stress falls on Princeton, which reflects the fact that the topic/old information is Einstein and Princeton is the new information. However, even (40-a) improves in contexts where we talk about Nobel Laureates.
who have visited Princeton, and especially in a list:

(41) Which Nobel Laureates have visited Princeton?
    Let’s see...EINSTEIN has, FRIEDMAN has,...
    (Inoue, 1979)

Some authors, such as Katz (2003), argue that the lifetime effect, like the Monet exhibit examples above, illustrates a future possibility presupposition of the present perfect:

(42) \[ \text{[present perfect]} \]
    \[ = \lambda P. \exists \tau(e) < t_c \land P(e)(w_c), \]
    defined iff \[ \exists t[t_c < t \land \text{POSS}(P, t, c)] \]
    where \( cs_c \) is the context set in the Stalnakerian sense, functioning as the modal base.

(43) \[ \text{POSS}(P, t, c) = 1 \text{ iff } \]
    \[ \exists w \exists e[w \in cs_c \land \tau(e) \subseteq t \land P(e)(w)] \]
(44) Katz argues that the data in (38) and (39) follow from the fact that if the exhibit is still open, then it is still possible to see it in the future, and the presupposition of the present perfect is licensed.

However, Katz’s analysis has difficulties with the Einstein and Princeton examples, since regardless of the topic and intonation, it is impossible to have another event of Einstein visiting Princeton in the future. To avoid this problem, Katz further proposes that topic and focus can affect how specified the event \( e \) is: in (41), the future possibility is about some relevant individual, not necessarily Einstein, visiting Princeton.

Another issue with Katz’s analysis is whether the present perfect actually has this presupposition. For example, there are some clearly irrepeatable events that allows the present perfect:

(44) The dog has died.

(45) The president has been assassinated!

Katz argues that (44) is felicitous in contexts where we do not know that the dog is dead, and hence the dying event might occur in the future. While it is true that sentences like (44) are used to announce a piece of news, it is not clear if speakers
really mutually believe that the dog might die (other than the fact that all living things inevitably die at some point). For (45), even if the speakers believe that the president will die at some point, they may not mutually believe that there is a possibility that (s)he dies by assassination. Of course, Katz could argue that the possible event is unspecified, but this leads to the question of how unspecified this event may be. If we allow the event to be too unspecified, then we would greatly overgenerate the possible uses of the present perfect, based on Katz’s analysis.

In Katz’s analysis, the present perfect is the alternative with additional presuppositions (as opposed to the past tense). With PIP, this means that it will overgenerate whenever the asserted event is one that could take place in the future, and predict that the past tense should be ruled out, contrary to fact. For example, recall that the past and the perfect versions of the sentence below are both possible, but have different inferences.

(46) (We know that the rent is paid on the first day of each month. The following sentences are uttered on the 15th of that month:)

a. Did Mary pay the rent this month?
(Asking about whether Mary paid the rent on the 1st.)

b. Has Mary paid the rent this month (yet)?
(Not asking about what happened on the 1st, but whether Mary has paid the rent so far.)

Katz’s account incorrectly predicts that the past tense sentence should be ruled out by PIP since the present perfect is the alternative with additional presuppositions, and these presuppositions are satisfied (it is possible that Mary pays the rent in the future).

Having concluded that the future possibility account does not work, we will need a way to account for the observed ‘lifetime effect’. I argue that in general, the data regarding the ‘lifetime effect’ can be accounted for by the stronger presuppositions of the unique past tense. In particular, examples like (38) and (40)-(41) reflect the fact that the time span or the lifetime of some contextually salient individual or event is the unique past interval that is maximally informative with respect to the temporal property life.

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*It is possible for the speakers to believe that in the future, some president (may not be the same person) may be assassinated. but under a de re interpretation of the president, Katz’s analysis will require that the speakers must believe that the particular person known to be the current president may be assassinated in the future. This does not seem to be the case. For example, the news reporter could announce that *Irrfan Khan has died of cancer*, without having to presuppose that the famous actor could die of cancer in the future.*
Therefore, in (40-a), the topic is Einstein, and if we talk about something Einstein did, it only makes sense if Einstein was alive during that interval (i.e. the reference time must be an interval having the temporal property life). Since the maximally informative interval with respect to this property is unique, the presupposition of the unique past tense is then satisfied, and the present perfect is ruled out by PIP.

In (40-b) and (41), on the other hand, the topic is Princeton, and its lifetime obviously includes the speech time, violating the presupposition of the past tense. However, the visiting time of Einstein and Friedman may be introduced into the context as new information by the present perfect, which can function as a temporal indefinite past in the manner proposed in the previous chapter. This is confirmed by the fact that we may continue the conversation in (41) with an anaphoric past tense:

(47) Which Nobel Laureates have visited Princeton?
    Let’s see...I know that Einstein has. He delivered some lectures there.

The contrast in (38-a) follows from the fact that the context does not contain the information on whether the exhibit is still open. If the unique past tense is used, the listener accommodates the time span of the exhibit and concludes that since the reference time is a past interval, it must be the case that the exhibit is over. Since by PIP, whenever the time span of the exhibit is in the past, the unique past must be used, it follows that the present perfect is then reserved for cases where the unique past tense cannot be licensed, namely, when the time span of the exhibit includes the speech time (the exhibit is still open).

On the other hand, in (44) and (45), the topics (the dog, the president) are not known to be dead yet since their deaths are announced as new information. Therefore, the context does not entail that their lifetimes are in the past, and the unique past tense cannot be licensed.

We can find other examples showing the interaction between the topic and the lifetime effect. In general, if the topic is what happened during a person’s (or any entity’s time span) lifetime, the speaker can use the lifetime as the reference time, without needing an additional, explicitly mentioned antecedent time. Since the past tense can be used only when the reference time is completely in the past, we automatically derive the inference that the subject is no longer alive.

(48) (Uttered without any contextually salient past time:)
    a. The Roman Empire built many baths and aqueducts across Europe.
b. Dostoevsky was a great Russian writer.
c. Maradona was a famous Argentinian soccer player.
d. My grandfather enjoyed playing chess.

This relates back to the debate on whether the English past tense is always anaphoric: in sentences like (48), if the past tense must be anaphoric, we would need a way of accommodating these past times systematically (in certain cases but not in others), which the previous literature has failed to achieve. Under the analysis that the English past tense can be licensed by uniqueness, we straightforwardly derive the fact that the past tense is obligatory in these cases.

Separating the unique and anaphoric past tense in English also explains why the inference regarding the lifetime of the subject disappears when there is a contextually salient past time. The reason is, in this case, the past tense is simply anaphoric to that time, and the reference time is not identified with the subject's lifetime. This is illustrated in (49). Unlike (49-a), the use of the (anaphoric) past tense in (49-b) does not give rise to the inference that B's family is dead.

(49)  
a. (There is no previous discourse:)  
   My grandpa played chess.
   Inference: The speaker's grandpa is dead.
b. A: What did your family do last Sunday?
   B: My grandpa played chess, my mother took me to the zoo, my brother played video games,...

To show that the past tense in (49) is not just accommodating an antecedent for the anaphoric past, we have the following example:

(50) (Talking about Alexander the Great, Napoleon Bonaparte, and William the Conqueror. There is no contextually salient past time:)  
    Each fought in many historically significant wars and experienced both victory and defeat.

(50) is interpreted as each person mentioned fought in wars during his lifetime, instead of talking about what happened during a general, long time span, which is not provided in the context. The past tense has a covarying reading with respect to each person, just as what we expect with the unique past tense.

Likewise, the different inferences of the past tense and the present perfect in (38) only arise because the past tense is licensed by uniqueness. Given a contex-
ually salient past time, the anaphoric past tense is used, and the present perfect is banned directly, without generating any inferences about whether the exhibit is still open:

(51)  (John and Mary are talking about what they did over the weekend:)
      a. #Have you been to the Monet exhibit?
      b. Did you go to the Monet exhibit?

The crosslinguistic data also support the analysis that the present perfect is not inherently subject to the lifetime effect constraint. Recall that standard Italian and colloquial French are languages where the present perfect can be used like a perfective past tense, and we can see that there is no restriction against using the present perfect for the late Einstein in (52).

(52)  (Talking about Einstein today:)
      a. Einstein ha visitato Princeton.
         ‘Einstein visited Princeton.’
      b. Einstein s’est exprimé sur ses convictions socialistes.
         ‘Einstein expressed his socialist beliefs.’
         (from the French wikipedia on Einstein)

5.2.1.1 Predictions for change-of-state events

Now let’s compare my analysis with the future possibility analysis with respect to change-of-state events. When there is a perceivable change-of-state event, the unique past tense is required if we talk about that event. In this case, using the present perfect will also lead to inferences. For example, in (53), if the speaker is looking at a particular piece of litter and asking about the person who left it there, then (53-a) is obligatory.

(53)  (Looking at a particular piece litter:)
      a. Who littered here?
      b. #Who has littered here?
         (Matthewson et al., 2019)

The present perfect sentence is felicitous only if the speaker is asking whether anyone has ever littered in that place at any past time. In addition, Lisa Matthewson
notes that it seems to suggest that the littering event is recent, or that the
speaker may know the set of people who might have littered here.

Again, I believe that Katz’s future possibility analysis has trouble capturing
this difference. In both cases, it is certainly possible that someone litters in the
future, and the prediction would be that the present perfect should be preferred.

Finally, the modal analysis in Katz (2003) is English-specific. For the crosslin-
guistic variation, one has to assume that for some reason, the present perfect in
languages like French, Italian and German does not carry the future possibility
presupposition.

The conclusion of this section is that the lifetime effect and repeatability in-
ference of the present perfect is not inherent to the present perfect, but rather
follows from competition with the (presuppositionally stronger) unique past tense
in English.

5.2.2 Current relevance

I mentioned in the previous chapters that the literature often uses ‘current
relevance’ to characterize the English present perfect. However, there is no con-
sensus about the definition of ‘current relevance’. In this section, I will discuss
some representative analyses.

5.2.2.1 Current relevance as topic

McCawley (1971) argues that current relevance is related to the topic: we
discussed the effect of topic and intonation in the Einstein and Princeton examples
in the previous section. In particular, McCawley (1971) argues that the sentence
Einstein has visited Princeton, when stressed on Einstein, is acceptable and
does not seem to presuppose that Einstein is alive, and it seems to mean the same
thing as Princeton has been visited by Einstein, where the topic is Princeton.
However, this simple analysis has many counterexamples, such as (54), where the
topic in both sentences is Frege.

(54) (Uttered today:)
   a. Frege has been denounced by many people.
   b. #Frege has been frightened by many people.
   (McCawley, 1971, p.106)

McCawley (1971) then concludes that the semantics of the verb phrase also affects
the interpretation of current relevance.

Inoue (1979) follows McCawley (1971) and agrees that current relevance is related to the topic. More specifically, she defines topic as the discourse topic: ‘a proposition about which the speaker is either providing or requesting new information... (using) the present perfect’ (Inoue, 1979). She argues that when using the present perfect, there is an entailment relation between the topic proposition and the proposition described in the sentence, although this entailment relationship is often not straightforward, and can be ‘dependent on the speaker’s knowledge of the world and his belief in the relevance or relatedness of the two situations represented in the two propositions’ (Inoue, 1979, p.14).

For Inoue (1979), current relevance is also a repeatability condition. She argues that ‘a currently relevant topic refers to a situation which is either being repeated, or is repeatable at the speech time’ (Inoue, 1979, p.14). She argues that for #Einstein has visited Princeton (with the neutral intonation), the topic proposition could be something like Einstein has visited many American universities, and the conversation would be about the particular universities that he has been to. However, since Einstein is no longer living, the visiting can no longer be repeated, and the present perfect is prohibited. In Princeton has been visited by Einstein, in contrast, she argues that the topic proposition is something like Princeton has memorable occasions. In addition, this analysis captures the fact that the sentence improves when there is a list of other people besides the late Einstein, as shown in (41) in the previous section. Inoue further lists the possible topics and their effects on the acceptability of the present perfect:

(55) (Uttered today:)
Einstein has visited Princeton.

- #Talking about Einstein engaging in various activities. (non-repeatable)
- #Talking about Einstein visiting American universities. (non-repeatable)
- ✓ Talking about Princeton University having memorable occasions. (repeatable)
- ✓ Talking about Nobel Prize winners visiting Princeton. (repeatable)
- ✓ Talking about Jewish scholars coming to the United States. (repeatable)

(Inoue, 1979, p.17)
While Inoue’s analysis successfully derives the basic contrast in the Einstein-Princeton sentences, as well as the Frege sentences (54), her repeatability condition is a constraint on the discourse topic, which is very flexible in practice. It turns out that her analysis will overgenerate in many cases, especially with change-of-state events where the unique past tense is obligatory. Some examples are:

(A tourist guide is showing people around in Italy. He points at a church:)
#Borromini has built this church.

a. #Talking about famous architects who have surviving works in Italy.
(repeatable)

b. #Talking about Borromini’s life and works.
(irrepeatable)

In (56), regardless of the discourse topic, the sentence is unacceptable. However, Inoue (1979) would predict that (56-a) should be able to license the present perfect, since it is a repeatable situation.

I believe that the data in (56) suggests that the restriction against using the present perfect is related to the obligatoriness of the past tense. The fact that we cannot find a topic that makes the present perfect acceptable also shows that it may not be topic that regulates its felicity.

The unique past tense analysis can account for (54). In (54-b), any event of Frege being frightened only makes sense if Frege is alive, and the reference time is the unique maximally informative interval with respect to the temporal property life ($\lambda t. \lambda w. \exists s [\text{Frege-alive}(s) \land t \subseteq \tau(s)]$). The present perfect is then ruled out by PIP. In (54-a), the reference time is not restricted to Frege’s lifetime, and the present perfect can be used. Similarly, for the Einstein-Princeton sentences, if the topic is Einstein and what makes sense only when Einstein is alive, then the reference time is obligatorily his lifetime, which satisfies the presuppositions of the unique past tense.

5.2.2.2 Current relevance and the result state

Portner (2003) has a slightly different view on the Einstein-Princeton sentences. He agrees that the difference between the Einstein and Princeton sentences follow from their different topics, but the prohibition of Einstein has visited Princeton (with the neutral intonation) does not follow from the repeatability condition, but

---

6It is not Borromini building this particular church that is repeatable, but rather, famous architects building churches is.
from the Extended Now presupposition of the present tense.\footnote{This analysis cannot explain why in English, the present perfect can provide an antecedent for the anaphoric past tense: if the present perfect presupposes that the reference time is an Extended Now interval, this interval cannot license the subsequent use of the anaphoric past. In addition, Portner will have to assume that languages like French, German, and Italian have a different present perfect, or different present tense.}

Regarding current relevance, Portner believes that it is related to how the result of a past event answers a topic question. He argues that (57) is often used to indicate that Mary is currently still here, which is the result state of the arriving event.

(57) Mary has arrived.

Portner argues that in (57), the state that helps answer a topic question (e.g. *Is Mary here yet?*) has a causal relation with the event. This relation is responsible for the ‘resultative’ reading of the present perfect.

Portner generalizes the idea to the non-resultative use of the present perfect. Instead of saying that the result state answers the topic question, Portner uses a more general state entailed by the epistemic modal base. For example, in (58), he argues that the intuitive interpretation of (58) is that ‘there is some current state which was caused by Mary’s reading *Middlemarch*’.

(58) Mary has read *Middlemarch*.

Portner argues that the current state which follows Mary’s reading of *Middlemarch* is used to answer some topic question, and illustrates it with the following example:

(59) A: We need to get an explanation of George Elliot’s style. Who can we ask?

   B: Well, George Elliot wrote *Middlemarch*, and if someone reads an author’s books, they understand her style. Unless they are stupid of course. Mary is smart, and she has read *Middlemarch*. So we can ask her. (Portner, 2003, (72))

In (59), the state resulting from Mary’s reading is that Mary is able to discuss George Elliot’s writing style. Portner argues that if the proposition *Mary has read Middlemarch* is added to the context, then the epistemic modal base will entail that state. Portner argues that this is a presupposition of the perfect operator.

Formally, Portner follows von Fintel (1994); Roberts (1996); Büring (1997);
McNally (1987) and assumes that the discourse topic is an implicit question that the speaker is trying to answer. He defines the presupposition of the perfect operator as:

\[(60) \quad \text{The presuppositions of the present perfect (Portner, 2003)}\]

A sentence \(S\) of the form \(\text{PERFECT}(\phi)\) presupposes:
\[\exists q[\text{ANS}(q) \land \mathcal{P}(p, q)],\]
where
\[
\begin{align*}
a. \quad & p \text{ is the proposition expressed by } \phi, \text{ and} \\
b. \quad & \text{the property } \text{ANS} \text{ is true of any proposition which is a complete or partial answer to the discourse topic at the time } S \text{ is uttered, and} \\
c. \quad & \text{the operator } \mathcal{P} \text{ is similar to an epistemic must:}
\end{align*}
\]
\[\mathcal{P}(p, q) \text{ is true iff } \forall w \in \cap(\mathcal{E}_{(w, u)} \cup p), q(w) = 1, \text{ where } \mathcal{E}_{(w, u)} \text{ is the epistemic conversational background accessed from world } w \text{ and utterance situation } u.\]

In other words, the use of the perfect presupposes that if the proposition \(p\) is true, then the accessible epistemic conversational background entails another proposition \(q\), which helps answer the topic question.

In (57)-(59), \(q\) is the state which results from the asserted event. This may be the result state of change-of-state events (57) or just some state with an (indirect) causal relation with respect to the epistemic modal base (59). The latter is especially difficult to define properly: Portner does not have any constraint on which states are good enough to license the use of the present perfect, other than that the epistemic conversational background entails that state.

For example, it is obvious that there are many instances of the present perfect without the resultative reading. Portner argues that these arise when the relation between the state and the asserted event is not one of direct (result state) causation.

One example is the following:

\[(61) \quad \text{The Earth has been hit by giant asteroids before.}\]

Portner argues that (61) is felicitous in contexts like the following:

\[(62) \quad \text{A: Is the Earth in danger of being struck by giant asteroids?} \]

\[
\begin{align*}
\text{B: Astronomical conditions aren’t very different now from what they have been in the past. And the Earth has been struck by giant asteroids before.} \\
\text{So it’s quite possible it will happen again.}
\end{align*}
\]
Portner (2003)

Portner argues that given the presupposition of the perfect in (60), using the present perfect highlights the fact that B’s utterance answers A’s question.

I think Portner’s argument here is weak, because the past tense may also be used to answer the same question:

(63)  A: Is the Earth in danger of being struck by giant asteroids?
     B: Astronomical conditions aren’t very different now from what they have been in the past. And 66 millions years ago, the Earth was struck by a giant asteroid. So it’s quite possible it will happen again.

The only difference between (62) and (63) is that the latter contains a specific temporal adverbial *66 millions years ago*, which provides an antecedent time for the anaphoric past. However, (63) answers A’s question just as much as (62) does. Portner’s analysis would predict that the present perfect should be preferred because its presuppositions are stronger and are satisfied in this context. The only way for Portner to avoid this issue is to argue that the explicit past adverbial prohibits the use of the Extended Now as the reference time. However, this goes back to the issue of whether an Extended Now analysis can account for the Present Perfect Puzzle, which the previous sections argue against.

In addition, the felicity of the present perfect in (60) is also problematic for Portner’s assumption that if an event is ‘too long ago’ from the speech time, it cannot be included in an Extended Now interval (which is the reason why Portner believes that the present perfect is ruled out in *#Gutenberg has discovered the art of printing*), since the event of the Earth being hit by asteroids is certainly more far away than Gutenberg’s discovery.

In fact, Portner’s analysis of the present perfect in (60) predicts that it should be preferred in *any* context where the speaker is answering a question, as long as the Extended Now presupposition is satisfied (i.e. no explicit past temporal adverbials). This will greatly overgenerate, including cases like the following:

(64)  (Pointing at a church:)
     A: Who built this church?
     B: #Borromini has built this church.

If B’s answer helps answering the topic question, Portner cannot explain why the present perfect is still infelicitous here.
In fact, Portner often compares the use of the present perfect and the past tense in out of the blue contexts, where the anaphoric past is obviously prohibited, and the unique past needs strong contextual support unless we are dealing with perceivable change-of-state events. Hence, more often than not, the present perfect will be felicitous. These ‘out-of-the-blue’ uses of the present perfect are problematic for Portner because in these contexts there are usually no contextually salient topic questions. This is the case for the typical ‘hot news’ reading of the present perfect, such as:

(65) The president has been assassinated!

To explain the ‘out-of-blue’ use of the present perfect, then, Portner argues that:

...a special situation arises when the Common Ground is close to empty, as at the start of a conversation. In such cases, the present theory implies that one of the two situations holds: either a very weak common ground suffices to allow the perfect’s presupposition to be satisfied, or the Common Ground is not as impoverished as it seems... (Portner, 2003, p.46).

Portner gives this particular example:

(66) The Orioles have won!

Portner argues that this sentence may be said even to a complete stranger, because the speaker assumes that everyone is interested in the question How is the Orioles baseball team doing? However, Portner does not discuss how to determine whether the initial, close-to-empty Common Ground contains enough information to support the use of the present perfect.

In an impoverished Common Ground where we cannot find a topic question, the prediction will be that the present perfect is prohibited. This prediction is not borne out: if the presuppositions of the past tense cannot be satisfied, or if salient past reference time cannot be accommodated, the present perfect is the only choice.

(67) (In a discourse initial context, without any salient topic question:)
    ??Mary moved to Kazakhstan.
    Mary has moved to Kazakhstan.\(^8\)

\(^8\)One way where the past tense sentence may be used is the following context: if I meet someone
In comparison, if the topic is about a specific past time, when answering the question, the anaphoric past tense is obligatory and the present perfect prohibited. Note that this generalization holds despite the absence of an explicit temporal adverbial.

(68)  
A: What did Mary do last year?  
B: She moved to Kazakhstan.  

I conclude that Portner’s analysis makes wrong predictions: the present perfect cannot have the extra presupposition in (60).

I believe that the ‘hot news’ reading of the present perfect simply follows from the fact that it can be used as an indefinite past in English. In fact, it has been noted in the literature that the ‘hot news’ perfect reading does not necessarily refer to a recent event, but rather to an event that the addressee does not know about (McCawley, 1971; Depraeterre, 1998). It follows that the ‘hot news’ reading of the perfect results from the fact that in ‘hot news’ contexts, there is no previously established past time, and the present perfect is used just to provide such a new time as a temporal indefinite.

5.2.2.3 Deriving the resulative reading

If Portner’s analysis does not work, we must find another way to account for the apparent resultative reading of the present perfect. Some of the contexts in which the present perfect indeed has a resultative reading are shown below.

(69)  
a. (Mary meets her friend after a long time:)  
A: How are you doing?  
B: I’ve been diagnosed with cancer.  
Inference: B is currently sick with cancer.  

b. (At a house party, we are waiting for friends to arrive. Bill hears the doorbell and opens the door for someone. Susan, however, is too focused on the video game and is unaware. She then notices voices at the door.)  
Susan: What’s happening?

who knows Mary on the street and her move is surprising, I could say ‘Guess what, Mary moved to Kazakhstan!’ In this case, the reference time is assumed to be the past interval since the last time they meet Mary. In a way not so different from Partee’s I didn’t turn off the stove! example, where it is uttered when someone comes to work and the reference time is accommodated to be ‘the twenty minutes before the speaker leaves the house in the morning’.
Katie: Mary has arrived. Let’s go meet her!
Inference: Mary is here now.

c. (The postman comes to deliver a package, without knowing whether
Mary is still here:)
A: Here is a parcel for Mary.
B: Mary has gone home.
Inference: Mary is no longer here.
d. (Mary, who is not at home now, texts her roommate about the
kitchen:)
A: I’d like to use the kitchen but you guys made such a mess last
night.
B: I have cleaned the kitchen.
Inference: The kitchen is clean now.
e. (I want to borrow Mary’s key to the office.)
Mary: I’ve lost my key.
Inference: The key is gone.

We can compare these examples with sentences with change-of-state predicates
and definite objects, where the unique past tense is obligatory if the speaker is
talking about the unique change-of-state event giving rise to the current state.

(70)

a. (Seeing that Mary is no longer here:)
   A: Where did Mary go?
   B: She went home.
   b. (Seeing that the kitchen is clean:)
      Who cleaned it?
   c. (Seeing that the key is gone:)
      Who took the key?

Comparing (69) to (70), we can see that they systematically differ in one aspect:
whether the result state is a known fact in the context. In (70), where the past
tense is obligatory, the result state is part of the Common Ground. In (69), on
the other hand, the result state is presented as a piece of new information. In

Lisa Matthewson (p.c.) points out that the present perfect version ‘Who has taken the key?’
may also be acceptable in a context like this: it implies that the speaker knows the domain of
people who might have taken it, and that it might be possible to get it back, and maybe it suggests
that the speaker is a bit annoyed, e.g. Who has taken the key this time?! In this case, it is not
necessarily about the particular event of the key being taken that leads to the current state of it
being gone, but rather, the set of all such events so far, with possibly different agents.
addition, in the contexts presented in (69), it is odd to try to cancel the result state of the asserted event. Unlike Portner (2003), I argue that answering the topic question should not be an explicit presupposition of the present perfect, but rather, it follows from general pragmatic principles. More specifically, since the topic question can be answered by a current state (e.g., the speaker being sick, Mary (not) being here, the kitchen being clean, and the key being unavailable) and assuming that the speaker is being cooperative and makes relevant assertions (cf. the Gricean principle of relevance), the addressee will infer that the assertion of the (change-of-state) event helps answering the topic question. It follows that the result state of the asserted event is taken to be that current state which resolves the topic question. In other words, the result state must be a current state. In addition, trying to cancel the result state will be infelicitous, since the speaker would violate the Gricean principle of relevance.

It follows from this analysis that the resultative reading of the present perfect may not surface if the topic question is different. For example, in a different context, (69-e) can easily get an existential/experiential reading, that there has been a past event of the speaker losing the key, without any implications about whether the key has been found since then.

If the present perfect presupposed the continuation of the result state, then the present perfect would be the alternative with the additional presupposition. By PIP, we would expect it to be obligatory in (70), since in each of the examples, the result state of the event is part of the Common Ground, satisfying the presupposition of the present perfect.

5.2.2.4 Comparing with perfect state theories

Another group of analyses motivated by the ‘current relevance’ inference of the present perfect propose that the current relevance comes from a state introduced by the perfect, which holds at the speech time (Parsons, 1990; Musan, 2001; Nishiyama and Koenig, 2004, a.o.). This state has been named the ‘perfect’ state, the ‘resultant’ state, and the ‘consequent’ state, with minor differences among different proposals.

Under the perfect state analysis, the resultative inference introduced in the previous subsection follows from the fact that this state holds at the speech time. Other current relevance inferences, which are more general than the result state of change-of-state events, motivate a broader definition of the perfect state than letting it simply be the result state. Portner (2011) has a summary of different
perfect state theories:

(71) Different definitions of the perfect state (Portner, 2011, modified)

a. The perfect state as the result state, or a state contingent upon the event (Moen and Steedman, 1988; Smith, 2013; de Swart, 1998; Spejewski, 1997); Portner (2003) also falls into this category, but the state is a presupposition;

b. The relation between the past event and the current state is temporal, with the state beginning during the event or at the end of the event (Kamp and Reyle, 1993; de Swart, 1998);

c. The perfect state is a special kind of ‘resultant state’, which is distinguished from the result state. The resultant state is an abstract state of the event’s ‘having occurred’ (Parsons, 1990; Musan, 2001, a.o.);

d. There are no semantic constraints on the identity of the perfect state (Nishiyama and Koenig, 2004; Nishiyama, 2006; Schwarz, 2009).

These groups of proposals all heavily rely on pragmatics to determine the nature of the perfect state. Out of these analyses, only Portner (2003) clearly defines the perfect state as a state entailed epistemically by the event taken place, and which helps answer the topic question. The analyses in (71-d) claim that the perfect state is semantically underspecified, represented by a free predicate variable which is then resolved in the context by Neo-Gricean pragmatic reasoning and Levinson’s (2000) I-Principle.

These theories all fail to account for the prohibition of the present perfect when the unique past tense is obligatory, such as the Borromini church example and the Gutenberg example. In these contexts, it is clear that there is a current state following the event, and these proposals predict that the present perfect should be felicitous, contrary to fact.

Another potential issue is whether the overlap of the perfect state and the speech time is an assertion or presupposition. In the DRT analyses such as (71-b), it is treated as an assertion. In Portner (2003), the relationship between the perfect state and the topic question is a presupposition. As the discussion so far shows, there is a great deal of variation in how a perfect inference arises, and we should not pursue a unified analysis where all of these inferences come from a perfect state.
5.3 The Universal Perfect

In this section, I will summarize Iatridou et al.’s (2003) analysis of the Universal Perfect reading, and show that my analysis of the present perfect is compatible with it.

The Universal Perfect reading refers to the reading that an event starts in the past and extends all the way to the speech time. It often occurs with certain adverbials such as since adverbials or for x time, although some of these adverbials do not by themselves guarantee the Universal Perfect reading. In the examples below, reading 1 illustrates the Universal Perfect reading, while reading 2 is known as the ‘existential’ perfect reading in the literature.

(72) Since adverbials
I have been sick since last year.
Reading 1: The sickness started in last year and persists to the speech time (the speaker is still sick).
\[ \exists s [t \subseteq \tau(s)] \text{ where } t = \text{the interval from last year to now}. \]
Reading 2: There has been (at least) one instance of sickness in the past interval from last year to now, but it is not clear how long it lasts or if the speaker is still sick.
\[ \exists s [\tau(s) \subseteq t] \text{ where } t = \text{the interval from last year to now}. \]

(73) For x time adverbials
Mary has lived here for five years (already/now).
Reading 1: Especially salient with already/now. Mary started living here 5 years ago, and she still lives here now.
\[ \exists s [t \subseteq \tau(s)] \text{ where } t = \text{the interval from 5 years ago to now}. \]
Reading 2: There has been an instance of Mary living here, which totals 5 years, but she may not still live here.
\[ \exists s [\tau(s) \subseteq t \land |\tau(s)| = 5 \text{ years}]. \]

Before Iatridou et al. (2003), the literature had no consensus on the nature of the Universal Perfect reading. This is due to the fact that in both (72) and (73), reading 2 does not in fact specify how long \( \tau(e) \) lasts, and it is possible that it happens to cover the entire time interval in question, as well as \( t_c \). For this reason, there has been a debate about how to distinguish the universal and the existential perfect readings in the literature. Some authors, such as Klein (1992, 1994), argue that the two readings are results of pragmatic inferences and the
vagueness of the duration of the stative; some other authors argue that there is a real semantic distinction (Dowty, 1979; Abusch and Rooth, 1990; Mittwoch, 1993, a.o.). Iatridou et al. successfully showed that the Universal Perfect reading is an entailment, and it indeed differs from the existential perfect reading. In particular, the ‘real’ Universal Perfect reading refers only to the reading 1 above, where it asserts that ‘the underlying eventuality holds throughout the interval specified by the adverbial, and its endpoints’ (the final endpoint being $t_c$ for the present perfect) (Iatridou et al., 2003). In other words, for the Universal Perfect reading to arise, the reference time must be an interval that ends at the speech time (i.e. an Extended Now interval). The beginning of this interval may be explicitly defined, as with since adverbials, or implicit, as in (73).

The relationship between adverbials and the Universal Perfect reading is summarized below (Iatridou et al., 2003):

(74) Adverbials and the Universal Perfect reading

a. Universal Perfect reading possible:
   
   since, for 5 days

b. Universal Perfect reading required:
   
   at least since, ever since, always, for 5 days now

The observation is that the adverbials that require the Universal Perfect reading have in common that the interval requires a ‘durative’ reading, namely, the predicate must hold throughout the interval ($t \subseteq \tau(e)$). On the other hand, the adverbials in (74-a) may also allow a ‘inclusive’ reading, namely, the predicate is included in the interval ($\tau(e) \subseteq t$). The ‘durative’ and ‘inclusive’ readings of the interval then correspond to the requirement of the underlying aspect: ‘unbounded’ (i.e. imperfective) and ‘bounded’ (i.e. perfective) in Iatridou et al.’s terms.

(75)  

a. Unbounded (imperfective)

   $\lambda P. \lambda t. \exists e [ t \subseteq \tau(e) \land P(e)]$

b. Bounded (perfective)

   $\lambda P. \lambda t. \exists e [ \tau(e) \subseteq t \land P(e)].$

There is also a correspondence between unboundedness and the Subinterval Property (Dowty, 1979):

(76) The Subinterval Property

The subinterval property holds of an interval $t$ iff the eventuality that
holds at that interval holds of every \( t' \) where \( t' \subset t \).

(77) Deriving the Universal reading

a. The reference time \( t \) satisfies \( \lambda t.\exists e[t \subseteq \tau(e) \land P(e)] \);

b. The final point of \( t \) is \( t_c \);

c. The Subinterval property holds of \( t \);

\( \Rightarrow t_c \subseteq \tau(e) \) and \( \tau(e) \) holds throughout \( t \)
(the Universal Perfect reading).

(Iatridou et al., 2003)

In English, there is a correlation between the subinterval property, boundedness, and progressive morphology. In addition, there is a distinction between statives and non-statives. The patterns can be summarized as:

(78) The progressive morphology and (un)boundedness

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<th>Nonstatives</th>
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<td>Unbounded</td>
<td>non-progressive</td>
<td>progressive</td>
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<td>Bounded</td>
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Statives in general do not need progressive morphology to be interpreted as unbounded or to satisfy the Subinterval Property. For non-statives, the progressive morphology is generally required. This characterization correctly predicts the distribution of the Universal Perfect reading in English:

(79) The distribution of the Universal Perfect reading

\[^{10}\]One exception is the verb *live*, which is sometimes categorized as an activity, but it can be interpreted habitually and does not need the progressive morphology to satisfy the Subinterval Property.

\[^{11}\]However, since English does not morphologically distinguish underlying perfective and imperfective (with the exception of progressive) aspects, all verbs may be interpreted as underlyingly perfective or imperfective in narration. This process is often regulated by the discourse coherent relations (Kamp and Reyle, 2011, a.o.). For example, in *John opened the door. It was dark in the room.*, the stative sentence is interpreted as ongoing at the reference time, therefore having an underlying imperfective aspect. This is not necessary though. Consider: *John turned off the light. It was pitch dark.* where the second sentence is interpreted as a result of the first sentence, the stative *was* is interpreted as an inchoative and completed at the reference time, therefore having an underlying perfective aspect. These patterns do not however undermine the general pattern observed in (78) regarding the simple and progressive morphology marking.
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<th>Statives</th>
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<td>Universal Perfect</td>
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<td>progressive</td>
</tr>
<tr>
<td>Existential perfect</td>
<td>non-progressive</td>
<td>non-progressive</td>
</tr>
</tbody>
</table>

We can illustrate this with some examples. Consider:

(80) I have been sick since last year.
   a. Underlying perfective: existential reading
   b. Underlying imperfective: Universal Perfect reading

(81) I have been sick ever since last year.
 ⇒ Only the Universal Perfect reading because *ever since* requires unboundedness

(82) Mary has been studying (ever) since this morning.
 ⇒ Only the Universal Perfect reading because of the progressive morphology

From a crosslinguistic perspective, Iatridou et al.'s (2003) analysis predicts that a language may have the Universal Perfect reading only if the underlying aspect is imperfective. In languages like Italian and French, the present perfect is inherently perfective. As expected, there is no ‘real’ Universal Perfect reading in these languages (83-a)-(84-a), and the languages use the present tense instead for such readings (83-b)-(84-b).

(83) (Italian:)
   a. Mario è stato malato.
      Mario AUX been sick
      ‘Mario has been sick (existential)/Mario got sick.’
   b. Guardiamo la tv già da tre ore.
      watch.1.PL.PRESENT the tv already since three hours
      ‘We've been watching tv since three hours ago.’

(84) (French:)
   a. Mary a été malade.
      Mary AUX been sick
      ‘Mary has been sick (existential)/Mary got sick.’
   b. Nous regardons la télévision depuis trois heures.
we watch.1.PL.PRESENT the tv since three hours

‘We’ve been watching tv since three hours ago.’

A final point is that Iatridou et al. treats both the Universal Perfect and the Existential Perfect readings as having an Extended Now interval as the reference time, with the only difference being the underlying aspect. Since I allow the present perfect to have a past interval as the reference time, this means that there are actually two kinds of existential perfect readings: one with a past reference time, and one with an Extended Now interval as the reference time. In terms of how the event is ordered with respect to the speech time, there is little difference between the two. There are several ways to test what the reference time is. We saw in earlier chapters that the present perfect may provide an antecedent for the subsequent anaphoric past tense (e.g. Mary has been to Paris. She saw the Eiffel tower there.), this suggests that the reference time of the first sentence is a past interval. On the other hand, since-adverbials indicate that the reference time is an Extended Now interval.

Regarding the Universal Perfect reading, I conclude that my analysis of the present perfect is compatible with Iatridou et al.’s analysis.

5.4 Additional comments on previous analyses

5.4.1 Schaden (2009): marked vs. default forms

A previous account also based on competition between the present perfect and the past tense is Schaden (2009). However, while the competition in this dissertation is based on the Presupposed Ignorance Principle (PIP) and the discourse status of the topic time, in Schaden (2009), the competition is based on the presence or absence of a perfect state, and a notion of markedness.

Briefly, for Schaden (2009), both the present perfect and the simple past can be used for locating an event or interval in the past. In addition, the perfect semantically encodes a ‘perfect state’, which overlaps with the speech time, and is responsible for the various inferences associated with the present perfect. For Schaden, this is part of the assertion, but it may or may not be interpreted by the addressee 12. Whether the perfect state is interpreted, however, depends on whether the present perfect is the ‘default form’ in a language.

In English, the default form for locating an event or interval in the past is the

12Schaden is not very clear on this but from my understanding of the paper, he seems to mean that the addressee could choose to ignore the assertion about the perfect state
simple past, with the marked form being the present perfect. When the speaker
uses the marked present perfect, the listener will infer that there is a reason to
introduce a perfect state, which will provoke an effect of current relevance. In
languages like French, Italian and German, the present perfect is the default form,
and the simple past is the marked form. Hence, using the default form will not
invite the listener to wonder why the perfect state is included. On the other hand,
uttering the marked simple past will invite the listener to interpret the absence of
the perfect state, leading to the denial of current relevance.

First, note that for Schaden (2009), the various inferences of the present perfect
are the assertive content of the perfect state. This assumption is controversial
since the literature does not agree on the nature of the various perfect readings,
and from the discussion so far, it looks like we have evidence that some of the
perfect readings should not be assertions.

In addition, Schaden (2009) is quite vague about what determines the default
and marked form in a language. He claims that ‘it is not possible to simply
derive the markedness from some intrinsic properties of the present perfect and
the simple past’. It is not clear why in French, German and Italian, the default
form is different, and it makes Schaden’s analysis overall seem a bit arbitrary and
descriptive. In my analysis, in contrast, the simple past form is more semantically
marked because it has stronger presuppositions than the present perfect.

Other than the controversy regarding the perfect state, Schaden only derives
the pragmatic inference of the absence of the perfect state for the simple past.
However, since the perfect state is part of the assertion, this means that in French,
Italian, and German, the speakers will have to ignore part of the assertion because
the present perfect in these languages is the default form. There does not seem to
be good reasons behind this process of ignoring part of the assertion. It is equally
plausible that since the present perfect is the default form in these languages,
its semantic content is also treated as default and the perfect state is always
interpreted. Schaden does not provide an argument against this possibility and
we cannot rule it out.

5.4.2 Grønn and von Stechow (2016): the English past can be either
definite or indefinite

A previous account based on the notion of definiteness is Grønn and von Ste-
chow (2016). They propose that the past tense in English is ambiguous between
a definite and an indefinite reading, with the meaning of ‘definiteness’ being one
of familiarity.

