Finiteness in Mandarin Clausal Complements: The Role of ICH and Future Modals

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Abstract: This article demonstrates how the Implicational Complementation Hierarchy (ICH) is manifested in Mandarin and accounts for the data with a synthesis model of complementation (Wurmbrand and Lohninger 2023). In line with proposals linking tense to finiteness in Mandarin (Y.-H. Audrey Li 1985, 1990, Sybesma 2007, T.-H. Lin 2015, He 2020, C.-T. James Huang 2022 etc.), I argue that the postulation is not only reasonable given independent evidence supporting a covert tense in the language, but also productive since the distribution of future modals and overt embedded subjects can be properly addressed with little theoretical cost. The finiteness preference in Mandarin complementation also aligns with ICH: *Proposition* complements only select finite clauses while *Event* complements are non-finite. *Situation* complements mostly choose the non-finite version, but some cases can or must choose the finite form. The complements to the left on the ICH are always 'equally or more finite' than those to the right.

Key words: Mandarin Chinese, complementation, finiteness, future modals, tense

1 Introduction

A 'finite' form of verbs or nouns with morphological inflections in the Latin grammar is taken to be 'completed' or 'determined' to refer to a concrete case (Klein 2009, McFadden and Sundaresan 2014). The notion of 'finiteness' later extends to describe properties of clauses based on whether they contain a finite verb form or not, including tense, aspect, mood, agreement, case marking of subjects, referential properties, illocutionary force, politeness, special forms not used in independent clauses, and the way in which the clause is anchored to a higher one or to the utterance context etc. (Nikolaeva 2007, McFadden and Sundaresan 2014, Wurmbrand et al. 2020). Within the Government and Binding and Minimalism frameworks, finiteness is a binary morphosyntactic category for the clause that (i) regulates tense and agreement on the verb, (ii) controls the realization of the subject argument, (iii) creates domains opaque for some syntactic rules, (iv) plays a crucial role in the ability of a clause to serve as an independent assertion (Nikolaeva 2007, McFadden and Sundaresan 2014). However, many researchers (Cristofaro 2007, Bisang 2007, Nikolaeva 2007, Wurmbrand et al. 2020 etc.) argue that it is difficult to connect the concept of finiteness to a specific syntactic category that is adequate for the cross-linguistic variations, given the fact that clausal properties claimed to be finiteness-relevant do not always come together in a single language or in a cross-linguistic perspective. Variations among the distribution of inflectional categories across verb forms and mismatches between the morphological form and syntactic/semantic behavior of verbs challenge conventional definitions of finiteness. It then becomes a concept pertaining to central properties of a clause but is least understood in linguistic theories (McFadden and Sundaresan 2014).

Most of the properties that are argued to reflect finiteness in the cross-linguistic investigations find their place in the Mandarin literature.[1] The debate on finiteness in Mandarin is long-lasting and, with little consensus, stems from the general situation of cross-linguistic inquiries on the topic and, specifically, from the lack of finiteness morphology in Mandarin. C.-T. James Huang (henceforth J. Huang) (1989), Y.-H. Audrey Li (henceforth A. Li) (1990), Hu et al. (2001), T.-H. Lin (2011), Grano (2015), Paul (2018), Nick Huang (henceforth N. Huang) (2018), Zhang (2019), Liao and Wang (2019) etc., have long noticed that Mandarin complement clauses roughly fall into two types: a type that patterns similarly to a main clause and another type that consists of control constructions that are constrained in many dimensions, including in the absence of overt subjects, opaque clausal domains, and/or certain morphosyntactic categories such as tense, aspect, modality and sentence-final particles (SFPs). The former is often tagged as a 'finite' complement while the latter is often considered as 'non-finite' for linguists that assume an implicit finiteness distinction in Mandarin.

As we will see soon, the debate calls for answers to at least three questions: (i) How should we view the disagreement on a hypothesized diagnostic for finiteness when examples that deviate from the predicted pattern exist? (ii) How are the proposed diagnostics/properties connected? (iii) Why and how are these properties linked to finiteness? This paper tries to address these questions. The rest of this section will briefly review the finiteness debate in Mandarin and introduces the diagnostics to be discussed. Section 2 then classifies the three types of complement clauses based on temporal independence: *Propositions*, *Situations* and *Events* (Wurmbrand and Lohninger 2023).[2] I argue that many finiteness-relevant properties[3] in the literature fall in three descriptive dimensions of clausehood: independency, complexity and transparency, which are connected in a way that represents a cross-linguistically robust Implicational Complementation Hierarchy (ICH). Following Wurmbrand and Lohninger (2023), Section 3 argues against a fixed-clause-size approach (Grano 2012, 2015) to Mandarin complementation, and accounts for the properties discussed in Section 2 within the synthesis complementation model. This model allows us to take interpretation alternation into account, offering a closer look at examples that deviate from the general pattern, which is often neglected in the Mandarin literature. In Section 4, I extend the decomposition analysis of *will/would* in English to Mandarin overt future morphemes such as *hui, jiang etc.,* and revitalize the early idea that finiteness in Mandarin is related to tense (A. Li 1985, 1990). I further lay out the empirical evidence and theoretical advantages of this move, including the possible existence of covert tense, the distribution of overt future morphemes and overt embedded subjects. If I am on the right track, Mandarin *Proposition* complements are finite while *Event* complements are non-finite. Different from previous accounts that often group *Situation* complements and *Event* complements together as a non-finite class, I suggest that while *Situation*

[1] The literature on finiteness in Mandarin has different foci in the main clauses and complement clauses (Sybesma 2017, 2019). Non-finiteness in main clauses often correlates to the 'incompleteness' effect. In this article, I only focus on the finiteness debate in complement clauses and leave aside the issue of 'imcompleteness'. Due to the limit of space, I will not go through approaches that correlate finiteness to achievement of 'anchoring' some sort of arguments externally to the utterance time or the actual world of the speech event. Please refer to Liao and Wang (2019) and Sybesma (2019) for details.

[2] Similar proposals in the literature term the three classes of complements differently (e.g. Rochette 1988, J. Huang 2022). For instance, *Proposition*, *Situation* and *Event* complements roughly correspond to Type I, Type II and Type III complements in J. Huang (2022).

[3] Due to limit of length, the properties discussed in this paper are not exhausted. Only well-investigated properties that are relevant to discussion are selected.

complements generally align with *Event* complements, some of them (e.g. the complements of *jueding* 'decide' and *houhui* 'regret') may also opt for a finite CP similar to the *Proposition* class. Lastly, I briefly discuss where Mandarin stands in the cross-linguistic picture of finiteness coding, before concluding in Section 5.

The seminal work by J. Huang (1982, 1989) starts the debate on the finiteness distinction in Mandarin. His insight of finite vs. non-finite distinction is followed by many researchers, but the evidence for finiteness met with disagreement. Hu et al. (2001), J.-W. Lin (2006, 2010), Grano (2012, 2015) etc., based their disagreement on the following arguments: (i) counterexamples to the finite/non-finite generalization exist; (b) the proposed defining property for finiteness is not always applicable for Mandarin; (c) the connection between the diagnostics and finiteness is not conclusive. I will briefly review different opinions on some of the influential diagnostics in the literature below. [4]

J. Huang (1982, 1989) suggests that English encodes finiteness with tense while in Mandarin, such a distinction is made based on the potential occurrence of the modal or aspectual elements of the AUX category (corresponding to Infl in later generative framework). The Mandarin complement in (1) allows aspect markers and modals while the complement of control predicates in (2) does not. The former type of complements is considered to be finite since they allow elements of the AUX category and the latter type non-finite. He further correlates the capability of licensing overt embedded subjects with finiteness and concludes that finite complements license overt subjects while non-finite complements license the null form PRO.