In particular, the indefinite reading of the English past is meant to cover the data considered problematic for a pure pronominal (i.e. anaphoric) tense approach, such as the ones covered in Section 2.2. This is achieved by adding a covert indefinite article over the tense head (cf. Section 2.2.3). The indefinite past also covers the past shifted reading of embedded past tense in English.

The present perfect, on the other hand, is given a typical Extended Now semantics. The Present Perfect Puzzle in English is then a semantic contradiction that follows from the modification of the Extended Now by a past temporal adverbial. The crosslinguistic variation is derived by assuming that languages without the Present Perfect Puzzle have a relative past reading of the present perfect.

However, Grønn and von Stechow (2016) do not discuss how to determine the distribution of the indefinite and definite past tenses. As Section 2.2 shows, the distribution of the ‘indefinite’ reading of the English past is predictable, parallel to unique definites in the nominal domain.

In addition, Grønn and von Stechow’s analysis also misses the fact that the English present perfect can also function as an indefinite past. I believe my proposal makes better predictions than Grønn and von Stechow (2016).

Finally, since the present perfect has an Extended Now semantics in Grønn and von Stechow (2016), they run into the same problem as previous accounts based on the Extended Now, discussed in Section 5.1.1.

5.5 Interim summary

In this chapter, I discussed the data regarding the perfect readings in detail. Recall that the previous literature has the following list of perfect readings and the definition of general-purpose past perfectives.

(85) Perfect readings

a. Experiential/existential
   Mary has visited the Louvre.

b. Resultative
   Mary has arrived.
   Inference: Mary is here now.

c. Recent past/hot news
   The Orioles have won the game!

d. Universal Perfect/Continuative
Mary has been studying since this morning.
Inference: Mary is still studying.

e. **Present Perfect Puzzle**

*Mary has arrived yesterday.*

f. **Lifetime effect**

#Einstein has visited Princeton.

g. **No narrative progression**

Narrating a series of past events that take place one after another:

#(This morning) Mary has woken up. She has gotten dressed.

(McCawley, 1971; McCoard, 1978; Portner, 2011, a.o.)

(86) **The general-purpose past perfective**

a. Has the experiential/existential reading, but does not show the lifetime effect

b. Has the resultative reading, but not required

c. Recent past/hot news possible

d. Felicitous out of the blue

e. Definite past adverbials allowed

f. Narrative progression allowed

(Bertrand et al., 2017)

Based on the discussion so far, we can conclude that there is actually no such thing as a general-purpose past perfective in the above sense. In particular, (86-e) and (86-f) follow from the absence of the anaphoric past tense as a competing alternative in those languages. The lack of the lifetime effect reflects the fact that only in English is there a past tense with a uniqueness presupposition, which is required by the Presupposed Ignorance Principle (PIP) in typical lifetime effect examples. The other readings simply reflect the basic readings of the present perfect and the fact that it may function as an indefinite past tense, introducing a past reference time into the context. For French and Italian, the lack of the Universal Perfect reading reflects the fact that the present perfect in these languages is always perfective.

The list below summarizes the source of the perfect readings in my analysis:

(87) **The source of perfect readings**

a. **Non-anaphoricity (Present Perfect Puzzle, lack of narrative progression):**

follows from the competition with an anaphoric alternative, which
must be used according to PIP;

b. Hot news, existential, recent past:
   introducing new reference time into the Common Ground and asserting the existence of a culminated past event;
   the ‘recentness’ is actually optional;

c. Resultative:
   follows from the Gricean principle of relevance and the existential reading above, answering a topic question about a current state with the assertion of a change-of-state event

d. Prohibition of the present perfect when the result state is contextually salient (\#Borromini has built this church):
   follows from the competition with the presuppositionally stronger unique past (English), which must be used according to PIP;

e. Lifetime effect:
   follows from the competition with the presuppositionally stronger unique past (English), which must be used according to PIP—past lifetime of an individual is unique;

f. Repeatability inference (Have you been to the exhibit? vs. Did you see the exhibit?):
   the reference time is taken to be the time span of the event, but the unique past tense cannot be used if it is not a past interval;

g. Universal Perfect:
   the present perfect allows the Extended Now as a reference time and in English the underlying aspect may be imperfective/progressive (Iatridou et al., 2003).
Chapter 6

Presuppositional perfectives in Mandarin Chinese

6.1 Introduction

In the previous chapters, I argued that the perfect readings associated with the English present perfect come from the fact that the present perfect competes with presuppositionally stronger alternatives, the anaphoric and the unique past tenses.

In this chapter, I argue that languages exhibit similar patterns in the domain of aspects and that different combinations of alternatives leads to different distributions of perfect-like readings. I present a case study of the perfective aspects in Mandarin Chinese, which is a superficially tenseless language.

The aspect system of Mandarin Chinese has been studied intensively in the literature, but without much consensus. In particular, the perfective aspect -guo has often been compared to the English perfect, due to some of the similar readings they share, such as the repeatability inference and the experiential readings. There is also much debate about the status of the various forms of the particle -le, which is often associated with a perfective reading and sometimes a resultative reading. I will explore the relationship between these alternatives in light of our earlier conclusions about tenses.

I will argue that in Mandarin Chinese, there are two -le’s with perfective semantics: one being the verbal -le, which always appears between the verb stem and the direct object, and the other being what I call the perfective sentence-final -le. In addition, there is another sentence-final -le-particle, known in the literature as the ‘sentential le’, which does not give rise to the perfective episodic reading, but rather a stative or habitual reading. Some previous authors, such as Soh and Gao (2006); Soh (2009) and Lin (2006, 2007), do make the distinction between the
verbal and the sentential -le, but in their data, they do not distinguish the verbal -le from the perfective sentence-final -le, and sometimes do not distinguish the perfective sentence-final -le from the stative/habitual sentential -le. This results in some confusion with certain judgements, and inhibits their attempt at providing a proper analysis.

In order to clarify these issues, I will first introduce the background of Chinese perfective particles. In particular, I make a four-way distinction between various particles homophonous to -le, two of which are perfective particles: the verbal -le and the perfective sentence-final -le. There is also the sentence-level stative/habitual -le, which presupposes a previous change of state, and there is the VP-level resultative-verbal-compound (RVC)-forming -le, which functions like a generic endpoint marker and turns an atelic VP into a telic one. These will be discussed in Section 6.2.2.

Then, I will show that the verbal -le is presuppositional and requires an event antecedent. The perfective sentence-final -le and the perfective -guo both do not have this presupposition. On the other hand, the perfective -guo has a presupposition that the result state of the asserted event does not answer the topic question. This leads to several inferences such as the discontinuity of the result state inference in certain contexts. I will also compare the different kinds of perfect-like readings in Mandarin Chinese and English, and propose a set of new diagnostics for perfect-like readings and the source of general-purpose past perfective readings (Bertrand et al., 2017; Matthewson et al., 2017).

The conclusion of this chapter is: (i) Mandarin Chinese has an anaphoric aspect, presupposing the familiarity of the event, in a way parallel to the anaphoric past tense; (ii) we can derive the distribution and the various inferences of Mandarin Chinese perfective particles using the same mechanism proposed for the English past tense and the present perfect; (iii) there should not be one homogeneous category of the ‘perfect’ reading, and we should not simply categorize any aspeuctual construction as a ‘perfect’ just because it shares some features with the English present perfect.

From a crosslinguistic perspective, I will also show that the Mandarin Chinese data requires that the language have direct access to discourse relations in the domain of events, rather than time intervals. In other words, the Chinese data cannot be reduced to the English-like temporal (in)definiteness. This conclusion provides insights about the possible crosslinguistic variation in morphologically tensed and tenseless languages, and the mechanisms that natural languages may employ to establish discourse relations and narrative coherence.
6.2 Overview and background assumptions

In this chapter, I will make the following assumptions: (i) Mandarin Chinese has a morphologically null NON-FUTURE tense as in Matthewson (2006); Sun (2014), and the temporal readings of sentences do not come from aspectual particles such as -qu and -le; (ii) the various perfective particles in Mandarin Chinese have standard perfective semantics; (iii) we should distinguish four kinds of -le particles: the verbal -le, the perfective sentence-final -le, the stative/habitual sentential -le, and the RVC-forming -le. Only the first two are perfective markers.

Assumptions (i) and (ii) require detailed discussions of the temporal and aspectual readings of Mandarin Chinese, and will be postponed until Chapter 7. Assumption (iii) will be addressed in this section.

6.2.1 Perfective aspects in Mandarin Chinese

The verbal -le is named after its position: it occurs in between the main verb and the direct object or a degree modifier. In general, the verbal -le presents a situation in its entirety. This is illustrated with a telic verb in (1-a) and an atelic verb in (1-b). In both cases, we have $\tau(e) \subseteq t$ for some $t$ and the event is viewed as completed. If these events are not completed (e.g. the tree was not completely knocked down, or Lisi has not completed his swim session), then these sentences will be rejected.

(1)  
   a. Qiche zhuang-dao le shu.  
      car knock-over LE tree  
      ‘The car knocked down the tree.’
   b. Lisi you le yong  
      Lisi swim LE swim  
      ‘Lisi swam (Lit. Lisi had a swim).’

However, there is a debate about whether the verbal -le has standard perfective semantics, due to the fact that sometimes, a sentence with verbal -le does not seem to entail the culmination of the event (2).

(2)  
   Ta he le na bei shui, danshi mei he wan.  
      he drink LE that glass water but NEG drink finish  
      ‘He drank that glass of water, but he didn’t finish it (i.e. he only took a sip).’

\textsuperscript{1}Many Mandarin Chinese compound verbs like youyong ‘swim’ consist of two morphemes, a transitive verb you ‘to swim’ and an event-denoting object yong ‘a swimming event, a swim’.

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The recent literature shows that the confusion here comes from special properties of Mandarin Chinese VPs. In particular, the reading in (2) comes from the fact that in Mandarin Chinese, consumption verbs with a definite object, such as *drink that glass of water*, allows the partial consumption reading (Zhang, 2018). There are other VPs which have the non-culminating inference with the verbal -le, such as manner verbs (which morphologically correspond to their result verb counterparts in English) and degree achievements. Once we adopt the correct analyses for these VPs, we can maintain the standard perfective semantics of the verbal -le, the perfective sentence-final -le, and guo. The details will be discussed in Chapter 7.

The previous literature also observes that the verbal -le tends to not occur with statives. Many statives marked with -le can only be interpreted as inchoatives. This is illustrated in the example below. The stative *pang* ‘fat’ usually has only the adjectival use, describing a state (3-a). However, when it is marked with le, it is interpreted as a change-of-state event (3-b).

(3)  
a. Zhangsan hen pang.  
Zhangsan COP fat  
‘Zhangsan is fat.’  

b. Qunian, Zhangsan pang le.  
last-year Zhangsan fat le  
‘Zhangsan gained weight last year.’

There is a debate about whether the -le is the source of the inchoative reading for these statives. The recent literature such as Tham (2013) has concluded that this is not the case. The rough idea is that the statives that seem to have the inchoative reading with the verbal -le are actually homophonous deadjectival CoS verbs (such as *pang* ‘fat/gain weight’ and *gao* ‘tall/grow tall’). In addition, it is not the case that the verbal -le never occurs with statives. These will be discussed in Section 7.3.2.

The perfective -guo is often characterized as an ‘experiential marker’ in the early literature such as Li and Thompson (1989). Some authors, such as Klein et al. (2000) argues that ‘it indicates that an event has been experienced at some indefinite time’ (Klein et al., 2000, p.3). I will go back to this point in later sections.

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2 Since the verbal -le occurs in between the main verb and the object/modifiers, when it occurs with a simple stative verb, it may end up in the sentence final position and become hard to distinguish from the -le’s that normally appear in that position. In (3-b), I added a past temporal adverbial to show that we are indeed dealing with a perfective -le, since the sentence has a past episodic reading, instead of the present stative reading of the sentential -le as in Soh (2009), see next subsection.
and argue that *guo* indicates an indefinite event, and not necessarily an indefinite time.

The experiential flavour of *-guo* also leads some authors to characterize it as a perfect, rather than a perfective. Indeed, many sentences with *-guo* are translated into English with the present perfect (4).

(4) a. Lisi kao guo yi ci bujige.
   Lisi take-exam GUO one time fail
   ‘Lisi has once failed an exam.’

   b. Wo qu guo Lufugong.
   I go GUO the.Louvre
   ‘I’ve been to the Louvre.’

The major issue with this characterization is, as Chapter 5 shows, that in the literature there is no consensus on the status of the perfect either. In addition, there are many instances where *-guo* cannot be translated with the English present perfect, and vice versa. In (5), we see that *-guo* can occur with a past temporal adverbial, while in English this results in the Present Perfect Puzzle.

(5) Zuotian wo jian guo Zhangsan.
   yesterday I see GUO Zhangsan
   ‘I saw Zhangsan yesterday.’

(6) shows that there are instances where the English present perfect and the perfective *-guo* have the opposite inferences when used in the same context.

(6) (We don’t know if Mary is still at the office:)
   a. Mary has left.
      **Inference**: Mary is no longer here.

   b. Mali likai guo.
      Mary leave GUO
      ‘Mary has left.’
      **Inference**: Mary left and came back.

In addition, we cannot take *-guo* to be a perfect aspect in the sense of Kratzer (1998). This would predict that the *-guo* in (5) is a past perfect, in which case the seeing event would be *before* yesterday, but the only reading of (5) is that the seeing event is *contained* in yesterday, which is expected if *-guo* is a genuine perfective aspect marker. I take this to be a piece of evidence against the perfect analysis of *-guo*.
For the reasons summarized above, despite the experiential reading of -guo, it is generally accepted as a perfective aspect by many studies (Klein et al., 2000; Smith, 2013; Lin et al., 2003; Lin, 2007), but with some additional semantic or pragmatic properties. The major debate in the literature is about how to distinguish -guo and the verbal -le and how to derive the inferences of -guo.

6.2.2 Distinguishing different kinds of -le’s

6.2.2.1 The perfective -le’s vs. the stative/habitual sentential -le

The particles homophonous with -le in Mandarin Chinese has two basic positions: after the main verb and at the end of the sentence. As mentioned above, an often discussed topic is the distinction between the verbal and stative/habitual sentential -le’s. It is generally accepted in the literature that they are different particles. The former follows the verb (7-a), and the latter comes at the end of the sentence (7-b)\(^3\).

(7) a. Wo chi le liulian.
   I eat LE durian
   ‘I ate (the) durian(s).’

   b. Wo chi liulian le.
   I eat durian LE.STATIVE
   ‘I eat durians now.’

It is also important to distinguish (7-b) from the superficially homophonous (8) with the perfective sentence final -le, which has a perfective episodic reading. This distinction has not been made in the previous literature. I will discuss this point in more detail in the next subsection.

(8) Wo chi liulian le.
   I eat durian LE.STATIVE
   ‘I have eaten/I ate durians.’

In most cases, the stative/habitual sentential -le is associated with a presupposition that there is a transition from \(\neg p\) to \(p\) (Soh and Gao, 2006; Soh, 2009). For statives and habituals, this is equivalent to a change-of-state presupposition, illustrated below in (9). The adverbial xianzai ‘now’ is added to emphasize this reading, but it is not necessary.

\(^3\)Note the translation of (7-b) is the present habitual reading. The same sentence could also be translated as a past episodic reading, in which case I will argue that the le is the perfective sentence-final le. See Section 6.2.2.2.
(9) a. Wo xianzai chi liulian le.
   'I eat durians now.'
   Presupposition: I used to not eat durians.

b. Wo xianzai hui tan jita le.
   'I can play the guitar now.'
   Presupposition: I couldn't play guitar earlier.

Note that in (9), the sentences have a stative or habitual interpretation, instead of a perfective, episodic inchoative one.

However, there are also cases of the stative/habitual sentential -le without presupposing a change-of-state, such as the following:

(10) a. Zhe shuang xie tai gui le.
   'This pair of shoes are too expensive.'

b. Zhe ge xigua hen tian le.
   'This watermelon is already very sweet.'

In (10-a), the shoes are always of the same price, and in (10-b), the sweetness of the watermelon has not undergone change. Instead, they have some kind of ‘contrary to expectations’ reading. Soh (2009) argues that this inference can be subsumed under the ¬p to p presupposition, with an assumption that this presupposition may be either accepted or rejected by the speaker upon utterance. In the former case, we have the standard ¬p to p presupposition, and in the latter case, the difference between the common grounds before and after the rejection gives rise to the contrary to expectations inference.4

(11) The contrary to expectations reading (Soh, 2009)

<table>
<thead>
<tr>
<th>Common Ground$_i$ at $t_i$</th>
<th>Common Ground$_j$ at $t_j$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presupposition: The watermelon is not sweet</td>
<td>After rejection of presupposition: The watermelon is sweet.</td>
</tr>
<tr>
<td></td>
<td>Assertion: The watermelon is sweet.</td>
</tr>
</tbody>
</table>

4For similar analyses of English already and German schon, see Löhner (1989); Michaelis (1992, 1996); Mittwoch (1993).
One way to distinguish the perfective -le’s and the stative/habitual sentential -le’s is that the former has a perfective, episodic reading where the stative verb is interpreted as inchoative, while the latter has a stative or habitual reading. It has also been noted in the literature that the verbal -le resists co-occurrence with stative VPs (the VP tends to be always interpreted as its inchoative counterpart). In later sections, I will show that it is actually possible for the verbal -le to co-occur with stative VPs, but it will need specific contextual information to be licensed.

Note that for some stative verbs, since there is nothing in the object position, the -le is both verb-final and sentence-final (12). Judging only by the surface word order, it is not clear whether this is a verbal or sentential -le, or if it is the perfective sentence-final -le, which we will discuss in Section 6.2.2.2. I take this to be a structural ambiguity due to the same surface word order.

(12) Zhangsan pang le.
Zhangsan fat le
‘Zhangsan gained weight/Zhangsan is now fat (which he wasn’t before).’

We can see that (12) may be interpreted as either present stative, or past episodic. One way to distinguish the two readings is to use a temporal adverbial: under the past episodic reading, the sentence describes a perfective change-of-state event, that can be located in a time frame (13), and whether Zhangsan is currently fat does not matter. In addition, it cannot describe a past state with a change-of-state presupposition.

(13) Qunian, Zhangsan pang le.
last-year Zhangsan fat le
‘Last year, Zhangsan gained weight.’
NOT: ‘Last year, Zhangsan was fat (which he wasn’t before).’

Under the stative/habitual sentential -le reading, we can add a temporal adverbial now to describe a current state of Zhangsan being fat with a presupposition that he used to be skinny (14), as opposed to a perfective gaining weight event located in the present.

(14) Zhangsan xianzai pang le.
Zhangsan now fat le.stative
‘Zhangsan is fat now (he used to be skinny).’
NOT: $\exists e [\text{gain-weight}(e) \land \tau(e) \subseteq t_c]$

Some additional examples noted in the literature are listed below. The (a) sen-
tences illustrate that the verbal -le resists stative eventualities. The (c) sentences illustrate that the perfective sentence-final -le has the episodic reading. The (b) sentences show that the sentential -le has a current stative/habitual reading with a change-of-state presupposition.

(15)  

a. ??Wo xiang le jia.  
I think LE home  
‘(Intended:) I missed home.’

b. Wo xiang jia le.  
I think home LE.STATIVE  
‘I miss home now (which I did not before/contrary to what one may expect).’  
(Soh, 2009, p.626)

c.Wo xiang jia le.  
I think home LE.SF  
‘I missed home. (i.e. There is an episode of the speaker missing home)’

(16)  

a. ??Ta xiang le baba.  
he resemble LE dad  
‘(Intended:) He resembled his dad.’

b. Ta xiang baba le.  
he resemble dad LE.STATIVE  
‘He resembles his dad now (which he did not before).’  
(Ross, 1995, p.110)

c. *Ta xiang baba le.  
he resemble dad LE.SF  
‘He resembled his dad.’

Note that in (15-c), the sentence has a past episodic reading: it can answer the question *When you were away, did you miss home?.* In (16-c), this reading is absent. I believe this is due to the fact that the intended reading is actually a past stative/habitual as in English. On the other hand, the verbal le is odd in both (15-a) and (16-a). In later sections, we will see that the verbal -le presupposes an event antecedent. These sentences are odd because the only cases they would be used are where they answer the questions *What/who did you miss?* and *Who did he resemble/start to resemble?* with the missing event and the (inchoative) resemblance being known already.

Another property that distinguishes the perfective -le’s and the sentential -le’s is the distribution with respect to the negation particle bu, which selects statives and imperfectives (Ernst, 1995; Lin et al., 2003). As expected, verbal -le and the
perfective sentence-final -le, being perfective, cannot occur under *bu (17-a)-(17-b), but the stative/habitual sentential -le can (17-c), since they can accompany stative sentences, and in these examples, they take scope over *bu.

   I NEG eat LE papaya
b. *Wo bu chi mugua le.
   I NEG eat papaya LE.SF
   (if the le is interpreted as a perfective particle)
c. Wo bu chi mugua le.
   I NEG eat papaya LE.STATIVE
   ‘I don’t eat papayas (which I used to eat).’
   (Ernst, 1995)

Again, this test applies to the perfective sentence-final le as well: *chi mugua le in (17-c) cannot be interpreted as a perfectly marked event.

The third property that distinguishes the -le’s as a perfective particle and the sentential -le is whether they can be used with a future modal *hui ‘will’ or *dasuan ‘plan’. The verbal -le and the perfective sentence-final -le cannot, while the sentential -le can (Soh, 2009).

(18) a. *Ta hui/dasuan xie le yi ben shu.
   he will/plan write LE one CL book
b. *Ta hui/dasuan xie yi ben shu le.
   he will/plan write one CL book LE
   (if the le is interpreted as a perfective particle)
c. Ta hui/dasuan xie yi ben shu le.
   he will/plan write one CL book LE.STATIVE
   ‘He will/plans to write a book now (which wasn’t the case before).’
   (Soh, 2009, p.627)

We can see that *xie yiben shu le cannot be interpreted as a perfectly marked AspectP. Instead, the le can only be interpreted as the sentential -le: it asserts the state of him now planning to write a book, with the presupposition that there has been a change-of-state.

6.2.2.2 The perfective sentence-final -le

There is much less discussion in the literature on the occurrence of -le at the end of the sentence but with a perfective, episodic reading, instead of the stative/habitual reading. In fact, it is mostly unnoticed and has never been singled
out as a separate particle. One example is the following:

(19)  (Zhangsan just comes out of the gym, and he runs into Lisi.)

Wo (gangcai) youyong le.
I just swim LE.SF

'I (just) had a swim.'

In (19), the swimming event is contained in the interval just now, and is asserted to have completed. There does not seem to be any presupposition. We can compare this with the use of the stative/habitual sentential -le discussed earlier, where we have a present habitual (20-a) or a present progressive (20-b) reading (which requires additional progressive marking with zai), with the change-of-state presupposition:

(20)  a.  Wo (xianzai) youyong le.
I now swim LE.STATIVE

'I swim now (I used to not swim).'

b.  Wo (xianzai) zai youyong le.
I now prog swim LE.STATIVE

'I am swimming now (I wasn't swimming earlier).'

In addition, the perfective sentence-final -le differs from the stative sentential -le in that it does not occur with modals such as hui ‘will’, neng ‘can’, and dasuan ‘plan’. It patterns with other generally accepted perfective markers such as the verbal le and guo (21)-(22):

(21)  Perfective markers and modals

  a.  *Wo dasuan youyong le.
I plan swim LE.SF

  '(Intended:) I plan to swim (perfective).'

  b.  *Wo dasuan you le yong.
I plan swim LE swim

  '(Intended:) I plan to swim (perfective).'

  c.  *Wo dasuan you guo yong.
I plan swim GUO swim

  '(Intended:) I plan to swim (perfective).'

(22)  The stative/habitual sentential -le and modals

  a.  Wo hui huaxue le.
I can ski LE.STATIVE
‘I can ski now (which was not the case before).’

b. Wo dasuan gongzuo le.
   I plan work le.stative
‘I plan to work now (which was not the case before).’

Due to examples like these, recent literature has explored the option that the various particle -le’s should be distinguished by their functions and not by positions alone. For example, Wang (2018) argues that the sentential -le is applied at the propositional level, and that as long as the sentence has an episodic perfective reading, the particle -le is the verbal -le, even if it occurs at the end of the sentence. Wang further proposes that in this case, the direct object has raised and the verbal -le has become sentence-final.

I agree with Wang’s point of view that we should use functionality to distinguish the different particles, instead of position. In particular, we have the stative/habitual, presuppositional sentential -le, which takes propositions as an argument, and does not give rise to episodic perfective readings. It should be distinguished from the non-presuppositional sentence-final -le which has the perfective episodic reading. However, I disagree with Wang’s opinion that the perfective sentence final -le is the same particle as the verbal -le. I will show in this chapter that they have different presuppositions: one requires an antecedent event, while the other does not.

In order to avoid confusion, I will use the term perfective sentence-final -le for the former (glossed as le.sf), and stative/habitual sentential -le (glossed as le.stative) for the latter.

6.2.2.3 The Resultative Verbal Compound (RVC)-forming -le

Earlier, we observed that the verbal -le, like guo and the perfective sentence-final le, cannot be embedded under the modals hui ‘will’ and dasuan ‘plan’. Superficially, there seem to be some counterexamples to this when the object is definite (23).

(23) a. Ta hui/dasuan wang-le ni de mingzi.
   he will/plan forget le.rvc you gen name
   ‘He will/plans to forget your name.’

b. Lisi hui/dasuan chi-le nage hanbao.
   Lisi will/plan eat le.rvc that hamburger
   ‘Lisi will/plans to eat (up) that hamburger.’

However, the literature has agreed that these are actually not counterexamples,
because the \textit{-le} in (23), despite also following the verb, occurs in a lower position than the perfective verbal \textit{-le}. In this dissertation, I will gloss it as \textit{LE.RVC}. It shares the position of the result-marking predicate in resultative verb compounds (RVCs, see next subsection), such as \textit{diao} ‘off/away’, \textit{wan} ‘finish’, and \textit{dao} ‘reach’ (Shi, 1988; Sybesma, 1997, 2013; Wu, 2000). Semantically it provides a generic culmination point that makes the verb telic.

To see this, note that it is possible to replace the \textit{le} in (23) with other generic result-marking predicates such as \textit{diao} ‘off’ or \textit{wan} ‘finish’ (24).

\begin{enumerate}
\item \textit{Ta hui/dasuan wang-diao ni de mingzi.}
\begin{flushleft}
\textit{He will/plans to forget your name.}'
\end{flushleft}
\item \textit{Lisi hui/dasuan chi-diao/wan nage hanbao.}
\begin{flushleft}
\textit{Lisi will/plans to eat (up) that hamburger.}'
\end{flushleft}
\end{enumerate}

With the perfective verbal \textit{-le}, such replacement is not possible (25).\footnote{In general, RVCs are not grammatical on their own for the past episodic reading, and they need to be aspectually marked or be conjoined with (or appear in \textit{before} or \textit{after} clauses) an aspectually marked VP to be interpretable.}

\begin{enumerate}
\item \textit{Lisi shuai-duan le tui.}
\begin{flushleft}
\textit{Lisi broke his leg.}'
\end{flushleft}
\item *\textit{Lisi shuai-duan diao tui.}
\begin{flushleft}
\textit{Lisi fall-broken off leg}
\end{flushleft}
\end{enumerate}

Similarly, the use of this RVC-forming \textit{-le} in imperatives is also replaceable with other result-denoting predicates:

\begin{enumerate}
\item \textit{Chi-le ta.}
\begin{flushleft}
\textit{Eat it!}'
\end{flushleft}
\item \textit{Chi-diao ta.}
\begin{flushleft}
\textit{Eat-off it}
\end{flushleft}
\end{enumerate}

I conclude that these examples do not involve the perfective verbal \textit{-le}, but the RVC-forming \textit{-le}.

To summarize, in Mandarin Chinese, there are three perfective particles that...
can give rise to a past episodic reading: (i) the verbal -le, which appears in between the verb and the direct object; (ii) the perfective sentence-final -le, which occurs at the end of the sentence; (iii) -guo, which often has an experiential reading.

On the other hand, the stative/habitual sentential -le is a propositional-level particle. It gives rise to a present stative/habitual reading, and it presupposes a \neg p \to p transition. The RVC-forming -le occurs in a lower position, and it is a generic result-denoting predicate, which forms RVCs like the other result-denoting predicates, such as wan ‘finish’, hao ‘good/done’.

While the previous literature distinguishes at most three -le’s in Mandarin Chinese (verbal, stative/habitual sentential, RVC-forming), I believe it is necessary to make the distinction between the four kinds of -le’s as listed above, given their different assertions, presuppositions, and syntactic distributions. This classification is crucial since a lot of the disagreements and confusion in the previous literature actually follow from failing to distinguish these particles.

6.2.3 Resultative verb compounds (RVCs)

Earlier, we saw that Mandarin Chinese has a kind of verb construction called resultative verb compounds (RVCs). These are formed by a verb stem plus a result-denoting predicate, which forms a telic verb. In the examples below, I included the cases both with and without direct objects/measure phrases, to illustrate the location of the particles.

(27) Without direct objects

a. xie-wan
   write-finish
   ‘to finish writing’

b. chi-diao/le
   eat-off/LB.RVC
   ‘to eat up’

c. sha-si/diao/le
   kill-dead/off/LB.RVC
   ‘to kill’

d. wang-diao/le
   forget-off/LB.RVC
   ‘to forget’

e. fang-hao
   put-well
   ‘to put down (properly)’
f. pao-dao
   run-arrive
   ‘to run (to some place)’

g. nong-huai
   make-broken
   ‘to break’

h. xiu-hao
   fix-well
   ‘to repair something to the point that it becomes fixed’

i. xi-ganjing
   wash-clean
   ‘to wash something to the point that it becomes clean’

(28) **With direct objects/measure phrases**

a. pao-wan/le san qianmi
   run-finish/LE.RVC three kilometers
   ‘to finish running three kilometers’

b. xie-wan/le zuoye
   write-finish/LE.RVC homework
   ‘to finish the homework’

c. dao-da/le shanding
   arrive-reach/LE.RVC mountain-top
   ‘to arrive at the top of the mountain’

d. chi-wan/le dangao
   eat-finish/LE.RVC cake
   ‘to eat up the cake’

Which particular result-marking predicate is used has to do with the lexical properties of the main verb. In general, *wan* is compatible with most VPs involving an incremental theme (*eat, drink, read*), and *dao* ‘reach/arrive’ is used with verbs of motion that involve a goal.

The RVC-forming *-le* seems to share the distribution with *diao* in that both denote some kind of elimination (27-b)-(27-d). It is also interchangeable with *wan* ‘complete’ in telic VPs involving a measure phrase or a goal (28).

In addition, very often we can directly put an adjective in place of the result-denoting predicate, as in the case of (27-g)-(27-i).

Note that (27-h) also shows that the manner-result verbs in Mandarin Chinese do not always have counterparts in English. This is a source of the confusion that leads to the idea in the literature that the verbal *-le*, the perfective sentence-final *-le*, and *-guo* do not entail culmination. The following examples illustrate this distinction between the Mandarin Chinese manner verb *xiu* ‘to repair, to fix’
and its RVC counterpart, the result verb xiu-hao ‘to fix (successfully)’. We can compare (29)-(31) (with all three perfective particles) with the English perfective and result verb fix (32).

(29) a. Wo xiu le zixingche, mei xiu-hao.
   I fix LE bicycle NEG fix-well
   ‘I tried to fix the bicycle but I didn’t manage to fix it.’

   b. Wo xiu-hao le zixingche, *mei xiu-hao.
   I fix-hao LE bicycle NEG fix-well
   ‘(Intended:) I fixed the bicycle but I didn’t managed to fix it’

(30) a. Wo xiu guo zixingche, mei xiu-hao.
   I fix GUO bicycle NEG fix-well
   ‘I tried to fix the bicycle but I didn’t manage to fix it.’

   b. Wo xiu-hao guo zixingche, *mei xiu-hao.
   I fix-hao GUO bicycle NEG fix-well
   ‘(Intended:) I fixed the bicycle but I didn’t managed to fix it’

(31) a. Wo xiu zixingche le, mei xiu-hao.
   I fix bicycle LB.SF NEG fix-well
   ‘I tried to fix the bicycle but I didn’t manage to fix it.’

   b. Wo xiu-hao zixingche le, *mei xiu-hao.
   I fix-hao bicycle LB.SF NEG fix-well
   ‘(Intended:) I fixed the bicycle but I didn’t managed to fix it’

(32) *I fixed the bicycle but I didn’t managed to fix it.

We can see that the verb to fix in English is a result verb, but in Mandarin Chinese, xiu ‘to engage in a fixing activity’ is a manner verb, and the RVC xiu-hao corresponds to the English verb fix.

In Chapter 7, I will discuss the previous literature on the apparent non-culminating reading of Mandarin Chinese perfectives in detail.

We also saw that there is a generic result-denoting predicate as well as the one homophonous with -le, which is compatible with many verbs, and must be distinguished from the verbal -le, since they would both show up just before the object. Earlier, we saw that the result-denoting -le can occur under hui ‘will’ and dasuan ‘plan’. The example is repeated in (33), with the replacement test showing that it is indeed an RVC--le.

(33) Lisi hui/dasuan sha-le/diao Zhangsan.
    Lisi will/plans kill-LB.RVC/off Zhangsan
    ‘Lisi will/plans to kill Zhangsan.’

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To see that the RVC-forming -le is interchangeable with another result denoting predicate such as diao ‘off’ without altering the culmination of the event, we can use the in x time test:

(34) Ta neng san miao nei chi-diao/le zhe ge mantou.  
    he can three second within eat-off/LE.RVC this bun  
    ‘He can eat up this bun in three seconds.’

Note that since (34) contains a modal neng ‘can’, the -le here cannot be the perfective verbal -le. We can see that both chi-diao and chi-le are compatible with in 3 seconds, which shows that both are telic verbs.

Another point is that although the RVCs make the VP telic, this does not mean that the non-RVC version of the same VP is always interpreted as atelic, because in this case the event type of the entire VP depends on the mapping relation between the event and the object/path (Krifka, 1989). For example, there does not seem to be any difference in the telicity of (35-a) and (35-b). Both are compatible with an in x time adverbial, and both entail that the eating of the three buns has completed.

(35) In x time test

   a. Zhangsan wu fenzhong nei chi le san ge baozi.  
      Zhangsan five minute within eat LE three CL bun  
      ‘Zhangsan ate three buns within five minutes.’

   b. Zhangsan wu fenzhong nei chi-wan le san ge baozi.  
      Zhangsan five minute within eat-up LE three CL bun  
      ‘Zhangsan ate three buns within five minutes.’

An analogy is Germanic verbal particles in constructions like eat up: while I ate up the pizza explicitly asserts that the pizza is eaten completely, the default interpretation of I ate the pizza is the same.

It has been noted that in Mandarin Chinese, VPs with definite direct objects allow the non-culminating reading with the perfective verbal -le, the sentence-final -le, and -guo. For VPs with numeral-classifier phrase direct objects, individuating classifiers may also allow the non-culminating reading with a perfective. However, these observations are not due to the semantics of the perfective but follow from the partial realization reading of the event. For these VPs, one way to avoid ambiguity is to use the RVC version of the verb, in which case only the culminating reading will be allowed. In addition, as we mentioned earlier, certain

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7Mandarin Chinese does not morphologically mark definiteness. Here, I mean that the direct object is semantically equivalent to a definite NP in English.
result verbs in English, such as *fix*, have manner verb counterparts in Chinese, with the corresponding result verb having the RVC form. This is also the case for degree achievements, where the non-RVC form is atelic, and the RVC makes them telic. See Zhang (2018, Ch.3) and Chapter 7 for details.

The terminology of ‘perfective’ in the aspect literature also leads to certain confusions about RVCs. In some languages (such as Slavic languages), perfectivity and telicity are often intertwined. For example, the prefix *pro-* in *pro-čitat’* ‘to (finish) read(ing)’ is interpreted both as a telicity and a perfectivity marker. It turns the activity verb *čitat’* ‘to read’ to a telic verb. To see this, note that the past tense *pro-čital ‘he (has) read’* has a past episodic reading where the reading event has culminated (i.e. he read to the end of the book), and *pro-* related the event to the reference time (*τ(e) ⊆ t*). On the other hand, the past tense *čital ‘he (has) read’* has a past episodic reading where the reading event has not necessarily culminated.

This is not the case in Mandarin Chinese. RVCs in Mandarin Chinese cannot give rise to a past episodic reading on their own. The past episodic reading requires additional aspectual marking with one of the perfective particles introduced earlier (cf. Sun (2014)). This is illustrated in (36) where the (a)-sentence missing the aspectual particle does not have the episodic reading.⁸

   Zhanagsan yesterday read-finish that CL book
   ‘(Intended:) Zhangsan finished that book yesterday.’

   b. *Zhangsan zuotian kan-wan le na ben shu.
   Zhanagsan yesterday read-finish LE that CL book
   ‘Zhangsan finished that book yesterday.’

   c. *Zhangsan zuotian kan-wan na ben shu le.
   Zhanagsan yesterday read-finish that CL book LE.SF
   ‘Zhangsan finished that book yesterday.’

   d. *Zhangsan zuotian kan-wan guo yi ben shu.
   Zhanagsan yesterday read-finish GUO one CL book
   ‘Zhangsan finished a book yesterday.’

The only exception to this is when an RVC-only clause is somehow anchored temporally against an explicitly aspectually marked clause, usually with words like *before* or *after*, as shown in (37).

⁸Note that the *guo*-sentence has *finish one book* instead of *finish that book*. This is because *guo* is incompatible with the latter, due to the so-called discontinuity effect observed in the literature: the particular book can never be unread once it’s finished. I will discuss the discontinuity inference of *guo* in Section 6.5.
(37) Zhangsan zuotian kan-wan na ben shu zhihou dasao le
Zhanagsan yesterday read-finish that CL book after clean LE
room
‘After Zhangsan finished that book yesterday, he cleaned his room.’

For the purpose of this dissertation, I will not discuss these examples. However, it
is a solid observation that in Mandarin Chinese, eventive predicates need explicit
aspectual marking (at least in the main clause) to get the past episodic reading.
This point is important for my assumption that Mandarin Chinese has tense (cf.
Sun (2014)), which I will discuss in Chapter 7.

6.2.4 Numeral-classifier phrase objects

There are two interesting observations regarding the verbal -le with numeral-
classifier phrases in the direct object position which are worth mentioning at this
point.

The first observation is that for certain verbs with numeral-classifier phrases,
the verbal -le can be used without describing a perfective event:

(38)  a. Zhangsan yang le yi zhi gou.
   Zhangsan keep LE one CL dog
   ‘Zhangsan has a dog.’

b. Ta shou li na le yi ge bao.
   he hand in hold LE one CL bag
   ‘He is holding a bag in his hand.’

c. Ta qi le yi pi ma.
   he ride LE one CL horse
   ‘He is riding a horse.’

d. Ta zai Boshidun zu le yi jian gongyu.
   he at Boston rent LE one CL flat
   ‘He’s renting a flat in Boston.’

As we can see, the reading of the sentences in (38) is very close to a present progres-
sive reading.\textsuperscript{9} In addition, for these sentences, the -le seems to be interchangeable
with a progressive (durative in Li and Thompson’s (1989) terms) marker zhe.\textsuperscript{10}

\textsuperscript{9}(38-d) also has a regular perfective reading, which describes an event of renting the flat con-
tained in a certain time interval. However, the present progressive reading shown in the text is
also very salient.

\textsuperscript{10}For (38-a), the replacement sounds slightly odd for native speakers, but it still seems possible.

\textsuperscript{11}There is another progressive marker in Mandarin Chinese, za, which appears pre-verbally. It
is not interchangeable with -le. In addition, with measure phrase objects, it patterns more with
the English progressive in that the state of him having a dog is seen as more transient.
Some previous authors name this reading the ‘present continuative’ reading (Liu, 1988; Jin, 2002), but there is little discussion in the literature on how this reading arises. Intuitively, the examples in (38) all involve some kind of change-of-state event (getting the dog, picking up the bag, etc.), but interestingly, the main verbs in (38) are all stative/activity verbs and do not have change-of-state meanings by themselves: *keep, hold, ride, rent*, as opposed to *get, take, jump onto*. In addition, the recent literature has also shown that it is not the case that the verbal -le in general has a continuative reading or that it has inchoative semantics (Tham, 2013, a.o., and see Chapter 7). Since they do not involve the perfective episodic reading that this dissertation is about, I will set them aside for now.

Another reason to distinguish these sentences from the typical perfective -le sentences is that in later sections, we will see that the typical uses of the verbal -le always presuppose an event antecedent, but in (38) this does not seem to be the case.

The second observation is that for certain verbs that involve consumption or a change-of-state, the verbal -le is preferred over the perfective sentence-final -le. Again, for these VPs, we do not observe the presuppositional effects of the verbal -le that are otherwise available. (39-a) has a reading which is similar to the expected reading of the sentence-final -le, which I will argue to be presupposition-less in later sections. However, the sentence-final -le itself is odd in this case, as shown in (39-b). I will argue in later sections that this is due to dissimilation effect with the stative/habitual sentential -le.

(39) (There is no event antecedent available:)

a. Wo mai le yi liang che.
   I buy LE one CL car
   ‘I(‘ve) bought a car.’

b. ?Wo mai yi liang che le.
   I buy one CL car LE.SF
   ‘I(‘ve) bought a car.’

(40) (I know that Lisi bought something today. I ask him what was it that he bought, and he answers:)

Wo mai le yi liang che.
   I buy LE one CL car

(i) Ta zai yang yi zhi gou.
   he PROG keep one CL dog
   ‘He is keeping a dog as a pet’
More precisely, it is not the case that (39-a) cannot be used for the event anaphora reading. This is illustrated in (40). In other words, with these VPs, sentences of the form [verb + le + numeral-CL phrase] are actually ambiguous between an event anaphora reading (of the verbal le) and the non-anaphoric reading (of the perfective sentence-final le), which will be spelled out in the next few sections.

In Section 6.4.3, I will argue that this is due to the potential ambiguity between the perfective sentence-final -le and the stative/habitual sentential -le (which presupposes a transition).

Having discussed all the necessary background information and assumptions, I will present my analysis of the Mandarin Chinese perfective particles over the next few sections.

6.3 The presupposition of verbal -le

In this section, I will present some novel data regarding the verbal -le and argue that it presupposes an event antecedent. I will first show that a verbal -le-marked event always comes with the inference that it is linked to another event entailed by the context via the identity or part-whole relation. The former accounts for cases where the verbal -le-marked event is identical to an event in the context, and the latter for cases where it is identified as a member of a collection of events in the context. I will then show that this inference is indeed a presupposition.\footnote{It has been pointed out by Berit Gehrke (p.c.) that the verbal -le behaves very much like the presuppositional imperfectives in Russian. In this dissertation, I do not have time or space to compare the two languages, but the reader can refer to G\o{}nn (2004) for an analysis of the presuppositional imperfectives.}

I propose there are three possible alternatives of perfective particles: (i) the verbal -le, which occurs between the verb and the direct object; (ii) the perfective sentence-final -le, which occurs at the end of the sentence; and (iii) -guo. The examples will show that the verbal -le is the only felicitous alternative whenever we have this kind of anaphoric dependency.

6.3.1 The identity relation

The most basic case of the anaphoric dependency relation that requires the use of verbal -le is the identity relation. This relation applies when two possibly different event descriptions describe the same event.
Identity (\(\rho_I\))

For two events \(e_1, e_2\) such that \(P_1(e_1, x_1, ..., x_n)\), \(P_2(e_2, y_1, ..., y_m)\) for event descriptions \(P_1\) and \(P_2\), where the \(x\)'s and \(y\)'s are arguments of \(e_1\) and \(e_2\) respectively, and \(n \leq m\), we have \(\rho_I(e_1, e_2)\) if:

a. \(P_2 \subseteq P_1\) or \(P_1 \subseteq P_2\),

b. \(\tau(e_1) = \tau(e_2)\),

c. \(\forall x_n \exists y_n [x_n = y_n]\).

In other words, if we have two events \(e_1, e_2\), for which the event descriptions \(P(e_1, x_1, ..., x_n), P(e_2, y_1, ..., y_m)\) apply, we can say that \(e_1\) is identical to \(e_2\) if (i) one of the event predicates is a no less specific version of the other event predicate (e.g. \(P_1\) may be eat and \(P_2\) may be eat or eat pasta, or \(P_1\) may be have dinner and \(P_2\) may be eat); (ii) \(e_1\) and \(e_2\) occupy the same time span, and (iii) all the arguments of \(e_1\) can be identified with an argument of \(e_2\).

Let us first illustrate this with an example from English. Suppose the speaker is trying to add more information to an event entailed by the context \(c\).

(42) Context: John had dinner from 7 to 8.

\[\exists e_1 [\text{dinner}(e_1) \land \text{agent}(e_1) = \text{John} \land \tau(e_1) \subseteq t \land t = \text{the interval from 7 to 8 pm}_c]\]

Utterance: He ate pizza.

\[\exists e_2 [\text{eat}(e_2) \land \text{agent}(e_2) = \text{John} \land \text{theme}(e_2) = \text{pizza} \land \tau(e_2) \subseteq t \land t = \text{the interval from 7 to 8 pm}_c]\]

The speaker identifies \(e_2\) with \(e_1\).

Now consider a similar situation in Mandarin Chinese. In (43), we see that the context entails an event \(e_1\). The assertion adds additional information to \(e_1\). The verbal -le-marked \(e_2\) has a more specific event predicate, and each argument of \(e_1\) is identified with its counterpart in \(e_2\). We can see that verbal -le is felicitous while the other two particles are odd.

(43) (Context: Zhangsan exercised both yesterday and today. In particular...)

a. Jintian ta you le yong.

\[\text{today} \ \text{he} \ \text{swim} \ \text{LE/swim} \ \text{'Today, he swam.'}\]

b. #Jintian ta you guo yong.

\[\text{today} \ \text{he} \ \text{swim} \ \text{GUO/swim}\]

c. #Jintian ta you yong le.

\[\text{today} \ \text{he} \ \text{swim} \ \text{swim} \ \text{LE/SF}\]
(43-a) Although the swimming event itself is new information, it is identified with the previously mentioned exercising event: ‘swimming’ is more specific than ‘exercise’; the agent of the exercising event is Zhangsan, the same as the agent of the swimming event; the two events occupy the same time span because the swimming event is asserted as an elaboration of the exercising event.

In (44-a), the asserted eating event is identified with the previously mentioned vegetable-eating event of Monday, with the addition of the theme argument (tomatoes).

In both cases, we can see that the verbal -le is the only appropriate choice here. In terms of perfectivity, there is no other difference in the way the event is presented: all three perfective particles present the events as completed, and contained within the reference time.

Note that we cannot argue that the swimming event or the eating tomatoes event themselves are presupposed: the speaker does not have any previous assumptions or beliefs that Zhangsan swam or ate tomatoes. Instead, they are only linked to previously mentioned, less specific events in the context, by the identity relation.

6.3.2 The part-whole relation

The part-whole relation holds between an event and a collection of events.

(45) Part-whole \((\rho_e)\)

Let \(e\) be an event, and \(E\) be a collection of events. We have \(\rho_e(e, E)\) if:

\(e \in E\).

It is generally accepted that some NPs (such as nominalized verbal expressions like the V-ing and NPs like the race, the conference, among others) can refer to events. I will further assume that for some such NPs, they refer to not just
events but also a collection of events that are made salient in the context. For example, the conference makes salient all the possible events that may take place at the conference: the registration, the keynote talk, etc. I also assume that the assertion of certain events will automatically makes salient the collection of events that may take place in the same occasion. Once we make these assumptions, the following judgement regarding the verbal -le becomes clear: whenever an event is a member of the contextually salient collection of events, it requires the use of the verbal -le as the perfective marker.

(46) Lisi canjia guo na chang yiqian mi saipao.
Lisi participate GUO that CL thousand meter race
‘Lisi participated in that 1000-meter race’

a. ...Ta na le jinpai.
   he get LE gold-medal
   ‘He got the gold medal.’

b. ...#Ta na guo jinpai.
   he get GUO gold-medal

c. ...??Ta na jinpai le.
   he get gold-medal LE.SF

(47) Wo he Lisi zuotian jian mian le.
I and Lisi yesterday see face LE.SF
‘I met with Lisi yesterday.’

a. ...Women yiqi chi le fan.
   we together eat LE meal
   ‘We ate together.’

b. ...#Women yiqi chi guo fan.
   we together eat GUO meal

c. ...?Women yiqi chi fan le.
   we together eat meal LE

In (46-a), the winning of the gold medal is viewed as a member of the collection of events associated with the race (or the larger sports event that this particular race is part of). The verbal -le is strongly preferred over the other perfective markers. We have the same judgement in (47-a), if the meal is viewed as a part of the same hang-out session.

In these examples, we can also see that an event marked with guo or the sentence-final -le can license a subsequent verbal -le. These two particles seem to be interchangeable, but guo has a stronger emphasis on the existence of the event. I will discuss these two particles in detail in later sections.
The following examples illustrate that event-denoting NPs may provide an antecedent for the subsequent use of the verbal -le. They all contain a DP adjunct (in boldface) with which the verbal -le-marked event corefers.

(48) Wo jinian de liuyou...
    I this-year GEN travel
    ‘For this year’s trip, I...’
    a. ...qu le Xuanhongsi.
       go LE Hanging-Temple
       ‘For this year’s trip, I went to see the Hanging Temple.’
    b. ...#qu guo Xuankongsi
       go GUO Hanging-Temple
    c. ...??qu Xuankongsi le.
       go Hanging-Temple LE.SF

(49) Jintian de yuedui pailian..
    today GEN band rehearsal
    ‘At Today’s band rehearsal...’
    a. ...Lisi tan le jita.
       Lisi play LE guitar
       ‘During the band’s rehearsal today, Lisi played the guitar.’
    b. ...#Lisi tan guo jita.
       Lisi play GUO guitar
    c. ...??Lisi tan jita le.
       Lisi play guitar LE.SF

(50) Xiaoli zhe ci kaoshi...
    Xiaoli this time exam
    ‘For this exam, Xiaoli...’
    a. ...kao le manfen.
       take LE perfect-score
       ‘Xiaoli got a perfect score for this exam.’
    b. ...#kao guo manfen.
       take GUO perfect-score
    c. ...??kao manfen le.
       take perfect-score LE.SF

As expected, the verbal -le must be preferred over the other two perfective particles in this construction, since the AspP describes an event which is understood as part of the collection of events given by the DP adjunct.

Importantly, this part-whole relation does not seem to apply to ‘sub-events’ in the strict sense, such as different stages of a single accomplishment. Consider:
(51) Zhangsan canjia guo yi qian mi saipao...
Zhangsan participate in thousand meter race
'Thangsan participated in a 1000-meter race.'

a. ...??Ta xian pao le wubai mi, you pao le wubai
he first run LE five-hundred meters then run LE five-hundred
mi.
meters
'T(Intended:) Zhangsan participated in a 1000-meter race. He first ran
500 meters, then he ran another 500 meters.'

(51-a) cannot describe the different stages of one single running session. Rather,
it strongly suggests that Zhangsan stopped after the first 500 meters, and then
started the second 500 meters as a separate running session. This inference may
follow from the perfective semantics of the verbal -le (that it presents the 500-
meter run as a completed event on its own). I cannot find any examples in which
different stages of an accomplishment can be described with the verbal -le. Hence,
I conclude that the part-whole relation only applies to collections of events as in
(46).

6.3.3 Presupposition projection tests

Earlier, I defined the use-conditions of verbal -le, without discussing the nature
of the relations involved. In this subsection, I will show that the event relation
that licenses the verbal -le patterns with the typical antecedent-anaphor relation,
and is a presupposition triggered by verbal -le.

First, verbal -le is infelicitous in the absence of an event antecedent with which
one of the discourse relations can be established. The judgment is especially clear
with atelic verbs, such as:

(52) (Without a previously mentioned event antecedent:)

#Lisi tan le jita.
Lisi play LE guitar

'(Intended:) Lisi played the guitar.'

(53) (Without a previously mentioned event antecedent:)

#Ta you le yong.
he swim LE swim

'(Intended:) He had a swim.'
(54) (Without a previously mentioned event antecedent:)

#Ta he le jiu.
he drink LE alcohol

'(Intended:) He drank wine.'

Some previous authors, such as Wang (2018), characterize these sentences as ungrammatical due to syntactic reasons. Other authors, such as Lin (2007), does not distinguish the verbal -le and the presupposition-less perfective sentence-final -le for these verbs, and due to the fact that the resultative reading of the perfective sentence-final -le is only possible with telic (and change-of-state) verbs, it has been speculated that the oddness of these examples suggest that the verbal -le (or the perfective ‘le’ in general) may require the telicity of the event predicate. However, we saw in the previous subsection ((49-a) and (43-a) for these VPs) that once we put these sentences in the right contexts, they are perfectly felicitous.

The oddness of (52)-(54) is infelicity instead of ungrammaticality, which is due to the absence of the event antecedent, rather than some inherent property of the verbal -le.

For most telic verbs, the judgment is the same, as shown in (55).

(55) (Without a previously mentioned event antecedent:)

#Ta kan-wan le na ben shu.
he read-finish LE that CL book

'(Intended:) He finished reading that book.'

However, as discussed in Section 6.2.4, for some change-of-state verbs, the verbal -le is always preferred when the object is a numeral-classifier phrase (or rather, the perfective -le-particles, either verbal or sentence final underlyingly, always shows up at in the verbal -le position). A -le-particle at the end of the sentence is always interpreted like a stative/habitual -le, which is odd in this case. One example is the verb buy, shown below.

(56) (Without a previously mentioned event antecedent:)

a. Ta mai le yi liang che.
   he buy LE/LE.SF one CL car
   ‘He (has) bought a car.’

b. ??Ta mai yi liang che le.
   he buy one CL car LE.SENTENTIAL
‘(Intended:) He (has) bought a car.’

c. Ta mai guo yi liang che.
   he buy guo one CL car
   ‘He has bought a car before (experiential).’

Since these involve the dissimilation effect with the perfective sentence-final -le and the sentential -le, I do not treat them as counterexamples. This issue will be further discussed in Section 6.4.3.

Once we factor out these special cases with change-of-state verbs and numeral-classifier phrase, we can see that verbal -le indeed has the presuppositional effect. In (57), verbal -le is infelicitous without an event antecedent, and the sentence-final -le is preferred:

(57) (Without a previously mentioned event antecedent:)

   a. #Ta mai le che.
      he buy le car
      ‘(Intended:) He (has) bought a car.’

   b. Ta mai che le.
      he buy car le.sf
      ‘He (has) bought a car.’

While some authors argue that there is a general link between the use of the verbal -le and the numeral-classifier phrase (or measure phrase) in the object position (Wang, 2018), this effect seems to be particularly strong only with verbs that involve consumption or a change-of-state, such as (56-a). In Section 6.4.3, I will argue that this is actually a dissimilation effect that arises from the homophony of the perfective sentence-final -le and the stative/habitual sentential -le, the latter of which has a change-of-state presupposition. Briefly, a sentence like (56-b) will be superficially ambiguous between a standard perfective reading (interpreting the le as the perfective sentence-final -le) and a change-of-state reading along the lines of ‘He has bought one car by now (he’s been buying cars lately, and now that number has reached one as compared to zero earlier)’, which is brought about by interpreting the le as the stative/habitual sentential le. For some reason, the change-of-state reading is made particularly salient by numeral classifier objects, and the perfective sentence-final -le must move to the verbal -le position in order to avoid confusion.

Having dealt with these complications, we can now apply standard presupposition projection tests and show that the event relations of the verbal -le are indeed presupposed. The standard tests for presupposition projection include po-
lar questions, negation or negative operators, and the antecedent and consequent of conditionals.

Presuppositions always project out of negation and polar questions. In general, if $p$ presupposes $q$, then $\neg p$ also presupposes $q$, as does the corresponding polar question. For example, *Mary stopped smoking* presupposes that Mary used to smoke, and both *Mary did not stop smoking* and *Did Mary stop smoking?* also do.

The following examples illustrate that polar questions (the a-sentences) and negation (the b-sentences) containing a verbal -le-marked event overall still requires an event antecedent, with one of the relations discussed earlier. In each set of the examples below, the (a) and (b) sentences are uttered in the order presented. In addition, since in Mandarin Chinese, the negation marker for eventives, mei (which literally means ‘did not happen’), is incompatible with the verbal -le, I use clause-level negation instead.

(58) **Identity**

a. Xiaowang du le Zhanzheng yu Heping ma?
   ‘Did Xiaowang read *War and Peace*?’
   ✓ Asking about a contextually salient reading event that Xiaowang engaged in.
   # Otherwise.

b. Wo bu renwei ta du le na ben shu. Yexu shi
   ‘I don’t think she read that book. Maybe she read *The Brothers Karamazov.*’
   ✓ Talking about a contextually salient reading event that Xiaowang engaged in.
   # Otherwise.

(59) **Part-whole**

a. Lisi na le jinpai ma?
   ‘Did Lisi get the gold medal?’
   ✓ Asking about events that happened during a contextually salient competition.
   # Otherwise.
b. Bu shi na le jinpai. Yinggai shi yinpai.
NEG is get LE gold-medal should be silver-medal
‘It’s not the case that he got the gold medal. I think it was a silver one.’
✓ Talking about events that happened during a contextually salient competition.
# Otherwise.

In each of the examples above, we still need an event antecedent for the verbal -le-marked event. For example, in (58-a), even though the speaker is not sure which book is read, the context must entail that a reading event has taken place; in (58-b), the negation only negates the object being War and Peace, without affecting the existence of the reading event. Likewise, in (59), even with negation, the verbal -le-marked event still must be interpreted as part of the competition (which is a collection of events).

In general, a presupposition can project out of either the antecedent or the consequent of a conditional. The only exception is when the presupposed content is introduced in the antecedent and the presupposition trigger is in the consequent. These patterns are illustrated in (60), where Mary stops/should stop smoking presupposes that Mary smokes. When we put the presupposing constituent in the antecedent (60-a) or in the consequent (60-b), both sentences overall still presupposes that Mary smokes. In contrast, in (60-c), the antecedent of the conditional mentions that Mary smokes, and the presupposition of stop smoking does not project.

(60) a. If Mary stops smoking, she will be healthier.
   b. If smoking is bad for her health, then Mary should stop smoking.
   c. If Mary smokes, she should stop smoking.

As an anaphoric element, the verbal -le follows the same pattern. The sentence as a whole still requires there to be an event in the context serving as the antecedent to the verbal-le-marked event, unless this event is introduced in the antecedent (either explicitly introduced or implied).

(61) Identity
a. Ruguo Xiaowang xuan le shangwu de ke, jiu he wo yi
   if Xiaowang choose LE morning GEN class then with me one
   ge ban.
   CL class
‘If Xiaowang chose the morning lecture, she will be in my class.’
✓ Talking about a contextually salient event of Xiaowang signing up for a particular class.
# Otherwise.

b. Ruguo Xiaowang xihuan zao qi, name ta yiding xuan le if Xiaowang like early get-up then she definitely choose le shangwu de ke.
morning CL class
‘If Xiaowang likes to get up early, she must have chosen the morning lecture (when she signed up for classes).’
✓ Talking about a contextually salient event of Xiaowang signing up for a particular class.
# Otherwise.

c. Ruguo Xiaowang qunian xuan guo daishu ke, name ta if Xiaowang last year choose algebra class then she yiding xuan le shangwu de, yinwei ta xihuan zao qi. definitely choose le morning GEN because she likes early get-up ‘If Xiaowang also signed up for algebra last year, she must have chosen the morning lecture, because she likes to get up early.’
Presupposition: None.

(62) Part-whole

a. Ruguo Lisi na-dao le jinpai, wo jiu qing ta chifan.
if Lisi take-get LE gold-medal I then offer him eat ‘If Lisi got the gold medal (at the competition), I will buy him dinner.’
✓ Talking about events that happened during a contextually salient competition.
# Otherwise.

b. Ruguo Lisi zhende hen lihai, na ta kending na-dao le if Lisi really very good then he definitely take-get LE jinpai.
gold-medal
‘If Lisi is really that good, then he must have gotten the gold medal (at the competition).’
✓ Talking about events that happened during a contextually salient competition.
# Otherwise.

c. Ruguo Lisi ye canjia guo na chang bisai, ta if Lisi also participate GUO that CL competition he kending na-dao le jinpai.
definitely take-get LE gold-medal
‘If Lisi also participated in that race, he must have gotten the gold medal.’

Presupposition: None.

In (62-a), it is important to distinguish the RVC-forming VP-level -le (cf. Section 6.2.2.3) and the verbal -le. In the examples here, I use a bare RVC-form na-dao le jinpai ‘(lit.) take-get LE gold medal’ to avoid the ambiguity that would arise in the morphologically simpler form na le jinpai ‘(lit.) take LE gold medal’, where the -le may be interpreted as either the VP-level RVC-forming -le or the verbal -le. If the if-clause has an RVC without aspectual marking, it will be interpreted as hypothetical or hasn’t taken place yet:

(63) RVC under if-clause

Ruguo Lisi na-dao/na-le jinpai...
if Lisi take-get/take-completed gold-medal

‘If Lisi gets the gold medal,...’

Inference: The result hasn’t come out yet.

In (63), the RVC-forming -le can be replaced with the result state dao ‘get’ as in na-dao jinpai. Putting RVC’s under the if-clause gives rise to the inference that the result of the competition has not come out yet.

In contrast, if we interpret the -le in na le jinpai as the verbal -le, then the sentence presupposes that the result has come out already (64), with the outcome serves as the antecedent of the verbal -le-marked event. In this case, it cannot be replaced by the bare RVC form (65). The getting the gold medal event must be identified with the outcome entailed by the context, as in the case with the RVC plus verbal -le (nadao le jinpai) in (62-a).

(64) Verbal -le under if-clause

Ruguo Lisi na le jinpai...
if Lisi take LE gold-medal

‘If Lisi got the gold medal,...’

Inferences: The result has already come out, we just don’t know what Lisi actually got.

(65) (The result has already come out, we just don’t know what Lisi actually got.)
(66) a. Every student stopped smoking.
   Presupposition: each student used to smoke.

b. Every student who used to smoke stopped smoking.
   Presupposition: At least one student used to smoke.\(^{13}\)

If the presupposition of \(B\) has wide scope, i.e. is not evaluated with respect to each \(A\), it simply projects out.

(67) Every student likes the King of France.
   Presupposition: there is a unique King of France.

The following examples illustrate the interpretation of the verbal -\(le\) under every. We can see that it follows the same pattern. Again, given a different context, it is not necessary that the relation in the a-sentences is the particular one listed, as long as one of the relations can be established.\(^{14}\)

(68) Identity

a. Meige ren dou chi le pingguo.
   every person all eat LE apple
   ‘Every person ate apples.’
   Presupposition: For each person, there is a contextually salient eating event.

b. Meige gangcai chi guo shuigu de ren dou chi le pingguo.
   every just-now eat GUO fruit C person all eat LE apple
   ‘Every person who just ate fruit ate apples.’
   Presupposition: None.

\(^{13}\)This presupposition comes from every, that the restrictor is not an empty set.

\(^{14}\)For (68), there is also a collective reading where there is one event of everyone eating something together, in which case the verbal -\(le\)-marked event will be anaphorically linked to that event.
(69) Part-whole

a. Meige yundongyuan dou jieshou le xingfenji jiance.
   every athlete all took LE dope test
   ‘Every athlete took the dope test.’

   Presupposition: There is a contextually salient competition in which
   these athletes participated, where the individual dope tests took
   place.

b. Meige canjia guo aoyunhui de yundongyuan dou jieshou le
   every participate GUO Olympics C athlete all took LE
   xingfenji jiance
dope test
   ‘Every athlete who has ever participated in the Olympics took the
   dope test (for the Olympics that year).’

   Presupposition: For each Olympics games, there is a dope test.

Each of the a-sentences overall still needs an event antecedent, under either
the wide scope or the narrow scope reading. The b-sentences illustrate the fact
that under the narrow scope reading, if the antecedent event is provided in the
restrictor, then the sentence overall does not need an antecedent anymore.

Based on these projection patterns, I conclude that the verbal -le indeed pre-
supposes an event antecedent, just like a typical anaphoric element.

6.3.4 Events vs. times

In this subsection, I will show that the anaphoricity of the verbal -le is strictly
based on events and not times (intervals). In other words, we cannot analyze the
verbal -le as reflecting the anaphoricity of the covert nonfuture tense.

First, we have the superficial observation that the verbal -le is indeed infelici-
tous out of the blue, in the absence of a contextually salient past time (70):

(70) (Out of the blue:)

    #Lisi tan le jita.
    Lisi  play LE guitar

    ‘(Intended:) Lisi played the guitar.’

However, note that the context in (70) also lacks a contextually salient event
antecedent. Therefore, (70) by itself cannot determine whether the infelicity is
due to the absence of an event or a time. When we do have an event antecedent,
on the other hand, the same sentence with the verbal -le becomes felicitous.

(71) (Talking about the rehearsal from last Sunday:)

Yuedui pailian Lisi tan le jita.
band rehearsal Lisi play LE guitar

‘At the band rehearsal, Lisi played the guitar.’

Secondly, just having a contextually salient past time does not guarantee the felicity of the verbal -le. Consider the following example, where the reference time is noon:

(72) (Context: It’s already past lunch time, and I don’t know if Zhangsan actually had lunch today.)

#Zhangsan zhongwu chi le hanbao.
Zhangsan noon eat LE hamburger

‘(Intended: Zhangsan ate a hamburger for lunch. (Lit. Z. ate a hamburger at noon.))’

Here, the context does contain a salient past time (noon), but it does not entail that an actual event of Zhangsan having lunch took place. In this case, both the non-anaphoric perfective particles, -guo and the perfective sentence-final -le, are felicitous:

(73) (Context: we don’t know if Zhangsan had lunch today, and it’s already past lunch time.)

a. Zhangsan zhongwu chi guo hanbao.
   Zhangsan noon eat GUO hamburger
   ‘Zhangsan ate a hamburger for lunch. (Lit. Z. ate a hamburger at noon.’

b. Zhangsan zhongwu chi hanbao le.
   Zhangsan noon eat hamburger LE.sf
   ‘Zhangsan ate a hamburger for lunch. (Lit. Z. ate a hamburger at noon.’

On the other hand, if the context contains an event antecedent, then only the verbal -le is felicitous:
(74) Ni zhongwu chi de shi shenme?
you noon eat C COP what
‘What was it that you ate for lunch?’
a. Wo zhongwu chi le hanbao.
I noon eat LE hamburger
‘I ate hamburgers for lunch. (Lit. I ate hamburgers at noon)’
b. ?? Wo zhongwu chi guo hanbao.
I noon eat GUO hamburger
c. ?? Wo zhongwu chi hanbao le.
I noon eat hamburger LB.SF

In (74), the use of the wh-cleft presupposes that the addressee actually had lunch. If this utterance is felicitous, it means that the context must entail that the addressee did have lunch. Hence, when answering the question, the eating event is identified with the lunch event, and only the verbal -le is felicitous.

We can compare (74) with (75), where there is a salient past reference time provided by the adverbial yesterday, but there is no contextually salient event antecedent. In this case, both non-anaphoric perfective particles are felicitous, while the verbal -le becomes odd, despite the past temporal adverbial at noon.

(75) Ni zuotian chi mei chi dongxi?
you yesterday eat NEG eat anything
‘Did you eat anything yesterday?’
a. Wo zhongwu chi guo hanbao.
I noon eat GUO hamburger
‘I ate hamburgers at noon.’
b. Wo zhongwu chi hanbao le.
I noon eat hamburger LB.SF
‘I ate hamburgers at noon.’
c. ?? Wo zhongwu chi le hanbao.
I noon eat LE hamburger
‘I ate hamburgers at noon.’

Note that the English translations are all the same: in English, as long as the reference time is anaphoric (to the time of the adverbial), there is only one possible alternative—the (anaphoric) past tense. In Mandarin Chinese, we have a perfective particle that needs an event antecedent.

I conclude that Mandarin Chinese differs from English in that instead of definite and indefinite tenses, it has definite (i.e. anaphoric) and indefinite aspects, which are sensitive only to the discourse status of the asserted event, instead of
the reference time. Presumably, this is because the language does not have explicit tense morphology. While there is a null *nonfuture* tense (see Chapter 7), the absence of explicit morphology makes it impossible for speakers to indicate the possible anaphoric dependencies in the temporal domain, and instead, the language chooses to do so in the domain of events via aspect particles. This observation leads to the question of whether we can find more languages that pattern with Mandarin Chinese in this respect.

Another question that follows is, whether Mandarin Chinese may have both an anaphoric and a non-anaphoric null *nonfuture* tense. Of course, if there are no non-trivial syntactic/morphological processes that are sensitive to the distinction, then an analysis with both version of the *nonfuture* tense will be indistinguishable from an analysis that makes this distinction. The data in this section allow us to conclude that at least the choice of the perfective particles cannot reflect the anaphoricity of the null *nonfuture* tense. Whether there are non-trivial consequences to distinguishing two phonologically null morphemes with different presuppositions in the language is a question I would like to leave for future research.

6.3.5 Remark on discourse relations in DRT/SDRT

6.3.5.1 More discourse relations?

The observation regarding the verbal *-le* is reminiscent of the rhetorical and other discourse relations observed with the English simple past, which motivated the Segmented Discourse Representation Theory (SDRT) (*Lascarides and Asher, 1993, 2008*, a.o.). Some of the relevant examples are given below:

(76) a. **Elaboration**
   
   Chris had a fantastic meal. He ate salmon.

b. **Explanation**
   
   Max fell. John pushed him.

c. **Result**
   
   John turned off the light. The room was pitch dark.

(*Kamp et al., 2011*)

Focusing on the relation between the event in the second utterance and the one in the first, we can see that the English simple past is very versatile regarding the possible discourse relations it allows. Of course, this also means that English does not make such distinctions in morphology, and one tense-aspectual construction
covers all of the cases listed above.

For Mandarin Chinese, on the other hand, we see that a verbal -le-marked event always stands in the *elaboration* relation with some event (or event collection) in the context, with the event either being identical to the antecedent, or a member of the antecedent event collection (77).

(77) **Elaboration test**

Zhangsan chi fan le...  
Zhangsan eat meal \( \text{LE.SF} \)

‘Zhangsan had dinner...”

a. ...Ta chi le yu.  
   he eat \( \text{LE} \) fish  
   ‘...He ate fish.’

b. ...Ta ??chi yu le.  
   he eat fish \( \text{LE.SF} \)

c. ...Ta #chi guo yu.  
   he eat \( \text{GUO} \) fish

For the purpose of comparison, I have also tested the use of the particles with respect to the other rhetorical and discourse relations in (76). The result seems to be that the verbal -le is only obligatory with the *elaboration* relation. Some examples with the other discourse relations are shown below:

(78) **Explanation test**

Zhangsan shuai-dao le.  
Zhangsan fall-down \( \text{LE.SF} \)

‘Zhangsan fell...’

a. ...Yinwei Lisi tui le ta.  
   because Lisi push \( \text{LE} \) him  
   ‘...because Lisi pushed him.’

b. ...Yinwei Lisi tui ta le.  
   because Lisi push him \( \text{LE.SF} \)  
   ‘...because Lisi pushed him.’

c. ...Yinwei Lisi #tui guo ta.  
   because Lisi push \( \text{GUO} \) him

We can see that in (78) and (80), the use of the verbal -le and the perfective sentence-final -le in the second sentence is quite flexible. If the speakers somehow
view the first and second events as both belonging to a collection of events in the context, then the verbal -le can be used. Alternatively, the two events may be viewed as simply taking place one after another, and the perfective sentence-final le can be used.

(79) **Explanation test 2**

Zhangsan hui shuo menggu yu.  
Zhangsan can speak Mongolian language

‘Zhangsan speaks Mongolian...’

a. ...Yinwei ta zai neimeng shang le xue.  
because he at Inner-Mongolia attended LE school  

b. ...Yinwei ta zai neimeng ???shang xue le.  
because he at Inner-Mongolia attend school LE.SF  

c. ...Yinwei ta zai neimeng shang guo xue.  
because he at Inner-Mongolia attend GUO school  

The different judgement in (79) shows that the explanation relation is probably not related to whether the le’s are licensed: we have the same relation, but in this case both -le’s are degraded.

We also have an interesting observation regarding guo. We can see that its felicity is closely related to whether there is a change-of-state related to a preceding event. In particular, in (78), guo is infelicitous if we try to use it on the pushing event that caused Zhangsan’s fall.

(80) **Result test**

Zhangsan meitian jiao shui.  
Zhangsan every-day pour water

‘Zhangsan waters (the plants) every day...’

a. ...Yueji guoran kai le hua.  
rose indeed bloom LE flower  
‘...and indeed the roses bloomed (as a result).’

b. ...Yueji guoran kai hua le.  
rose indeed bloom flower LE.SF  
‘...and indeed the roses bloomed (as a result).’

c. ...Yueji guoran #kai guo hua.  
rose indeed bloom GUO flower
In (80), it is infelicitous if we try to use it on the blooming event as a result of Zhangsan’s watering. In contrast, in (79), while the going to school event (habitual) serves as an explanation for the first sentence, going to school does not by itself involve a change of state. In this case, guo becomes felicitous, and is strongly preferred over the other two particles, and also gives rise to the ‘experiential’ reading. These observations are related to the ‘discontinuity of the result state’ inference of guo, which I will discuss in Section 6.5.

6.3.5.2 Time and event-based anaphoric dependencies

Another point I would like to address now is how to place the event-anaphora nature of the verbal -le in theories like Discourse Representation Theory (DRT). DRT was invented in order to account for dependencies in natural language such as anaphora and presupposition, and it has been used to account for temporal and aspectual data such as the difference between the English simple past and the past progressive (also the French passé simple and imparfait) (Kamp, 1981, 1988; Kamp and Reyle, 1993; Kamp et al., 2011; Kadmon, 1987; de Swart, 1998, a.o.). In particular, focusing on the second event in the examples below, we have the observation that the simple past somehow ‘pushes the narration forward’ in the sense that the simple past event is interpreted as taking place after the event in the first sentence, while the past progressive event is interpreted as being simultaneous to the first event. The French passé simple and imparfait follow the same pattern.

(81)  

a. Josef turned around. The man pulled out his gun.  
b. Josef turned around. The man was pulling out his gun.

In DRT, events and discourse referents representing them are treated on par with other variables denoting individuals, times, and states.

I will now briefly discuss how (81) is accounted for in a recent version of DRT, namely Kamp et al. (2011). In Kamp et al. (2011), these data are accounted for by treating the two past tense constructions as carrying a presupposition of an anaphoric relation between a ‘reference time’ and the ‘location time’ of the eventuality (i.e. a state or an event). The ‘reference time’ in DRT differs from the use of the term in the Reichenbachian system in that in DRT, it is an anaphoric element that needs to be resolved to (i.e. identified as) a term in the context the sentence is interpreted in. The ‘location time’ is defined as the time that the utterance is about (similar to the ‘reference time’ in Reichenbachian terms). For
Kamp et al. (2011), tenses involve two relations, listed in (82). The underlying aspect determines the relation between the eventuality and the location time (83).

(82) The semantic contribution of tense in Kamp et al. (2011)
   a. the relation between t\textsubscript{loc} ‘the location time’ and n ‘the utterance time’;
      \Rightarrow determines if the tense is past, present, or future
   b. the relation between t\textsubscript{loc} and r ‘the reference time’.
      \Rightarrow r is linked to an element from the context via anaphoric presupposition resolution

(83) The semantic contribution of aspect in Kamp et al. (2011)
   the relation between t\textsubscript{loc} and e/s (or τ(e)/τ(s))
   \Rightarrow imperfective: t\textsubscript{loc} \subseteq τ(e/s); perfective: τ(e/s) \subseteq t\textsubscript{loc}

In Kamp et al. (2011), presuppositions are analyzed as a kind of anaphora resolution. The relations (82-b) between the reference time and the location time conveyed by these tenses (or more precisely, tense-aspect bundles) in English and French are analyzed as presuppositions, and once they are ‘resolved’ in the contexts, the condition is added to the discourse representation structure (DRS).

A (non-stative) sentence in the English simple past is understood as having an underlying perfective aspect. It carries a presupposition that consists of a reference time r, and a relation ρ between r and the location time it introduces. In the example presented in (84), the DRS on the left represents the context established by the first sentence. The DRS introduced by the second sentence, along with its presuppositions, is shown on the right as a tuple (with the presuppositions on the left in curly brackets). When updating the existing DRS with the second sentence, the tense triggers this presupposition: the reference time r, and the relation ρ between r and t\textsubscript{2}.

(84) a. Josef turned around. The man pulled his gun.\textsuperscript{15}

\begin{align*}
   & n, j, t_1, e_1 \\
   & \begin{align*}
   & \text{Josef(j)} \\
   & t_1 \prec n \\
   & e_1 \subseteq t_1 \\
   & e_1 : \text{turn-around(j)}
   \end{align*} \\
\end{align*}

\begin{align*}
   & n, x, t_2, e_2 \\
   & \begin{align*}
   & \text{the man(x)} \\
   & t_2 \prec n \\
   & e_2 \subseteq t_2 \\
   & e_2 : \text{pull-gun(x)}
   \end{align*} \\
\end{align*}

\textsuperscript{15}The first sentence of course also has a presupposition, but we are assuming that they have been resolved already, resulting in the DRS on the left.
Kamp et al. (2011) argue that for the English simple past and the French passé simple in (81-b) and (84), the relation $\rho$ is taken to be ‘temporal precedence’ $\prec$. The presupposition is then resolved by looking for the appropriate antecedent for $r$. There are two options here: (i) the previous event $e_1$, and (ii) the previous location time $t_1$. Kamp et al. (2011) choose the second option without argument.

After the resolution of the presupposition, the new DRS is merged with the existing one, resulting in the following DRS.

$$\begin{array}{|c|}
\hline
n, j, t_1, e_1, x, t_2, s_s \\
\hline
\text{Josef}(j) \\
t_1 \prec n \\
e_1 \subseteq t_1 \\
e_1 : \text{turn-around}(j) \\
t_1 \prec t_2 \\
\text{the man}(x) \\
t_2 \prec n \\
e_2 \subseteq t_2 \\
e_2 : \text{pull-gun}(x) \\
\hline
\end{array}$$

(85)

For a past progressive sentence, on the other hand, the relation $\rho$ is one of temporal inclusion. Note that the progressive (imperfective) aspect has the condition $t_2 \subseteq s_2$, that the progressive state $s_2$ includes its location time $t_2$.\(^{16}\)

$$\begin{array}{|c|}
\hline
n, j, t_1, e_1 \\
\hline
\text{Josef}(j) \\
t_1 \prec n \\
e_1 \subseteq t_1 \\
e_1 : \text{turn-around}(j) \\
\hline
\end{array}$$

(86) a. Josef turned around. The man was pulling his gun.

b. The man was pulling his gun.

\(^{16}\)Note that we have $s_2 : \text{PROG}(^\wedge e_2 : \text{pull-gun}(x))$, instead of simply $e_2 : \text{pull-gun}(x))$. This is due to the concern of the Imperfective Paradox (Dowty, 1979): the described event fragment is not required to eventually evolve into a complete event of the kind. Kamp et al. (2011) avoid this problem by decomposing the past progressive and the imparfait into the past tense and the aspectual operator $\text{PROG}$, which transforms an event type $e$ into a state type $\text{PROG}(e)$. The Imperfective Paradox is avoided by using the intensional abstraction operator $^\wedge$. 