(1) Zhangsan shuo [(ta) lai le /hui lai].
Zhangsan say 3.SG come ASP FUT come
'Zhangsan said that (he) came/(he) will come.'
(Adapted from J. Huang 1989: 188)

(2) a. * Lisi shefa [PRO hui/neng/keyi/zai lai].
Lisi try will/can/may/DUR come
b. *Lisi shefa [PRO lai zhe/guo/le].
Lisi try come DUR/EXP/PFV (J. Huang 1989: 189)

Y. Li (1985) and Hu et al. (2001) challenge the observation by showing that not all modals and aspect markers are excluded in complements claimed to be non-finite according to J. Huang (1989). For instance, the modal *yao* and the perfective aspect marker *le*$_1$[5] is felicitous in the complements of some control predicates. Hu et al. (2001) also provide counterexamples in which non-finite complements in J. Huang (1989) allow overt subjects. Though Zhang (2016) does not directly talk about finiteness, she argues that controlees in Mandarin are minimal pronouns in the default null form (PRO) or some overt forms, thus also challenges Huang's proposal.

In response to these challenges, J. Huang (1989) argues that though in some cases the perfective aspect is allowed in non-finite complements, the aspect marker is better construed with

[4] For examples taken from the literature, the form of the example, the glosses and the translations are given as in the original, to avoid deviating from the authors' assumptions or misleading the readers. This may create inconsistency across cited examples. My own data adopt the following abbreviations: BIE (pseudo-imperative marker *bie*), COP (copular), DE (prenominal/preverbal modifier marker/verbal suffix *de*), DUR (durative aspect), EXP (experiential aspect), FUT (future marker), NEG (negation), PASS (passive marker), PFV (perfective aspect), PL (plural), SFP (sentence-final particles), SG (singular), SHUO (complementizer *shuo*), YAO (the modal *yao*) .

[5] The Mandarin literature calls the word *le* as '*le*$_1$' when used as a verbal suffix and '*le*$_2$' when used as an SFP. The former is often analyzed as a perfective marker while the exact meaning of the latter is still controversial.

the matrix verb, or with the entire sequence including the upper and the lower verb, supported by the evidence that when such sentences are negated, the negative form of the perfective aspect *mei-you* shows up on the matrix predicate rather than in the complement. A. Li (1990) hypothesizes that an 'aspect lowering' rule moves the aspect marker from the matrix verb to the embedded clause. A. Li (1985, 1990) propose that the finite vs. non-finite distinction does not lie in the potential occurrence of modals in general, but in the possible occurrence of only those that have become future tense markers such as *hui* and *yao*. But Li's proposal cannot explain why *hui* is prohibited while *yao* is possible in non-finite complements. J. Huang (2022) further argues that some examples bearing overt embedded subjects in Hu et al. (2001) do not involve obligatory control and can be reanalyzed as the same matrix predicate selecting a finite propositional complement, hence they do not constitute a challenge.

Besides, A. Li (1985, 1990), Sybesma (2007), T.-H. Lin (2011, 2012, 2015), N. Huang (2015), J. Huang (2022) etc., also suggest tense as the defining property of finiteness: a finite clause is tensed syntactically while a non-finite clause is tenseless or bears a deficient Tense category in syntax. T.-H. Lin (2011) suggests that a valued T^0 provides the reference time required by aspect projections for temporal anchoring. A deficient T^0 that lacks this value does not, hence non-finite clauses are incompatible with aspect markers and clause final *le*$_2$. T.-H. Lin (2015) further extends the pronominal view of tense by Partee (1973) to Mandarin and briefly shows how the pronominal tense supplies the reference time. Following the lead of T.-H. Lin (2015), J. Huang (2022) postulates that the syntactic tense in Mandarin non-finite clauses is an anaphor that has to be bound by the matrix T^0 while the one in finite clauses is a variable. However, J.- W. Lin (2006, 2010) argues against the existence of tense and thus also the finite/non-finite distinction in Mandarin.

SFPs were later proposed to diagnose finiteness in Mandarin (T.-H. Lin 2011, 2015; Paul 2018, Zhang 2019). T.-H. Lin (2011) observes that root modals such as *neng* 'be-able-to' cannot scope over *le*$_2$, which he assumes to be a perfect/inchoative marker, while epistemic modals *keneng* 'be likely to' can take *le*$_2$ in its scope. He accounts for these facts by the same assumption that a non-finite T^0 lacks a value providing the reference time for *le*$_2$ and thus is incompatible with it. Though the assumptions and analyses are different, Paul (2018) and Zhang (2019) also suggest that the presence of SFPs indicates a finite clause.

Last but not least, clausal transparency has recently become a focus in the debate of finiteness. Grano (2012, 2015) proposes that syntactic contrasts which have been taken as evidence for the finite/non-finite split are more parsimoniously explained by appealing instead to a monoclausal/biclausal split. The so-called non-finite clauses, e.g. the complement of *shefa* 'try', involve a vP complement of a functional head in a mono-clausal construction. There is no PRO in vP but just a trace left by moving the vP-internal subject to the specifier of the functional phrase. The so-called finite clause such as the complement of *renwei* 'believe' is a CP within a bi-clausal structure. The aforementioned 'non-finite' diagnostics such as 'aspect lowering', lack of modals, obligatory covert subjects etc., can be reduced to clausal transparency of a monoclausal structure as a result of restructuring. Nevertheless, N. Huang (2018) points out that the monoclausal claim for restructuring is inadequate for Mandarin. He suggests that elements such as the clause introducer *shuo* and the focus sensitive item *ye* 'also' that are located high in the structure above vP, can occur in the complements of the restructuring constructions. Given the fact that the option of a clausal complement is available for both control constructions and non-control constructions, yet restrictions in the *shuo*-clause complements of control predicates have clear parallels with non-finite clauses in other languages, N. Huang (2018) concludes that Mandarin does encode finiteness.

In addition, J. Huang (2022) also suggests that restructuring phenomena such as aspect lowering, *before*-collocation, internal topicalization, verb copying etc., are diagnostics of non-finiteness.

The debate shows that control complements and non-control complements generally distinguish from each other in many ways, but do not always do so systematically, as demonstrated by the disagreement on the diagnostics. One source of disagreement comes from the flexibility of syntax-semantics mapping in complementation. On the one hand, some predicates can select either a finite complement or a non-finite complement.[6] Some of the 'counterexamples' to the finiteness distinction in Mandarin are in fact different realization of complementation (J. Huang 2017, 2022). On the other hand, some of the counterexamples to the diagnostics neglect the dynamic interaction between the interpretation of the matrix predicate and the complement clause (Wurmbrand and Lohninger 2023). Cross-linguistic investigations show us that languages implement different properties to express finiteness, which possesses no universal definition. It is expected that even with clear defining properties and diagnostics for finiteness in hand, the debate will keep going on about whether the selected properties connect to finiteness but not to other syntactic explanations such as clause size, non-root status of the clause etc., and which one is more appropriate than the others as the defining property. Therefore, the disagreement on the diagnostics and the lack of consensus of a defining property of finiteness in Mandarin call for a complementation account that takes syntax-semantics mapping flexibility into consideration, and offer arguments in favor of a certain property being selected as the defining property, if a finite/non-finite distinction is proposed. I will return to these questions in Section 3-4, after demonstrating in the next section the connections among most diagnostics reviewed above.

2 The manifestation of ICH in Mandarin

In this section, I will show that most of the diagnostics reviewed in Section 1 align with ICH (Wurmbrand and Lohninger 2023). Based on Givón (1980) and Ramchand and Svenonious (2014), Wurmbrand and Lohninger (2023) propose that complement clauses can be grouped into three broad classes: *Propositions*, *Situations* and *Events*,[7] which follow an implicational 'clausehood' hierarchy, demonstrated in Table 1. Namely, complements to the right of the scale are more dependent, transparent, and integrated than those on its left of the scale in an implicational way.

Table 1

Implicational Complementation Hierarchy (ICH)

MOST INDEPENDENT		LEAST INDEPENDENT
LEAST TRANSPARENT	Proposition≫Situation≫Event	MOST TRANSPARENT
LEAST INTEGRATED		MOST INTEGRATED

[6] For the convenience of discussion, I term the complements under discussion as 'finite complements' and 'non-finite complements', even though the very distinction is still under debate at this stage.

[7] This article treats the terminology 'proposition', 'situation' and 'event' merely as labels for clause types. These labels do not correspond exactly to the meanings of 'proposition', 'situation' and 'event' as used in main-stream semantic theories.

Transparency in ICH indicates whether the embedded clause is permeable for certain operations or dependencies. Integration suggests the degree to which the embedded predicate is an integral part of the matrix predicate. In Mandarin, the property of transparency and integration are often intertwined (J. Huang 2022). Therefore, I will adopt the dimension of complexity[8] instead of integration as a descriptive aspect to illustrate how the ICH is manifested in Mandarin.[9]

Before presenting the Mandarin data, it is necessary to be explicit about my general view on the relation among temporal independence, proposition and finiteness, compared to similar accounts. By 'temporal (in)dependence', I mean temporal flexibility between the matrix and the complement, as Wurmbrand and Lohninger (2023) do. I have not taken into account the possibility of Sequence of Tense and double access readings as J. Huang (2022) does, due to the complexity of the topic and limited formal analyses for these phenomena in Mandarin (see J.-W. Lin 2006 for a proposal). Hence the concept of 'temporal (in)dependence' is slightly different from that in J. Huang (2022). Wurmbrand and Lohninger (2023) propose that the semantic properties to classify the three broad classes of complements are the independence of temporal interpretations and subject reference (partial control vs. exhaustive control). When defining a *Proposition* complement, Wurmbrand and Lohninger (2023) also intertwine these two properties with the possibility of denoting a proposition, i.e., a statement that can be judged true or false. But it is not the case that only *Proposition* complements denote a proposition. For example, Wurmbrand & Lohninger (2023) classify the finite complement of *decide* in (3b) as a *Situation* complement based on its restricted temporal properties. However, the phrase to verify a propositional interpretation, i.e., 'which is true', can only comment on the truth value of the whole sentence in (3a) while in (3b) it can comment on either the truth of the whole sentence or the complement 'she will/would fly to Paris next week'. This fact indicates that the complement in (3b) denotes a proposition.

(3) a. Clara decided to fly to Paris next week, which is true.
b. Clara decided that she will/would fly to Paris next week, which is true.

Therefore, *pace* Wurmbrand & Lohninger (2023), I conclude that a propositional interpretation and temporal independence do not always single out the same class of complements. Specifically, a *Proposition* complement always denote a proposition, but a proposition can be a statement about a future irrealis event, which is compatible with some *Situation* complements. I would also like to clarify that propositional interpretation and being finite do not always go together since the non-finite complement of *claim* in 'Clara claimed to have been to Paris last week' has long been assumed to be propositional (Pesetsky 1992, Landau 2000, Wurmbrand 2014 etc.). Furthermore, as Landau (2015) and Pearson (2016) demonstrate, other than temporal non-simultaneity, whether the predicate is attitudinal or not plays a crucial role in licensing partial control. *Proposition* and *Situation* complements that involve non-simultaneity may or may not license partial control. Thus the property of subject reference proposed by Wurmbrand & Lohninger is less reliable in classification. Also due to the lack of a thorough understanding of partial control in Mandarin,[10] I therefore mainly adopt temporal independence as the primary criterion in classifying Mandarin

[8] This is also a clausal dimension in the earlier version of ICH by Wurmbrand and Lohninger (p.c.).
[9] This section originates from Chapter 4 of the dissertation by the author. Though readers might find the properties of clausehood discussed in this section overlap with the scales of independence, opacity and integration in J. Huang (2022), both works are independently developed. For simplicity, this paper focuses only on constructions with only one predicate in the matrix and the complement clause. Complex cases with more predicates are left for future research.
[10] See N. Huang (2018), Meng and Li (2019) for some discussions.

complements, which is different from Wurmbrand & Lohninger (2023) where both temporal independence and subject reference play the main role, and propositional denotation also counts implicitly.

2.1 Temporal independence

Proposition complements can have flexible temporal interpretations with respect to the matrix while *Situation* complements pose pre-specified temporal relations between the matrix and the complement. For example, *Proposition* complements allow different time adverbs in the matrix and the complement in a flexible way, as shown in (4).

(4) a. **Zuotian** Yuehan shuo [Mali **mingtian** (hui) qu
yesterday John say Mary tomorrow FUT go
Shanghai].
Shanghai
'Yesterday, John said that Mary is going to/will go to Shanghai tomorrow.'

b. **Zuotian** Yuehan shuo [Mali **shang-ge** **xingqi** qu-le
yesterday John say Mary last-CL week go-PFV
Shanghai
Shanghai].
'Yesterday, John said that Mary went to Shanghai last week.'

Situation complements also allow different time adverbs in the matrix and the complement, but the temporal relation is constrained. Most *Situation* complements denote a future irrealis interpretation as shown in (5a-b), but can also restrict to anterior readings as in (5c-d).[11] *Event* complements are the most temporally dependent. They disallow different time adverbs in the matrix and the complement, indicating that the embedded event holds a simultaneous relation with the matrix, depicted by the examples in (6).

(5) a. **Zuotian** Yuehan {dasuan/quan Mali} [**xia-ge** **yue** qu
yesterday John plan/urge Mary next-CL month go
Shanghai].
Shanghai
'Yesterday John planned/urged Mary to go to Shanghai next month.'

b. # **Zuotian** Yuehan {dasuan/quan Mali} [**shang-ge** **xingqi** qu
yesterday John plan/urge Mary last-CL week go
Shanghai] [12]

[11] The editor asked if there are other *Situation* predicates that do not select future irrealis complements, in addition to *houhui* 'regret'. Based on a small scale of sample, I cannot find another case like *houhui* 'regret'. A potential case might be *zeguai* 'blame', which highly prefers anterior complement event. But my consultants demonstrate variation in the acceptance of *jiang-yao* in its complement, e.g., *Zhangsan zeguai wo jiang-yao likai zheli* 'Lit. Zhangsan blamed that I would leave here'. Hence I do not include it here.

[12] One reviewer mentioned the possibility of quan 'urge' in (5b) having a past time adverb *shang xingqi* 'last week' in the complement anterior to the one in the matrix clause (*zuotian* 'yesterday'), meaning 'Yesterday John advised Mary that she should have gone to Shanghai earlier last week'. As the translation offered by the reviewer indicates, *quan* is no longer interpreted as 'urge' but as 'advise', which takes a *Proposition* complement rather than a *Situation* complement. Therefore, the suggested example does not undermine our claim.