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After resolving $r$ to $t_1$ and specifying $\rho$ as $\subseteq$, we obtain the following DRS.

Now let us consider how Kamp et al’s analysis may carry over to the Chinese data. (88-a) and (88-b) illustrate the ‘identity’ ($\rho_I$) and ‘part-whole’ ($\rho_e$) relations that the event in the second sentence can have with the event introduced by the first sentence.

To account for these examples, we will have to argue that the second sentence with the verbal -le has the following DRS.
There are two important differences with the English simple past example earlier: 
(i) the presupposed relation is not about the new location time \( t_2 \) and the ‘reference time’ (or ‘reference point’) \( r \), but about the new event \( e_2 \) and the reference point \( r \); (ii) \( r \) has to be resolved to the previous event \( e_1 \), instead of the previous location time.

Earlier, we saw that Kamp et al. (2011) take it for granted that the English past tenses resolve \( r \) to the previous location time instead of the previous event. For the English data, it will not really make a difference, but for the Chinese data, this choice is not trivial, as we argued earlier that the anaphoric dependency observed with the verbal -le has to be with another event, not with a reference time.

6.3.5.3 Single- vs. multi-coordinate systems

There are simpler DRT-based analyses in the literature, without using the more elaborated notions of the reference time and the relation \( \rho \) as in Kamp et al. (2011). These include Partee (1984); Dowty (1986); Hinrichs (1986); Webber (1988). Briefly, what they have in common is that they only need the reference time in resolving temporal and event anaphora. Some authors, such as Altshuler (2011), call them ‘single-coordinate systems’ (and Kamp et al.’s (2011) version ‘multi-coordinate systems’).

As Kamp et al. (2011) noted, under a single-coordinate system,

...an event(ive) sentence in a narrative introduces not only the event it describes into the discourse context, but also a reference point, which follows this event, and acts as the (default) location time for the eventuality of the next sentence. Stative sentences do not introduce such a subsequent point. They inherit their reference point from the context in which they are interpreted and pass it on to the next sentence (hence stative sentences do not propel the story forward)...On this alternative account, the determination of the relation \( \rho \) becomes simpler: \( \rho \) is always identity between the reference point and the new location time. (Kamp et al., 2011, p.206)

Again, the difference between English and Mandarin Chinese lies in that Mandarin Chinese has aspectual markers sensitive to anaphoric links between events, which cannot be reduced to a relation between times. For this reason, I believe Kamp’s (2011) multi-coordinate system (which allows for different types of \( \rho \), and in which the reference point \( r \) does not come for free) should be preferred over
the single-coordinate ones. While I will not use DRT for my analysis, this observation will provide insights for what kind of anaphoric dependencies a language may admit in the process of narration.

6.4 The distribution of the perfective sentence-final -le

In this section, I will focus on some of the basic facts about the perfective sentence-final -le. In the previous section, we saw that it is distinguished from the verbal -le in that it does not presuppose an event antecedent. However, there is a lot of disagreement in the literature about the classification and the distribution of these two perfective particles. In order to clarify the data, I will first discuss two perfective constructions that involve the use of ‘-le’: the double -le construction and the ba-causatives+-le. I will argue that: (i) the double -le construction does not contain the verbal -le as some of the previous analyses assume, but rather, one is the RVC-forming -le and the other the perfective sentence-final -le; (ii) the -le that occurs with ba-causatives is the perfective sentence-final -le, instead of the verbal -le as in Sybesma (2013); (iii) there is a dissimilation effect between the homophonous -le-particles, which prohibits the back-to-back use of the RVC-forming -le and the verbal -le, as well as the perfective sentence-final -le and the stative/habitual sentential -le. We also have evidence that in Mandarin Chinese, each clause only allows one perfective aspect marker: the verbal -le, -guo, and the perfective sentence-final -le are in complementary distribution.

6.4.1 Double -le

6.4.1.1 Basic observations

The double -le construction involves both a -le at the end of the sentence, and a -le in between the main verb and the direct object/measurement phrase (90).

(90) Wo dao-le  xuexiao le.
    I arrive-LE.RVC school LE.SF
    ‘I’ve already arrived at the school.’

The following data show that the double -le construction has the standard perfective reading, and does not differ from other perfective particles in this respect.

(91) a. Activities
Wo you-le yong le.
I swim-LE.RVC swim LE.SP
‘I have had a swim already.’
⇒ the swimming event is completed

b. Accomplishments
Wo you-le san qianmi le.
I swim-LE.RVC three kilometers LE.SP
‘I have swum three kilometers already.’
⇒ the three kilometers is completed

c. Achievements
Wo dao-le shanding le.
I arrive-LE.RVC mountain-top LE.SP
‘I have reached the summit.’
⇒ the change-of-state is completed

Note that for statives that do not involve an object or a measurement phrase, there is no double -le construction, simply because the double -le construction needs to have an object or measurement phrase for the two -le’s to manifest. Since with a measure phrase, statives become accomplishments (e.g. live in San Francisco for five years), we will leave out measure phrases when testing this. It turns out the observation is that the double -le construction is odd for statives, unless the main verb is a mono-syllabic stative verb with an inchoative counterpart, in which case, it will be interpreted as an achievement (e.g. xin ‘to believe in something’ or ‘to become convinced’ (92)).

In Mandarin Chinese, only mono-syllabic statives have adjectival/stative counterparts and often (possibly deadjectival) inchoative counterparts. Bi-syllabic stative verbs, on the other hand, have neither the stative or inchoative counterparts. This is illustrated by (92)-(93).

(92) a. ??Wo xiangxin-le ni le.
   I believe-LE.RVC you LE.SP
   ‘I have believed you.’

b. Wo xin-le ni le.
   I believe-LE.RVC you LE.SP
   ‘I have started believing you.’

(93) a. Ta xin fo.
    He believe buddha
    ‘He is a buddhist.’
b. Na duan shijian, ta xin le fo.
   that period time he convert LE buddha
   ‘He converted to Buddhism during that period.’

c. Tingshuo Lisi xin-le fo le.
   hear-say Lisi believe-LE.RVC buddha LE.SF
   ‘I heard that Lisi has converted to Buddhism.’

In (92-a), the bi-syllabic verb xiangxin ‘believe’ does not have an inchoative counterpart, and is odd with the double -le construction. On the other hand, the mono-syllabic verb xin ‘to believe in, to become convinced’, which does have an stative (93-a) and an inchoative counterpart (93-b), allows the double -le construction (92-b).

Based on the evidence above, I conclude that: (i) the double -le construction has standard perfective semantics of the event being viewed in its entirety; (ii) statives do not occur in the double -le construction, and the only ‘stative’ verbs in this construction are the ones with an inchoative counterpart, and have the inchoative reading (92-b).

6.4.1.2 Double -le as perfective RVCs

Previous authors, such as Soh and Gao (2006), take the double -le construction as involving the verbal and (what they call) the sentential -le (i.e. the stative/habitual sentential -le). However, I will argue that the double -le construction consists of an RVC and a perfective sentence-final -le. In other words, the -le taken to be the verbal -le by Soh and Gao (2006) is not the genuine presuppositional verbal -le, but rather the result-marking predicate in the VP, as in (23) in Section 6.2.2.3.

There are four pieces of evidence for my claim. First, as I mentioned in Section 6.2.2.3, the result-marking predicate -le in the VP can be replaced by another generic result marking predicate, such as diao ‘off’, wan ‘finish’, etc. This is the case in the double -le constructions as well. In the following examples, I included some of the typical VPs that allow the ‘double -le’ construction. We can see that the first -le particle in the a-sentences can all be replaced with another result-marking predicate in the b-sentences, without any change in the meaning.

(94) (There is no previously mentioned event antecedent:)

a. Ta xie-le na feng xin le.
   he write-LE.RVC that CL letter LE.SF
   ‘He has written the letter.’
b. Ta xie-wan na feng xin le.
   he write-finish that CL letter LE.SF
   ‘He has written the letter.’

(95)  (There is no previously mentioned event antecedent:)
   a. Wo zao jiu wang-le ta le.
      I early already forget-LE.RVC he LE.SF
      ‘I forgot about him long ago.’
   b. Wo zao jiu wang-diao ta le.
      I early already forget-off he LE.SF
      ‘I forgot about him long ago.’

(96)  (There is no previously mentioned event antecedent:)
   a. Women dao-le shanding le.
      we arrive-LE.RVC mountain-top LE.SF
      ‘We have arrived at the top of the mountain.’
   b. Women dao-da shanding le.
      we arrive-reach mountain-top LE.SF
      ‘We have arrived at the top of the mountain.’

(97)  (There is no previously mentioned event antecedent:)
   a. Wo chi-le fan le.
      I eat-LE.RVC meal LE.SF
      ‘I’ve eaten already.’
   b. Wo chi-wan fan le.
      I eat-finish meal LE.SF
      ‘I’ve eaten already.’

(98)  (There is no previously mentioned event antecedent:)
   a. Ta sha-le ren le.
      he kill-LE.RVC person LE.SF
      ‘He has killed someone.’
   b. Ta sha-si/diao ren le.
      he kill-dead/off person LE.SF
      ‘He has killed someone.’

This replacement is not possible with the real verbal -le (recall (24) from Section 6.2.2).

The second piece of evidence is that in all of the replaced examples above, the double -le is felicitous without an event antecedent, which would be required by the real verbal -le. This observation suggests that the double -le construction cannot contain the verbal -le.

The third piece of evidence is that the replacement with another RVC-forming
The predicate does not seem to change the culmination of the event. The RVC-forming -le, like other RVC-forming predicates, makes the event telic. We can compare it with the verbal -le, which is simply a perfective aspect. In early sections, I mentioned that it has been observed in the literature that in Mandarin Chinese, certain accomplishments verbs with a definite direct object may allow the non-culminating reading with the verbal -le (99). We can see that this reading is not available with the double -le construction, since it involves an RVC, which does not allow the partial consumption reading.

(99) (Question: What did Zhangsan eat?)

Ta chi le na ge dangao, mei chi-wan.
he eat LE that CL cake, NEG eat-finish

‘He ate part of that cake, but didn’t finish it.’

(100) Ta chi-le/wan na ge dangao le. #Mei chi-wan.
he eat-LE.RVC/finish that CL cake LE.SF NEG eat-finish

‘He ate up that cake, #but didn’t finish it.’

This suggests that in the double -le construction (100), the -le after the main verb is indeed a result-marking predicate like the other RVC-forming particles.

There are two additional related observations I would like to point out. The first point is that like the perfective sentence-final -le, the double -le construction cannot be used to add information to a previously mentioned event. For example, (94-a) cannot answer the question What did he just write?, which the genuine verbal -le can (101); likewise, (100) cannot answer the question What did he just eat?

The second point relates back to the previous subsection. Recall that bi-syllabic stative verbs like xiangxin ‘believe’ cannot appear in the double -le construction. Since such verbs in general do not form RVCs (102), the oddness with the double -le construction is expected, because this construction has an RVC-forming -le.

(101) Double -le vs verbal -le

Ni gangcai xie le shenme?
you just-now write LE what

‘What did you just write?’
a. Wo xie le xin.
   I write LE letter
   'I wrote a/the letter.'

b. #Wo xie-le xin le.
   I write-LE.RVC letter LE.SF

(102) Bi-syllabic stative verbs with RVCs

a. *xiangxin-dao/diao/hao/le/wan/zhaol/...
   believe-get/off/well/le/complete/on...

b. *xianmu-dao/diao/hao/le/wan/zhaol/...
   admire-get/off/well/le/complete/on...

The analysis that the double -le construction actually consists of an RVC and a perfective sentence-final -le also straightforwardly accounts for the earlier observation that it does not occur with statives. The reason is simply that RVCs are all achievements.

The fourth piece of evidence is that when we actually use the genuine verbal -le to add information to a previously mentioned event, we cannot form the double -le construction with another perfective sentence-final -le any more. Consider:

(103) (Context: Zhangsan exercises every day. I ask him what he did for his workout yesterday. He says...)

   *Zuotian wo you-le yong le.
   yesterday I swim-LE.RVC swim LE.SF

   '(Intended:) The workout I did yesterday was swimming.'

(104) (Context: We know that Zhangsan had lunch, and he now tells us about it.)

   *Wo wufan chi-le hanbao le.
   I lunch eat-LE.RVC hamburger LE.SF

   '(Intended:) I ate hamburgers for lunch.'

This observation suggests that the verbal -le and the perfective sentence-final -le are actually in complementary distribution. In other words, there can only be one perfective aspect marker in each clause. The RVC-forming -le, on the other hand, is not subject to this constraint, since it only changes the telicity of the VP, and does not by itself give rise to the perfective episodic reading.

Therefore, I conclude that the so-called double -le sentences only contains the
perfective sentence-final -le as the perfective aspect marker, with the -le after the verb being the generic result-marking predicate in the VP. In other words, the double -le sentences are actually RVC VPs with the perfective sentence-final -le.

6.4.1.3 Comparison to previous analyses

Early accounts such as Soh and Gao (2006) do not distinguish the stative/habitual sentential -le from the perfective sentence-final -le. In order to have a unified analysis of the ¬p to p transition reading of the former and the perfective episodic reading of the latter, Soh and Gao (2006) argue that the perfective episodic reading comes from a ¬e to e transition. In particular, they argue that if e is atelic, the transition point starts at the beginning of e, which gives rise to an inchoative reading (105); if e is telic, the transition point starts at the end of e, which gives rise to the completion reading (106). In addition, they argue that non-RVC accomplishments also have the inchoative reading (107).

(105) Ta youyong le.
    he swim    LE.SF
    ‘He started swimming (i.e. he is swimming now).’

(106) Women dao shanding le.
    we reach mountain-top LE.SF
    ‘We have arrived at the top of the mountain (i.e. we are at the top of the mountain now).’

(107) Ta xie na feng xin le.
    he write that CL  letter LE.SF
    ‘He started writing that letter (i.e. he is writing the letter now).’

Translation as given in Soh and Gao (2006)\textsuperscript{17}

In other words, Soh and Gao (2006) believe that there is an episodic ‘inchoative’ reading that involves transition from ¬e to e.

However, Soh and Gao's observation is incomplete and partially inaccurate. First, the reading reported in (105) for atelic verbs is inaccurate. Soh and Gao cite the following example (without the #) to show that the -le at the end of the sentence has a reading that the swimming event has started and may or may not have terminated:

\textsuperscript{17}Although Soh and Gao (2006) take these -le’s to be the sentential -le, since they have the perfective episodic reading in these examples without the ¬p to p presupposition, I will gloss them as the perfective sentence-final -le.
(108) Ta youyong le. #Cong zaoshang you dao xianzai hai zai you.  
he swim LE.SF from morning swim till now still PROG swim  
'(Intended:) He started swimming. Starting from this morning till now, 
he’s still swimming.'

In my judgments, the continuation in (108) should be infelicitous, since the first 
sentence asserts that the swimming event has ended.

If we interpret the -le at the end of the first sentence as the stative/habitual 
sentential -le, it only has the ‘inchoative’ reading if the swimming is habitual (i.e. 
he started swimming regularly now) (109-a). As I pointed out in Section 6.2.2.2, 
an episodic inchoative reading will require the use of the progressive marker zai, 
shown in (109-b). The same applies to (107), shown in (109-c). This observa-
tion further confirms that the stative/habitual sentential -le selects for a stative 
predicate (in this case, a progressive state).

(109) a. Ta yiqian bu youyong. Xianzai youyong le.  
he before NEG swim now swim LE.STATIVE 
‘He used to not swim, but he does now.’ 

b. Ta gangcai mei zai youyong, xianzai zai youyong le.  
he just-now NEG PROG now PROG swim LE.STATIVE 
‘He wasn’t swimming earlier, but he is swimming now.’

c. Ta zhiqian mei zai xie na feng xin, xianzai zai xie 
le. LE.STATIVE  
he before NEG PROG write that CL letter now PROG write 
‘He wasn’t writing that letter before, but now he is writing it.’

(106), on the other hand, has the ‘we are at the top of the mountain now’ inference 
not because of the $\neg$p to p or $\neg$e to e transition as Soh and Gao (2006) claim, but 
rather, it involves the resultative reading of the perfective sentence-final -le, in a 
way parallel to the resultative reading of the English present perfect.

In addition, the sentences with a sentence-final -le under the episodic reading 
do not have the $\neg$p to p presupposition (110). Soh and Gao (2006) do not address 
this fact. Their account will have to explain why the presupposition disappears:

(110) (Zhangsan just comes out of the gym, and he runs into Lisi. There is no 
contextually salient event antecedent or any presupposed transition.)

Wo gangcai youyong le.  
I just swim LE.SF
‘I just had a swim.’

NOT: ‘I started swimming (and I’m still swimming).’

I also disagree with Soh and Gao (2006) that non-RVC accomplishments have the episodic –e to e transition reading. For Soh and Gao (2006), this reading amounts to a ‘just started’ (as opposed to ‘started and completed’) reading, which is essentially the non-culminating reading in Mandarin Chinese that is widely discussed in the literature. In fact, the only accomplishments with this reading are verbs with incremental themes and a definite object, which are exactly the verbs that allow the partial realization reading with the perfective aspect in Mandarin Chinese (Zhang, 2018):

(111)  

a. Ta xie na feng xin le.
    he write that CL letter LE.SF
    ‘He started writing that letter.’

b. Ta chi na kuai pisa le.
    he eat that CL pizza LE.SF
    ‘He started eating that pizza.’

The recent literature (cf. Chapter 7) has established that the partial realization reading is not due to the perfective aspect, which in Mandarin Chinese has the standard perfective semantics. In other words, Soh and Gao wrongly assumes that the non-culminating reading in (111) is due to the semantics of -le.

The non-culminating reading is allowed in Mandarin Chinese for verbs with incremental themes only with definite objects and objects with individuating classifiers (Zhang, 2018). Hence, our prediction is that with individuating classifiers, the sentence-final -le should also allow the ‘only started’ reading. This is indeed the case, as (112) shows.

(112) Ta he na san wan shui le.
    he drink that three bowl water LE.SF
    ‘He drank from those three bowls of water (i.e. only started drinking and not finishing).’

(113) illustrates that with non-individuating classifiers such as ‘liter’, this reading is not available, since the non-culminating reading is not available:

\(^{18}\text{Zhang (2018) noted that for individuating classifiers, the partial realization reading requires that each of the atoms must be partially affected. Here, for the sentence-final -le, it is also the case: each of the three bowls of water must be (at least) partially consumed.}\)
He drank three liters of water already.

Note that the examples above all have the non-RVC verb stem. Therefore, Soh and Gao's observation that the sentence-final -le has the inchoative reading with non-RVC accomplishments is inaccurate.

We can also test the perfective reading of the sentence-final -le with explicit past adverbials. The following sentences illustrate the reading with statives, activities, accomplishments, and achievements (all interpreted episodically).

As we can see, the sentence-final -le has the standard perfective reading \((\tau(e) \subseteq t)\) with all event types, contrary to Soh and Gao's prediction.

The conclusion of this subsection is that the perfective sentence-final -le has the standard perfective reading with all event types. It is distinguished from the sentential -le in that it does not presuppose a \(-p\) to \(p\) transition, and the event is interpreted episodically instead of habitually.

6.4.2 Causatives and the ba-construction

The causative ba-construction under the perfective episodic reading \((115)\) also uses the perfective sentence-final -le. It has the following word order:

\[
(115) \quad \text{Wo ba diannao nong-huai le.} \\
\text{I BA computer make-broken LE.SF} \\
\text{‘I broke the computer.’}
\]
In the previous literature on Mandarin Chinese causatives, the -le here is taken to be the same as the verbal -le, which is analysed as a ‘realization’ marker (Sybesma, 2013). However, I will show in this subsection that it is actually the perfective sentence-final -le, taking into account its distribution and its presuppositions. First, I will discuss the previous analysis of ba-causatives.

6.4.2.1 Previous analysis

The ba-construction is a causative construction in Mandarin Chinese. In the literature, ba- is taken to be a causative light verb, and to head a CausP above the embedded VP:

(116) Ta xiang ba fangjian dasao ganjing.
he want BA room tidy clean
‘He wants to clean up the room.’

The subject of a ba-sentence is the causer, and the causee is raised from its original position. Both bear a semantic relation with the CausP instead of the embedded VP. As (117) shows, the meal is not the agent of eat, nor is Lisi the theme.

(117) Zhe dun fan ba Lisi chi qiong le.
this CL meal BA Lisi eat poor LE SF
‘The eating of this meal made Lisi poor.’

In Sybesma (2013), the VP takes a result-denoting small clause (SC), and he argues that the -le is a realization marker in the small clause (118), which asserts that the change-of-state has realized. As we can see, the ‘realization’ reading (117) is essentially a perfective episodic reading, but Sybesma (2013) believes that the -le here is not a perfective aspect marker. He has the following analysis of (117).

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10Sybesma’s analysis is motivated by the various data involving the inchoative reading and the non-culminating reading of the verbal -le. In Chapter 7, however, we will see that the more recent literature has agreed that these data do not undermine the analysis of the verbal -le as a perfective aspect marker.
In addition, Sybesma (2013) argues that the Caus head must be phonologically filled, either by the insertion of ba, or by the movement of the VP (120). The latter option corresponds to the non-ba version of the causative sentence (119).²⁰

(19) Zhe dun fan chi-qiong le Lisi.
this CL meal eat-poor LE Lisi.
‘The eating of this meal made Lisi poor.’

(20) 'The eating of this meal made Lisi poor.'
Sybesma (2013) then concludes that the verbal -le and the sentence-final -le in the ba- (117) and non-ba- (119) versions of the sentence are the same realization marker. In addition, Sybesma (2013) does not discuss whether (117) and (119) can be distinguished semantically.

6.4.2.2 The ba- vs non-ba-causatives

I argue that (117) and (119) can indeed be distinguished, and it is not the ba- and non-ba-causatives, but rather the location of -le, that makes the difference. In particular, the -le in (117) is a sentence-final -le, and this construction has the same definedness conditions as other instances of the sentence-final -le. On the other hand, the -le in (119) is the verbal -le, with the same event antecedent presupposition.

In addition, contrary to Sybesma’s analysis, where the ba- or non-ba- versions of the causatives decide the location of the realization marker -le, I show that in the non-ba version of the sentence, it is also possible that we use a sentence-final -le instead of a verbal -le. In either case, the ‘realization’ reading noted by Sybesma (2013) simply follows from the perfective semantics that the event has completed. In other words, there are three possible structures here:

\[(121) \quad \text{ba-causative + perfective sentence-final -le} \]

a. Zhe dun fan ba Lisi chi qiong le.
   this CL meal BA Lisi eat poor LE. SF
   ‘The eating of this meal made Lisi poor.’
b. AspP
   Asp CausP
   le.SF NP1 CausP
   This meal Caus VP
   ba NP2 VP
   Lisi V SC
eat NP3 SC
t poor

(122) Non-\textit{ba}-causative + perfective sentence-final -\textit{le}

a. Zhe dun fan chi qiong Lisi le.
   this CL meal eat poor Lisi le.SF
   ‘The eating of this meal made Lisi poor.’

b. AspP
   Asp CausP
   le.SF NP1 CausP
   This meal Caus VP
   eat V SC
t NP3 SC
Lisi poor

(123) Non-\textit{ba}-causative + verbal -\textit{le}

a. Zhe dun fan chi qiong le Lisi.
   this CL meal eat poor le Lisi
   ‘The eating of this meal made Lisi poor.’
The choice of the perfective particle (the perfective sentence-final -le or the verbal -le) only depends on the discourse status of the event, and not on the form of the causative. However, given that the verbal -le must appear in between the main verb and the direct object (or the causee), and in the ba-construction, the causee is moved to a higher position than the main verb, a ba-causative does not admit the verbal -le for structural (and the surface word order) reasons (see (121-b)).

On the other hand, with the perfective sentence-final -le, the choice between the ba- (121) and non-ba versions (122) of the causative depends on several factors. One is focus:

(124)  a. Wo ba yi tai diannao nong-huai le.
I BA one CL computer make-broken LE.SF
‘I broke a computer.’
(The focus is on broken.)

b. Wo nong-huai yi tai diannao le.
I make-broken one CL computer LE.SF
‘I broke a computer.’
(The focus is on one computer.)

Another factor is the strength of the causee. This has been noted by Sybesma (2013). When the causee is a strong NP (i.e. demonstratives, proper names, personal pronouns, as well as bare nouns interpreted as unique definites), expressing old information, the ba-construction is preferred over the non-ba version.
While Sybesma (2013) argues that the strength of the causee is related to the fact that causatives are inherently perfective (bounded, telic, quantificationally closed), and are not affected by the use of the ba-construction, the observation here also seems to be related to the information structure: the ba-version of the sentence (125-a) tends to focus on the result of Lisi being dead, while the non-ba version (125-b) tends to focus on the fact that the person he killed is Lisi. Unless with specific contexts (e.g. a serial killer is on the loose and now he has killed Lisi too), we tend to interpret the proper name Lisi as old information, and hence prefer the ba-version of the sentence (125-a). If Lisi (as opposed to the killing event) is interpreted as new information, the non-ba version of the sentence will be preferred.

I will now show that the perfective sentence-final -le and the verbal -le with causatives have the same distribution as we observed earlier: the latter requires an event antecedent.

As we saw in the earlier sections, the perfective sentence-final -le can be uttered without an event antecedent. This contrasts with the verbal -le.

(126) (There is no event antecedent when the following is uttered:)

a. Wo zuijin qu Shanghai le.
   I recently go Shanghai LE.SF
   ‘I recently had a trip to Shanghai.’

b. #Wo zuijin qu le Shanghai.
   I recently go LE Shanghai
   ‘(Intended:) I recently had a trip to Shanghai.’

The same pattern holds with the causatives introduced earlier. First, without an event antecedent, only the perfective sentence-final -le is felicitous, for both the ba- and non-ba versions of the causative:

(127) (There is no event antecedent when the following is uttered:)

a. Wo ba diannao nong-huai le.
   I BA computer make-broken LE.SF
   ‘I broke the computer.’
b. Wo nong-huai diannao le.
   I make-broken computer le.
   I make-broken computer LE.SF
   ‘I broke the computer.’

c. #Wo nong-huai le diannao.
   I make-broken LE computer
   ‘(Intended:) I broke the computer.’

And as expected, when the asserted event has an anaphoric relation with an event in the context, only the verbal -le is felicitous:

(128) (We know that Lisi broke something. The speaker asks:)

Ni nong-huai de shi shenme?
you make-break C COP what

‘What was it that you broke?’

a. #Wo ba diannao nong-huai le.
   I BA computer make-broken LE.SF
   ‘(Intended:) I broke the computer.’

b. #Wo nong-huai diannao le.
   I make-broken computer le.
   I make-broken computer LE.SF
   ‘(Intended:) I broke the computer.’

c. Wo nong-huai le diannao.
   I make-broken LE computer
   ‘I broke the computer.’

These observations show the choice between the perfective sentence-final -le and the verbal -le only depends on the discourse status of the asserted event, and not on the form of the causative.

6.4.3 Dissimilation effects

Given the large number of homophonous -le particles, I argue that we observe a dissimilation effect. This term refers to the tendency in languages to avoid having two phonological segments that are too similar to each other occurring together. When two -le-particles appear too close to each other, dissimilation effect causes one of the -le-particles to not surface. I argue that the dissimilation process is responsible for a lot of the confusion regarding the appropriate analysis of the various -le particles.
First, the RVC-forming \textit{-le} cannot co-occur with the verbal \textit{-le}, given their proximity:

(129) (What did you forget?)

Wo wang(*-le) le ta de mingzi.
I forget\text{-LE.RVC LE he GEN name}

’I forgot his name.’

In (129), when answering the question \textit{what did you forget?} we must use the verbal \textit{-le}, which is anaphoric. On the other hand, the verb \textit{wang} ‘to forget’ needs to occur as an RVC to get the culmination reading, and recall that the RVC-forming \textit{-le} can occur with \textit{wang}. To see this, consider the following sentence:

\begin{enumerate}[a.]
    \item *Wo xiang wang na jian shi.
        I want forget that CL event
        ‘(Intended: I want to forget that event.)’
    \item Wo xiang wang-diao/le na jian shi.
        I want forget-off/LE.RVC that CL event
        ‘I want to forget that event.’
\end{enumerate}

In (130), when the speaker says that (s)he wants to forget something, the intended meaning is not that she wants to engage in the forgetting process, but the culmination of forgetting (i.e. to successfully forget it). Hence, the non-RVC form is ungrammatical (130-a), and we must have an RVC-forming predicate, in this case, either \textit{diao} ‘off’ or the RVC-forming \textit{-le}.

However, the RVC-forming \textit{diao} ‘off’ differs from the RVC-forming \textit{-le} in that it can occur with the verbal \textit{-le}.

(131) (What did you forget?)

Wo wang(-diao) le ta de mingzi.
I forget\text{-OFF LE he GEN name}

’I forgot his name.’

Since both (129) and (131) have the culmination reading (i.e. the speaker forgot the name completely) and that \textit{wang} ‘forget’ by itself does not have the culmination reading (130-a), we must conclude that the reason why (129) only has one \textit{-le} on the surface is due to the dissimilation effect between the RVC-forming \textit{-le} and the verbal \textit{-le}.  

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The second point is that the perfective sentence-final -le cannot occur with the stative/habitual sentential -le.

This point relates to the analysis of the stative/habitual sentential -le by Soh (2009), that it presupposes a transition from ¬p to p. Soh (2009) shows that the stative/habitual sentential -le can be distinguished from genuine perfective particles such as the verbal -le and -guo in that it cannot co-occur with downward-entailing quantifiers if the quantifier specifies information relating to the end point of a situation. Some downward entailing-quantifiers include: budao x ‘less than x’ and zuiduo x ‘at most x’. To see this, compare (132-a) with (132-b):

(132) a. Ta chi le/guo budao san ge mantou.
    he eat LE/GUO less-than three CL bun
    ‘He ate less than three buns.’

    b. *Ta chi budao san ge mantou le.
    he eat less-than three CL bun LE.STATIVE
    ‘(Intended: He ate less than three buns already.)’

However, if the downward-entailing quantifier describes a stative situation (i.e. does not specify information relating to the end point), it can occur with the stative/habitual sentential -le:

(133) Wo you budao wu kuai qian le.
    I have less-than five dollar money LE.STATIVE
    ‘I have less than five dollars left (which wasn’t the case before).’

Soh (2009) then concludes that this restriction follows from the ¬p to p presupposition of the stative/habitual sentential -le: since any number less than x satisfies less than x/at most x as well, the ¬p to p transition cannot be satisfied if we are counting the number of culminated events over time (since the number of culminated events will only increase over time, we always start with a smaller number). This is not a problem with statives, since a stative like having less than five dollars may start from a higher number (e.g. used to have more money, but now less than five dollars).

While I agree with Soh’s (2009) analysis of the stative/habitual sentential -le, Soh does not distinguish it from the perfective sentence-final -le and simply treats all -le particles at the end of the sentence as the stative/habitual sentential -le. Soh will have trouble explaining (134) below. We can see that if we put the downward-entailing quantifier in the subject position, there is no problem with
having a -le at the end of the sentence (134).21

(134) a. (You) Zuiduo san ge ren xie-wan zuoye le.
   there-is at-most three CL person write-finish homework LE.SF
   ‘At most three people finished the homework.’

   b. (You) Budao san ge ren chi-wan fan le.
   there-is at-most three CL person eat-finish meal LE.SF
   ‘At most three people finished the meal.’

   c. (You) Zuiduo san ge ren tou gei Lisi le.
   there-is only at-most three CL person vote for Lisi LE.SF
   ‘At most three person who voted for Lisi.’

If this -le were the stative/habitual sentential -le with the transition presupposition, we would expect it to be infelicitous as in (132-b). However, as the translation shows, (134) simply has the standard perfective reading and does not presuppose any ¬p to p transition in the first place. This suggests that the -le at the end of the sentence is actually the perfective sentence-final -le. Since (134) simply has the perfective reading, downward entailing quantifiers do not have a problem with that. We can also see below that in general, the perfective aspect can occur with downward entailing quantifiers in either the object or the subject position, as shown by the verbal -le, -guo (135-b)/(136-b) and the English perfective (135-a)/(136-a).

(135) a. He ate less than three buns.

   b. Ta chi le/guo budao san ge mantou.
   he eat LE/Guo less-than three CL buns
   ‘He ate less than three buns.’

(136) a. At most three people voted for Lisi.

   b. Zuiduo san ge ren tou gei le/guo Lisi.
   at-most three CL person vote for LE/Guo Lisi.
   ‘At most three people voted for Lisi.’

Since Soh treats all -le particles at the end of the sentence as the stative/habitual -le, he cannot explain why in (134), the sentences become good again.

   Now, the question is: when we have a measure phrase in the object position, why can’t we interpret the -le at the end of the sentence as the perfective sentence-final -le? Since there is nothing wrong with the perfective aspect and downward entailing quantifiers, we should expect the following sentence to be grammatical:

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21For some speakers, it is helpful to add the existential particle you ‘there is’.
My intuition is that this has to do with the nature of the measure phrase and how it counts events. Note that (132)/(137) differs from (134) in that the former has the measure phrase in the object position, while the latter, where the perfective sentence-final -le is good, has the measure phrase in the subject position. While in both cases, the measure phrase counts the number of events that take place, they differ in the natural time sequencing of the events.

If the measure phrase is counting the subject, then in general, the number of events does not necessarily take place one after another. For example, in (134-a), the less than three doing homework event may not necessarily be put in a back-to-back temporal sequence: one person may start writing and the second person starts after him, but finishes before the first person does. Alternatively, they may all start and finish writing at the same time. The same holds for (134-b) and (134-c). Hence, it does not make sense to think of the transition from a lesser number of events to more, and the -le at the end of the sentence is naturally interpreted as the perfective sentence-final -le, instead of the stative/habitual -le which presupposes the ¬p to p transition.

In contrast, if the subject stays the same and the measure phrase counts the object, then the number of events will strictly increase over time. For example, in ??, the agent can only finish one bun, then two buns, and then three buns, etc. It follows that there is always a transition (in terms of different numbers of events). This is especially true for change-of-state and consumption events. For these events, this seems to have grammaticalized and the sentence-final -le is always interpreted as presuppositional to account for (regardless of what kind of measure phrase it is), and for downward entailing measure phrases, the sentence is judged infelicitous.

This may also explain why for certain VPs with a measure phrase in the object position, the perfective sentence-final -le is odd (141), and the verbal -le may occur without an event antecedent (140).

Recall that the verbal -le contrasts with the perfective sentence-final -le (138)-(139) in that the former requires an event antecedent.

(138) (We know that Lisi had dinner. What did he eat?)

a. Ta chi le yu.
   he eat LE fish
‘He ate fish.’

b. ??Ta chi yu le.
    he eat fish le.sf

(139) (There is no event antecedent:)

a. #Lisi chi le yu.
    Lisi eat le fish

b. Lisi chi yu le.
    Lisi eat fish le.sf
    ‘Lisi has eaten fish.’

Recall from Section 6.2.4 that the only exception is exactly with change-of-state and consumption VPs that contain measure phrases in the object position (140)-(141).

(140) (There is no event antecedent:)

a. Wo chi-diao le san ge baozi.
    I eat-off le three CL buns
    ‘I ate three buns.’

b. Ta nong-huai le san tai diannao.
    (s)he make-break le three CL computer
    ‘(S)he broke three computers.’

(141) (There is no event antecedent:)

a. ?Wo chi-diao san ge baozi le.
    I eat-off three CL buns le.sf

b. ?Ta nong-huai san tai diannao le.
    (s)he make-break three CL computer le.sf

To the extent that (141) can be interpreted, they only have the ‘I have eaten three buns already’ (as opposed to only two buns earlier) transition reading which follows from the stative/habitual sentential -le, instead of the standard perfective ‘I ate three buns’. If the latter reading is intended, the perfective sentence-final -le is moved from its normal position to the position of the verbal -le and -guo, in order to avoid the wrong interpretation (alternatively, it is possible that the speaker uses the homophonous verbal -le as a non-anaphoric perfective temporarily as a substitute).

In fact, this reasoning also applies to cases where the perfective sentence-final -le is odd. Recall that with a measure phrase in the object position, the sentence-final -le is odd:
(142) ??Wo mai san liang che le.
   I buy three car LE.SF
   '(Intended:) I've bought three cars.'

Assuming that normally, people do not buy cars in bulk, there will be three buying events in temporal order, and this naturally encourages the transition reading, namely, the speaker used to have two cars, and now he has three.

In contrast, certain events with a measure phrase may be interpreted as a whole, in which case the perfective sentence-final -le can occur naturally. For example:

(143) Wo pao san qianmi le.
   I run three kilometers LE.SF
   'I finished a 3000m run.'

(143) allows the -le to be interpreted as the perfective sentence-final -le, in which case the assertion is that the speaker has completed a single running session (and stopped running). Note that under the transition reading where the -le at the end of the sentence is interpreted as the stative/habitual sentential -le, the sentence will have an inference that the speaker is still running, and has just passed the 3000 meters threshold (144). This is because the stative/habitual sentential -le only describes present states, and the event must be interpreted as on-going (progressive).

(144) Wo pao san qianmi le.
   I run three kilometers LE.STATIVE
   'I've run 3000m already.'

Another issue is, with non-downward entailing quantifiers, there should be no problem with using the stative/habitual sentential -le for the transition reading, and the perfective sentence-final -le as the perfective aspect marker at the same time. However, dissimilation effect stops this construction from surfacing:

(145) *Ta chi san ge mantou (*le) le.
   he eat three bun LE.SF LE.STATIVE
   '(Intended: He ate three buns already.)'

If we use the perfective sentence-final -le, it will be back-to-back with the stative/habitual sentential -le. By dissimilation, the language wants to avoid that, just like the case with the RVC-forming -le and the verbal -le we saw earlier.

Based on the reasoning above, I argue that in Mandarin Chinese, there is a
dissimilation effect with respect to the different -le particles with different functions. In addition, we also observe evidence that the language tries to avoid the potential miscommunication in cases where there may be an ambiguity, as in the case with measure phrases in the object position.

6.5 The inferences of the perfective sentence-final -le and -guo

In this section, I will discuss some of the inferences of the perfective sentence-final -le and -guo, and compare them with the English present perfect and the past tense. One basic feature that distinguishes the two particles is the inferences regarding the result state of an event.  

In general, guo is associated with a ‘discontinuity of the result state’ inference, and it is often compared with the resultative reading of the perfective sentence-final -le:

(146) The discontinuity reading vs. the resultative reading

a. Lisi dakai guo chuanghu.
   Lisi open guo window
   ‘Lisi (has) opened the window.’

   Inference: The result state of that event does not hold now (either the window is closed now, or that it’s open, but someone first closed it after Lisi’s opening event, and then someone other than Lisi opened it again.)

b. Lisi ba chuanghu dakai le.
   Lisi BA window open le.sf
   ‘Lisi (has) opened the window.’

   Inference: The window is still open.

The nature of these inferences is the subject of debates in the previous literature. In this section, I will first show that the sentence-final -le does not entail the continuation of the result state. Rather, the ‘continuation of the result state’ inference shows similarities with the resultative reading and the ‘hot news’ reading of the English present perfect. I will then compare the sentence-final -le and -guo in detail, and show that we cannot carry over the analysis of the English tenses,

22Some previous analyses, such as Lin (2006, 2007, 2010), do not distinguish the verbal -le and the perfective sentence-final -le in this respect. However, as the previous sections show, the verbal -le is only felicitous when the asserted event is identified with a previously mentioned event, or as a part of a previously mentioned collection of events. It does not have any inferences with respect to the result state.
and that there is no single aspect particle in Mandarin Chinese that corresponds to the English present perfect.

6.5.1 The continuation of the result state inference

The most notable inference of the perfective sentence-final -le is the continuation of the result state, especially with causatives and change-of-state verbs.