Shanghai

c. **Zuotian** Yuehan hen houhui [**shang-ge** **xingqi** qu-le
yesterday John very regret last-CL week go-PFV
Shanghai
Shanghai].
'Yesterday John regretted having been to Shanghai last week.'

d. #**Zuotian** Yuehan hen houhui [**xia-ge** **yue** qu
yesterday John very regret next-CL month go
Shanghai
Shanghai].

(6) a. # **Zuotian** Yuehan kaishi/changshi [**mingtian** likai Beijing]
yesterday John begin/try tomorrow leave Beijing

b. # **Zuotian** Yuehan kaishi/changshi [**shang-ge** **xingqi** likai
yesterday John begin/try last-CL week leave
Beijing].
Beijing

More examples of predicates are given in (7) (J. Huang 2017, 2022; He 2020).

(7) a. *Proposition* Class: *faxian* 'find out', *fouren* 'deny', *gaosu* 'tell', *huaiyi* 'suspect', *jide* 'remember (factive)', *juede* 'think', *queren* 'confirm', *renwei* 'believe', *shengcheng* 'claim', *shengming* 'declare', *shuo* 'say', *zhidao* 'know', *wangji* 'forget (factive)', *xiwang* 'hope', *xiangxin* 'believe'…

b. *Situation* Class: *bi* 'force', *baituo* 'ask someone to do a favor', *dasuan* 'plan, intend', *houhui* 'regret', *jihua* 'plan', *jueding* 'decide', *qing* 'invite', *quan* 'urge, persuade', *mingling* 'order', *xiangyao* 'want', *yinyou* 'lure', *zhengqu* 'strive', *zhidao* 'instruct', *zhunbei* 'prepare' …

c. *Event* class: *changshi* 'try', *gan* 'dare', *jide* 'remember (implicative)', *jixu* 'continue', *kaishi* 'begin', *ken* 'be willing', *neng* 'be able to', *qitu* 'intend', *tingzhi* 'stop', *wangji* 'forget (implicative)', *xiguan* 'be accustomed to', *xihuan* 'like'…

We can see that predicates like *wangji* 'forget', *jide* 'remember' may select different types of complements without changing the meanings of the predicate. The group of *Event* complements consists of a variety of predicates. For example, the complement event is simultaneous with the matrix event for aspectual predicates such as *kaishi* 'begin' and *jixu* 'continue'. However, the complement event of *changshi* 'try'[13] maintains a non-future and non-irrealis relation with the matrix event. Namely, *changshi* 'try' requires the complement event to be not realized yet, however some sort of action must be in progress to ensure the embedded event to be in a 'trying' state. For predicates like *hui* 'can', *neng* 'be able to' and *gan* 'dare', whether the complement event happens or not does not matter. The embedded event is roughly considered to be simultaneous

[13] An earlier version of this article took *shefa* 'try' as an example to illustrate properties of the *Event* class. As one reviewer and one editor indicated, unlike English *try* which is ambiguous between the meanings 'make an effort' and 'have a try', *shefa* seems to favor the former meaning, demonstrating properties similar to a *Situation* complement in some respect. I replaced *shefa* with *changshi* to target at the meaning 'have a try'.

with the matrix, indicated by the fact that different time adverbs in the matrix and the complement are disallowed.

Temporal dependency is also reflected by the restrictions of overt temporal morphologies. For instance, the examples in (8-10) illustrate the distribution of future morphemes. Mandarin adopts *hui, jiang, yao, jiang-hui, jiang-yao* to express future. Since the differences among future markers go beyond the current goal, I only emphasize that for the properties under discussion here, *jiang-yao* and *jiang-hui* follow the same syntactic constraints as *jiang*, and gloss them as future markers without worrying about whether they are variants of *jiang* or are just modal concords. In future contexts, *Proposition* complements are compatible with *hui/yao/jiang/jiang-hui/jiang-yao*.[14] The data below take *hui* as an example, but the facts hold for other future markers as well. Due to the temporal restrictions of *Event* complements, future readings of complement eventualities are unavailable, thus future morphemes are disallowed. Though future irrealis *Situation* complements require the embedded event to be in the future, *hui/jiang/jiang-hui/jiang-yao* are prohibited. [15]

(8) a. Yuehan shuo [Mali **hui** jian Zhangsan].
John say Mary FUT meet Zhangsan
'John said that Mary will/would meet Zhangsan.'

b. Yuehan zhidao [Mali **hui** jian Zhangsan].
John know Mary FUT meet Zhangsan
'John knows/knew that Mary will/would meet Zhangsan.'

(9) a. Yuehan kaishi [(***hui**) zuo yujia].
John begin FUT do yoga
'John began to do yoga.'

b. Mali changshi [(***hui**) manzu guke de yaoqiu].
Mary try FUT satisfy customer DE requirement
'Mary tried to satisfy the requirements of customers.'

(10) a. Yuehan dasuan [mingnian (***hui**) qu Riben].
John plan next-year FUT go Japan
'John planned to go to Japan next year.'

b. Yuehan quan Mali [mingtian (***hui**) jian Zhangsan].
John urge Mary tomorrow FUT meet Zhangsan
'John urged Mary to meet with Zhangsan tomorrow.'

Sun (2014) suggests that Mandarin root clauses with a single predicate demonstrate the pattern of aspect marking summarized in (11). For instance, the example in (12a) illustrates that a bare eventive predicate denotes a generic rather than an episodic reading, while the presence of future time adverb in (12b) leads to an episodic futurate reading (Copley 2009), i.e., Mary has the plan

[14] The examples in (8) are incompatible with *jiang*, probably due to the prosodic constraint on the complement of *jiang*, see N. Huang (2015) for more details. But *jiang* is available in *Proposition* complements once we change the embedded predicates.

[15] Please see Section 2.3.1 for more details about *yao*, which I believe that no reliable evidence shows that it is a future modal in *Situation* and *Event* complements. I thank the editor for drawing my attention to future morphemes other than *hui*.

to eat fish tomorrow.[16] Non-future episodic interpretations require aspectual markings, as shown in (12c-d). Sun (2014) further observes that *Proposition* complements (proposed to be finite by her) demonstrate a similar pattern as independent root clauses in episodic non-future contexts, as depicted in (13).

(11) a. Stative predicates are not marked by aspect markers in general.
b. Bare eventives can only denote generic readings (non-episodic) or scheduled/planned events (with a future time adverb).
c. Eventives denoting a non-future episodic reading are obligatorily marked by aspect markers.

(12) a. Mali chi yu. (√ generic, *episodic)
Mary eat fish
'Mary eats fish.'
b. Mali mingtian chi yu.
Mary tomorrow eat fish
'Mary eats fish tomorrow.'
c. Mali **zai** chi yu.
Mary PROG eat fish
'Mary is/was eating fish.'
d. Mali chi-**le/guo** yu.
Mary eat-PFV/EXP fish
'Mary ate/has eaten fish.'