(147)  a. Ta ba diannao nong-huai le.
        he BA computer make-broken LE.SF
        ‘He has broken the computer.’
        Inference: The computer is still broken.
    b. Lisi lai Beijing le.
        Lisi come Beijing LE.SF
        ‘Lisi has come to Beijing.’
        Inference: Lisi is still in Beijing.

However, this inference is cancellable, as the continuation shows:

(148)  a. Ta jintian ba diannao nong-huai le. Ranhou you
        he BA computer make-broken LE.SF then again fix-well
        xiu-hao le.
        LE.SF
        ‘He broke the computer today. Then it was fixed.’
    b. Lisi shang ge yue lai Beijing le. Ranhou you zou le.
        Lisi last CL month come Beijing LE.SF then again leave LE.SF

        ‘Lisi came to Beijing last month. Then he left again.’

The data in (148) suggests that the ‘continuation of the result state’ reading is not semantically entailed by the perfective sentence-final -le.

However, note that the use of the perfective sentence-final -le in (147) is very similar to the ‘resultative’ reading of the English present perfect discussed earlier. Recall that in the absence of a contextually salient past time, the English present perfect introduces an new reference time and event into the Common Ground, and doing so invites the inference (given that the speaker follows the Gricean Maxim of Relevance) that the result state is relevant to the topic question which concerns the current state of the object. This process results in the inference that the result state of the event still holds, unless the speaker adds further information. To see this, note that the following examples with the resultative reading have in common
that the result state of the asserted event helps answer the topic question.

(149) (Why didn’t you finish your paper?)

Wo ba diannao nong-huai le.
I BA computer make-broken LE.SF

‘I broke my computer.’
**Inference:** Since my computer is broken now, I can’t write the paper.

(150) (Can Mary drive home?)

Buxing. Ta he jiu le.
no she drink wine LE.SF

‘No. She drank alcohol.’
**Inference:** She’s drunk, so she can’t drive.

(151) (Can Lisi play basketball with us tomorrow?)

Buxing. Ta shuai-duan tui le./Ta ba tui shuai-duan le.
no he fall-break leg LE.SF/he BA leg fall-break LE.SF

‘No, because he broke his leg.’
**Inference:** Lisi’s leg is broken now, so he can’t play basketball.

(152) (I need to find Lisi. Where is he?)

Ta hui jia le.
he return home LE.SF

‘He just went home.’
**Inference:** He’s at home now, so you won’t find him here.

We can see that the resultative reading of the sentence-final -le arises when the topic question can be answered by some state, namely, the result state of the asserted event. I take this as governed by the Gricean principle of relevance: for example, in (152), the speaker asserts the change-of-state event of Lisi going home only if it is relevant. Therefore, it must be the case that the result state of that change-of-state event answers the topic question. It follows that the Lisi is still at home (i.e. not here) and not available.

In all of the examples above, it is very odd to try to cancel the result state. On the other hand, the resultative reading is easily cancellable if the topic question
is not related to any current state.

(153) (Talking about what happened yesterday:)

Lisi ba diannao nong-huai le. Ranhou you xiu-hao le.
Lisi CAUS computer make-broken LE.SF then again fix-well LE.SF

‘Lisi broke the computer yesterday. And then it got fixed again.’

In (153), the speakers are only interested in what took place yesterday, and the existence of a current state will not be helpful in answering that question.

These examples suggest that we should not analyze the resultative reading as inherent to the perfective sentence-final -le, instead, we should follow a pragmatic strategy to derive this reading. In addition, the obligatoriness of the resultative reading is contingent on the topic question. The ‘continuation of the result state’ inference is of similar nature as the resultative reading of the English present perfect: both follow from updating the Common Ground with a change-of-state event.

Like the English present perfect, the perfective sentence-final -le also has the ‘hot news’ reading, where the Common Ground can entail very little (to no) information at the time of the utterance, and the event is viewed as recent and new information (i.e. assumed to be unknown to the addressee prior to the utterance).

(154) (There is no previous discourse, but we know that Lisi’s key has been missing for two days. Now Lisi says:)

Wo zhao-dao yaoshi le!
I look-find key LE.SF

‘I’ve found my key!’

(155) (Lisi is calling his family after arriving at his university. There is no previous discourse.)

Wo dao xueziao le!
I arrive school LE.SF

‘I’ve arrived at the campus!’

(156) (Talking to a stranger in the street.)

Beijing dui ying qiu le!
Beijing team win ball LE.SF
‘Team Beijing has won the game!’

As the translation shows, the use of the sentence-final -le in these sentences correspond to that of the English present perfect. In English, present perfect functions as an indefinite past when there is no previously established past time, the ‘hot news’ reading may establish a new past reference time and announce that an event has taken place at that time. Similarly, the perfective sentence-final -le functions as an indefinite aspect when there is no previously established event (assuming that the non-future tense is neutral regarding anaphoricity).

6.5.2 The result state

In this subsection, I will further compare guo and the perfective sentence-final -le in terms of their relationship with the result state. I will propose that guo does differs from the perfective sentence-final -le in that it has a ‘anti-resultative’ presupposition (i.e. the result state of the asserted event does not answer the topic question).

6.5.2.1 Evidence of guo having an additional presupposition

Recall from Section 6.2.1 that like the English present perfect, the particle guo also has an experiential reading, and ‘it indicates that an event has been experienced at some indefinite time’ (Klein et al., 2000, p.3). Given that the experiential reading and the hot news reading of the English present perfect both follow from the basic ‘existential’ perfect reading that at least one instance of the event has taken place prior to the speech time, a question that follows is: why is the perfective -guo not available for the ‘hot news’ reading? If it also has no presuppositions like the English present perfect, it should also be an alternative for introducing a new event. One possible answer is that -guo does have its own presuppositions.

Consider the following context:

(157) (Looking at some litter:)
   a. Who littered here?
   b. #Who has littered here?
   (Matthewson et al., 2019, adapted)

In Chapter 2, we saw that in English, the past tense is obligatory in (157) if the question is about the event that gives rise to the current litter the speakers are
looking at. The present perfect, on the other hand, can only be interpreted as asking about the general experience. I argued that this is because the result state of the littering event is part of the Common Ground. Since the time span of the littering event giving rise to that state is unique(ly Maximally Informative with respect to the change-of-state), the presupposition of the unique past tense is satisfied. By Maximize Presupposition, the unique past tense is preferred over the presuppositionally weaker present perfect.

In Mandarin Chinese, the same context gives us the following judgements regarding the perfective particles:

(158) (Looking at some litter:)

a. Shui zai zher reng le laji?
   who at here throw litter le.sf ‘Who littered here?’

b. # Shui zai zher reng guo laji?
   who at here throw guo litter

c. ?? Shui zai zher reng le laji?
   who at here throw le litter

The verbal -le is odd because its requires the asserted event to be in an anaphoric relation with a previously mentioned event. To the extent that the antecedent event may be accommodated, (158-c) only makes sense if the littering event is interpreted as identical to/a part of some known event (e.g. The speakers are at a picnic and (158-c) may be uttered in the given context. The littering event would be interpreted as part of the picnic. Or we could have a context where everyone is expected to leave something and apparently there is someone who left litter, and the speaker wants to know who it was, etc.). Since the verbal -le is unrelated to the continuation of the result state in general, I will omit it in the subsequent discussion.

The most natural utterance in the context in (158) is the perfective sentence-final -le (158-a). On the other hand, the -guo-sentence (158-b) has an interpretation similar to the English present perfect, that the question only asks about the general experience and not about the particular littering event that gives rise to the result state in the Common Ground.

At this point, we are tempted to propose an analysis along the lines of the English tenses: maybe, the perfective sentence-final -le has a uniqueness presupposition of the event. This presupposition would be satisfied in this case, since the littering event that gives rise to the result state in the Common Ground is
However, we also have evidence against this analysis. We saw in the previous subsection that the perfective sentence-final -le also has the ‘hot news’ reading, where a new event is introduced into the Common Ground. This reading is unexpected if the perfective sentence-final -le functions like the English past tense, which does not have the ‘hot news’ reading. In general, the perfective sentence-final -le does not seem to require any familiarity or uniqueness of the asserted event. In addition, the perfective sentence-final -le does not presuppose that the result state holds either, since this inference is cancellable. These observations suggest that we cannot adopt an analysis parallel to the English tenses.

It seems that our only option is to see if -guo presupposes anything which derives the observed data patterns. I will first discuss a previous analysis along these lines, then I will present my own analysis.

6.5.2.2 Repeatability?

Lin (2006, 2007) argues that the discontinuity inference of guo is related to the definiteness of the object. The observation is that when the direct object is indefinite, the discontinuity of the result state is not required (159-a), but when the object is definite, the discontinuity is obligatory.

(159) a. Ta nong-huai  guo yi tai diannao. Xianzai hai mei xiu-hao.
   he make-broken GUO one CL computer now still NEG fix-well
   'He has broken a computer. It’s still not fixed.'

   b. Ta nong-huai  guo zhe tai diannao. #Xianzai hai mei
   he make-broken GUO this CL computer now still NEG
   xiu-hao.
   fix-well
   'He has broken this computer before. #It’s still not fixed.'

Lin (2007) argues that this contrast can be derived if -guo has a repeatability presupposition. Lin has the following definition of -guo:

(160) The meaning of a P-event with -guo (Lin, 2007, p.15)

   Assertion: $\exists e \exists w [P(e)(w) \land \tau(\text{Istage}(e,P)) < t_c]$
   
   Presupposition: $\exists s [\text{Target}(e,s)] \Rightarrow \exists w_{\text{inr}} \exists e'[e' \neq e \land t_c \subseteq \tau(e') \land P(e')(w_{\text{inr}})]$

   where $t_c$ is the speech time, $w_{\text{inr}}$ is an inertia world in the sense of Dowty (1979).
There are several definitions to clarify here. First, Lin (2006, 2007, 2010) has a notion of 'Istage' for events (161).

(161) **The Istage of an event** (Lin, 2006, p.5)

\[ \text{ISTAGE}(t, P) \text{ is defined if } P(t) = 1, \text{ and when defined,} \]

a. if \( P \) is telic, \( \text{ISTAGE}(t, P) = t \) minus the last point of \( t \);

b. if \( P \) is atelic, \( \text{ISTAGE}(t, P) = t \).

Briefly, for telic verbs, the Istage is the part before the culmination, and for atelic verbs, it is the entire duration of the event.

Second, we need to briefly summarize what is meant by ‘inertia world’. In Dowty (1979), given an interval \( t \) and a world \( w \), the set of inertia worlds consists of the possible worlds in which what is going on in \( w \) at \( t \) continues as expected. In particular, in (159), if the computer is broken or fixed in the actual world \( w \) at the speech time \( t_c \), the same state of the computer is expected to hold in all the accessible inertia worlds. The presupposition of -\( \text{guo} \) in (160) says that if the event has a result state, then in some inertia world at the speech time \( t_c \), there is another instance of the same \( P \)-event, distinct from the original instance.\(^{23}\)

Third, we need to clarify what is meant by ‘distinct event’ (\( e' \neq e \)). Lin (2007) gives the following definition. Two \( P \)-events can be identified as distinct if either they occupy different times (162-a), or they have at least one distinct argument (162-b).

(162) **Distinct Events** (Lin, 2007, p.10)

For two eventuality descriptions, \( P(e, x_1, ..., x_n) \) and \( P(e', y_1, ..., y_n) \), \( e \) is distinct from \( e' \) if

a. \( \tau(e) \cap \tau(e') = \emptyset \), or

b. \( \exists x_n \exists y_n [x_n \neq y_n] \)

Together, a sentence with -\( \text{guo} \) asserts that the Istage of the event is located in the past, and presupposes that if the event has a result state (\( \exists s [\text{Target}(e, s)] \)), then there is a distinct event of the same sort in an inertia world, which overlaps with the speech time.

Now consider (159-b), where the event predicate is **break this computer**. Since

\(^{23}\)Note that the definition with material implication predicts that for atelic predicates, the presupposition is trivially true since they do not have a result state.

\(^{24}\)Lin does not clarify this but it seems that if the result state has the same status across all the inertia worlds, then if the result state does not hold in some inertia world, it does not hold in all of them.
the direct object is definite, another P-event \( e' \) must have the same direct object/theme too (i.e. his particular computer). Hence, for \( e' \) to count as 'distinct' from the original \( e \), it can only be temporally distinct. Since the presupposition of -\( \text{guo} \) requires that the speech time \( t_c \subseteq \tau(e') \), in order for the original \( e \) to be temporally distinct, the result state of the original \( e \) must have been over by \( t_c \). This is equivalent to the computer being no longer broken by the speech time.

Note, however, that for Lin's analysis to work, he has to implicitly assume that \( \tau(e) \) not only includes the time span of \( e \), but also the entire duration of its result state. This is because (160) only says that the original \( e \) cannot overlap with the speech time (so that a distinct \( e \) can), not that its result state cannot. This is unconventional. In general, we do not want \( \tau(e) \) to include the duration of the result state. Consider the following sentence:

(163) \text{Ta zuotian nong-huai guo diannao.}
\text{He yesterday make-broken GUO computer}
\text{‘He broke his computer yesterday.’}

If \( \tau(e) \) includes the duration of the result state, we would be locating not just the breaking event, but also the state of the computer being broken, in the reference time \textit{yesterday}. The sentence would then entail that the computer was broken and fixed on the same day, which is obviously not the case. Lin (2007) does not see this as a problem because he treats -\( \text{guo} \) not as a perfective aspect marker but as an absolute past tense marker. However, we do have good reasons to believe that -\( \text{guo} \) is a perfective aspect marker, and the temporal semantics of Mandarin Chinese does not come from these particles (cf. Chapter 7). For these reasons, I believe Lin's (2007) analysis of -\( \text{guo} \) is unsatisfactory.

Another thing to note is that Lin's analysis also relies on the event description used by the speaker. Under Lin's analysis, the following sentence is predicted to be acceptable in the context given, contrary to fact:

(164) \text{(Looking at a broken vase:)}
\text{#Youren da-sui guo yi ge huaping.}
\text{someone hit-broken GUO one CL vase}
\text{‘(Intended:) Someone broke a vase.’}

This is because Lin defines distinct events as either temporally distinct or having a different argument. For VPs like \text{Zhangsan break this computer}, the arguments are fixed and the only way for another P-event \( e' \) to be distinct is for it to be
temporally distinct from the original $e$. However, for an event description like *someone breaks a vase*, $P$ does not actually say which individuals the agent and the theme may be. This means that another $P$-event can be counted as ‘distinct’ if it has a different (actual) argument, without having to be temporally distinct from the original $e$. Recall that Lin assumes $\tau(e)$ covers the entire time span of the result state of $e$. It follows that even if the result state of the asserted $e$ still covers the speech time $t_c$, there can still be a distinct $P$-event $e'$ with a different argument in the inertia worlds (for example, if it was actually Lisi who broke the vase, the context may allow for an event of Zhangsan breaking the vase as $e'$), satisfying the presupposition of -guo in (160). Therefore, Lin would predict that (164) should be felicitous. However, this prediction is not borne out.

In fact, it is not clear if Lin’s observation regarding the definiteness of the direct object is accurate or not. Consider the following example:

(165)  
(Lisi asks me if he can borrow my computer. I’m not sure about this and consults another friend. He says:)  

Bie jie-gei ta. Lisi zhiqian jiu nong-huai guo Zhangsan don’t lend-give him Lisi before already make-broken guo Zhangsan de diannao. Dao xianzai dou mei xiu-hao.  

gen computer until now even neg fix-well  

‘Don’t lend it to him. He has broken Zhangsan’s computer before. It’s still not fixed until now.’

Here, the direct object of the breaking event, is definite, yet -guo is fine. Lin’s analysis would predict the opposite.

6.5.2.3 The presupposition of -guo

In this subsection, I will elaborate on the conclusion of the previous subsection and define the presupposition of -guo. The conclusion of the preceding discussion is: (i) the perfective sentence-final -le does not presuppose or entail the continuity of the result state of the asserted event; (ii) the perfective sentence-final -le does not seem to have any presupposition because it has the ‘hot news’ reading, where the event is presented as new information and does not require any information in the Common Ground; (iii) the discontinuity inference of -guo may be cancelled in certain contexts; (iv) the repeatability presupposition of -guo in Lin (2007) does not work, since the discontinuity inference does not entirely depend on the definiteness of the direct object in the event description.
With these ideas in mind, consider two examples discussed earlier again:

(166) (Lisi asks me if he can borrow my computer. I'm not sure about this and consults another friend. He says:)

Bie jie-gei ta. Lisi zhiqian jiu nong-huai guo Zhangsan don't lend-give him Lisi before already make-broken GUO Zhangsan de diannao. Dao xianzai dou mei xiu-hao.

GEN computer until now even NEG fix-well

‘Don't lend it to him. He has already broken Zhangsan's computer before. It's still not fixed until now.’

(167) (Looking at a computer:)

Lisi nong-huai guo zhe tai diannao. #Mei xiu-hao.
Lisi make-broken GUO this CL computer NEG fix-well

‘(Intended: Lisi has broken this computer, and it’s still not fixed.)’

Both (166) and (167) involve a definite direct object and -guo, yet the discontinuity inference is obligatory in only one of them (i.e. (167)). What is the difference between (166) and (167) then? Taking the context into consideration, my intuition is that they differ in whether the result state of the asserted event helps answer the topic question, in a way parallel to Portner’s (2003) analysis of the resultative perfect.

Recall from Section 5.2.2.2 that Portner argues that the English present perfect is used if the result state of the asserted event helps answer a topic question. While this analysis does not work for the English present perfect, due to the fact that in English, the status of the reference time is what actually determines which tense form is used, we may apply this idea to Mandarin Chinese. In particular, in (166), the important message is not the state of Zhangsan's computer being broken, but rather the fact that there has been a past event of Lisi breaking someone else’s stuff. In (167), on the other hand, the topic is the computer the speakers are looking at, and the speakers point out that it is fixed already.

In other words, -guo has a presupposition that the result state of the asserted event does not help answer a topic question. We can define this presupposition as below (note that it is essentially the opposite condition as Porter’s (2003) condition for the English Present Perfect):

(168) The presupposition of -guo
A sentence with \(-\text{-guo}\) is felicitous iff:
\[\neg \exists q [\text{ANS}(q) \land \mathcal{P}(p, q)],\]
where
a. \(p\) is the proposition expressed by the \text{-guo}-sentence;
b. \(\text{ANS}\) is true of a proposition if it is a complete or partial answer to the discourse topic at the time the sentence is uttered;
c. \(\mathcal{P}(p, q)\) is true iff \(\forall w \in \cap (\mathcal{E}_{(w,u)} \cup p), q(w) = 1\), where \(\mathcal{E}_{(w,u)}\) is the modal base based on causality, accessed from world \(w\) and utterance situation \(u\).

Under this analysis, the difference between (166) and (167) is straightforwardly derived. In (167), since \(-\text{-guo}\) would be infelicitous if the result state of the asserted breaking event answers the topic question (the state of the computer), the discontinuity of the result state is obligatory. This is confirmed by the following observation:

(169) (Looking at a broken computer:)

a. Lisi ba zhe tai diannao nong-huai le.
Lisi BA this CL computer make-broken LE.SF 'Lisi broke this computer.'

Inference: This time, it was Lisi.

b. ??Lisi nong-huai guo zhe tai diannao.
Lisi make-broken GUO this CL computer
'\text{Lisi has broken this computer before.}'

Inference: This time, it wasn’t Lisi who broke it.

In (169), the result state is part of the Common Ground, and the topic question \textit{Who broke this computer?} cannot be answered by a current state. Therefore, if we want to answer that topic question, we must use the perfective sentence-final \(-\text{-le}\). To the extent that (169-b) with \text{-guo}\ can be interpreted, the result state of the asserted breaking event must \textit{not} answer the topic question of the current broken state (uttering something that does not answer the topic question is by itself an awkward move and may violate the Gricean Maxim of Relevance). In other words, the inference would be something like ‘Yes, Lisi has broken it in the past, but that time it was fixed, and he is not responsible for the current state’.

Now consider (166). Since the topic question is something along the lines of

\(^{25}\text{Portner (2003) has the epistemic modal base to account for the more general cases of ‘current relevance’ than simply causality (i.e. the result state). For \text{-guo}, it seems that what answers the topic question has to be the result state (and not any generally relevant statement), so I use the modal base based on causality.}\)
what do we know about Lisi? and cannot be directly answered by a current state, it is possible to answer the question with -guo. The sentence simply asserts that there has been an event of Lisi breaking someone else’s computer, without making any implications about the result state.

This analysis also derives our earlier observation:

(170) (Looking at some litter. The speaker wonders who left it:)

#Shui zai zher reng guo laji?
who at here throw GUO litter

‘(Intended:) Who littered here?’

(171) (Looking at a broken vase. The speaker wonders who broke it:)

#Youren da-sui guo yi ge huaping.
someone hit-broken GUO one CL vase

‘(Intended:) Someone broke a vase.’

In both cases, since the topic question is about the result state of the guo-marked change-of-state event, -guo’s presupposition is not satisfied.

This analysis also derives the fact that in general, -guo is infelicitous with irreversible events if the entity undergoing the change-of-state is definite or a known individual.

(172) a. #Ta sha-si guo Lisi.
    he kill-dead GUO Lisi
    ‘(Intended:) He has killed Lisi (Lisi is dead now).’

b. #Konglong juezhong guo.
    dinosaurs become-extinct GUO
    ‘(Intended:) Dinosaurs have become extinct (there are no dinosaurs now).’

I argue that the sentences in (172) are infelicitous because in the typical contexts in which these sentences are uttered, the topic is about the individual(s) undergoing the change-of-state, hence the topic question always relates to the result state (i.e. the current state of the object since it’s an irreversible state). Since definites often encode old information, this is not surprising.

We can compare (172) with the following example, where -guo significantly improves:

26 Dinosaurs in (172-b) has the kind-reading and can therefore be viewed as definite.
In (173), the topic question is whether this person is a suitable assassin (for example, whether this person is skilled in assassinations). What answers the question is the existence of the events of killing, rather than the fact that Zhangsan and Lisi are dead (in fact, it does not matter who the objects are). This differs from (172-a), where the speaker wants to convey the information that Lisi is dead now. This is an observation that Lin’s (2007) analysis based on event description and repeatability cannot account for.

In addition, the presupposition of -guo also accounts for the ‘experiential’ reading that it has. The term ‘experiential’ reading often has two senses. One is similar to an existential perfect or indefinite past reading, and the other is a reading where the focus is entirely on the existence of the event itself rather than its consequences and result states. The experiential reading of -guo falls into the category of the latter. Since the result state of a -guo-marked event does not answer the topic question, the emphasis of the utterance will be on the existence of that event, rather than its result. Some of the typical ‘experiential’ uses of -guo include:

(174) a. Shui zai jiaoshi reng guo laji?
    who at classroom throw GUO litter
    ‘Who has littered in the classroom (before)?’

    b. Shui nong-huai guo zhe tai diannao?
    who make-broken GUO this CL computer
    ‘Who has broken this computer (before)?’

In these examples, the question is not about whether there is litter now due to the littering event, or whether the computer is currently broken. The speakers are only interested in whether such events have taken place. As the following example shows, it may be coincidental that the event actually leads to a current state. The crucial fact here is that this state (there being a bottle) does not directly answer the topic question:
(175) (Question: Is Lisi a tidy person?)

Bushi. Lisi zai jiaoshi reng guo laji. Na ge pingzi jiu shi no Lisi at classroom throw guo litter that CL bottle actually COP ta de. he GEN

‘No. Lisi has littered in the classroom. In fact, that bottle is his.’

Whether the bottle is still there does not affect our conclusion about Lisi not being a tidy person, since the existence of a past littering event is sufficient.

To conclude, I argue that -guo presupposes that the result state of the event does not answer the topic question. This accounts for the discontinuity inference and the experiential reading. I also believe that my analysis covers more data points than previous analyses do.

6.5.3 The discontinuity inference with atelic verbs

In the previous section, I argued that ‘the discontinuity of the result state’ inference of -guo follows from its presupposition that the result state does not answer the topic question. In the literature on Chinese aspects, some linguists (Pan and Lee, 2004, a.o.) believe that the discontinuous inference of -guo not only applies to change-of-state verbs, but also to atelic verbs. For atelic verbs, the discontinuous inference is that the state or activity is over by the speech time (176-a).

(176) a. Ta pang guo.
he fat guo ‘He used to be fat.’

Inference: He’s no longer fat.

b. Ta you guo yong.
he swim guo swim ‘He has swum.’

Inference: He’s no longer swimming.

In fact, the previous literature often does not distinguish the two types of ‘discontinuous’ readings, and tries to account for both with a single mechanism, such as change-out-of-state or repeatability (Pan and Lee, 2004; Lin, 2007, a.o.). In this section, I argue that we should distinguish the two kinds of inferences. In particular, the discontinuous reading with atelic verbs is an entailment that follows from the perfective semantics of -guo and a past reference time.
There is no consensus on whether Mandarin Chinese has tense. Hence, the temporal readings of sentences are often attributed to the various aspect particles. However, more recent studies such as Sun (2014) have established that Mandarin Chinese has a null NONFUTURE tense in the sense of Matthewson (2006). The NONFUTURE tense may denote any interval that does not succeed the speech time. I also assume NONFUTURE tense in Mandarin Chinese is underspecified for definiteness, and does not pose restrictions on whether the reference time is contextually salient or not.

With this assumption, if the reference time is a past interval, the inference of -guo with statives and activities simply follows as a consequence of its perfective semantics. Consider the following example:

(177)  Ni ye nianqing guo.
you also young GUO
‘You used to be young, too.’

In (177), the most natural reading would be that non-future tense denotes a past interval (if the non-future tense picks out a present time, the utterance would be that a state of the addressee being young is contained in that interval, which is odd). The perfective semantics of -guo then restricts the time of the state in question to that interval, resulting in the reading that the state of being young is over.

(178)  \[
\text{[NONFUT } \text{Ni ye nianqing guo.]} \\
\text{‘You used to be young too.’} \\
\exists s [\text{young}(s) \land \tau(s) \subseteq t], \text{ where } t \text{ is a past interval.} \\
\Rightarrow \tau(s) \prec t_c
\]

In the literature, (177) is often compared with the following example:

(179)  \#Ta lao guo.
he old GUO
‘(Intended:) He used to be old.’

Some authors, such as Pan and Lee (2004), argue that (179) contrasts with (177) in that it is possible to change out of a state of being young, but not out of a state of being old, and that -guo inherently has a change-out-of-state requirement that selects this property. However, Pan and Lee (2004) makes no assumption of tense in Mandarin Chinese. Once we accept that Mandarin Chinese has a non-future tense, the infelicity of (179) follows directly without the need to propose additional
properties for -guo:

(180) [NONFUT Ta lao guo.]

‘(Intended:) #He used to be old.’

\[ \exists s [\text{old}(s) \land \tau(s) \subseteq t], \text{where } t \text{ is a past interval.} \]

\[ \Rightarrow \tau(s) \prec t_c \]

In (180), we can see that if we use -guo, its perfective semantics gives rise to the entailment that the state of being old is over by the speech time. Given our world knowledge, this is impossible.

For activities, we have the same observation. The use of -guo entails that the swimming event is over.

(181) Ta gangcai you guo yong.

he just swim GUO swim

‘He just had a swim.’

(182) [NONFUT Ta gangcai you guo yong]

‘He just had a swim.’

\[ \exists e [\text{swim}(e) \land \tau(e) \subseteq t], \text{where } t \text{ is a past interval.} \]

\[ \Rightarrow \tau(e) \prec t_c \]

In fact, in all cases of the ‘discontinuous’ reading for atelic verbs, the reference times all seem to be a past interval.

On the other hand, under the present reading of the NONFUTURE tense, where it denotes the speech time, the perfective aspect (including -guo) is not possible, since the speech time is too instantaneous for \( \tau(e) \subseteq t_c \).

We can also show that the discontinuous inference with atelic verbs differs from that of change-of-state verbs discussed earlier, in that the former is an entailment while the latter follows from the presupposition of -guo regarding the topic question.

(183) a. Lisi pang guo ma?

Lisi fat GUO Q

‘Has Lisi ever been fat?’

b. Lisi nong-huai guo zhe tai diannao ma?

Lisi make-broken GUO this CL computer Q

‘Has Lisi ever broken this computer before?’

---

27 This may not be a problem for states, which can fit into instantaneous moments. However, I think \( \tau(s) \subseteq t_c \) still describes a highly implausible situation where there is an instantaneous state contained within the speech time.
In particular, the discontinuity requirement on the state of being fat disappears in (183-a), since the answer can be ‘yes’ if Lisi is still fat. On the other hand, in (183-b), we still get a discontinuous inference that even if the answer is ‘yes’, the breaking event would not be related to the computer’s current state (or at least the speakers do not care whether that’s the case). This follows from the presupposition of -guo that the result state of the event does not answer the topic question.

We can compare my analysis with previous analyses such as Pan and Lee (2004), which will be discussed in the next subsection.

6.5.3.1 The change-out-of-state hypothesis

Pan and Lee (2004) note that the earlier accounts of guo based on repeatability, such as Li and Thompson (1989) and Iljic (1990), are not tenable, given examples like (177) above (where a non-repeatable state young can be marked with guo). They argue instead that what characterizes -guo should not be repeatability, but the ability to ‘change out of state’. This is motivated by the fact that -guo is incompatible with lao ‘old’, as we saw earlier in (179). In (179), -guo is infelicitous. Pan and Lee (2004) argue that the difference between young (177) and old (179) is that, it is possible to change out of a state of being young, but impossible for a state of being old.

The change-out-of-state property is defined as in (184-a). Pan and Lee (2004) distinguish it from the properties of reversibility (184-b) and repeatability (184-c).

(184) a. Change out of state
   \[ S_1 \Rightarrow \neg S_1, \]
   where \( S_1 \) is a state.

b. Reversibility
   \[ S_1 \Rightarrow S_2(\neq S_1) \Rightarrow S_1, \]
   where \( S_2 \) is the present state, and \( S_1 \) is the pre-existing or reversed state.

c. Repeatability
   \[ \text{Sit}_1 \Rightarrow \text{Sit}_1, \]
   where \( \text{Sit} \) is a situation (an event or a state).

To summarize, the change-out-of-state property derives the contrast between old and young in the use of -guo. While the semantics of old entails that there cannot be a change out of the state (of being old), the semantics of young allows it. This
avoids the problem faced by early accounts based on repeatability.

In addition, for Pan and Lee (2004), the change-out-of-state property of -guo applies to the result state as well. They argue that the discontinuous inference of -guo follows from the same property. For example, in (185), there is an inference that the person is no longer in the US. Pan and Lee (2004) argues that this is because there is a change out of the result state of being in the US.

(185) Ta san nian qian qu guo meiguo.
de three year ago go GUO US.
‘He had been to the US three years ago.’

However, this inference is easily defeasible. The sentence can be continued as in (186). The person can still be in the US (even though it’s the result state of a new trip, one would need to distinguish different state tokens).

(186) Ta san nian qian qu guo meiguo, zuotian you qu le.
de three year ago go GUO US yesterday again go LE.
‘He had been to the US three years ago, and yesterday he went again.’

Similarly, in (187), the second sentence denies the discontinuity of the result state (the table leg being broken).

(187) Shang ge yue ta nonghuai guo yi tiao zhuozitui, xianzai hai mei last CL month he break GUO one CL table-leg now still NET xiu hao.
repair-good
‘Last month he broke a table leg. It still hasn’t been repaired.’

To account for these facts, Pan and Lee (2004) propose that the change-out-of-state inference is an implicature inherently carried by -guo. For Pan and Lee (2004), this inherent implicature of -guo distinguishes it from (verbal) -le.28 They argue that -le has a ‘continuation of the result state’ implicature:

(188) Implicatures of Mandarin perfective aspects
a. -guo implies that the predicate satisfies the change-out-of-state property;
b. (verbal) -le implies that the result state of the predicate continues to the speech time.

28 Like other previous studies, Pan and Lee (2004) also do not distinguish the verbal -le and the perfective sentence-final -le.
Both particles have standard perfective semantics besides these implicatures, and
the choice between them is regulated by the following condition:

(189) **Pragmatic condition on the use of -guo and (verbal)-le**
Use -guo when describing a change out of state; otherwise, use (verbal)
-le when describing the continuation of the result state.

(Pan and Lee, 2004)

This pragmatic condition is meant to account for cancellable inferences that
arise with -guo and -le. For example, Pan and Lee (2004) argue that there is a
contrast between (190-a) and (190-b).

(190) a. Ta qu guo meiguo.
    he go GUO US
    ‘He went to the US/has been to the US.’
    **Inference:** He’s probably not there any more.

b. Ta qu le meiguo.
    he go LE US
    ‘He has gone to the US.’
    **Inference:** He’s probably still there.

The pragmatic reasoning goes as follows:

The semantics of the predicate go to the US does not impose any
restriction on the "change out" or the continuation of the result state,
which is "being in the US", so both -guo and -le are semantically
compatible with the predicate in question. Therefore, the choice be-
tween these two so-called perfectives is determined by the pragmatic
condition stated above. Under the strong implicature that there is a
"change out" of the result state after the reference time, i.e. the person
in question is no longer in the US, -guo will be preferred over -le.
On the other hand, under the strong implicature that the result state
continues after the reference time, -le will be used. In other words,
the choice of -guo vs. -le depends on whether the speaker wants to
emphasize the "change out" or the continuation of the result state in
question. (Pan and Lee, 2004, p.18)

However, as Section 6.3 showed, the verbal -le in (190-b) does not actually
involve any continuity inference regarding the result state. It simply adds infor-
mation to a previously mentioned event (or part of a series of events), as illustrated
by the examples below.
We know that everybody went on a trip during the summer. Where did Lisi go in particular?

Ta qu le meiguo.
he go LE US

‘He went to the US.’

Hence, a more appropriate comparison should use the perfective sentence-final -le, which does invite the continuity of the result state inference:

(192) (Where is Lisi?)

Ta qu meiguo le.
he go US LE.SF

‘He’s gone to the US.’
Inference: He’s no longer here.

Pan and Lee (2004) do not distinguish the discontinuous inferences that arise with atelic verbs and those that arise with change-of-state verbs. However, we saw earlier that the former is an entailment that arises when the reference time is a past interval \((\exists c/s[\tau(c/s) \subseteq t] \text{ where } t < t_e)\), while the latter is not. In addition, Pan and Lee (2004) do not discuss how the implicatures associated with -guo and (verbal) -le arise. They simply take it for granted that the two perfective particles carry these implicatures. Their pragmatic condition also seems like a description. Since they fail to distinguish the verbal -le and the perfective sentence-final -le, the data are a bit controversial. As we saw in the previous sections, the verbal -le does not have any inference regarding the result state of an event since it is just an anaphoric particle, and the continuation of the result state inference with the perfective sentence-final -le is defeasible. Finally, for events that do not involve a result state, it is not clear how to choose between these perfective particles under this analysis.

6.6 Interim summary

So far in this chapter, I showed that the three perfective particles in Mandarin Chinese all have the standard perfective semantics, but differ in the presuppositions they carry. In particular:
The Mandarin Chinese perfectives

a. The verbal -le: anaphoric particle. A verbal -le-marked event needs an event antecedent in its local context with which either the identity or part-whole relation holds.

b. guo: presupposes that the result state of the guo-marked event does not answer the topic question (cf. Portner (2003)).

c. The perfective sentence-final -le: standard perfective aspect marker, no presuppositions.

We also concluded that Mandarin Chinese differs from languages like English in that the anaphoric dependency is established between events, and not time (intervals), possibly due to the lack of explicit tense morphology in the language. In addition, the various inferences, such as ‘resultative’, ‘hot news’ and the discontinuity inference of guo can be derived from the presuppositions listed in (193), and the competition between the alternatives with principles similar to the Presupposed Ignorance Principle (PIP) as with the present perfect and past tense data.

6.7 Analysis in update semantics

I will now illustrate how to incorporate the Chinese data into the update semantics from Chapter 4. The basic architecture will be the same, with the addition of discourse reference for events: assignment functions can now assign to a variable not just an individual or an interval, but also an event.

In addition, since Mandarin Chinese has a null tense and we do not observe explicit linguistic constraints on anaphoric dependencies in the temporal domain, I will assume that the Mandarin Chinese tense functions like the English present perfect in the version of update semantics I adopt: (i) it may be an old or new variable; (ii) it does not come with any definedness condition other than that it should always be assigned to an interval \( t \) such that \( t \preceq t_c \).

The Mandarin Chinese perfective particles are summarized below:

(194) Mandarin Chinese perfectives

a. -le, vb: presupposes an event antecedent via the identity or part-whole relation

b. guo: presupposes that the result state does not answer the topic question (cf. Portner (2003))
c. -le\textsubscript{sf}: presuppositionally neutral, standard perfective

The nonfuture tense with the index i will abbreviated as T\textsubscript{i} from now on.

6.7.1 Verbal le

Since event anaphora in Mandarin Chinese is always via a relation, for simplicity, I will treat all perfective particles in Mandarin Chinese as adding a new variable to the context.

(195) Update example for le\textsubscript{vb}
Let c be a context, p be the LF [T\textsubscript{i} [le\textsubscript{vb} [Mary eat the cake]]], where T\textsubscript{i} is the non-future tense.

a. if i ∈ dom(c):
   c + p is defined iff:
   (i) f(i) ≤ t\textsubscript{c} where t\textsubscript{c} is the utterance time; and
   (ii) j /∈ dom(c); and
   (iii) ∃k ∈ dom(c), k ≠ i, k ≠ j, and ∀⟨f, w⟩ ∈ c, f(k) = some event e in w.
   If defined, c + p
   = {⟨f', w⟩ | f'[i]f ∧ eat(f'(j)) ∧ Agent(f'(j)) = Mary ∧ Theme(f'(j)) = the cake ∧ τ(f'(j)) ⊆ f'(i) ∧ p(f'(k), f'(j)), for some ⟨f, w⟩ ∈ c'},
   where p is either ρ\textsubscript{I} or ρ\textsubscript{e}.

b. else:
   c + p is defined iff:
   (i) j /∈ dom(c); and
   (ii) ∃k ∈ dom(c), k ≠ i, k ≠ j, and ∀⟨f, w⟩ ∈ c, f(k) = some event e in w.
   If defined, c + p
   = {⟨f', w⟩ | f'[i, j]f ∧ f'(i) ≤ t\textsubscript{c} ∧ eat(f'(j)) ∧ Agent(f'(j)) = Mary ∧ Theme(f'(j)) = the cake ∧ τ(f'(j)) ⊆ f'(i) ∧ p(f'(k), f'(j)), for some ⟨f, w⟩ ∈ c'},
   where p is either ρ\textsubscript{I} or ρ\textsubscript{e}.

We can see that the non-future tense is open about the status of the temporal variable. The verbal le\textsubscript{vb} requires that the context already entails some event e which has been assigned to the variable k, and adds another variable j to dom(c) which is assigned to an event e' such that p(e, e') where p may be either ρ\textsubscript{I}
‘identity’ or ρ ‘part-whole’ as defined in the previous chapter.

6.7.2 Perfective sentence-final le

The perfective sentence-final le, abbreviated as \( le_{sf} \), is presuppositionally neutral:

(196) Update example for \( le_{sf} \)
Let \( c \) be a context, \( p \) be the LF: \([T_1 [le_{sf} [Mary eat the cake]]]]\), where \( T_1 \) is the non-future tense.

a. if \( i \in \text{dom}(c) \):
   \( c + p \) is defined iff:
   (i) \( f(i) \preceq t_c \); and
   (ii) \( j \notin \text{dom}(c) \).
   if defined, \( c + p \)
   \( = \{ \langle f', w \rangle | f'[j]f \land eat(f'(j)) \land Agent(f'(j)) = Mary \land Theme(f'(j)) = \text{the cake} \land \tau(f'(j)) \subseteq f'(i), \text{for some } \langle f, w \rangle \in c' \} \),

b. else:
   \( c + p \) is defined iff:
   (i) \( j \notin \text{dom}(c) \).
   if defined, \( c + p \)
   \( = \{ \langle f', w \rangle | f'[i,j]f \land eat(f'(j)) \land Agent(f'(j)) = Mary \land Theme(f'(j)) = \text{the cake} \land \tau(f'(j)) \subseteq f'(i), \text{for some } \langle f, w \rangle \in c' \} \),

In other words, \( le_{sf} \) behaves like an indefinite for events. It is the most neutral perfective particle in Mandarin Chinese.