(13) a. Yuehan shuo [Mali chi yu]. (√ generic, *episodic)
John say Mary eat fish
'John said that Mary ate/eats fish (Mary was/is a fish-eater).'
b. Yuehan shuo [Mali ***(zai)** chi yu].
John say Mary PROG eat fish
'John said that Mary was eating fish. (episodic)'
c. Yuehan shuo [Mali chi ***(le/guo)** yu].
John say Mary eat PFV/EXP fish
'John said that Mary ate/had eaten fish. (episodic)'

The other two groups, however, lack such temporal marking in general (J. Huang 1989), except that some *Situation* and *Event* complements allow perfective or experiential aspect marker, i.e., the aspect lowering phenomenon mentioned in Section 1.[17] Even so, the perfective/experiential aspect marker in *Situation* and *Event* complements does not act the same as it does in *Proposition* complements. The *Proposition* complement with *le*$_1$ or *guo* in (13c) shifts the runtime of the embedded event backward to the matrix event time, i.e., the fish-eating precedes the time of John's utterance. However, the temporal relation between the two eventualities in *Situation* and *Event* complements in (14) involving aspect lowering still maintain. *Le*$_1$/*guo* indicates that both the

[16] Sun (2014) and He (2024) suggest that sentences like (12b) are Chinese counterparts of English futurates (Copley 2009), e.g., *John goes skydiving tomorrow*/ *John is going skydiving tomorrow*. Following Copley's (2009) analysis, Sun (2014) indicates that actually a covert finite modal is present. See He (2024) for a full analysis for Mandarin.
[17] The *Situation* complement of *houhui* 'regret' does not involve aspect lowering, see details below.

matrix and the complement eventuality occurred in the past of the utterance time. Namely, the evaluation time for the complement event is the same as the matrix, i.e., the utterance time, indicating a restructuring structure.

(14) a. Zhangsan bi Lisi [canjia-**le** bisai].
Zhangsan force Lisi participate-PFV match
'Zhangsan forced Lisi to participate in the match.'

b. Zhangsan changshi [zuo-**guo** zhe-dao cai].
Zhangsan try do-EXP this-CL dish
'Zhangsan tried to make this dish.'

To summarize, the *Proposition* class is the most flexible in temporal interpretations, as long as the right morphological marking shows up in the complement. *Situation* and *Event* complements both have their own temporal restrictions, for which overt temporal morphology is deficient. Interestingly, *Situation* complements most commonly denote a future irrealis reading, and one would expect that future morphemes *hui/jiang/jiang-hui/jiang-yao* are the right fit, yet they are prohibited.

2.2 Subject referential independence

Mandarin demonstrates a correlation between embedded subject reference and the temporal properties of the complement (Landau 2004, 2015; Pearson 2016), shown by reference flexibility and syntactic forms of embedded subjects. *Proposition* complements impose no restrictions on the embedded subject in reference and forms. An overt proper name or a free pronoun is possible. As shown in (15), the embedded subjects do not need to be controlled by or agree with a matrix argument in person or number.

(15) a. Zhangsan$_i$ shuo [**Lisi/ta$_{i/j}$** chi-le fan].
Zhangsan say Lisi/3SG eat-PFV food
'Zhangsan$_i$ says that Lisi/he$_{i/j}$ ate.'

b. Zhangsan$_i$ gaosu Lisi$_j$ [**Wangwu$_k$/ta$_{i/j/k}$/nimen$_{i+/j+/k}$** chi-le fan].
Zhangsan tell Lisi Wangwu/3SG /2PL eat-PFV food
'Zhangsan$_i$ told Lisi$_j$ that Wangwu$_k$/he$_{i/j/k}$/you$_{i+/j+/k}$ has/have eaten.'

Embedded subjects in *Situation* complements are controlled by the matrix argument, most naturally in the null form PRO. Hu et al. (2001), Zhang (2016) suggest that bound variables in the form of reflexive *ziji*, complex complemented pronouns (*cpro*, pronouns followed by a complement in the form of 'numeral + classifier + noun') or bound pronouns can also occur as subjects in some *Situation* complements, illustrated by the examples in (16).

(16) a. Baba quan Mama [jinwan **tamen liang ge ren** yiqi
Dad urge Mom this-evening 3PL two CL person together
kan dianying].
see movie
'Dad urged Mom to see a movie together this evening.'

b. Wo dasuan [tian hei yihou **women** yiqi qu].
1SG plan sky dark after 1PL together go
'I've made the plan that we go there together after it gets dark.'

c. Baba he Mama dasuan [wanshang **ziji** qu duchang].
Dad and Mom plan evening self go casino
'Dad and Mom made the plan that they go to a casino this evening.'
(Zhang 2016: 287-289, 16c is slightly adapted)

Ziji and *cpro* have adverbial usages, meaning 'on one's own, by oneself', as the example in (17a) illustrates. Zhang (2016) argues that adverbial uses of *cpro* and *ziji* 'self' cannot be focused by *lian…dou* 'even' construction, shown in (17c), which is different from the real subject 'A-Lin' in (17b). The *cpro* and *ziji* in the *Situation* complements (16) can be focused by *lian…dou* in (17d), hence are real subjects.

(17) a. A-Lin {ta yi ge ren/ziji} qu-le duchang.
A-Lin 3SG one CL person/self go-PFV casino
'A-Lin went to a casino by himself.'

b. Lian A-Lin dou qu-le duchang.
even A-Lin also go-PFV casino
'Even A-Lin went to a casino.'

c. *A-Lin lian {ta yi ge ren/ziji} dou qu-le
A-Lin even 3SG one CL person/self also go-PFV
duchang.
casino

d. Baba he Mama dasuan [wanshang lian {tamen liang ge
Dad and Mom plan evening even 3PL two CL
ren/ziji} dou qu duchang].
person/self also go casino
'Dad and Mom made the plan that even they two go to a casino this evening.'
(Zhang 2016: 281, 17c-d are adapted)

Pace Zhang (2016), I suggest that *cpro* and *ziji* 'self' in *Event* complements cannot be focused by *lian…dou*, as the sentences in (18) show, indicating that they are used as adverbials rather than as subjects. Thus embedded subjects of *Event* complements are fully dependent on the matrix argument, realized as PRO.

(18) a. Lili changshi [jintian {ta yi ge ren/ziji} chi-fan].
Lili try today 3SG one CL person/self eat-meal
'Lili tried to eat alone today.'

b. *Lili changshi [jintian lian {ta yi ge ren/ziji} dou
Lili try today even 3SG one CL person/self also
chi-fan].
eat- meal

The adverbial vs. subject interpretation of *ziji* can be sharply tested for predicates that can both take *Proposition* and *Event* complements, which is consistent with other temporal properties of the

complement. Ussery et al. (2016) notice that in obligatory control constructions, i.e., *Event* complements, *ziji* has to be interpreted as the adverbial meaning 'on one's own'. In *Proposition* complements, other than the reading in which *ziji* is an adverbial following a *pro* (J. Huang 2022), *ziji* can also be interpreted as a reflexive 'self' co-indexed with the matrix argument. For instance, *wangji* 'forget' (same for *jide* 'remember') in the factive usage takes a *Proposition* complement in which *ziji* 'self' can serve as the embedded subject. Overt future morpheme *hui* and aspect markers are possible, as shown in (19). The implicative usage in (20) takes an *Event* complement denoting an irrealis eventuality, in which *ziji* 'self' serves as an adverbial intensifier. In this reading, aspect markers and future modal *hui* are prohibited.

(19) a. Xiaoming wangji [ziji dai shubao le].
Xiaoming forget self bring backpack SFP
'Xiaoming fogot that he had brought the backpack.'

b. Xiaoming wangji [ziji dai-**le** shubao le].
Xiaoming forget self bring-PFV backpack SFP
'Xiaoming forgot that he had brought the backpack.'

c. Xiaoming wangji-le [ziji **hui** bian lao].
Xiaoming forget-PFV self FUT become old
'Xiaoming forgot that he would become old.'