6.7.3 guo

In contrast, guo has an additional presupposition that there is no state that follows from the guo-marked event that can answer the topic question.

(197) Update rule for guo
Let \( c \) be a context, \( p \) be the LF \([T_1 [guo [Mary eat the cake]]]]\), where \( T_1 \) is the non-future tense.

a. if \( i \in \text{dom}(c) \):
   \( c + p \) is defined iff:
   (i) \( f(i) \preceq t_c \); and
   (ii) \( j \notin \text{dom}(c) \); and
(iii) \( \neg \exists q[\text{ANS}(q) \land \mathcal{P}(p, q)] \), where

(a) \text{ANS} is true of a proposition if it is a complete or partial answer to the discourse topic at the time the sentence is uttered;

(b) \( \mathcal{P}(p, q) \) is true iff \( \forall w \in \cap (\mathcal{E}_{(w, u)} \cup p), q(w) = 1 \), where \( \mathcal{E}_{(w, u)} \) is the modal base based on causality, accessed from world \( w \) and utterance situation \( u \).

If defined, \( c + p \)

\[ \{ (f', w) \mid f'[i]f \land \text{eat}(f')(j) \land \text{Agent}(f')(j) = \text{Mary} \land \text{Theme}(f')(j) = \text{the cake} \land \tau(f'(j)) \subseteq f'(i), \text{for some } (f, w) \in c' \} \]

b. else:

\( c + p \) is defined iff:

(i) \( j \not\in \text{dom}(c) \); and

(ii) \( \neg \exists q[\text{ANS}(q) \land \mathcal{P}(p, q)] \), where

(a) \text{ANS} is true of a proposition if it is a complete or partial answer to the discourse topic at the time the sentence is uttered;

(b) \( \mathcal{P}(p, q) \) is true iff \( \forall w \in \cap (\mathcal{E}_{(w, u)} \cup p), q(w) = 1 \), where \( \mathcal{E}_{(w, u)} \) is the modal base based on causality, accessed from world \( w \) and utterance situation \( u \).

If defined, \( c + p \)

\[ \{ (f', w) \mid f'[i, j]f \land f'(i) \leq t_c \land \text{eat}(f')(j) \land \text{Agent}(f')(j) = \text{Mary} \land \text{Theme}(f')(j) = \text{the cake} \land \tau(f'(j)) \subseteq f'(i), \text{for some } (f, w) \in c' \} \]

6.7.4 Conclusion

To summarize, all three perfective particles add a new event variable to the context. The verbal \( le \) and \( guo \) have independent presuppositions, but both are stronger than the sentence final \( le \).

(198) The competing perfectives in Mandarin Chinese

<table>
<thead>
<tr>
<th>Presuppositions</th>
<th>( le_{af} )</th>
<th>( le_{vb} )</th>
<th>( guo )</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) ( i \not\in \text{dom}(c) ); (ii) anaphoric dependency via event relation</td>
<td>(i) ( i \not\in \text{dom}(c) ); (ii) no result state answers topic question</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The prediction by PIP is that whenever the ‘anaphoric dependency via event relation’ or the ‘no result state answers topic question’ presupposition is satisfied, the verbal \( le \) and \( guo \) are obligatory, respectively. The sentence-final \( le \) is only
felicitous whenever the other two alternatives are not possible. This is indeed the observed pattern.
Chapter 7

Additional issues in Mandarin Chinese

7.1 Introduction

In the earlier discussion, I made two crucial assumptions regarding Mandarin Chinese: (i) Mandarin Chinese has a null tense; (ii) the various perfective particles in Mandarin Chinese have standard perfective semantics. In this chapter, I will justify these two assumptions. I will discuss the previous literature on these two issues, and show that we have good evidence supporting these two assumptions. This chapter is organized as follows: I will first discuss the issue of tense in Mandarin Chinese in Section 7.2; I will then discuss the literature on the Mandarin Chinese perfective, in particular the non-culminating reading in Section 7.3.1 and the (supposedly) inchoative reading of the verbal -le in Section 7.3.2.

7.2 Tense in Mandarin Chinese

Since Mandarin Chinese is a superficially tenseless language with no overt tense morphology, the problem of tense in the language has been a subject under debate. Some linguists, such as Sybesma (2007); Sun (2014); Lin (2015), argue for covert tense in Mandarin Chinese. On the other hand, Lin (2006, 2007, 2010) argues against tense in Mandarin Chinese.

The debate about tense has a syntactic side and a semantic side. The syntactic arguments essentially are about whether Mandarin Chinese distinguishes finite and non-finite clauses (Lin, 2010; Grano, 2017; Lin, 2015). Since there is also a debate on whether finiteness is necessarily the same as tense (McFadden and Sundaresan, 2014; Grano, 2017), I will leave aside the data related to finiteness, and focus on the semantic arguments for and against tense in Mandarin Chinese. This relates to Matthewson’s (2006) question of whether superficially tenseless languages have
the same notion of restricting the reference time as tensed languages.

In this section, I will summarize and comment on previous analyses of tense in Mandarin Chinese, and conclude that Sun’s (2014) proposal that Mandarin Chinese has a null NONFUTURE tense makes better empirical predictions than other previous accounts.

7.2.1 Earlier tenseless analyses

Traditionally, Mandarin Chinese is classified as a tenseless language, due to the lack of overt tense morphology. From the semantic point of view, this means that Mandarin Chinese has no means of restricting the reference time (Matthewson, 2006).

Under the Reichenbachian tense system, tense is a relation between the topic time/reference time and the speech time. Accordingly, Klein (1994) argues that ‘Mandarin Chinese has no grammaticalized means to restrict TT (topic time) to a particular time span in relation to UT (utterance time)’.

Similarly, Klein et al. (2000) claim that ‘the position of TT (topic time) on the time line...must be marked by adverbials or left to the context’. Note that for Klein et al. (2000), aspectual particles do not mark tense in Chinese. This view contrasts with later analyses, in which aspectual particles are often treated as having some kind of tense meanings (see details below).

7.2.2 Tense as agreement feature

Sybesma (2007) argues that tense in Mandarin Chinese (and Dutch) is an agreement marker, based on the following observation.

(1) (Out of the blue:)

a. Wo zhu zai Lutedan.
   I live at Rotterdam
   ‘I live at Rotterdam.’

   I 1989 year live at Rotterdam
   ‘I lived at Rotterdam in 1989.’

Sybesma (2007) argues that out of the blue, atelic predicates (1-a) can only be interpreted as present. To get the past reading, it needs an explicit past adverbial (1-b). He argues that this is parallel to the Dutch examples below.

(2) (Out of the blue:)

a. #I woonde in Rotterdam.
   I lived in Rotterdam
   ‘I lived in Rotterdam.’

b. Ik woonde in 1989 in Rotterdam.
   I lived in 1989 in Rotterdam
   ‘I lived in Rotterdam in 1989.’

Sybesma (2007) argues that this shows that Mandarin Chinese has a covert past tense which needs a past antecedent to be felicitous, and only differs from Dutch in that it is phonologically null. In particular, he takes tense, in both Mandarin Chinese and Dutch, to be an agreement morpheme located in the T node, which needs to agree with an overt past temporal adverbial to ‘check’ its feature.

On the other hand, with perfective -le, a telic predicate only has the past episodic reading (3-a). Sybesma argues that the perfective -le corresponds to the perfect in Dutch (3-b).

(3)  a. Wo mai le yi ben shu.
     I buy le one CL book
     ‘I've bought a book/I bought a book.’

b. Ik heb een boek gekocht.
   I have a book buy_PP
   ‘I've bought a book/I bought a book.’

Note that under Sybesma’s analysis, the tense morpheme, in either Mandarin Chinese or Dutch, is semantically vacuous. It only needs to agree with something else with past features, such as an adverbial. It does not by itself restrict the range of the reference time. In other words, Sybesma’s argument is equivalent to that neither language has semantic tense in the sense that it restricts the reference time.

7.2.3 Default aspects with temporal semantics

Lin (2010) argues against Sybesma’s analysis based on the following reasoning: (i) when Sybesma’s sentences are uttered out of the blue, the default reference time is the speech time, and no past reading is expected; (ii) parallel readings do not guarantee the existence of the same elements; (iii) positing a phonologically null past tense in Mandarin Chinese generates non-existent readings in other sentences.

Sun (2014) shows that telic predicates need aspectual marking to get the past episodic reading, see Section 7.2.5.
In particular, the ‘non-existent’ readings Lin (2010) refers to are the following.

(4) Lisi hui qu yi ge hen youqian de nüren.
    Lisi will marry a CL COP rich woman
‘Lisi will marry a woman who is rich.’

Lin argues that if the relative clause contains a ‘free’ past tense, then there would be a reading corresponding to the relative past reading in (some varieties of) English: that the woman would be rich before the marriage time, but in the future with respect to the speech time.

(5) Lisi will marry a woman who was rich.

However, in Mandarin Chinese, this sentence can only get two readings: either the woman is rich at the speech time, or at the time of the marriage.

Moreover, Lin claims that there is a systematic contrast between imperfective (unbounded) and perfective (bounded) event descriptions in their temporal interpretations. He claims that the former always gets the default present reading (6-a), and the latter the default past reading (6-b)-(6-c).

(6) a. Wo hen jinzhang.
    I COP nervous
    Lin’s translation: ‘I am nervous.’

    b. Wo da po yi ge beizi.
    I hit broken one CL glass
    Lin’s translation: ‘I broke a glass.’

    c. Ta dai wo qu Taipei.
    He take me go Taipei
    Lin’s translation: ‘He took me to Taipei.’

    (Lin, 2006, 2010, modified)

Lin (2010) argues that this contrast is evidence that Aktionsart determines the default aspects, which have built-in temporal semantics, in the fashion of Bohne-meyer and Swift (2004). In particular, atelic predicates have default imperfective aspect, and telic predicates have default perfective aspect.

(7) \[ \text{[PERFECTIVE]} = \lambda P. \lambda t_{\text{TOP}}. \lambda t_0. \exists t[t \subseteq t_{\text{TOP}} \land P(t) \land t_{\text{TOP}} < t_0] \]

(8) \[ \text{[IMPERFECTIVE]} = \lambda P. \lambda t_{\text{TOP}}. \exists t[t_{\text{TOP}} \subseteq t \land P(t)] \]

\footnote{For the distinction between the two perfectives, \textit{-le} and \textit{-guo}, Lin (2006, 2007) argues that \textit{-guo} also asserts the discontinuity of the predicate and that the final stage of event must precede the topic time. However, as the previous chapter shows, there is no need to put the discontinuity as part of the assertion of \textit{-guo}.}
Lin also proposes the default temporal interpretation rule. With this rule and the following lexical entry for the imperfective aspect, imperfectives can readily receive an interpretation from the speech time.

(9) Default temporal interpretation rule:

A matrix sentence $\phi$ of type $(i, t)$ is true iff $[\phi](s^*) = 1$, where $s^*$ is the speech time.

The default present interpretation of (6-a) is a result of the application of this default interpretation rule, with the speech time $s^*$ saturating $t_{\text{top}}$, illustrated below.

(10) (Out of the blue:)

a. Wo hen jinzhang.
   I COP nervous
   ‘I am nervous.’

b. $\exists t[s^* \subseteq t \land \text{nervous}(I)(t)]$

When there is an overt past adverbial, the default rule does not apply, enabling the past reading by letting the past time denoted by the adverbial saturate $t_{\text{top}}$.

(11) a. Wo zuotian hen jinzhang.
   I yesterday COP nervous
   ‘I was nervous yesterday.’

b. $\exists t[\text{yesterday} \subseteq t \land \text{nervous}(I)(t)]$

The perfective sentence, on the other hand, gets a past reading with the default interpretation rule, illustrated below for (6-b).

(12) (Out of the blue:)

$\lambda t_{\text{top}}.\exists t[t \subseteq t_{\text{top}} \land \text{I-break-a-glass}(t) \land t_{\text{top}} \prec s^*]$

Under this analysis, Lin argues that Sybesma's observation can be explained with aspects alone, without positing a phonologically null tense in Mandarin Chinese.

There are two major problems with Lin’s (2006; 2007; 2010) analysis. First, Lin still leaves open how $t_{\text{top}}$ is determined for perfective sentences. Recall that the perfective is defined as:

(13) $[\text{PERFECTIVE}] = \lambda P.\lambda t_{\text{top}}.\lambda t_0.\exists t[t \subseteq t_{\text{top}} \land P(t) \land t_{\text{top}} \prec t_0]$
Since the default temporal interpretation rule only ensures that $t_{\text{top}}$ precedes the speech time (which saturates $t_0$), Lin still needs to resort to contextual information for determining $t_{\text{top}}$. This is in effect almost equivalent to saying that Mandarin Chinese has a null pronominal tense that is contextually determined. $t_0$ on its own only helps make sure the event in the past.

Second, under Lin’s analysis, when there is an overt temporal adverbial, the default rule will not apply, and the $t_0$ will be saturated by the time denoted by the adverbial. In this case, $t_{\text{top}} < t_0$ incorrectly predicts that perfective sentences have the anteriority reading where the event precedes the time denoted by the adverbial, contrary to fact (14). In addition, $t_{\text{top}}$ still needs to be saturated.

(14) a. Zuotian wo da po le yi ge beizi. 
   yesterday I hit break LE one CL glass
   ‘Yesterday I broke a glass.’/*’Before yesterday I broke a glass.’

b. $\lambda t_{\text{top}}. \exists t [ t \subseteq t_{\text{top}} \wedge \text{I-break-a-glass}(t) \wedge t_{\text{top}} < \text{yesterday} ]$

One way to get the correct reading of (14) is to let the time denoted by the adverbial to saturate $t_{\text{top}}$, and let the speech time saturate $t$ again, just like in the default interpretation rule. Hence, Lin would need the default interpretation rule to always apply. Given that the perfective requires $t_{\text{top}} < t_0$, and that telic predicates always have default perfective, this predicts that the perfective aspect and telic predicates in general always have absolute past tense semantics in Mandarin Chinese. This prediction is not borne out.

Apart from the analysis itself, the most serious problem with Lin’s (2006; 2007; 2010) account is the judgements that led him to conclude that Aktionsarten determine default tense in the first place. Many native speakers, including myself, disagree with his claims about the sentences in (6). The sentences are repeated below (15).

(15) a. Wo hen jinzhang.
    I COP nervous
    Lin’s translation: ‘I am nervous.’

b. Wo da po yi ge beizi.
    I hit broken one CL glass
    Lin’s translation: ‘I broke a glass.’

c. Ta dai wo qu Taipei.
    He take me go Taipei
    Lin’s translation: ‘He took me to Taipei.’

(Lin, 2006, 2010, modified)
Recall that Lin claims that statives like (15-a) always get the present reading by default, and that non-statives (15-b) and (15-c) always get the default past reading.

The actual judgement of natives speakers is that (15-a) can freely get the past reading when there is a contextually salient past time. In addition, (15-b) does not automatically get the past reading, and it seems incomplete just by itself. (15-c), on the other hand, only has a future-oriented reading ‘he’s taking me to Taipei’ or ‘he will take me to Taipei’. In order to get the past episodic reading, (15-b) and (15-c) need overt aspectual marking, such as -le or -guo.³

(15-b) involves a perfective-like construction known as Resultative Verb Compounds (RVCs) in Mandarin Chinese literature. The result denoting part ‘broken’ is usually analyzed as being in a lower aspectual position inside the vP, and it makes the vP telic by specifying the culmination point (Travis, 2010; Sybesma, 2013). RVCs cannot locate the events in time by themselves, and need the presence of an overt aspectual marker in the higher AspP position for the past episodic reading.

The corrected judgments are shown below.

(16) Corrected judgments:

a. Wo hen jinzhang.  
   I COP nervous  
   ‘I am/was nervous.’

b. Wo da-po *(le) yi ge beizi.  
   I hit-broken LE one CL glass  
   ‘I broke a glass.’

c. Ta dai wo qu Taipei.  
   He take me go Taipei  
   ‘He’s taking me to Taipei (futurate).’

7.2.4 Pronominal tense in Mandarin Chinese

Lin (2015) disagrees with the arguments of Lin (2010). Recall that Lin’s (2010) arguments are based on the ‘default past reading’ of perfective sentences and the ‘default present reading’ of imperfective sentences. Lin (2015) argues that this contrast by itself is insufficient to support a tenseless analysis, since similar patterns are actually widely observed in languages.

For example, in English, eventives with a perfective aspect cannot occur with

³Sun (2014) argues that this is parallel to similar future-oriented readings associated with verbs like go in languages like French and Spanish.
the present tense under the episodic reading, and a past tense is required (17), just like Mandarin Chinese. Lin (2015) points out that, if this contrast is evidence that superficially tenseless languages like Mandarin Chinese uses aspectual information for temporal interpretations, and if Lin's (2010) analysis is correct, the completely parallel English sentences would suggest that English is also tenseless, contrary to fact.

(17) a. I am nervous.
b. *I break a glass.
c. I broke a glass.

On the non-existent readings of the ‘free’ past tense in relative clauses, Lin (2015) argues that the contrast between Mandarin Chinese and English only shows that Mandarin Chinese does not have a relative past like English. Since the semantics of embedded past tense is subject to great crosslinguistic variation, this alone cannot prove that Chinese must be tenseless.

Following Kratzer (1998), she argues that the English past tense can spell out a present reference time with a ‘perfect’ aspect (not to be confused with the ‘perfect’ construction), giving rise to the relative past readings.

(18) \[ \text{[perfect]} = \lambda P. \lambda t. \lambda w. \exists e [\tau(e) \prec t \wedge P(e)(w) = 1] \]

The null past in Mandarin Chinese, on the other hand, cannot spell out the perfect aspect, parallel to the German simple past (Kratzer, 1998).

Lin proposes a phonologically null version of the pronominal tense, following Partee (1973); Kratzer (1998). The phonological null tense needs a salient past time in the context. Similar to Lin (2010), when there is no salient past time, the reference time is taken to be the speech time. Lin also follows Kratzer (1998) in assuming three aspects: the imperfective, the perfective, and the perfect, repeated below.

(19) a. \[ \text{[imperfective]} = \lambda P. \lambda t. \lambda w. \exists e [t \subseteq \tau(e) \wedge P(e)(w) = 1] \]
b. \[ \text{[perfective]} = \lambda P. \lambda t. \lambda w. \exists e [\tau(e) \subseteq t \wedge P(e)(w) = 1] \]
c. \[ \text{[perfect]} = \lambda P. \lambda t. \lambda w. \exists e [\tau(e) \prec t \wedge P(e)(w) = 1] \]

Nevertheless, Lin (2015) is quite vague about the distinction between the perfective and the perfect. She follows Kratzer (1998) and argues that the difference between Mandarin Chinese and English follows from the assumption that Chinese past tense cannot spell out the speech time with the perfect, while the English
past tense can. This means that for the sentence I broke a glass with a perfective aspect in Chinese, she has the following semantics.

(20) a. Wo da po (le) yi ge beizi.
    I hit broken LE one CL glass
    ‘I broke a glass.’ (past reading)

b. The pronominal tense denotes the speech time $s^*$ (Lin, 2015)

c. $\lambda w. \exists e [\tau(e) \subseteq s^* \land \text{I-break-a-glass}(e)(w) = 1]$

Lin (2015) claims that in this sentence, the pronominal tense denotes the speech time since there is no salient past time in the context, and $\tau(e) \subseteq s^*$ gives rise to the reading that the event is ‘completed by the speech time’. This is an inaccurate characterization because $\tau(e) \subseteq s^*$ is actually the reading responsible for the prohibition of the perfective aspect with the present tense across languages—since the speech time is often taken to be instantaneous, no (non-instantaneous) event can satisfy it.

In order to get the ‘past’ reading that the event is completed by the speech time, Lin (2015) will need the perfective marker -le to spell out the perfect aspect $\tau(e) \prec s^*$. However, if this is allowed, the Chinese tense and aspect system will be parallel to her assumptions about the English past tense again, spelling out the perfect aspect with speech time for past readings, the very point she argues against.

Moreover, she argues that when the reference time is a salient past time, there is no significant change in the reading of the perfective sentence (20). This argument is still based on the controversial judgments of Lin (2006). As mentioned in the previous subsection, past episodic readings in Mandarin Chinese requires the use of the aspect particles. In addition, if the perfective -le can spell out either the perfect aspect or the perfective aspect, when we have a past reference time, we would expect either the past reading or the past perfect reading, contrary to fact (21).

(21) Zuotian wo chi le yi ge hanbao.
    yesterday I eat LE one CL hamburger
    ‘Yesterday I ate a hamburger/#Yesterday I had eaten a hamburger (eating precedes yesterday).’

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4The original paper has the sentence without -le. However, as I argued earlier, the sentence without -le is infelicitous by itself.
Null nonfuture tense

Sun (2014) takes a different approach to the problem: she investigates the temporal interpretations of bare predicates (*i.e.* without overt aspectual marking) in Mandarin Chinese.

Sun first made the following observations:

(22) a. Root clauses with stative bare predicates describe states. Root clauses with eventive (*i.e.* nonstatives) bare predicates yield only generic or habitual readings.
b. All stative bare predicates can appear without aspectual markings, and can freely get episodic readings. All eventive predicates require overt aspectual markings for episodic readings.
c. Eventive predicates that appear without overt aspect cannot have their temporal reference fixed by an adverb alone. (Sun, 2014)

These observations follow from the assumptions below.

(23) Assumption I: Semantic types of statives and eventives
Statives bare predicates are predicates of time (⟨i,t⟩), and can combine directly with a time. Eventive bare predicates are predicates of events (⟨v,t⟩), combine with a time through the mediation of an aspect or a Q operator. (Katz, 1995; Kratzer, 1998; Sun, 2014)

(24) Assumption II: Aspectual marking in Mandarin Chinese Aspect must be overtly marked in Mandarin Chinese.

Sun (2014) concludes that Mandarin Chinese has a projection which introduces times (type i). It combines with stative predicates (type ⟨i,t⟩) without needing the intermediate aspect projection. With eventive predicates (⟨v,t⟩), however, it needs something that returns a type ⟨v,i⟩ or a quantificational adverb. In either case, without this type i projection, we cannot account for the contrast between statives and eventives, and cannot rule out temporal adverbials alone plus bare eventive predicates for the episodic reading.

The fact that temporal adverbials alone cannot temporally locate eventive

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5Such as often, always, or rarely. See Chapter 4 of Sun (2014).
predicates in the absence of aspect also suggests that earlier tenseless analyses of Mandarin Chinese that solely depend on contextual information and temporal adverbials are insufficient. The different semantic types of statives and non-statives, along with their different requirements for explicit aspectual marking, suggest that there needs to be a temporal argument slot in the structure, which Sun assumes to be provided by tense.

7.2.5.1 The temporal interpretation of bare predicates

Bare statives can freely get the past episodic reading without any aspectual marking. They can combine with temporal adverbials directly (25).

(25) Zuotian Lulu hen jusang.  
yesterday Lulu cop frustrated  
‘Yesterday, Lulu was very frustrated.’

Individual level predicates modified with temporal adverbials give rise to the pragmatically odd reading that the individual no longer has the relevant property (26).

(26) #Gangcai Ermao hen gao.  
just-now Ermao cop tall  
‘#Just now, Ermao was very tall.’

Achievements must be overtly marked for aspect (such as perfective -le and -guo) to get the past episodic reading (27-a)/(28-a). In contrast to statives, just the temporal adverbial alone is insufficient for anchoring the event in time (27-b)/(28-b).

(27) a. Keren dao *(le/guo).  
visitor arrive LE/GUO  
‘Intended: The visitor arrived.’

b. Keren gangcai dao *(le/guo).  
visitor just.now arrive LE  
‘The guest just arrived.’

(28) a. Lisi ying *(le/guo).  
Lisi win LE/GUO  
‘Lisi won.’

b. Jintian Lisi ying *(le/guo).  
today Lisi win LE/GUO  
‘Lisi won today.’

Activities, likewise, regardless of whether there is an overt temporal adverbial, need overt aspectual marking for the episodic reading (29). This includes the
progressive zai, durative zhe, perfective -le and -guo.⁶

(29) a. Zuotian Lisi tan *(le/guo) jita.
   yesterday Lisi play LE/GUO guitar
   ‘Lisi played the guitar yesterday.’

   b. Gangcai Lisi *(zai) tan jita.
   just.now Lisi PROG play guitar
   ‘Lisi was playing guitar just now.’

Accomplishments pattern with achievements and activities. Temporal adverbials alone are insufficient for the past episodic reading (30).

(30) a. Zuotian Lisi chi *(le/guo) yi kuai dangao.
   yesterday Lisi eat LE/GUO one CL cake
   ‘Yesterday Lisi ate a cake.’ ⁷

   b. Gangcai Lisi *(zai) chi yi kuai dangao.
   just.now Lisi PROG eat one CL cake
   ‘Lisi was eating a (piece of) cake just now.’

In the absence of aspectual marking, non-statics can only get the generic or habitual reading. Sun (2014) points out several contexts where this is possible, summarized below.

(31) Q-Adverbs:

   a. Zhongguo dui zong shu.
      Chinese team always lose
      ‘The Chinese team loses all the time.’

   b. Ermao jingchang ting zhei shou ge.
      Ermao often listen this CL song
      ‘Ermao often listens to this song.’

(32) Locative PPs:

   a. Ta zai zhei jia mianbaofang mai tianli.
      3SG at this CL bakery buy dessert
      ‘He buys his dessert at this bakery.’

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⁶Note that sentences containing the locative zai can get past episodic progressive readings. For instance, Shangwu Lisi zai tushuguan cha ziliao. ‘Lisi was looking things up in the library this morning.’ Sun (2014) shows that such sentences do contain a progressive zai, which is deleted at PF due to its homophony with the locative zai. Hence, these are not counterexamples but instances of haplology.

⁷Tsai (2008) noted that the sentence without le/guo improves when there is a contrast: Lisi chi yi kuai dangao, wo chi liang kuai ‘Lisi eats one cake, I eat two.’ However, the only possible reading is still either habitual, or a planned future, which I will summarized in Section 7.2.5.4.
b. Lulu zai woshi li ting zhe shou ge.
   Lulu at bedroom inside listen this song
   ‘Lulu listens to this song in her bedroom.’

(33) **Other modifiers:**

a. Bolibeihen rongyi sui.
   glass very easy break
   ‘Glasses break easily.’

b. Zhe ji jia dian hen wan guanmen.
   this several store very late close
   ‘These stores close late.’

(34) **Bare activities:**

a. Lisi da wangqiu.
   Lisi play tennis
   ‘Lisi plays tennis.’

b. Gulong chouyan.
   Gulong smoke
   ‘Gulong smokes.’ (Sun, 2014, 4.3.1)

Unlike with the episodic reading, past and present temporal adverbials can fix
the topic time for these sentences and yield the corresponding past or present ha-
bitual/generic readings (35). The only requirement is that the temporal adverbial
needs to denote an interval that is long enough to be compatible with a habit or
generic property.

(35) Daxue shiqi Lisi tan jita.
   university time Lisi play guitar
   ‘When he was a college student, Lisi (habitually) played the guitar.’

Sun (2014) argues that the generic/habitual readings of sentences with bare
eventive predicates are due to a quantificational element that returns a predicate of
times (type \(\langle i, t \rangle\)). This quantificational element may be an overt Q-adverb (31),
or a covert Q-operator (32)-(34). The predicate of times can then take a temporal
argument directly like a stative, and there is no need for aspectual marking.

7.2.5.2 **Against default aspects and neutral aspects in Mandarin Chinese**

A rather popular alternative analysis of superficially tenseless languages in-
volves default aspects. The idea of default aspect is not new: Bohnemeyer and
Swift (2004) argue that when a predicate is unmarked for (viewpoint) aspect, many
languages (including English, German, Inuktitut and Russian) have null default
imperfective for atelic predicates, and null default perfective for telic predicates.

(36)  a. \[[\text{PPV}] = \lambda P. \lambda t_{\text{TOP}}. \exists e[P(e) \land \tau(e) \subseteq t_{\text{TOP}}]\]
    b. \[[\text{IMPF}] = \lambda P. \lambda t_{\text{TOP}}. \exists e[P(e) \land t_{\text{TOP}} \subset \tau(e)]\]

(Bohnmeyer and Swift, 2004)

Authors such as Lin (2006, 2007, 2010), try to apply this idea to Mandarin Chinese, by incorporating the supposedly default present and past readings of different verbs into the meaning of the default aspect they get. Recall that Lin (2006, 2007, 2010) has the following versions of the default aspects.

(37)  a. \[[\text{PERFECTIVE}] = \lambda P. \lambda t_{\text{TOP}}. \lambda t_0. \exists t[t_0 \subseteq t_{\text{TOP}} \land P(t) \land t_{\text{TOP}} \prec t_0]\]
    b. \[[\text{IMPERFECTIVE}] = \lambda P. \lambda t_{\text{TOP}}. \exists t[t_{\text{TOP}} \subseteq t \land P(t)]\]

(Lin, 2010)

However, Sun (2014) points out that this analysis is faulty, because it contradicts the aforementioned relation between the availability of the episodic reading and explicit aspectual marking in Mandarin Chinese.

In particular, if we accept default aspects, then activities, being atelic, should be able to get the present progressive reading in the absence of aspectual marking when the reference time is taken to be the speech time, contrary to fact: recall that this reading is impossible without overt progressive making with zai. Sun (2014) points out that authors who adopt the default aspect approach for Mandarin Chinese, including Lin (2006, 2007, 2010), do not distinguish the habitual reading from the progressive (see Section 7.2.3.), which differ in whether there is an ongoing event at speech time. Since these default aspect analyses require \(\tau(e) \subseteq t_{\text{TOP}}\), they actually predict only the progressive reading. The speakers’ judgements, however, are that without overt progressive marking, the only possible reading of activity verbs is habitual or generic, which does not follow from the (default) imperfective semantics \(\tau(e) \subseteq t_{\text{TOP}}\).

(38)  a. Lisi da wangqiu.
       Lisi play tennis
       ‘Lisi plays tennis (habitual).’

    b. Lisi *(zai) da wangqiu.
       Lisi PROG play tennis
       ‘Lisi is playing tennis.’

Similarly, null default perfective aspect would predict that achievements can also get present episodic readings without aspectual marking, since achievements,
being instantaneous, should be able to satisfy $t_{\text{TOP}} \subseteq \tau(e)$ when $t_{\text{TOP}}$ is taken to be the speech time. This prediction is not borne out either.

(39) *Boli sui.
glass break
‘(Intended:) The glass breaks (just as we speak).’

Sun (2014) also argues against the ‘neutral aspect’ in Mandarin Chinese root clauses. These accounts include Smith and Erbaugh (2005); Smith (2008).

Smith and Erbaugh (2005); Smith (2008) propose that bare sentences (in Mandarin Chinese and a number of other languages) have a neutral aspect in the sense that they can be interpreted either as bounded or as unbounded. In order to derive the different readings between telics and atelics, they propose the ‘Temporal Schema Principle’.

(40) Temporal Schema Principle
In a zero-marked clause, interpret a verb constellation according to the temporal schema of its situation type, unless there is explicit or contextual information to the contrary.

(Smith and Erbaugh, 2005)

The temporal schema of atelics is unbounded, and that of telics is bounded. In order to get the present or past readings, Smith and Erbaugh (2005) proposes another deictic pattern principle, shown below.

(41) Deictic pattern
Unbounded situations are located in the present.
Bounded situations are located in the past.

(Smith and Erbaugh, 2005)

These two principles together predict that by default, bare states and activities have present readings, and bare achievements, semelfactives, and accomplishments have past readings. In sum, apart from the fact that these principles seem like mere stipulations, Smith and Erbaugh (2005) come to the same conclusion as Lin (2006, 2007, 2010), which we have already argued against. In addition, their prediction about bare semelfactives (e.g. knock, cough, sneeze) is wrong too: they can only get present habitual/generic readings out of the blue, and with salient past times in the context, only past habitual/generic readings without aspectual marking.

(42) a. (Out of the blue)
Zhangsan kesou.
Zhangsan cough
‘Zhangsan coughs.’
b. Zuowan Zhangsan kesou.
    last.night Zhangsan cough
‘Zhangsan coughed the entire time last night (habitual).’

7.2.5.3 The null NONFUTURE tense: underspecified compared to English

The data from above motivate Sun (2014) to follow Matthewson (2006) and argue that Mandarin Chinese does have semantic tense in the sense that it restricts the reference time.

In particular, Mandarin Chinese has a morphologically null NONFUT, which restricts the reference time of bare root clauses to non-future times. It is an identity function over intervals, presupposing that the interval either precedes or contains the speech time.

\[ [\text{NONFUT}] = \lambda t : t \prec t_c \text{ or } t \supseteq t_c \]

In effect, this is equivalent to other pronominal tense theories.\(^8\)

\[ TP_{(s,t)} \Rightarrow \text{a proposition} \]
\[ T_{(i)} \quad \text{NONFUT} \quad \text{AspP}_{(i, st)} \]

\( \text{nonfut} \) denotes a property of times

Regarding the present reading of statives in out-of-the-blue contexts, Sun (2014) argues that this is because in the absence of adverbials, the most salient time interval is the speech time, which the NONFUT tense in Mandarin Chinese allows. This is illustrated below. Both (45-a) and (45-b) automatically get the present reading.

(45) (Out of the blue:)

a. Lulu hen congming.
   Lulu cop smart
   ‘Lulu is very smart.’

b. Lulu hen jusang.
   Lulu cop frustrated
   ‘Lulu is frustrated.’

\(^8\)For example, \([\text{PAST}])\] is defined iff \(g(i) \prec t_c\) (Heim, 1994).
Sometimes individual-level predicates automatically gets a past reading when the subject predicated of is known to be a person in the past. This is illustrated in (46).

(46) (Zhugeliang is a famous person in Chinese history; there are no previously established past times:)

Zhugeliang hen congming.
Zhugeliang COP intelligent

'Zhugeliang was smart.'

Sun (2014) argues that this is not a counterexample to the NONFUT analysis. The reason why (46) has a past reading is because the person, Zhugeliang, is a famous historical figure from the past (the Three Kingdoms period). His lifetime is the most salient time in this context given the speaker's world knowledge, and it is compatible with the presupposition of NONFUT. In addition, the exact same sentence, if uttered during Zhugeliang's lifetime, can also receive a present reading. In that case, it is simply because the reference time is taken to be the speech time.

In addition, Sun argues that an analysis with both a null past and a null present cannot apply to Mandarin Chinese, based on evidence from sentences with plural eventualities with more than one temporal locations, as in Matthewson (2006). Consider:

(47) a. Gulong he Moyan dou chouyan.
Gulong and Moyan both smoke
‘Both Gulong (dead) and Moyan (alive) smoke(d).’

b. Zuotian he jintian Lulu dou hen jusang
yesterday and today Lulu both COP frustrated
‘Lulu was/is frustrated both yesterday and today.’

(Sun, 2014)

Sun (2014) and Matthewson (2006) both argue that since there is only one predicate, there should be only one TP, and the only way to avoid a contradiction is to posit that the covert tense is NONFUT. Note that Matthewson (2006) does not take the NONFUT to be freely interpreted as present or past, but assumes that it is a pronominal tense just like the English past, with the only difference being that it has a looser restriction on the range of intervals assigned to be. In the particular examples above, the NONFUT is assigned an interval that is large enough to cover both the lifetime of Gulong and of Moyan (47-a), or one that covers both yesterday
In addition to Sun’s data, we can also test this using individual-level predicates. Individual-level predicates like intelligent lead to lifetime effects in languages that distinguishes past from present, such as English. In contrast, Mandarin Chinese does not show such an effect, and conjoined NP consisting of a dead and an alive person, can directly combine with the predicate (48).

(48) Feisher he Kaersen dou hen congming. Fischer and Carlsen both cop intelligent
    ‘Bobby Fischer (dead) and Magnus Carlsen (alive) were/are both intelligent.’

The distinction between nonfuture times and future times is further supported by the presence of a forward lifetime effect in Chinese (Chen and Husband, 2018). This refers to the infelicity of using an individual-level predicate without any modal marking (equivalent to the English will) for an individual that is not born yet. While no lifetime effects arise in (48) above, the picture changes when the conjunction involves a future time (49), since the future requires a modal will.

(49) (Context: Holly, a British actress, will give birth to her first baby in New York next month. Her assistant, Georgia, had her baby in California last month.)

#Tamen de xiaohai dou shi meiguo gongmin.
they poss child both cop American citizen

Intended: ‘Their babies are/will both be American citizens.’ (Chen and Husband, 2018, p.10).

These judgements are confirmed in an acceptability judgment task and a self-paced reading experiment. For details, see Chen and Husband (2018).

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9Recent work by He (2020) shows that sentences with conjoined subject DPs are unacceptable when the main predicate is stage-level, and the unacceptability can be accounted for without assuming that the tense must be non-future. In addition, she argues that sentences like (47-a) with individual-level predicates do not strongly support the non-future analysis either, since even in a present-past language like English, it is often acceptable to refer to a dead person’s properties with the present tense. However, since the tense is null in Mandarin Chinese, whether we have a single non-future or an English-like system does not affect my analysis of Chinese aspects. I will follow Sun (2014) and assume that the tense is non-future.

10Note that a tenseless analysis by itself does not circumvent this problem unless we assume that both subevents have the same viewpoint aspect. As Matthewson (2006) noted, without such an assumption, we are simply recreating the problem at the level of aspects.
Another reason why Matthewson (2006) and Sun (2014) argue for the nonfuture tense is that there is a crosslinguistically robust generalization: the (contingent) future is not a tense, but a modal. Unlike past and present adverbials, future temporal adverbials alone cannot shift the reference time to the future. In addition, this constraint is not dependent on the Aktionsart of the predicate, and applies to statives and eventives alike. Contingent future must be marked with a modal parallel to the English will. Compare the following sentences to the ones from Section 7.2.5.1.

(50)  
a. Mingtian Lulu *(hui) hen jusang.  
tomorrow Lulu will COP frustrated  
'Tomorrow Lulu will be frustrated.'

b. Mingtian Lulu (hui) hen mang.  
tomorrow Lulu will COP busy  
'Tomorrow Lulu will be busy.'

(without hui it sounds like we are talking about Lulu's schedule for tomorrow)

c. Mingtian *(hui) you yi chang haizhan.  
tomorrow will have one CL sea.battle  
'Tomorrow there will be a sea battle.'

(without hui it sounds like the sea battle is planned)

d. Zhongguo dui mingtian *(hui) ying bisai.  
China team tomorrow will win match  
'Tomorrow the Chinese team will win the match.’

(without hui it sounds like that match is fixed)

Note that depending on how easily the state or event can be planned or scheduled (e.g. frustrated vs. busy), these sentences without the modal hui have varying acceptability.

Compare with the following: since the train is usually scheduled, the sentence is perfectly felicitous without the modal, while using the modal suggests that the train is off its schedule and its departure time becomes uncertain.

(51)  
Huoche mingtian liu dian *(hui) kai.  
train tomorrow six o'clock WILL go  
'The train leaves at six.'

As the following data shows, the same predicates, depending on how easily they can be scheduled, lead to different degrees of acceptability also in English and
French futurate sentences (i.e. present tense or present progressive for a scheduled or planned future, no woll is used).

(52)  
   a. *John is frustrated tomorrow.
   b. John is busy next week.
   c. *Arsenal wins tomorrow.
   d. *The fish dies tomorrow.

(53)  
   a. *Jean est très frustré demain.
       Jean is very frustrated tomorrow
   b. Jean est occupé la semaine prochaine.
       Jean is busy the week next
   c. *Arsenal gagne demain.
       Arsenal wins tomorrow
   d. *Ce poisson meurt demain.
       this fish dies tomorrow

In sum, the cases where future temporal adverbials with bare predicates do have future reference are parallel to the futurates with the present tense in English and French, derived from a covert modal involving a non-future plan, \textsc{plan} \cite{Copley2009}.

(54)  \textsc{plan}(d)(p)(w)(t) is defined iff d directs p in w at t.

When defined, \textsc{plan}(d)(p)(w)(t) = 1 iff d is committed to p in w at t.

(55)  An entity d \textit{directs} a proposition p in w at t iff:

\begin{itemize}
  \item[$\forall w'$ where d has the same abilities in $w'$ as in $w$:
  \item[$\forall w''$ metaphysically accessible from $w'$ at t and consistent with d's commitments in $w'$ at t:
  \item[$\exists t' > t[p(w')(t')]$] $\iff$ $\exists t'' > t[p(w'')(t'')]$]
\end{itemize}

\cite{Copley2009}

In addition, Sun's \cite{Sun2014} analysis also correctly predicts that Mandarin Chinese futurates differ from English and French in that they involve a non-future plan, since t is restricted to non-future times. Since this point is not relevant for the purpose of this dissertation, I will omit the discussion. The reader can see Sun \cite{Sun2014} for details.
Sun's detailed analysis of tense provides a fresh perspective, since unlike her predecessors, she examines bare predicates without aspectual marking. The advantage of this approach is that it filters out the possible distractions contributed by aspects in Mandarin Chinese. However, her analysis also leaves the role of aspect in temporal interpretation relatively open.

Sun (2014) gives the following semantics of the perfective -le, which is similar to the analysis of Lin (2006, 2007, 2010) in that it is an aspectual marker with tense semantics:

\[(56) \quad [le] = \lambda P. \lambda t'. \lambda t. \exists e [(P(e) \land \tau(e) \subseteq t' \land \tau(e) \prec t)] \text{ Sun } (2014, \text{p.90})\]

Consider the following sentence. It is ungrammatical without explicit aspectual marking. Sun (2014) follows Lin (2010) and other authors, and argues that when uttered out of the blue, the time in the T node, in this example \(g(j)\), coincides with the speech time \(t_c\).

\[(57) \quad 1987 \text{ nian, Moyan fabiao } *\text{(le) Hong Gaoliang Jiazu}\]

1987 year Moyan publish le red sorghum clan

'In 1987, Moyan published The Red Sorghum Clan.'

\[(58) \quad \phi \Rightarrow 1 \ \text{iff} \ \exists e [\text{M.publish H.} \land \tau(e) \subseteq 1987 \land \tau(e) \prec g(j)]\]

Under this analysis, -le takes two temporal arguments. The time denoted by the temporal adverbial only saturates the first temporal argument of -le. The second temporal argument, \(t\), is supplied by the T note, in this case, it is \(g(j)\).

Sun (2014) argues that \(g(j)\) is taken to be the speech time \(t_c\) in this case, yielding the truth value 1 iff \(\exists e [\text{M.publish Honggaoliang} \land \tau(e) \subseteq 1987 \land \tau(e) \prec t_c]\).

Note that Sun's analysis of -le in (56) has \(\tau(e) \prec t\) instead of directly ordering \(t'\) and \(t\) (e.g. \(t' < t\)). This is because in the derivation process, the interval denoted by the temporal adverbial saturates \(t'\) and the speech time saturates \(t\).
Sun does this to avoid contradictions with temporal adverbials that denote an interval including the speech time, such as this year and this week.

(59) a. Jinnian, Moyan fabiao *(le) Hong Gaoliang Jiazu
    this.year Moyan publish LE red sorghum clan
    ‘This year, Moyan published The Red Sorghum Clan.’

b. 1 iff ∃e[M. publish Honggaoliang(e) ∧ τ(e) ⊆ the year including t_c ∧
    τ(e) ⪯ t_c]

    Instead of t’ ⪯ t_c, which is contradictory since t’ = the year including
    t_c

Since t is taken to be the speech time when uttered out of the blue, it then follows that -le always gets the past-shifted episodic reading.

In fact, this modification is not necessary. There is actually no need to assume that -le takes two temporal arguments. In addition, recall from Chapter 2 that in languages like English, it is possible that the actual reference time of the sentence is more specific than the time denoted by ‘present’ adverbials. We can assume that the same holds for Mandarin Chinese. When the speaker utters (59) to recount a past episodic event, the topic time is in fact the portion of the current year that precedes (or at most includes) the speech time. Assuming a canonical perfective semantics with one temporal argument suffices for the interpretation of the sentence, and derives the correct reading (60).

(60) 1 iff ∃e[M. publish Honggaoliang(e) ∧ τ(e) ⊆ the time of this year that ⪯ t_c

On the other hand, assuming that -le takes two temporal arguments as in (56) has a few problems by itself. One of the temporal arguments is saturated by the temporal adverbial, the other by g(j) in (58), which is interpreted by default as the speech time. In addition, the temporal adverbial (t’) and the T node (t) do not have any direct relationship: the T node, interpreted as g(j), is always the speech time regardless what the temporal adverbial is. And when there is no temporal adverbial, this analysis leaves one temporal argument of -le unsaturated.

In fact, Sun leaves the interpretation of temporal adverbials relatively open: in her analysis of bare predicates, she allows the temporal adverbial to (dynamically) bind the tense g(j). It is unclear why the presence of aspectual marking would interfere with this binding relationship.

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11In fact, any other time after the speech time would require either the future modal hui or the covert modal plan as in (54).
In addition, given the analysis in (56) and (58), it seems that the T node, $g(j)$, is never taken to be anything other than the speech time in practice. The past interpretation crucially relies on the aspect marker -le ($\tau(e) < g(j)$). The nonfuture tense is not really semantically contributing anything to the past episodic interpretation. This goes against the point of having nonfuture tense in languages like Mandarin Chinese (and other languages such as St’át’imcets) in the first place. As Matthewson (2006) argues, the nonfuture is a pronominal tense and behaves just like English tense except for looser requirements on the range of possible temporal intervals it can be: ‘...it should display anaphoric effects...In a discourse context which has established a past reference time, past time reference is carried over to a following sentence’ (Matthewson, 2006). Given the data discussed in Sun (2014), it is not clear why Chinese nonfuture cannot be a pronominal tense like the nonfuture in Matthewson (2006).

Like previous analyses such as Lin (2006, 2010), this analysis of verbal -le orders the event time $\tau(e)$ directly with respect to the speech time. Despite the fact that Lin (2006, 2010) is a tenseless analysis and Sun (2014) is a tensed analysis, both eventually make the same conclusion that it is -le which eventually determines the past reading of the sentence. However, we know from Chapter 6 that the distribution of verbal -le is limited to contexts with an event antecedent, and the past reading should not depend on it.

Sun (2014) does not discuss in detail the semantics of other aspectual markers in temporal interpretation.

7.2.6 Discussion

Based on the literature review above, I conclude that Sun’s (2014) analysis that Mandarin Chinese has a null nonfuture tense makes better empirical predictions than previous analyse.

However, her analysis of aspect-marked clauses, such as (57), does not derive the correct reading. In fact, as this literature review shows, none of the previous analyses has really successfully derived the temporal interpretations of aspect-marked clauses in Mandarin Chinese. The literature also has no clear consensus on the role of perfective -le and -guo in narration. While Sybesma (2007) treats them as perfective or perfect markers parallel to Dutch perfects, other authors like Lin (2006, 2007, 2010) and Sun (2014) give them absolute past tense semantics. Although they have different opinions about Chinese tense, they both to a large extent rely on the definition of -le to derive the past readings of sentences marked
with it.

7.3 Perfective particles in Mandarin Chinese have standard perfective semantics

In this section, I will discuss some of the remaining issues with the Mandarin Chinese perfective aspect in the literature, including the ones introduced in Section 6.2. Some of these issues, such as the non-culminating reading for some accomplishments and the inchoative reading with statives, have led previous linguists to add additional semantics to the perfective -le’s on top of their perfective reading, or assume non-standard perfective semantics to accommodate these data. However, recent work by Zhang (2018, Chapter 4) shows that the non-culminating reading of certain accomplishments does not come from the perfective aspect. In this section, I will first review the literature on the non-culminating reading, and conclude that Zhang’s (2018) analysis is correct. Then, I will discuss the literature on the inchoative reading in Mandarin Chinese, and conclude that it does not come from the perfective -le’s either.

7.3.1 The termination vs. completion debate

7.3.1.1 Non-culminating -le

The literature on Chinese aspects often notes that using the perfective -le with some accomplishment VPs may not give rise to a completion reading, known as non-culminating accomplishments (61).

(61) Wo chi le nage dangao, danshi mei chi wan.
      I eat LE that cake but NEG eat finish
    ‘I ate that cake, but I did not finish it.’

Some previous accounts attribute this reading to the properties of -le, and conclude that the perfective aspect in Chinese does not have canonical perfective semantics but some kind of termination reading (Klein et al., 2000; Lin, 2006, 2007; Smith, 2013).\(^{12}\)

\(^{12}\)The perfective yaa in Hindi has also been argued to have non-culminating readings. See Singh (1998). For languages with similar phenomena, previous literature has also proposed that the semantics of accomplishment verbs are different from English, such as allowing a partial affected thematic relation for certain incremental themes (Hindi) (Singh, 1991, 1998), or using the notion of inertia worlds to allow for non-culmination in the evaluation world (Salish) (Bar-el et al., 2005).
For example, the analysis of Klein et al. (2000) is shown in (62). Klein et al. (2000) make use of the notion of the ‘distinguished phase’ of verbs. Briefly, verbs are classified as 1-phase and 2-phase verbs, corresponding to (bounded) atelic and telic verbs (63).\footnote{In this system, unbounded statives (i.e. if true, then true forever) are classified as 0-phase (Klein et al., 2000).}

(62) The definition of -le in Klein et al. (2000)

\begin{align*}
\text{TT overlaps PRETIME T-DP and T-DP} \\
\text{—[———+++++++](+++++) —— source phase; +++++ distinguished phase; [ ] TT; () optional}
\end{align*}

where TT is the topic time, T-DP is the time of the distinguished phase of the verb.

(63) Distinguished Phase

The distinguished phase DP is:

a. the only phase of 1-phase verbs;

b. either the source phase (i.e. before the culmination) or the target phase (i.e. the result state) of 2-phase verbs.

(Klein et al., 2000)

Crucially, for Klein et al. (2000), non-RVC accomplishment VPs are treated as 1-phase verbs (i.e. atelic), and they only semantically encode a change of state if they contain a result-marking predicate as an RVC. Hence, the VP in (61), \textit{chi nage dangao} ‘eat that cake’, does not have a semantically encoded endpoint where the cake is completely eaten, and is contrasted with the RVC \textit{chi-wan nage dangao} ‘eat up that cake’.

As the diagram in (62) shows, for Klein, -le only needs the topic time to overlap, but not completely include the distinguished phase. For non-RVC accomplishments VPs, since the distinguished phase is the part of the event before culmination, it is possible that the event ends before it ever reaches its culmination.\footnote{In addition, this analysis also predicts that -le is the source of the inchoative reading with stative verbs. However, as we will see in Section 7.3.2, there is evidence that -le does not have inherent inchoative semantics.}

While Klein’s analysis successfully derives the non-culminating reading of sentences like (61), characterizing all non-RVC accomplishments as 1-phase verbs predicts that they all have the non-culminating reading with -le. However, this is not the case. It has been noted that when the object has a measure phrase, since
the object is quantized, the verb turns out to be telic and it does culminate with -le (64). Whether the verb is in RVC form (containing the result predicate wan ‘finish’) does not affect the culmination.16

(64) a. Wo chi (wan) le yi kuai dangao, *danshi mei chi wan. I eat finish LE one CL cake but NEG eat finish ‘(Intended:) I ate a piece of cake, but I didn’t finish it.’

b. Wo pao (wan) le yi qian mi, *danshi mei pao wan. I run finish LE one thousand meter but NEG run finish ‘(Intended:) I ran for one kilometer, but I didn’t finish.’

c. Wo kan (wan) le san ben shu, *danshi mei kan wan. I read finish LE three CL book but NEG read finish ‘(Intended:) I read three books, but I didn’t finish.’

In fact, it has been noted in the literature that for such verbs, the referentiality of the direct object affects the culmination of the event with -le: definite objects give rise to non-culminating readings. This is the case in the non-culminating example earlier (61), where the direct object is that cake. If we replace it with one piece of cake in (64-a), then the resulting event must culminate with -le. However, according to Klein, the sentences in (64) without RVCs should all only have the terminative reading.

A similar idea of decomposing events into different phases for the non-culminating reading is formalized in compositional semantics in Lin (2006, 2007). He has the analysis of -le in (65).

(65) \[-le\] = \(\lambda P. (t, t)\).\(\lambda t_{top}.\lambda t_0 . \exists t[P(t) \land \text{ISTAGE}(t, P) \subseteq t_{top} \land t_{top} < t_0 \land t_{ana} \subseteq \text{RSTATE}(t, P)]\)

where \(t_{top}\) is the topic time, \(t_0\) is the evaluation time (taken to be the speech time), and \(t_{ana}\) is an anaphor-like variable that needs to be bound or given a value from the context.

(Lin, 2006, p.15)

Events are decomposed into Istage and Rstate. The Istage roughly corresponds to Klein’s (2000) source phase, and the Rstate corresponds to the result state for telic verbs, and the time after the event for atelic verbs. Both definitions are given in (66).

16Chief and Koenig (2007) found one such example on Google. However, all of the native speakers that I have consulted disagree with the judgement. It is possible that there is some variation among speakers, but the predominant judgement is that with numeral objects, consumption verbs must culminate with -le.
(66) **Istage and Rstate**

a. \( i\text{stage}(t,P) \) is defined if \( P(t) = 1 \), and when defined,

   (i) if \( P \) is telic, \( i\text{stage}(t,P) = t \) minus the last point of \( t \);
   
   (ii) if \( P \) is atelic, \( i\text{stage}(t,P) = t \).

b. \( r\text{state}(t,P) \) is defined if \( P(t) = 1 \), and when defined,

   (i) if \( P \) is telic, \( r\text{state}(t,P) \) is the interval at which the result state of \( P \) exists.
   
   (ii) if \( P \) is atelic, \( r\text{state}(t,P) \) is the interval consisting of every moment after \( t \).

   (Lin, 2006)

As we can see in (65), for Lin, -le is not a canonical perfective aspect. It has absolute past tense semantics \((t_{top} < t_0)\), as well as requirements regarding the times of Istage and Rstate. In particular, -le has a perfective meaning only with respect to the Istage \((i\text{stage}(t,P) \subseteq t_{top})\), and has an imperfective meaning with respect to the Rstate \((t_{ana} \subseteq r\text{state}(t,P))\).

Since -le only requires that the Istage is included in the topic time interval, it gives rise to the non-culminating reading. On the other hand, the requirement that \( t_{ana} \subseteq r\text{state}(t,P) \) is meant to derive some kind of resultative reading for -le with telic verbs.

This analysis has several problems. First, in Chapter 6, I showed that the verbal -le does not have any constraint on whether the result state holds, so there is no need to posit the assertion regarding \( t_{ana} \) and \( r\text{state} \). In addition, Lin (2006, 2007) leaves open how \( t_{ana} \) is determined. In an example given in the 2006 paper (67), \( t_{ana} \) is simply taken to be the speech time \((s^+)\). However, according to Lin’s definition, it is just an anaphoric variable and should be able to take another time in the context as its antecedent. This would predict unwanted entailments if the antecedent is taken to be some undesirable time in the context, and Lin did not discuss how to restrict the choice of the antecedent.

Also, note that for atelics such as drink wine in (67), the Rstate requirement isn’t doing much, since the Rstate is all the time after the event takes place. Lin defined the Rstate in such a way simply to make -le compatible with atelic verbs too.

(67) a. Lisi he le jiu.
   Lisi drink LE wine
   ‘Lisi drank some wine.’

b. \( \exists t_{top}, t[Lisi\text{-drink-wine}(t) \wedge i\text{stage}(t, \lambda t[Lisi\text{-drink-wine}](t)) \subseteq t_{top} \wedge \)
In addition, it is not clear if Rstate has any other function for atelic verbs. I can see how this analysis may be extended to a perfect-state-like analysis, along the lines of Nishiyama (2006); Nishiyama and Koenig (2010), among others, but Lin does not spell or mention this possibility.

7.3.1.2 Standard perfective 

We have seen that both Klein et al. (2000) and Lin (2006, 2007) assume that the non-culminating reading comes from -le. However, recent literature such as Zhang (2018) has shown that this is not necessarily the case. Zhang (2018) points out that Klein et al. (2000) and Lin (2006, 2007) fail to examine the different kinds of VPs in Mandarin Chinese, and simply conclude that all (non-RVC) VPs are non-culminating. In addition, she argues that some of the so-called non-culminating accomplishments in Mandarin Chinese are a misnomer since strictly speaking they are not actual accomplishments, but are taken to be so by the translation into English. Zhang (2018) shows that the non-culminating reading in Mandarin Chinese may arise from: (i) transitive verbs packaged as manner verbs, (ii) degree semantics of the degree achievements, and (iii) the referentiality of the direct object for consumption verbs. Once we factor these out, it turns out that accomplishments do culminate with -le in Mandarin Chinese. This suggests that -le should have standard perfective semantics. I will summarize her observations in this subsection.

Zhang (2018) noted that some morphologically simple transitive verbs in Chinese, such as fix, kill, and break, are actually manner and not result verbs (in the sense of Hovav and Levin (2010)). This is illustrated with fix below. Unlike their English counterparts, these verbs allow non-culminating readings with -le (68), and telicity tests show that they pattern with activities rather than accomplishments: they combine with for-adverbials (69-a)-(69-b), and with in-adverbials (69-c), they only have an inchoative reading.\footnote{There are two constructions in Mandarin Chinese that are equivalent to the for-adverbial test. The reduplication construction (69-a) and pre-direct-object adverbial phrase (69-b) (Cheng and Huang, 1994). They behave slightly differently with consumption verbs, see below.}

(68) \text{Wo xiu le che, dan shi mei xiu hao.} \\
I fix LE car but NEG fix fine \\
'I tried to fix the car, but I didn’t manage to fix it.'
When these verbs combine with a result-denoting predicate and form an RVC, they do culminate with -le (70), and can only be modified by in-adverbials (71).

a. Wo xiu che xiu le san ge xiaoshi.
   I fix car fix LE three CL hours
   ‘I fixed the car for three hours.’

b. Wo xiu le san xiaoshi de che.
   I fix LE three hour MOD car
   ‘I fixed the car for three hours. (lit. I fixed three hours’ amount of car)’

c. Ta san xiaoshi nei xiu le che.
   3.SG three hours within fix LE car
   ‘(S)he started fixing the car in three hours.’

   NOT: (S)he fixed the car in three hours.

Similarly, just like their English counterparts, Mandarin Chinese intransitive degree achievements also show flexible telicity with these tests. They have the non-culminating reading (72-a), and are compatible with in-adverbials (72-b).

a. Chuan chen le san xiaoshi, mei you wanquan chen xia-qu.
   ship sink LE three hour NEG have completely sink down-go
   ‘The ship sank for three hours, but it didn’t completely sink.’

b. Chuan san xiaoshi nei chen le.
   ship three hour within sink LE
   ‘The ship sank in three hours.’

   (Zhang, 2018, p.154)

With -le, they allow the failed attempt (73-a) or the partial success (73-b) readings.
(73)  a. Wo jiare le shui, dan shui-wen wanquan mei
    I \textit{heat} \textit{LE} {\textit{water} but \textit{water-temperature completely \textit{NEG}}
    sheng-gao.
    \textit{rise-high}
    \textquoteleft \textit{I heated the water, but the water temperature did not rise at all.}\textquoteright
b. Wo jiare le shui, dan shui hai shi wen-wen de bu zenme
    I \textit{heat} \textit{LE} \textit{water} but \textit{water} \textit{still be} \textit{warm-warm MOD NEG quite re.}
    hot
    \textquoteleft \textit{I heated the water, but the water is still just warm and not quite hot.}\textquoteright
    (Zhang, 2018, p.155)

To summarize, these two types of verbs should not be categorized as non-culminating accomplishments in the first place, since \textit{fix}-type verbs are actually activities, and degree achievements allow flexible culminations by their lexical semantics, just like in English. The perfective \textit{-le} does not contribute to the non-culminating reading.

Unlike the first two types of verbs, consumption verbs with numeral-classifier phrase objects do pattern with telic verbs in the \textit{in-}adverbial test as expected (74).

(74) \hspace{1em} Ta san xiaoshi nei he le san sheng/wan shui.
    \textit{(s)he three hours within drink} \textit{LE} \textit{three liter/bowl water}
    \textquoteleft \textit{(S)he drank (up) three liters/bowls of water in three hours.}\textquoteright

As for the (Chinese equivalent of) \textit{for-}adverbial tests, these VPs are incompatible with the pre-direct-object adverbial (75-a), but allow the reduplication construction (75-b). However, note that in (75-b), they allow a reading that is equivalent to the \textit{in-}adverbial reading.

(75)  a. *Ta he le san xiaoshi de san sheng shui.
    \textit{(s)he drink} \textit{LE} \textit{three hour DE three liter water}
    \textquoteleft \textit{(Intended:) (S)he drank three liters of water for three hours. (lit.}
    \textit{(s)he drank three hours of three liters of water)}\textquoteright
b. Ta he san sheng shui he le san ge xiaoshi.
    \textit{(s)he drink} \textit{three liter water} \textit{drink} \textit{LE} \textit{three CL hour}
    \textquoteleft \textit{(S)he drank three liters of water for three hours/It took him/her}
    \textit{three hours to drink up three liters of water.}\textquoteright

These tests suggest that VPs formed with consumption verbs are indeed accom-
plishments, unlike the analysis in Klein et al. (2000).

While there is some variation among native speakers in whether the non-culminating reading is possible with numeral-classifier objects in general, if the object is definite (for example, with demonstratives), speakers overwhelmingly agree that they allow the non-culminating reading (61), (76). This is true for both count and mass nouns alike.

(76) Ta he le na san sheng shui, mei he wan.
    he drink LE that three liter water NEG drink finish
    ‘He drank from those three liters of water, but he did not finish.’

In addition, Zhang points out that when the object is indefinite, numeral-classifier phrases with individuating classifiers tends to allow the non-culminating reading (at least for speakers that do allow this reading for indefinite objects as well). She lists the following examples (77), and argues that for these sentences to be true under the non-culminating reading, each apple and each bowl of water must have been consumed partially. She calls it the ‘distributive’ reading.

(77) a. Wo chi le san ge pingguo, %mei chi wan.
    I eat three CL apple, NEG eat finish
    ‘I ate (part of) three apples, but I did not finish them.’

b. Wo he le san wan shui, %mei he wan.
    I drink LE three bowl water, NEG drink finish
    ‘I drank (from) three bowls of water, but I did not finish them.’

For indefinite objects with non-individuating classifiers, however, only the culminating reading is possible. Again, this is the case for both count (78-a) and mass nouns (78-b).

(78) a. Wo chi le san jin pingguo, *mei chi wan.
    I eat LE three pound apple NEG eat finish
    ‘(Intended:) I ate three pounds of apples, but did not finish.’

b. Wo he le yi sheng shui, *mei he wan.
    I drink LE one liter water NEG drink finish
    ‘(Intended:) I drank a liter of water, but did not finish.’

17 For Mandarin Chinese, it has been argued that abstract measure classifiers, such as sheng ‘liter’, only have the measure reading (Li, 2013). They contrast with individuating classifiers such as ge. Zhang (2018) observes that there is a correlation between the individuating reading and whether an NP can have the referential reading. Intuitively, for the referential reading to make sense, the referents need to be individuated either inherently or in the context.

18 There is some variation among speakers in whether the non-culminating reading is allowed for indefinite objects. I belong to the group of people who do not allow this, and for me, the sentences in (77) only have the culminating reading.
To summarize, the non-culminating reading with consumption verbs only arises when (i) the direct object is definite; (ii) the direct object NP has an individuating classifier. Since in both cases, the same perfective aspect is used, the non-culminating reading cannot be due to the perfective marking.¹⁹

In Zhang (2018), the non-culminating reading with consumption verbs is accounted for with a partitive operator (79) that only appears when the direct object is ‘referential’ (i.e. either definite, or having an individuating classifier), and it gives rise to a partial thematic relationship with the patient.

(79) **The partitive operator**

\[
\text{PART} = \lambda P. \lambda x. \lambda d. \lambda e. [P(e) \land \text{part}_d(x)(e) = d \land \text{patient}'(x)(e)]
\]

(Takes an event predicate, a referential direct object, a degree argument, and returns another event predicate where the direct object is in a partially affected thematic relation with the event to the degree of \(d\).)

(Zhang, 2018, p.216)

(80)

```
VP
  
  V
  
  \sqrt{\text{PART}}

NP_{\text{referential}}

na san sheng shui

‘those three liters of water’

he

‘drink’
```

Zhang (2018) argues that definites and individuating classifiers have in common in that they allow a group atom reading and the referential reading follows from it. For example, a VP with a definite numeral-classifier phrase object, such as *eat those three apples* or *drink those three liters of water*, can be true as long as the three apples/three liters of water as a group atom has been consumed. There is no need for each apple (the natural atoms) to be (partially) eaten.

Assuming that definite NPs with non-individuating classifiers have the following standard semantics,

(81) \[
\text{[na san sheng shui]} = \iota x [\text{ATOM}_{\text{group}(x)} \land \exists y [\bigcup_k \text{water}_k(y) \land \text{LITER}(y) = 3 \land \text{mpart}(x) = \text{mpart}(y)]]
\]

(Zhang, 2018, p.217)

¹⁹In these examples, only the verbal -le is used (assuming that its presuppositions are satisfied). The other perfective constructions follow the same pattern.
where mpart(⟨x⟩) = mpart(⟨y⟩) means the material part of the definite group atom ⟨x⟩ (those three liters of water) equals the material part of a non-atomic individual of water (in this case ⟨y⟩) of the same weight; the \( \cup \) operator lowers the kind reading of water to the set of individuals reading (Chierchia, 1998; Li, 2013)

the resulting semantics of he na san sheng shui ‘drink those three liters of water’, with the partitive operator, does not entail telicity.

(82) a. \([he \ \text{PART}] = [\text{PART}](\text{\textit{he}})] = \lambda x. \lambda d. \lambda e. (\text{drink}'(e) \land \text{part}^A(x)(e) = d \land \text{patient}'(x)(e)]

b. \([he \ \text{na san sheng shui}] = [he\text{PART}](\text{\textit{na san sheng shui}})] = \lambda d. \lambda e. \lambda x. (\text{Atom}_{\text{\textit{group}}}(x) \land \exists y [\cup \text{\textit{water}}(y) \land \text{\textit{liter}}(y) = 3 \land \text{mpart}(x) = \text{mpart}(y)] \land \text{drink}'(e) \land \text{part}^A(x)(e) = d \land \text{patient}'(x)(e)]

Indefinite numeral-classifier phrases with individuating classifiers require that each atom is consumed partially. To achieve this effect, Zhang (2018) adopts the distributive operator from Link (1983), reproduced below.

(83) Modified distributive operator for partitive verbs
\([D_{\text{part}}] = \lambda P_{(e,(d,\langle v,t\rangle))}. \lambda x. \lambda e. \forall y [y \leq x \land \text{ATOM}(y) \Rightarrow \exists d \exists e' [e' \leq e \land P(y)(d)(e')]]

(For each atomic part ⟨y⟩ of ⟨x⟩, there is a sub-event of the same type, and a degree d, where ⟨y⟩ is partially affected to the degree of d)
(Adapted from Zhang (2018, p.218))

(84) \begin{tikzpicture}
  \node (VP) at (0,0) {VP};
  \node (NP_referential) at (1.5,-2) {NP\textsubscript{referential}};
  \node (D_part) at (-1.5,-2) {D\textsubscript{\text{\textit{part}}}};
  \node (V) at (0,-2) {V};
  \node (PART) at (-2,-4) {\text{\textit{PART}}};
  \node (san_ge_pingguo) at (2,-4) {\text{\textit{san ge pingguo}}};
  \node (\text{\textit{three apples}}) at (2,-5.5) {‘three apples’};
  \node (he) at (-1.5,-4) {he};
  \node (\text{\textit{drink}}) at (-1.5,-5) {‘drink’};

  \draw (VP) -- (NP_referential);
  \draw (NP_referential) -- (D_part);
  \draw (D_part) -- (V);
  \draw (V) -- (PART);
  \draw (PART) -- (he);
  \draw (he) -- (\text{\textit{drink}});
  \draw (\text{\textit{three apples}}) -- (NP_referential);
\end{tikzpicture}

The derivation is shown below.

(85) \([\text{\textit{san ge pingguo}}] = \lambda x. [\text{\textit{ATOM}}_{\text{\textit{natural}}}(\text{\textit{apple}}_k, x) \land \text{\textit{COUNT}}(x) = 3] \]
(86) \[D \text{ eat part san ge pingguo} = \lambda e. [\text{ATOM}_{\text{natural}}(\text{apple}_k, x) \land \text{COUNT}(x) = 3 \land \forall y [\text{ATOM}(y) \land y \leq x \Rightarrow \exists d \exists e' [e' \leq e \land \text{eat}(e') \land \text{part}_\Delta(y)(e') = d \land \text{patient}(y)(e')]] \]

(After existential closure of $x$)

In contrast, for indefinite numeral-classifier phrases with non-individuating classifiers, such as *he san sheng shui* ‘drink three liters of water’, the numeral-classifier phrase serves as an event measurement phrase, and a standard Krifka semantics is sufficient to account for the culminating reading with \textit{-le}. The partitive and distributive operators will not apply.

To summarize, Zhang (2018) shows that (i) the non-culminating reading only arises with certain types of VPs, so the perfective aspects cannot be the source of this reading; (ii) it is possible to successfully account for the distribution of non-culminating readings without proposing non-standard perfective semantics for the perfective particles.

### 7.3.2 Verbal \textit{-le} does not have the inchoative reading

In Section 6.2, I mentioned that statives with the verbal \textit{-le} are usually interpreted as inchoative events. Some previous accounts, such as Klein et al. (2000), assume that the inchoative reading with statives comes from the verbal \textit{-le}.

In Klein et al. (2000), the verbal \textit{-le} asserts that the topic time overlaps part of the distinguished phase of an event as well as some time before it. Therefore, it always generates the inchoative reading with 1-phase (i.e. atelic) verbs (recall from (62)).

In this subsection, I will show that the inchoative reading that arises with certain statives does not come from the verbal \textit{-le}, for the following reasons: (i) stative verbs that do get the inchoative reading with the verbal \textit{-le} often have homophonous deadjectival CoS counterparts; (ii) statives do not need to be interpreted inchoatively with the verbal \textit{-le}; (iii) if the verbal \textit{-le} has inchoative semantics, it should also give rise to such a reading with activities, contrary to fact.

Based on these facts, we can conclude that the verbal \textit{-le} does not have inchoative semantics.

#### 7.3.2.1 Distinguishing statives and deadjectival CoS verbs

Sybesma (1997) and Tham (2013) noted that we actually do not have good
reasons to assume that the inchoative reading noted by Klein et al. (2000) comes from the verbal -le. The reason is that the stative verbs already have inchoative uses without the verbal -le.

Recall that Klein’s analysis (cf. Section 7.3.1.1) argues that the verbal -le has the inchoative reading with atelic verbs (what Klein calls ‘1-phase verbs’). This analysis is based on the observation that in the following sentences, gao ‘tall’ and pang ‘fat’ are interpreted as inchoative events with the verbal -le:

\[
\begin{align*}
(87) \quad & \text{a. Ta gao le (henduo).} \\
& \text{he tall LE a-lot} \\
& \text{‘He grew a lot taller.’}
\end{align*}
\]

\[
\begin{align*}
(87) \quad & \text{b. Ta pang le (henduo).} \\
& \text{he fat \ LE a-lot} \\
& \text{‘He gained a lot of weight.’}
\end{align*}
\]

However, in (88), we can see that these predicates can be interpreted as either stative or inchoative, without the presence of the verbal -le.

\[
\begin{align*}
(88) \quad & \text{a. Ta neng gao.} \\
& \text{he can \ tall} \\
& \text{‘He can grow taller/he will become tall.’}
\end{align*}
\]

\[
\begin{align*}
(88) \quad & \text{b. Ta hui pang.} \\
& \text{he will fat} \\
& \text{‘He will gain weight/he will become fat.’}
\end{align*}
\]

\[\text{(Sybesma, 1997, p.230)}\]

Tham (2013) argues that the ambiguity in (88) comes from homophonous stative verbs and deadjectival CoS verbs. She argues that there are two kinds of stative verbs in Mandarin Chinese: the ones with deadjectival CoS counterparts, and the ones without. Only the former also have the inchoative reading with the verbal -le, suggesting that the verbal -le does not contribute to the inchoative reading.

In particular, there are contexts in which the two groups of statives can be distinguished easily. One example is under modals with hai ‘still’. Compare (89-a) with (89-b). The tall in the second sentence yihou hai hui gao ‘he will grow even taller in the future’ in (89-a) only has the inchoative reading. In contrast, in (89-b), where the copula hen is present in yihou hai hui hen gao ‘he will still be tall in the future’, only the stative reading is possible.

\[
\begin{align*}
(89) \quad & \text{a. Sanmao xianzai hen gao. Yihou hai hui gao.} \\
& \text{Sanmao now \ COP tall \ later \ still \ will \ tall}
\end{align*}
\]
‘Sanmao is tall now, and he will grow even taller in the future.’

b. Sanmao xianzai hen gao. Yihou hai hui hen gao.
Sanmao now COP tall later still will COP tall
‘Sanmao is tall now, and he will still be tall in the future.’

(Tham, 2013)

In contrast, stative verbs without deadjectival CoS counterparts do not show this contrast, regardless of whether the copula is present. These verbs include xihuan ‘like’ (90-a) and xiangxin ‘believe’ (90-b).

(90) a. Sanmao xianzai hen xihuan tamen, yihou hai hui (hen) xihuan
Sanmao now COP like them later still will COP like tamen.
them
‘Sanmao likes them a lot now, and will still like them (a lot) in the future.’

b. Sanmao xianzai hen xiangxin tamen, yihou hai hui (hen)
Sanmao now COP believe them later still will COP xiangxin tamen.
believe them
‘Sanmao believes them a lot now, and will still believes them (a lot) in the future.’

(Tham, 2013)

In general, the two groups of statives can be distinguished by the complexity of their morphology. Statives with CoS event counterparts tend to be morphologically simpler, such as gao ‘tall/to become taller’, pang ‘fat/to gain weight’, and shou ‘thin/to lose weight’, etc. On the other hand, the morphologically more complex statives, such as xiangxin ‘to believe’, xinren ‘to trust’, xihuan ‘to like’, tend to not have the CoS counterparts. They also tend to have more complicated argument structure, usually having a theme argument and resulting in a transitive verb.

Unsurprisingly, the latter group does not generally have the inchoative reading with the verbal -le., but this reading may arise from pragmatic coercion. The following example is taken from the Peking University Center for Chinese Linguistics Corpus (PKU) (Tham, 2013).

(91) Jinrong jianguan dangju he riben zhengfu guo duo baohu finance oversee authority and Japan government too much protect jinrong jigou, renmen xiangxin le riben jigou bu hui finance institution people believe LE Japan institution NEG will
The financial oversight authority and the Japanese government overly protect financial institutions. People believed the myth that Japanese institutions would not collapse.’ (PKU)

The sentence has two interpretations. The more dominant one is that the people believed (as opposed to started believing) in the myth for a period before the reference time of the sentence. Tham (2013) reports that it also has the ‘started believing’ reading, but there is some variation among the speakers’ judgments.20

Based on these observations, Tham (2013) concludes that there are two kinds of inchoative readings with -le. One type, such as that of gao ‘tall’, actually comes from the homophonous deadjectival CoS verbs, that are structurally encoded as inchoative. The other type, such as the CoS interpretation with -le of stative verbs and modals without the corresponding deadjectival CoS verbs, ‘may arise from pragmatic coercion’. (Tham, 2013, p.671).

7.3.2.2 No inchoative reading with activities

Another piece of evidence against making -le inchoative is the absence of the inchoative reading with activities. According to the definitions of -le in Klein et al. (2000) and Lin (2006), activities should also be able to get the inchoative reading with -le. However, this is not the case (92).

(92) a. Lisi you le yong.
Lisi swim LE swim
‘Lisi swam.’

NOT: Lisi started to swim.

b. Lisi pao le bu.
Lisi run LE steps
‘Lisi ran.’

NOT: Lisi started to run.

c. Lisi tan le jita.
Lisi play LE guitar
‘Lisi played the guitar.’

NOT: Lisi started to play guitar.

20In either case, under the analysis in Chapter 6, the verbal -le is licensed here because the believing event is part of the series of events listed (i.e. the topic being the financial situation in Japan during that time).
d. Lisi he le jiu.
   Lisi drink LE wine
   ‘Lisi drank some wine.’
   NOT: Lisi started to drink.

Similarly, (Zhang, 2018) showed that different types of accomplishments (including the ‘non-culminating’ ones such as fix-type activities) in Mandarin Chinese also do not have inchoative interpretations with -le. They only have the canonical perfective reading $\tau(e) \subseteq t$.

These judgements are unexpected if -le has built-in inchoative semantics. I conclude that -le should have standard perfective semantics.

7.4 Conclusion

In this chapter, we discussed the previous literature on Mandarin Chinese tense and aspects. In particular, we conclude that Mandarin Chinese has a null tense, whose value is restricted to non-future times. We also concluded that there is no need to posit non-culminating semantics for perfectives in Mandarin Chinese, or inchoative semantics for the verbal -le.
Chapter 8

Conclusion and future research

8.1 Decomposing ‘perfect’-like readings

The data in the previous chapters suggest that there is not one single ‘perfect’ reading in languages. Different kinds of inferences associated with the English present perfect, such as the ‘hot news’ reading, the ‘experiential’ reading, and the ‘resultative’ reading, have different sources in languages. The fact that these readings are associated with different perfective particles in Mandarin Chinese also suggests that we should not label something in a language as a ‘perfect’ simply because it shares some of the inferences with the English present perfect.

The generally accepted classification of ‘perfect’ readings is repeated below:

(1) Different kinds of ‘perfect’-like readings

a. Experiential/existential
   Mary has visited the Louvre.
   ⇒ There is at least one instance of Mary visiting the Louvre prior to the speech time. Also felicitous without a contextually salient past time.

b. Resultative
   Mary has arrived.\(^1\)
   ⇒ The result state holds.

c. Recent past/hot news
   The Orioles have won the game!
   ⇒ A past event presented as new information, often recent.

d. Universal Perfect/Continuative

\(^1\)It has been noted in the literature that under the resultative perfect reading, the result state cannot be cancelled: #I’ve lost my keys, but then I found them again. See Bertrand et al. (2017); Matthewson et al. (2017). However, this only applies with the resultative reading, and not with the present perfect in general.
Mary has been studying since this morning.
(Mary is still studying.)

e. Present Perfect Puzzle
*Mary has arrived yesterday.
⇒ Prohibited with a definite past temporal adverbial.

f. Lifetime effect
#Einstein has visited Princeton.
⇒ Prohibited with dead subjects.

g. No narrative progression
#(This morning) Mary has woken up. Then she has gotten dressed.
⇒ Cannot be used in narration of a series of past events taken place back to back.

In Chapter 5, I argued that they come from different sources, which are repeated below.