(20) a. Xiaoming wangji [PRO ziji dai shubao] le.
Xiaoming forget self bring backpack SFP
'Xiaoming has forgotten to bring the backpack on his own.'

b. Xiaoming wangji [PRO ziji dai-(***le**) shubao] le.
Xiaoming forget on-one's own bring-PFV backpack SFP
'Intended: Xiaoming forgot to have brought the backpack on his own.'

c. Xiaoming wangji [PRO (***hui**) ziji (***hui**) dai shubao] le.
Xiaoming forget FUT on-one's own FUT bring backpack SFP

Though closely related, the overtness of embedded subjects is not always consistent with the temporal properties of a complement. For instance, *houhui* 'regret' and *jueding* 'decide' both take *Situation* complements. But unlike other *Situation* complements, not only aspect markers are necessary in the complements of *houhui* 'regret', but also *ziji* 'self' is interpreted as a reflexive subject rather than an adverbial, as illustrated in (21a). Similarly, the complements of *jueding* 'decide' in (21b) also allow overt future markers like *hui* and overt subjects (*ziji* 'self'). To preview, the inconsistency in subject overtness for these *Situation* complements, as will be argued in Section 4, is because these predicates select a finite complement.

(21) a. Mali$_i$ hen houhui [ziji$_i$ dangshi qu-*(le) Riben].
Mary very regret self at-that-time go-PFV Japan
'Mary regrets a lot that she went to Japan at that time.'

b. Zhangsan jueding [ziji hui qinzi fuze zhe-ge xiangmu].
Zhangsan decide self FUT on-one's own in-charge-of this-CL

project
'Zhangsan decided that he will take care of this project on his own.'

To summarize, *Proposition* complements allow independent overt subjects. *Situation* complements most commonly select PRO, but occasionally allow overt bound variables such as *cpro*, pronouns or *ziji* 'self'. *Event* complements only license PRO.

2.3 Structural complexities

This section takes the distribution of modals and SFPs to demonstrate that *Proposition* complements are structurally more complex than *Situation* and *Event* complements.

2.3.1 Distribution of modals

Cross-linguistically, epistemic modals are syntactically higher than circumstantial modals such as deontic and dynamic modals (Jackendoff 1972, Iatridou 1990, Brennan 1993, Cinque 1999, Hacquard 2006 etc.). Tsai (2010) and T.-H. Lin (2011) suggest that Mandarin future modals like *hui* and *yao* are between epistemic and circumstantial modals in the structure. Mandarin *Proposition* complements are compatible with the full fledge of modals, if the semantics of the matrix predicate permits them. *Situation* and *Event* complements are only compatible with modals that are restricted to the lower domain (to be specific, circumstantial modals syntactically below future modals), if the modals and the matrix predicate are semantically compatible. For example, the *Proposition* complements in (22) go well with epistemic modals, future modals and circumstantial modals. However, other than *yao*, epistemic and circumstantial modals are prohibited in *Situation* and *Event* complements, as shown in (23).

(22) a. Zhangsan shuo/zhidao [Lisi **keneng** mai-le jiu].
Zhangsan say/know Lisi might buy-PFV alcohol
'Zhangsan said/knew/knows that Lisi might have bought alcohol.'

b. Zhangsan shuo/zhidao [Lisi **hui/bixu/neng** mai jiu].
Zhangsan say/know Lisi FUT/must/be-able-to buy alcohol
'Zhangsan said/knew/knows that Lisi will/must/was/is able to buy alcohol.'

(23) a. Wo bi Lisi [***kenneng/*hui/*neng/*yinggai** lai].
I force Lisi might/will/can/should come
'I forced Lisi to come.'

b. Lisi changshi [***keneng/*hui/*neng/*keyi** lai].
Lisi try might/will/can/may come
'Lisi tried to come.'

(Adapted from J. Huang 1989: 189-190, the original matrix predicate in (23b) is *shefa* 'try' instead of *changshi* 'try'.)

Mandarin modal *yao* can occur in many *Situation* complements and some *Event* complements,[18] as shown in (24). Grano (2015) suggests that *yao* is the optional overt realization of the future

[18] Not all *Event* complements are compatible with *yao*, as we can see in (i). This is expected because the *Event* complements constitute a diverse group.

modal *woll* with no tense, which is covert in English. However, if we adopt this hypothesis, then *yao* is very special. Given the simultaneous restrictions on *Event* complements, it is impossible that *yao* be a future modal in these cases. Then *yao* is like all other future modals in *Proposition* complements and root clauses, but is the only optionally overt future marker available in *Situation* complements, and is some other modal in *Event* complements.

(24) a. Wo quan/bi ta [yao lai].
I persuade/force he will come
'I tried to persuade/force him to come.' (Hu et al. 2001:1123)

b. Wo zhunbei [mingtian yao canjia yi-ge hui].
I plan tomorrow will attend one-CL meeting
'I plan to attend a meeting tomorrow.'
(Y.Li 1985, cited from Hu et al. 2001:1122)

c. Zhangsan changshi [yao jinru huichang].
Zhangsan try YAO enter venue
'Zhangsan tried to enter the venue.'

In fact, we can get rid of these stipulations about *yao*. *Yao* possesses future, deontic or dynamic usages in root clauses (Lv 1980, Zhu 1982, Tsai 2010 etc.), shown by the examples in (25). I propose that it is circumstantial in *Situatio*n and *Event* complements while it is flexibly interpreted in *Proposition* complements and root clauses (He 2020). In the complements of matrix predicates without a directive/imperative flavor (e.g. *zhunbei* 'prepare, plan', *changshi* 'try'), *yao* expresses the volition of the subject, as it does when used as a dynamic modal in (25c).

(25) a. (Tian) yao xiayu le.
sky YAO rain SFP.
It is going to rain. (future)

b. Ni yao qu.
2SG YAO go
'You should go.' (deontic)

c. Zhangsan yao mai zhe-ben shu.
Zhangsan YAO buy this-CL book
'Zhangsan wants to buy this book.' (dynamic)

In the complements of bouletic predicates compatible with a directive/imperative flavor (e.g. *quan* 'persuade/urge', *bi* 'force', *baituo* 'ask somebody to do a favor' etc.), *yao* bears an imperative reading as in (25b). The negation of *yao* in *Situation* complements can be replaced by a pseudo imperative element *bie* 'don't, should not' (Liao and Wang 2019) without changing the meaning, indicating that *yao* is a deontic modal rather than a future modal in (24a).

(26) a. Wo quan/bi ta [bu yao lai].
1SG persuade/force 3SG NEG YAO come

b. Wo quan/bi ta [bie lai].

(i) *Zhangsan neng/gan [yao lai].
Zhangsan can/dare YAO come

1SG persuade/force 3SG BIE come

Then we can see a clear line between overt future modals and circumstantial modals in complementation. *Proposition* complements can host overt future modals and modals that are structurally above them while *Situation* and *Event* complements can only host structurally lower circumstantial modals.

2.3.2 Distribution of SFPs

Paul and Pan (2017) propose that SFPs project in three layers in CP: the innermost Low CP right on top of TP (which they term as 'Low C domain'), the second-highest ForceP and the topmost speaker/hearer-related PropositionP. Most Mandarin SFPs except those in the Low C domain (*le₂*, *laizhe* and *eryi* 'only'[19]) are prohibited in embedded, non-root contexts. *Laizhe* and *le₂* are possible in *Proposition* complements but disallowed in *Event* and future irrealis *Situation* complements (T.-H. Lin 2011, 2015; Zhang 2019). The following sentences in (27)-(28) take *le₂* as examples to illustrate the observation.

(27) a. Zhangsan keneng [qu Taibei le]
Zhangsan be-likely-to go Taipei SFP
'Zhangsan may have gone to Taipei.' (T.-H. Lin 2011: 52)

b. Wo mei tingshuo [Ajie ding-hao piao le].
I not hear Ajie order-ready ticket SFP
'I did not hear that Ajie had finished ordering of the ticket.'
(Zhang 2019: 976)

(28) a. *Zhangsan neng [qu Taibei le]
Zhangsan be-able-to go Taipei SFP
Intended: 'Zhangsan is able to have gone to Taipei.' (T.-H. Lin 2011: 53)

b. *Zhangsan mei dasuan [qu Taibei le].
Zhangsan NEG.PFV plan go Taipei SFP
Intended: 'Zhangsan didn't plan to have gone to Taipei.'

Paul and Pan (2017) propose that *eryi* 'only' projects higher than *le₂* and *laizhe*. Since *eryi* in the sentence final position can be parsed with the embedded complement or with the matrix, it is difficult to justify the grammaticality of *eryi* in complement clauses, because we cannot exclude the possibility of *eryi* scoping over the matrix, which is grammatical. Therefore, I embed *eryi* in the first conjunct of a coordinate construction in (29) to secure that *eryi* is in complement clauses. The data show that *eryi* is able to occur in *Proposition* complements, but is infelicitous in the other two groups.

(29) a. Zhangsan shuo/renwei [Lisi na-le shu eryi, bing meiyou

[19] Both *laizhe* and *le₂* are sensitive to the temporal properties of their complements and thus are claimed to be tense/aspect related. *Laizhe* indicates that the event has occurred in the past (Zhu 1982). *Le₂* suggests that a 'currently relevant state' (Li and Thompson 1981) is under discussion and often carries the inchoative reading such that the situation at hand is (conceived of as) new (Zhu 1982). These readings can be translated to English roughly as being in the perfect form and 'it turns out that'.

Zhangsan say/think Lisi take-PFV book only and NEG.PFV zuo qita de shi].
do other de matter
'Zhangsan said/thought that Lisi only took the book, yet Lisi didn't do any other things.'

b. *Zhangsan dasuan [jian Lisi **eryi**, er bu daying ta
Zhangsan plan meet Lisi only yet NEG promise 3SG renhe yaoqiu].
any request
'Intended: Zhangsan planned to only meet Lisi and yet not to promise anything to him.'

c. *Zhangsan changshi [jian Lisi **eryi**, er bu cong ta
Zhangsan try meet Lisi only and NEG from 3SG nali dedao renhe dongxi].
there obtain any thing
'Intended: Zhangsan tried to only meet Lisi and not to get anything from him.'

2.4 Clausal transparency

The preceding sections suggest that 'aspect lowering' is triggered in some *Situation* and *Event* complements but is not detected in *Proposition* complements (J. Huang 1989, A. Li 1990, Hu et al. 2001, Grano 2012, 2015, N. Huang 2018, He 2020). Specifically, *le*$_1$*/guo* in *Situation* and *Event* complements indicates that the runtime of both the matrix and the complement event precedes the utterance time, as if the complement is integrated into the matrix event to be operated as a whole for temporal anchoring, indicating a transparent domain. Below I further take inner topicalization and focus fronting to illustrate transparency differences among complements. Please refer to J. Huang (2022) for more diagnostics on the transparency of complement clauses.

Inner topicalization (Ernst and Wang 1995, Shyu 1995, Paul 2002, 2005; T.-H. Lin 2015 etc.) refers to preposing the object to a position following the matrix subject but before the matrix predicate. In (30), the preposed object needs to be within the same clause as the embedded predicate, indicating that inner topicalization is clause bounded. However, inner topicalization is available for the *Event* complement and *Situation* complement in (31), showing that there is no clause boundary between the matrix and the complement for this operation.

(30) a. Wo xiangxin [Lisi [**zhe-pian baogao**$_1$] xie-wan-le t_1].
I believe Lisi this-CL report write-finish-PFV
'I believe that Lisi has already written this report.'

b. *Wo [**zhe-pian baogao**$_1$] xiangxin [Lisi xie-wan-le t_1].

(31) a. Wo [**zhe-pian baogao**$_1$] hui changshi [jinkuai
I this-CL report will try as soon as possible
xie-wan t_1]
write-finish
'I will try to finish this report as soon as possible.'

b. Lisi [**jinzhan baogao**$_1$] dasuan [zai zhe zhou nei tijiao
Lisi progress report plan at this week in submit
t_1]
'Lisi plans to submit the progress report this week.'
(Adapted from N. Huang 2018: 351, the original matrix predicate in (31a) is *shefa* 'try')

Focus fronting also applies for *Situation* and *Event* complements, but is blocked in *Proposition* complements[20] (Ernst and Wang 1995, Shyu 1995, Paul 2002, 2005etc.). In (32a-b), the focused element in a *lian...dou* phrase has to be within the embedded clause. In the *Situation* and *Event* complements in (32c), focus fronting is possible out of the embedded clause.

(32) a. Lisi xiangxin [Zhangsan [lian **zhe zhong xiao shi**]$_1$ dou
Lisi believe Zhangsan even this type small matter all
ziji chuli t_1].
self handle
'Lisi believes that Zhangsan handles even trivial matters like these himself.'
b. * Lisi [lian **zhe zhong xiao shi**]$_1$ dou xiangxin Zhangsan
[ziji chuli t_1]
c. Lisi [lian **zhe zhong xiao shi**]$_1$ dou {changshi/ dasuan} [ziji
Lisi even this type small matter all try/plan self
chuli t_1].
handle
'Lisi tries/plans to handle even trivial matters like these himself.'
(N. Huang 2018: 352, the original matrix predicate in (32c) is *shefa* 'try' instead of *changshi* 'try'.)

The restructuring phenomena above suggest that *Situation* and *Event* complements constitute a transparent domain for certain syntactic operations, while *Proposition* complements do not.

2.5 Interim summary

The properties associated with clausal (in)dependency, structural complexities and clausal transparency in Mandarin complement clauses are summarized in Table 2.

[20] One reviewer suggests that he/she accepts focus fronting in *Proposition* complements, different from the reported observation. Most of my consultants have a dialectal background in the northern area of mainland China. Their judgements replicate those in the literature which show that focus fronting is clause-bounded. Dialectal influence might play a role in the judgement variation.

Table 2

Clausal properties under discussion

Properties		Morphosyntactic tests	Propositions	Situations (future irrealis)[1]	Events
(In)dependence	temporal reference	different time adverbs	√	√	×
		aspect markers	free	*PROG PFV/EXP (restructuring only)	*PROG PFV/EXP (restructuring only)
		overt future modal *hui/jiang/ jiang-hui/jiang-yao*	√	(×)[2]	×
	subject reference	syntactic forms	lexical DPs	PRO, *cpro*, reflexive, bound pronoun	PRO
		reference	non-control/control	control	control
Complexity	distribution of modals	modals higher than future modals	√	×	×
		modals below future modals	√	√	(√)
	SFPs in Low C	*le₂, laizhe, eryi*	√	×	×
Transparency		inner topicalization	×	√	√
		focus fronting	×	√	√
		aspect lowering	×	√	√

Note. [1] This table only summarizes the performances of future irrealis *Situation* complements, which are the majority of this group.
[2] (×) indicates that overt future morphemes are unavailable in most future irrealis *Situation* complements, but not all (finite *Situation* complements can license overt future morphemes).