(2) The source of perfect readings

a. Non-anaphoricity (Present Perfect Puzzle, lack of narrative progression):
follows from the competition with an anaphoric alternative, which must be used according to PIP;

b. Hot news, existential, recent past:
introducing new reference time into the Common Ground and asserting the existence of a culminated past event;
the ‘recentness’ is actually optional;

c. Resultative:
follows from the Gricean principle of relevance and the existential reading above, answering a topic question about a current state with the assertion of a change-of-state event;

d. Prohibition of the present perfect when the result state is contextually salient (#Borromini has built this church):
follows from the competition with the presuppositionally stronger unique past (English), which must be used according to PIP;

 e. Lifetime effect:
follows from the competition with the presuppositionally stronger unique
past (English), which must be used according to PIP—past lifetime of an individual is unique;

f. Repeatability inference (Have you been to the exhibit? vs. Did you see the exhibit?):
the reference time is taken to be the time span of the event, but the unique past tense cannot be used if it is not a past interval;

g. Universal Perfect:
the present perfect allows the Extended Now as a reference time and in English the underlying aspect may be imperfective/progressive (latridou et al., 2003).

In other words, we should decompose the ‘perfect’-readings into finer categories. Some of them reflect not the inherent meaning of the present perfect construction, but rather the enriched meaning after the computation of implicatures and antipresuppositions. We should not study the present perfect construction in isolation, but take into account its alternatives, such as the unique and anaphoric past tenses.

8.1.1 The ‘neutral’ past perfectives and possible alternatives

Previous studies have proposed a category of ‘general-purpose past perfective’ (Bertrand et al., 2017; Matthewson et al., 2017), which has the following properties:

(3) The general-purpose past perfective (Bertrand et al., 2017)
   a. Has the experiential/existential reading, but does not show the lifetime effect
   b. Result state may hold at the utterance time, but not required
   c. Recent past possible
   d. Definite past adverbials allowed
   e. Narrative progression allowed

In particular, the tense/aspect constructions which give positive results to these tests include:

(4) • Québec French passé composé;
   • Brazilian Portuguese pretérito perfeito (simples), excluding the pretérito perfeito composto: ter + participle;
German (and to a lesser extent Dutch) perfect;

- Ktunaxa past marker ma;
- Tlingit ŋa-;
- English simple past

(Bertrand et al., 2017)

However, we can also see that there is a bit of overlapping between the general-purpose past perfective readings and some of the perfect-like readings above, such as the recent past, the experiential/existential readings, and the resultative reading. In addition, there are also some overlapping properties with the anaphoric past tense, such as allowing definite past adverbials and narrative progression. In addition, the criteria above do not control the discourse status of the result state. We saw in Chapter 2 and 3 that this property makes an important distinction between the English past tense and a strictly anaphoric past tense such as the German past tense (for non-statives). Based on the reasoning in Chapter 5, a possibly hypothesis is that these overlaps between the general-purpose past perfective readings and the perfect readings may reflect the inherent readings of these tense-aspectual constructions in the absence of competition. In earlier chapters, we see that this analysis at least seems to work for the German perfect. I also concluded that the English past is lexically ambiguous between an anaphoric and a uniqueness past. It will be worthy to further investigate the other ‘general-purpose past perfective’ constructions listed above, taken into account their alternatives and the additional possibility of the uniqueness presupposition.

In the literature, there are several large-scale comparisons and cross-linguistic studies motivated by the variations observed. There are a number of recent corpus studies such as Grønn and von Stechow (2017) and the Translation Mining Project (de Swart, 2016; van der Klis et al., 2020, 2021), with the aim of comparing the different usage and distributions of tense-aspectual constructions for the ‘perfect’ and the closely related past perfective readings. There is also fieldwork using a storyboard ‘Miss Smith’s Bad Day’ (Matthewson, 2014), which is specifically designed for testing the various ‘perfect’ properties (Matthewson et al., 2017; Bertrand et al., 2022).

The large-scale fieldwork by Bertrand et al. (2017, 2022) shows that there is actually no cross-linguistically uniform ‘perfect’ category in the semantic sense. They propose a finer-grained classification of the various perfect and past perfective-like readings. In the languages examined (15 languages from 8 families with a total of 22 tense-aspectual forms), they identify four categories: (a) past perfectives; (b)
experiential-only forms (with an experiential reading, but no resultative reading); (c) resultative-only forms (which allow the resultative reading but exclude the experiential reading); (d) hybrid forms (allowing both the experiential and resultative readings).

In addition, the four categories can be grouped into to bigger categories: (i) the past perfective forms for Bertrand et al. (2022) involve a pronominal past tense in the sense of Partee (1973); Kratzer (1998, a.o.); (ii) all three other categories involve existential quantification over times (experiential) or events (resultative). This is summarized in the table below.

![Table: Four cross-linguistic categories of perfect/past perfective forms](image)

Note that Bertrand et al. (2022) have not identified any pronominal form in the domain of eventualities. I think it may be worthy to consider this possibility, since there is no obvious reason why there should be a gap. The ‘hybrid’ category also allows for two possible analyses: lexical ambiguity between the experiential and the resultative, or a unified analysis. However, Bertrand et al. (2022) note that forms that fall into this category are very heterogeneous in terms of all the other ‘perfect’-properties such as Present Perfect Puzzle, Universal Perfect reading, recent past, and the lifetime effect. For this reason, it seems that a unified analysis is very difficult to achieve. Moreover, there is the question of how to derive the variation in the other ‘perfect’-properties.

Based on the conclusions made in the previous chapters, I would like to propose an alternative categorization of the various perfect and past perfective forms, summarized in the table below.

![Table: Different kinds of tense/aspect constructions](image)
 Unlike Bertrand et al. (2022) where we have a contrast between pronominal (i.e. anaphoric) forms and existential forms (where the existential semantics is an entailment), I would like to argue for a classification similar to that of the nominal domain: anaphoric forms, unique forms, and presuppositionally neutral forms. These categories parallel the pattern of anaphoric definites and pronouns, unique definites, and indefinites in the recent literature (cf. Chapter 3). In particular, Schwarz (2009, a.o.) argues for separation of anaphoricity and uniqueness in the study of defin­itives, and indefinites are treated as presuppositionally neutral, with their existential reading and distribution derived from principles like Maximize Presupposition or similar principles (Heim, 1991; Percus, 2006; Sauerland, 2008; Singh, 2011; Spector and Sudo, 2017, a.o.).

The central idea of this dissertation is that (i) what we often observe is the enriched meaning of a tense-aspectual construction, after the computation of implicatures and/or antipresuppositions; and (ii) the distribution of a tense-aspectual construction not only reflects its own properties, but also that of its alternatives. In other words, a proper analysis of a tense-aspectual construction requires us to examine its set of alternatives. I argue that this competition contributes to the ‘perfect’ readings across languages, which reflect similar asymmetries in the presuppositions of the tense-aspectual constructions (anaphoricity, uniqueness, resultative/non-resultative).

In the table above, one can see that there are some blank cells, given the few languages that I examined in this dissertation. In addition, given the data in this dissertation, the two domains (times and events) are mostly independent of one another: in English, German, French and Italian, the alternatives differ in the status of the reference time, and in Mandarin Chinese, the null NONFUTURE tense is neutral about the status of the reference time, and the aspect particles differ in
the status of the events they mark. This leads to the question of whether there are more patterns and evidence of interaction between the domains of times and events. I will leave it to future fieldwork.

The generally accepted criteria for a strictly anaphoric tense/aspect construction include:

(7) Diagnostics for a strictly anaphoric tense/aspect construction
   a. Infelicitous without an antecedent (time or event)
   b. Can be bound like a pronoun

Based on the discussion in Chapter 2, the criteria for a uniqueness-based past tense include:

(8) a. Obligatory use when the context entails the result state of the asserted event:
   (i) (Looking at a church:)
       Who built this church?
   (ii) (Talking about Mary)
       Mary was born in London.

b. Obligatory use when the reference time is a past interval that can be uniquely identified, such as the lifetime of the subject:
   (i) (Talking about Einstein:)
       Einstein visited Princeton.
       (reference time = Einstein’s lifetime)
   (ii) (Talking about an exhibit which is over:)
       Did you see the exhibit?
       (reference time = the time span of the exhibit)

c. Obligatory use when the reference time is a past interval in which a particular event is assumed/expected to have taken place:
   (i) Bill did not graduate from high school.
   (ii) (Penny is currently in her late twenties:)
       Penny didn’t go to college.

If a tense/aspect construction in a given language satisfies the above properties, then it is likely that it has a uniqueness presupposition.

We may find other presuppositions in other tense-aspect constructions in other languages, but so far, we only saw one example of the anti-resultative category, which is the Mandarin Chinese -guo. The criteria we used was:
Diagnostics of other presuppositions

Whether the result state of the asserted event may answer the topic question.

(may lead to observations such as the discontinuity inference)

The most special category in (6) is the ‘none’ category, because it represents the most ‘neutral’ type of past perfective alternative. From the earlier discussions, we conclude that this category is where many of the constructions with perfect-like readings belong to—not due to any inherent property of their own, but due to the competition with the other presuppositionally stronger alternatives. I summarize the ‘neutral’ past perfective as:

The neutral past perfective

a. Can combine with a past reference time (but not obligatory);
b. Can have an underlying perfective aspect;
c. Does not have other presuppositions.

Since it may exhibit anti-presupposition effects when presuppositionally stronger alternatives are available, we will need to check a language for all the other alternatives first.

8.1.2 Diagnosing perfect-like readings

Based on the discussion above, we can see that many observed properties, such as non-anaphoricity, repeatability, discontinuity inferences, and whether the Present Perfect Puzzle is observed, are related to both the properties of the tense/aspect construction itself and the set of alternatives available in the language. I propose below a set of crucial properties in determining whether a particular ‘perfect’-reading is available for a perfect-like construction:

Properties correlating with ‘perfect’-like readings

a. Competing with an anaphoric alternative?
b. Competing with a uniqueness alternative?
c. Time-based/Event-based?
d. Always perfective?
e. Result state can answer topic questions?

In particular, the discussion in Chapter 2 and 3 shows that if a language has an anaphoric past tense, we will observe the Present Perfect Puzzle in that language,
and the present perfect will not be used in (past) narrative progression. On the
other hand, the event-based aspect particles in Mandarin Chinese are not subject
to these constraints.

The lifetime effect follows from the fact that the language has a presupposi-
tionally stronger unique past tense: when there is no other contextually salient
past time, and if the topic is a past entity, the lifetime/time span of that entity
can be uniquely identified, satisfying the presupposition of the unique past tense,
and prohibiting the presuppositionally weaker present perfect.

The prohibition of use in contexts that entail the result state of the asserted
event may follow from two properties: in the case of the English present perfect,
the competition with the unique past tense, and in the case of Mandarin Chinese
-guo, the presupposition that the result state cannot answer the topic question.
This presupposition of -guo is also responsible for its discontinuity inference.

In general, the existential/experiential perfect reading indicates the ability of
the form to be used as a general-purpose past perfective, and the recent past/hot
news reading follows from the ability to introduce a new time/event into the
Common Ground, which often suggest indefiniteness (in contrast to a anaphoric
tense/aspect construction). In addition, the hot news reading is closely related
to the resultative perfect reading, where introducing the event into the Common
Ground also invites the inference that the result state of the event now holds and
often helps answer the topic question (with the exception of the Mandarin Chinese
-guo).

Finally, the Universal Perfect reading is related to whether the perfect in the
language can have an underlying imperfective/progressive aspect. This is the case
in English and German, but not for Italian/French and Mandarin Chinese.

The following table summarizes the various properties of the tense/aspect con-
structions we have discussed so far.

(12) Properties of tense/aspect constructions
| Competing with an anaphoric alternative | ✓ | ✗ | ✓ | ✓ |
| Competing with a uniqueness alternative | ✓ | ✗ | ✗ | ✗ |
| Time-based/ event based | time | time | event | event |
| Always perfective | ✗ | ✓ | ✓ | ✓ |
| Result state can answer topic question | ✓ | ✓ | ✓ | ✗ |

The table below summarizes the various kinds of ‘perfect’-like readings. In this table, the ‘resultative/continuous result state’ reading refers to the inference that the result state of the asserted event holds, and the ‘result state in the Common Ground’ refers to whether the tense/aspect construction can be used when the result state of the asserted event is part of the Common Ground (cf. the Borromini church example).
Comparing these two tables, we can see that there is a correlation between the properties of these tense/aspect constructions and the various ‘perfect’ readings. Of course, we will need to test these criteria with a wider range of languages and the relevant tense-aspect constructions in future studies, but I believe that the diagnosis outlined in this section provides better and more accurate predictions of the possible crosslinguistic patterns than what is available in the literature so far.

### 8.2 Experiential as existential past?

In this section, I will compare my analysis of -guo and its experiential reading with the analysis of Javanese tau and Atayal in by Chen et al. (2020), where it is argued that the experiential reading may come from an existential relative past tense. Given that some of the inferences and behaviours of -guo are very similar to these two particles, it is necessary to compare the two analyses.

Both the Javanese tau and the Atayal in have been described in the literature as having an experiential reading, that the event has happened at some unspecified time in the past (at least once). The following examples are taken from Chen et al. (2020, (2)-(3)).

(14) Javanese tau
a. Sopo sing tau munggah gunung?
   who RELTAU AV.ascend mountain
   ‘Who has ever climbed a mountain?’

b. Aku tau munggah gunung.
   I TAU AV.ascend mountain
   ‘I’ve climbed a mountain.’

(15) Atayal in

a. kya ima’ m-n-wah m-karaw rgyax wah?
   exist who AV-IN-go AV-climb mountain PRT
   ‘Who has climbed a mountain?’

b. m-n-wah=saku’.
   AV-IN-go=1SG.ABS
   ‘I have climbed a mountain.’

We can compare these examples with Mandarin Chinese -guo, with the same kind of experiential reading:

(16) Mandarin Chinese -guo

a. Shui pa guo shan?
   who climb GUO mountain
   ‘Who has climbed a mountain?’

b. Wo pa guo shan.
   I climb GUO mountain
   ‘I have climbed a mountain.’

The properties of tau and in which lead Chen et al. (2020) to conclude that they are existential relative past tenses are follows: (i) restriction to anteriority–obligatory back-shifted reading in embedded clauses and incompatible with future reference times; (ii) lack of the deictic or anaphoric uses, being prohibited in the stove example in Partee (1973), and cannot be used for narrative progression; (iii) felicitous without a contextually salient past time; (iv) shows scopal interactions with respect to negation; (v) allows domain restriction. It is important to note that some of these properties are shared by -guo. However, in this section, I will break down the data and the arguments in Chen et al. (2020) and show that these properties do not by themselves force an existential past tense analysis. I will conclude that the ‘experiential’ reading discussed in Chen et al. (2020) by itself does not suggest that a particular tense/aspect construction is an existential past tense. In particular, I want to argue that we should not adopt the same analysis for guo just because it shares these properties with tau/in. In addition, the most important difference between -guo and tau/in is that the former obligatorily has
a perfective reading, while the latter two allow for a range of aspectual readings including perfective, habitual and progressive.

Since I do not have access to Javanese or Atayal speakers, I do not have enough data to support an alternative analysis for \textit{tau} and \textit{in}. However, I believe that the comparison between these particles and -\textit{guo} provides insights into the variety of tense/aspect constructions available in languages. The fact that we cannot analyze -\textit{guo} as \textit{tau/in} also suggests the diversity of possible patterns.

8.2.1 Back-shifting in embedded clauses

\textit{Chen et al. (2020)} show that both \textit{tau} and \textit{in} have obligatory back-shifted readings in embedded clauses, suggesting that they may be relative past tenses.

\begin{itemize}
  \item \textbf{(17)} Pak Agus ngomong deke \textit{tau} nesu.
    \begin{description}
    \item \textit{Mr. Agus AV.say HE TAU angry}
    \item \textit{‘Mr. Agus said that he had been angry.’ (Javanese)}
    \end{description}
    \begin{description}
    \item ✓ \textit{in context: Agus was angry last week and then he called me yesterday when he was no longer angry (back-shifted).}
    \item # \textit{in context: Agus was angry when he called me (simultaneous).}
    \end{description}

  \item \textbf{(18)} k-m-n-ayal shira’ yaba’ maha m-in-yaqih inlungan=nya’ sa say-AV-IN yesterday father COMP AV-IN-bad heart=3SG.GEN LOC wayal qani.
    \begin{description}
    \item past this \textit{‘Dad said yesterday that his mood had been bad in the past few days.’}
    \item (Atayal)
    \item ✓ \textit{in context: When Dad called me, he was already feeling better (back-shifted).}
    \item # \textit{in context: Dad was still sad when he called me (simultaneous).}
    \end{description}
\end{itemize}

\textit{(Chen et al., 2020, (19)-(20))}

Similarly, -\textit{guo} also has an obligatory back-shifted reading:

\begin{itemize}
  \item \textbf{(19)} Lisi shuo ta sheng \textit{guo} qi.
    \begin{description}
    \item Lisi say he get \textit{GUO} fury
    \item ‘Lisi said he had been angry.’
    \end{description}
    \begin{description}
    \item ✓ \textit{in context: When Lisi called me, he was not angry anymore (back-shifted).}
    \item # \textit{in context: Lisi was still angry when he called me (simultaneous).}
    \end{description}
\end{itemize}

For the purpose of comparison, the simultaneous reading in Mandarin Chinese
simply uses the copula *hen* (lit. ‘very’), although the copula also allows the back-shifted reading:

(20) Lisi shuo ta hen shengqi.

Lisi say he cop angry
‘Lisi said he was angry.’

✓ in context: When Lisi called me, he was not angry anymore (back-shifted).

✓ in context: Lisi was still angry when he called me (simultaneous).

Chen et al. (2020) also show that *tau* and *in* can be used in the ‘past of the future’ readings, where the reference time of the embedded clause is prior to the matrix time (future), instead of the speech time. This suggests that they cannot be absolute past tenses but relative.

(21) (Context: You encourage Siti to work on her thesis this afternoon, so that her mom will be happy even if she doesn't finish. ‘After all, Mother will know that you have worked.’)

Ibuk-mu ape ngerti awakmu tau nggarap skripsi-mu.

mother-your PUT know 2SG TAU AV.make thesis-your

‘Your mother will know that you have worked on your thesis.’ (Javanese)

(22) (Context: You encourage Tali’ to weed the farm this afternoon, and that grandpa will be happy even if he doesn’t finish. ‘After all, Grandpa will know you have worked.’)

musa’=nya’ baq-un maha l-m-n-ahing=su’.

PUT=3SG.ERG know-PV COMP weed-AV-IN=2SG.ABS

‘He will know that you weeded (some).’ (Atayal)

(Chen et al., 2020, (21)-(22))

Similarly, Mandarin Chinese -guo also has the past-of-the-future reading in such sentences:

(23) Mama hui zhidaoní xie guo lunwen de.

mom will know you write GUO paper DE
‘Mom will know that you have worked on your paper.’

However, Chen et al. (2020) also admit that these back-shifted readings by themselves do not justify the claim that these particles are relative past tenses.
I also believe that these data by themselves are compatible with an analysis of tau/in/guo as perfective particles. In particular, we can compare these data with English, where the simultaneous reading in general requires an imperfective aspect on the embedded verb:

(24)    a. Mary said she was angry.  
        (simultaneous reading possible)  
    b. Mary said she ran.  
        (back-shifted reading only)  
    c. Mary said she was running.  
        (simultaneous reading possible)  

Since in English, stative verbs are interpreted as imperfective by default, (24-a) allows the simultaneous reading. In contrast, eventive verbs in their simple form are interpreted as perfective by default, in which case there is only a back-shifted reading (unless interpreted as a past habitual) (24-b), and they need the progressive marking to get the simultaneous episodic reading (24-c).

Hence, the data with tau, in and guo could also be interpreted as these particles being perfective aspect markers, which always have the back-shifted reading anyway (this may be due to coercion given that the matrix time—the saying time—is too short to have the event being fully contained in it).

While I do not have access to speakers of Javanese and Atayal to confirm this hypothesis, at least in Mandarin Chinese, we can see that the perfective/imperfective aspect split is explicit. Apart from the contrast between (19) and (20) for statives, we also have the same contrast on eventives, where the simultaneous reading requires the progressive zai.

(25)    a. Lisi shuo ta you guo yong.  
        Lisi say he swim GUO swim  
        ‘Lisi said that he had swum.’  
        (back-shifted reading only)  
    b. Lisi shuo ta zai you yong.  
        Lisi say he PROG swim swim  
        ‘Lisi said he was having a swim.’  
        (simultaneous reading allowed)  

I conclude that despite the obligatory back-shifted reading of -guo in embedded clauses, there is no good reason to analyze it as a relative past tense like the Javanese tau and Atayal in.
8.2.2 Scopes, domain restriction, and anaphoric/deictic uses

In Partee (1973), it is shown that a simple existential analysis of the English past tense does not derive the correct reading of the following sentence regarding its scopal interactions with negation:

(26) (Context: On the way to work, you suddenly remembered that...) I didn’t turn off the stove.

\[ X:\neg \exists t [t < t_c \land \forall t' t < t' \land \neg I \text{turn off the stove at } t'] \]

Chen et al. (2020) argue that the Javanese tau and Atayal in contrast with English in that they do show scopal interactions with negation (the scope is determined by the surface structure):

(27) Wong londo gak tau mangan sego.

person western NEG TAU AV.eat rise

‘Foreigners have never eaten rice.’ (Javanese)

(28) iyat=saku’ m-in-hikang.

NEG=1SG.ABS. AV-IN-slim

‘I have never been slim.’ (Atayal)

(Chen et al., 2020, (30)-(31))

Chen et al. (2020) conclude that this suggests that tau and in are existential past tenses, instead of pronominal ones.

Comparing Mandarin Chinese -guo with them, we see that it also has scopal interactions with negation:

(29) Wo mei chi guo mifan.

I NEG eat GUO rice

‘I have never eaten rice.’

The inverse scope does not exist in Mandarin Chinese since the negation marker mei cannot be used to modify verbs (e.g. ‘not-eating rice’).

However, as I mentioned in Chapter 2, the stove example by itself does not exclude the existential analysis of the English past tense, since the correct reading can be derived with appropriate domain restriction for the existential past. In other words, the same observation with -guo also does not suggest that it is an existential past tense.

In fact, Chen et al. (2020) also point out that tau/in can be used with con-
textually salient domain restriction. They provide the following examples:

(30)  (Context: Talking about Dewi’s experience in Canada from September to December 2015. It is now October 2016.)

Dewi ora tau mangan sego neng Kanada.
Dewi NEG Tau AV.eat rice in Canada

‘Dewi never ate rice in Canada.’ (Javanese)

(31)  (Context: Describing someone’s previous experience of being trapped in the mountains without any food.)

iyat m-n-aniq ana cikay mami’.
NEG M-IN-eat even some rice

‘He didn’t eat even any rice.’ (Atayal)

(32)  (Context: Seeing a student dozing off in class, the teacher asks:)

iyat=su’ m-n-’abi’ shira’?
NEG=2SG.ABS AV-IN-sleep yesterday

‘Didn’t you sleep yesterday?’

(Chen et al., 2020, (51)-(53))

While Chen et al. (2020) argue that these are examples of domain restriction with existential quantification over times, where the domain restriction is provided by the context or by a temporal adverbial, they are virtually indistinguishable from an anaphoric reading. In each of these examples, we could alternatively argue that the reference time is a contextually salient past time and the sentences simply have the anaphoric or deictic reading. Chen et al. (2020) do not provide any criterion for distinguishing the two.

In fact, the data that Chen et al. (2020) use to show that tau/in do not have the anaphoric or deictic uses fall into two categories: (i) the prohibition in Partee’s (1973) stove example; (ii) no narrative progression uses. I will show below that neither of these provide a solid argument against a pronominal past tense analysis.

First, recall that Partee’s stove example is uttered in the following context with the following inference:

(33)  (Context: On my way to work, I suddenly remembered that what happened when I was leaving the house.)

I didn’t turn off the stove!
Inference: The stove is on now.

Indeed, neither \textit{tau/in} or the Mandarin Chinese -\textit{guo} can be felicitously used in this context. The (a) and (b) are taken from Chen et al. (2020, (41)).

(34) (Context: On my way to work, I suddenly remembered that what happened when I was leaving the house.)

a. aku kok rung (\#\textit{tau}) mate-ni kompor yo!  
   \hspace{1cm} I PRT not.yet AV.\textit{die-APPL} stove yes  
   \hspace{1cm} ‘(Intended:) I didn’t turn off the stove!’ (Javanese)

b. \#iyat=maku’ in-uyut qu gasu’.  
   \hspace{1cm} NEG=1SG.ERG IN-put.off ABS gas  
   \hspace{1cm} ‘(Intended:) I didn’t turn off the stove!’ (Atayal)

c. \#Wo mei guan \textit{guo} luzi!  
   \hspace{1cm} I NEG turn-off GUO stove  
   \hspace{1cm} ‘(Intended:) I didn’t turn off the stove!’ (Chinese)

First, recall from Chapter 2 that this sentence does not by itself force a pronominal analysis anyway, since the correct reading can be derived by domain restriction to the interval before the speaker’s leaving the house. So conversely, the prohibition here does not necessarily mean that the tense/aspect construction cannot be pronominal. At least for Mandarin Chinese, we can say that there is a null \textsc{nullfuture} tense which allows the anaphoric reading of the reference time, so the infelicity of \textit{guo} in this particular example may be due to something else, and the same may apply to \textit{tau/in}. Second, and more importantly, this particular example has a very strong resultative reading, that the stove is still on and with nobody at home now it is dangerous. While the resultative reading is not essential to Partee’s analysis, when asking for the speakers’ judgements about the stove example, it seems that they often have to imagine a context (or implicit topic question) where the resultative reading is salient. In other words, the fact that \textit{guo} is infelicitous in (34-c) really shows that \textit{guo} does not allow the resultative reading. In fact, Chen et al. (2020) also point out that both \textit{tau} and \textit{in} have a similar discontinuity of the result state inference. While I do not have access to speakers of Javanese and Atayal to further check with the judgments, it is possible that the prohibition of \textit{tau} and \textit{in} in the stove example, like that of \textit{guo}, is only reflecting their failure of getting the resultative reading, rather than their non-anaphoric nature. Given that both particles are compatible with a contextually salient past reference time in general (30)-(32) (none of which has a resultative reading), we cannot simply conclude that they are existential past
tenses without further investigation. The similarities between -guo and tau/in also do not undermine our analysis of -guo as a perfective aspect (with special presuppositions).

The second set of examples that Chen et al. (2020) use to argue for an existential past analysis of tau and in is where these two particles do not have the narrative progression use. In languages like English, the past tense (or more accurately, the simple past for non-statives, which is perfective) is used in narration, updating the reference time to the time 'just after' the reference time of the previous sentence (Kamp and Reyle, 1993, 2011; de Swart, 1998, a.o.). Chen et al. (2020) argue that tau and in are rejected in typical narrative progression contexts:

(35) (Context: Describing a past trip, in temporal order.)

Aku tau numpak pesawat neng Jakarta, (#tau) mudun pesawat
I TAU AV.rise airplane to Jakarta TAU AV.descend airplane
terus, (#tau) nggowo koper-ku. Mari ngono aku (#tau)
continue TAU AV.bring suitcase-my finish like-that I TAU
numpak taksi reng hotel.
AV.rise taksi reng hotel

'I once took a plane to Jakarta, got off the plane, and then got my suitcase. After that, I took a taxi to the hotel.' (Javanese)

Consultant’s comments: ‘If tau is added, then it becomes a different story.’

(36) (Context: Describing how Tali’ acted when he came home.)

a. m-zyup blihun qu Tali’ ru’ m-tama’ ru’ h-m-zi’ qutux
   AV.-enter door ABS Tali’ CONJ AV.-sit CONJ pour-AV one
   kupu’ qwaw.
cup wine
   ‘Tali’ came in, he sat down, and poured a glass of wine.’ (Atayal)

b. #m-zyup blihun qu Tali’ tu’ m-in-tama’.
   AV.-enter door ABS Tali’ CONJ AV.-IN-sit
   ‘Tali’ came in, and he sat down.’ (Atayal)

Consultant’s comments: ‘...How come you said he once sat down?’

(Chen et al., 2020, (35)-(36))

Chen et al. (2020) note that ‘the use of tau and in for subsequent events in narration is either incongruous with the previous event,..., or interrupts the narrative progression’ (Chen et al., 2020, p.728). They conclude that this suggests that tau and in cannot function as anaphoric past tenses.

However, in the literature on discourse coherence, narrative progression is not
necessarily a criterion for the anaphoricity of the tense. For example, in the DRT analysis of tenses and aspects (Kamp and Reyle, 1993; Kamp et al., 2011; de Swart, 1998, a.o.), narrative progression is a property of aspects, instead of tenses. This is motivated by the contrast between the simple past forms in English and French, which often establishes a new reference time which is ‘just after’ the reference time in the previous sentence, and the past progressive/imperfective, which does not move the reference time. In other words, failing to move the sequence of narration forward may only be reflecting the properties of a particular aspect and not whether there is an anaphoric tense. In addition, there are several ways to interpret these observations, and depending on the analysis, a truly ‘anaphoric’ tense would stand for the *same* reference time as the previous sentence, and narrative progression would require adding a *new* reference time. For the purpose of this dissertation (cf. Chapter 2), it only matters to us that in English, in both cases, the past tense is chosen over the present perfect, and we can assume that the past tense in both cases is anaphoric and which relation (either ‘just after’ or ‘equals’) the reference time has with its antecedent is a property of the aspects involved.

Given the status of narrative progression, whether a tense/aspect construction can be used for narrative progression does not by itself provide evidence for whether an anaphoric tense is involved. In fact, Chen et al. (2020) also noted that in Atayal, the *in* particle can be used to refer to a contextually salient reference time, just that it does not move the reference time forward. They provide the following example:

(37) (The beginning of a story about an old man going to the mountain and returning home.)

a. m-n-wah rgyax qu bnkis qasa ru’ m-sbzih m-usa’ ngasal. AV-IN-go mountain ABS elder that CONJ AV.-return AV-go house ‘The old man went to the mountain, he returned home...’ (Atayal)

b. m-n-wah rgyax qu bnkis qasa ru’ m-in-sbzih ska’ tuqi. AV-IN-go mountain ABS elder that CONJ AV-IN-return middle road ‘The old man went to the mountain, but he returned halfway.’ (Atayal)

(Chen et al., 2020, (37)-(38))

While Chen et al. (2020) cite the contrast between the sentence with (37-b) and without *in* (37-a) as illustrating that *in* cannot be anaphoric, their consultant points out that the *in*-marked sentence (37-b) is interpreted as ‘the returning
event takes place at some point during the old man’s journey to the mountain’, while the sentence without in places the returning event after the journey to the mountain. To me, this contrast seems reminiscent of the contrast between the English simple past and past progressive, where one moves the narration forward and the other retains the same reference time. Hence, it may well be that tau and in still involve an anaphoric tense, but just that they do not move the narration forward like the English simple past (for non-statives) does.

Note that in Mandarin Chinese, testing the perfective particles with narrative progression is tricky because it also depends on whether the events being narrated are part of a contextually salient collection of events. In that case, the verbal -le is preferred over the other perfective particles since it allows the asserted events to be in a part-whole relation with a salient situation:

(38) (Please describe how you cleaned the house yesterday.)

Wo xian sao le di, ranhou you xi le yifu, hai ca le zhuozi.
I first sweep LE floor then then wash LE clothes and wipe LE table

‘I first swept the floor, and then I did the laundry, and wiped the table.’

Note that here, all three events are described as part of the overall cleaning process, and that the temporal sequencing is not established by the verbal -le, but rather by the adverbs xian ‘first’, ranhou ‘then’, you ‘then’, etc., without which the verbal -le cannot by itself determine the temporal sequencing (i.e. move the narrative forward). The only sequential inference without these adverbs would come from the assumption that the speaker probably narrated these events in temporal order and hence, the narrative order would correspond to the actual chronological order of these events. However, this inference is easily defeasible.

If the (larger collection of) cleaning event is not contextually salient, we may use either the perfective sentence-final -le or -guo, but neither really forces the temporal sequencing of the events except for the assumption that the speaker probably listed them in chronological order.

(39) (What did you do yesterday?)

a. Wo sao di le. Hai xi yifu le.
   I sweep floor LE.SF and wash clothes LE.SF
   ‘I swept the floor and did laundry.’
   I sweep guo floor and wash guo clothes
   ‘I swept the floor and did laundry.’

The only difference between the (a) and (b) sentences seems to be that the -guo sentences focus a bit more on the existence of the events, without necessarily caring about their results. For example, during a murder investigation, the police may list the things the suspect did on the day of the murder and in this context, -guo is preferred.

These observations suggest that in Mandarin Chinese, the perfective particles do not by themselves engage in narrative progression. However, they can all be used to describe events that took place during a contextually salient past time, suggesting that they are all compatible with an anaphoric tense.²

8.2.3 Out-of-the-blue contexts

Another property shared by tau/in and guo is that they are felicitous in contexts without a salient reference time.

(40) (There is no contextually salient past time in the context.)

Paspor-ku tau ilang.
   passport-my TAU lose

‘My passport was lost once.’ (Javanese)

(41) (There is no contextually salient past time in the context.)

maki’ qutux ryax, m-n-wah t-qulih syaw na bsilung.
   live.AV one day AV-IN-go VBZR-fish.AV side GEN deep-pool

‘One day, they went fishing by the lake.’ (Atayal)

(Chen et al., 2020, (46)-(47))

(42) (There is no contextually salient past time in the context.)

Ta diu guo huzhao.
   he lose guo passport

‘He has once lost his passport.’

²In Chapter 7, I presented evidences for the null NONFUTURE tense in Mandarin Chinese. Since the tense is phonologically null, there is no direct evidence for or against having two null tenses in the language, one being anaphoric and the other existential. In Chapter 6, I also showed that the verbal -le does not reflect the anaphoricity of the NONFUTURE tense. By Occam’s Razor, I conclude that the null NONFUTURE tense is underspecified in this respect.
While these facts are compatible with analyzing the particles as denoting an existential past tense, they are also compatible with the proposal that these languages have a null tense which is existential, and that the particles are markers of aspects. However, the languages differ in the role these particles play in the past episodic reading. In Sun (2014), it is shown that the past episodic reading for eventives and statives differ in that the former needs aspectual marking including -guo, in which case there is only the standard perfective reading. Given the different semantic types of statives and eventives, we have good reasons to believe that the past reference time is provided by a null tense instead of -guo (cf. Chapter 7). For Javanese and Atayal, on the other hand, Chen et al. (2020) note that tau/in are not required for the past episodic reading in general, nor do they only give rise to the standard perfective reading when they are used. This observation makes it difficult to carry over the analysis of tense and aspects in Mandarin Chinese to Javanese and Atayal. Instead, Chen et al. (2020) argue that Javanese and Atayal have both a null pronominal (nonfuture) tense, and an existential past tense, which is spelled out as tau/in.

To conclude, the similarities between -guo and tau/in are not sufficient for a similar analysis of these particles. The properties we have discussed so far, such as obligatory back-shifting in embedded contexts, the existential reading, lack of narrative progression, prohibition in the stove example, scope interactions with negation, and being felicitous in out-of-the-blue contexts, do not necessarily suggest that a tense/aspect construction is an existential past tense. In other words, while guo shares many of these properties, we should not simply adopt the analysis of tau/in for guo. In addition, the difference between Mandarin Chinese and Javanese/Atayal also points to the possible extent of crosslinguistic variation.

8.3 Russian tense-aspectual forms

In this dissertation, I concluded that the resultative perfect reading is a combination of the basic existential/experiential perfect reading and Gricean pragmatics. This is the case for English and languages like French. I also made a similar point about the resultative reading of the Mandarin Chinese sentence-final -le. If this analysis is on the right track, it follows that in general, a tense-aspectual form that has the existential reading (of a culminated event) should be able to get the resultative reading in the right contexts.

However, there are more complicated cases in Slavic languages, such as Russian. Borik (2018) conducted a study examining the choice of the Russian tense-
aspectual forms and comparing them with the English present perfect readings.

Briefly, in Russian, like other Slavic languages, a verb is usually associated with a perfective version and an imperfective version, with the former often derived from the latter via processes such as prefixation and suffixation. However, there is no one-to-one correspondence between the perfective and imperfective morphology and the perfective and imperfective aspect in the semantic sense. In particular, there is the so-called ‘general factual imperfective’, with imperfective morphology but has a perfective meaning (Grønn, 2004). Borik (2018) notes that the general factual imperfective has the experiential/existential perfect reading, but the resultative perfect reading is expressed with the perfective morphology. Based on these data, she concludes that:

the semantic contribution of the imperfective aspect in the experiential perfect is, essentially, perfective, just like in all the other cases of the general factual uses of the imperfective aspect. This means that semantically, the resultative perfect and the experiential perfect meanings can be treated similarly, despite the fact that there are two different aspectual forms that are used to render these meanings in Russian. In other words, from a purely semantic perspective, the contribution of aspect in Russian in the experiential and the resultative perfect constructions can be argued to be the same.

However, the fact that there is an aspectual difference in expressing experiential and resultative perfect in Russian should also be a good indication that the two meanings should not simply be collapsed together. How precisely the relevant differences between these two uses of the perfect, possibly pragmatic in nature, should be derived is a separate and not a trivial question.

(Borik, 2018)

A follow-up question for future research is how to derive the pattern in Russian. In particular, why can we not use the general-factual imperfective for the resultative reading? Semantically, both the general-factual imperfective and the perfective form should have the existential semantics, asserting the culmination of a past event. One possibility is that the perfective form has an explicit resulative presupposition (maybe similar to Lin’s (2007) analysis where the perfective -le presupposes the continuation of the result state, or something close to Portner’s (2003) analysis of the present perfect), and the distribution of the two forms is
derived by PIP. Or, it is possible that my analysis of the resultative reading is missing something and needs to be revised. I will leave this for future research.

8.4 Further temporal-nominal parallels?

In this dissertation, I compared the temporal (times and events) and nominal domains in terms of definiteness. This dissertation is mainly concerned with the parallel patterns with respect to indefinites, unique and anaphoric definites. A question that naturally arises is, are there other parallels in the two domains?

For example, we can consider wide-scope indefinites like a certain book or a book Bill has recommended. Linguists have proposed several groups of analyses: some argue that they are referential ([Fodor and Sag, 1982; Schwarzschild, 2002, a.o.]), some utilize (skolemized) choice functions ([Reinhart, 1997; Winter, 1997, a.o.]), and some treat them as presuppositional ([Cresti, 1995; Van Geenhoven, 1998; Von Fintel, 1998; Sudo, 2022, a.o.]). They differ from regular indefinites in that they have flexible scope, seem to have a quasi-referential reading sometimes, and seem to be more specific and may have an existential presupposition. It would be interesting if we can find a tense-aspectual construction that behaves similarly, possibly presupposing the existence of a time interval or event.

Another possible parallel is bare nouns. Bare nouns may also give rise to generic and kind readings, and in many languages, they may also have a definite reading close to that of the weak definite. This could relate to the issue of habituality, plurality of times/events, and event kinds.

More generally, we may also take into account the idea of competition when studying other de-verbal categories. Some languages have a three-way distinction between adjectival passives, verbal passives, and present perfect, illustrated below in Italian.

(43) Italian

a. La porta è aperta.
   the door is open
   ‘The door is open.’

b. La porta è stata aperta.
   the door AUX be.PARTICIPLE opened.PARTICIPLE
   ‘The door has been opened.’

c. Maria ha aperto la porta.
   Maria AUX opened.PARTICIPLE the door
   ‘Mary opened/has opened the door.’

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Should we treat these three sentences as alternatives to each other? And if so, what is the prediction? What do perfects and passives have in common and how do they differ?

I do not have answers to these questions in this dissertation. However, I think they are valuable research questions and I will leave them for future research.
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