Many of the clausal properties in Table 2 are once argued to diagnose finiteness in the literature. Now we can see how they are connected. They show that *Proposition* complements do not impose constraints on temporal reference and more or less pattern like independent root clauses. This class constitutes an opaque domain that may license non-controlled overt embedded subjects, various modals and embeddable SFPs. *Event* complements require the matrix event to be simultaneous with the complement event and only allow controlled PRO. *Situation* complements are in between. They pattern closely with the *Event* complements in creating a transparent domain disallowing aspect marker (unless aspect lowering occurs), overt future markers and SFPs. The properties in Table 2 illustrate that the ICH effect is also observable in Mandarin: *Proposition* complements are more independent, more complex and less transparent than the other two groups. Finiteness, no matter exactly which morphosyntactic property a language chooses to represent, is a clausal property sensitive to ICH (Wurmbrand et al. 2020).

3. The syntax-semantics mapping of complement clauses

The source of ICH is the containment relation among clausal domains corresponding to their semantic primitives. Ramchand and Svenonious (2014) propose that the conceptual primitive of an event description requires the projection of VP. Then a situation description is built by relating an event to a time through T. By anchoring a situation through C to an utterance context in which Force and speaker-oriented properties come into play, a proposition description is created. Thus the implicational relations among the three clausal domains are established. Namely, as Wurmbrand and Lohninger (2023) suggest, the projection of an Operator domain must involve the projection of Theta domain and TMA domain, and the projection of a TMA domain must be built on the projection of the Theta domain, but not vice versa. Wurmbrand and Lohninger (2023) extend this proposal to complement clauses and suggest a "synthesis model of complementation". This model distinguishes itself from other alternatives in at least two ways: only assuming minimal projections for specific meanings and highlighting a dynamic interaction between the matrix predicate and the complement clause. *Propositions*, *Situations* and *Event*s have to at least project the Operator domain, TMA domain and Theta domain respectively. This minimal projection hypothesis predicts that *Proposition* complements always tend to be more independent, opaque and complex than the other two classes, because the Operator domain often leads to syntactic and semantic consequences such as freezing effect, independent temporal anchoring and speaker-oriented projections (Chomsky 2001, Bianchi 2003, Bošković 2008 etc.). A *Situation* complement is relatively more complex and independent than an *Event* complement because the TMA domain involves tense, modal and agreement projections that are missing in the Theta domain. Hence ICH is derived.

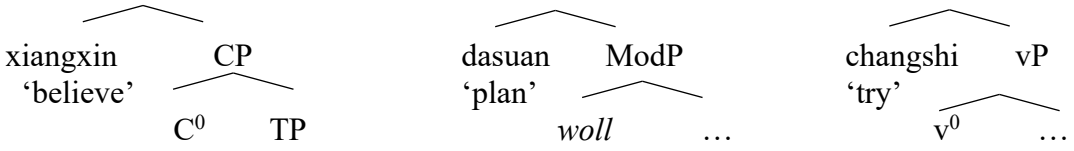
The synthesis model only sets a lower bound of the clause size dependent on interpretations, no upper bound or one-to-one correspondence between syntax and semantics is designated. The proposal is compatible with a free merge system, where the compatibility of verb-complement configurations is determined at the output when syntax feeds into semantics (Lohninger and Wurmbrand, to appear). However, the model does restrict projections beyond the minimal with semantic selection. A syntactic structure beyond the minimal is projected only if it has no consequence for interpretation. Otherwise, projections from higher domains are prohibited because their existence signals another class of complement. Therefore, the current proposal is essentially different from a fixed-size view of clausal complementation in Granno (2015, 2017), in which the clause size is assumed to be maximal with few semantic factors coming into play. Moreover, the model not only admits the influence of matrix predicates on complement clauses, but also recognize that the interpretation of the complement plays a role to some extent in deciding which meaning speakers pick for the matrix predicate. This model nicely captures the Mandarin facts, which I will elaborate on next.

3.1 Minimal projections and projections beyond the minimal

Following He (2020), J. Huang (2022), I extend the proposal in Wurmbrand and Lohninger (2023) to Mandarin and assume that the minimal functional projections of *Proposition*, *Situation* and *Event* complements are CP, ModP and vP respectively, as demonstrated in (33). Future irrealis

Situation complements involve a covert future modal *woll* (Abusch 2004, Wurmbrand 2014) to express future,[21] thus possessing the minimal projection of a modal phrase (ModP), i.e. *woll*P. Negation, manner adverbs, *ye* 'also' do not induce changes in temporal relations, illocutionary force or speaker-oriented properties, thus are felicitous in Mandarin *Event* complements, even though they project above vP.

(33) a. *Propositions* b. future irrealis *Situations* c. *Events*



The Operator domain in *Proposition* complements explains why this class constitutes an opaque domain that prevents cross-clausal syntactic operations (Chomsky 2001, Bošković 2008, Wurmbrand 2015 etc.). N. Huang (2018) assumes that inner topicalization and focus fronting in Mandarin involve overt cyclic movements to the specifier of InnerTopicP/InnerFocusP in the Operator domain, and treats aspect lowering as an Agreement operation between the aspect marker base-generated on the verb and an unpronounced aspect head in the matrix for feature valuation. Upon feature valuation achieved by movement, the inner topic/focused expression freezes in the *Proposition* complements and cannot move further to the matrix. Due to the Phase Impenetrability Condition (PIC, Chomsky 2001), the aspect marker in a *Proposition* complement clause fails to agree with the matrix AspP across the Operator domain. Hence these phenomena are blocked in *Proposition* complements but not in *Situation/Event* complements in which the Operator domain is missing in general.

The synthesis model also indicates that not all elements from the Operator domain are excluded from *Situation* complements or *Event* complements, except those that are significant in determining the semantic type of complements. As we can see in Table 2, SFPs and epistemic modals are excluded in *Situation* and *Event* complements. [22] Syntactically speaking, since SFPs are in the Low C domain and epistemic modals are not only high above TP (Cinque 1999), but are also above *le2* and *laizhe*, these are projections of the Operator domain (Grano 2017). Semantically speaking, these elements also yield semantic consequences that can change the complement type.

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[21] For *Situation* complements that involve a pre-specified anterior temporal relation, e.g., the complement of *houhui* 'regret', no *woll*P is projected, but AspP is.

[22] For the time being, I have to set aside the account for the distribution of aspect markers, because its complexity exceeds the scope of this article. But I would like to offer my preliminary thoughts. T.-H. Lin (2011) suggests that a non-finite T^0 in *Situation* and *Event* complements lacks a value for the reference time for the imperfective to achieve temporal anchoring, thus imperfective aspect is excluded. The perfective aspect marker *le1* somehow is different and does not require a reference time, hence is available in some non-finite complements. I am afraid that this proposal is problematic. Besides the stipulation that Mandarin perfective and imperfective aspect are very different in temporal anchoring, additional stipulations need to be made regarding English and Mandarin given that English *Situation* and *Event* infinitives are compatible with aspect projections, as shown below. If the incompatibility with aspect projections is due to the lack of reference time in non-finite clauses, English and Mandarin non-finite clauses should follow the same constraints in aspect projection, contrary to fact.

(i) a. He has not had a good season with injury and must be a bit depressed – he wants to be playing.
b. Try to be looking at the child when you make your request.
(Data cited herein have been extracted from the British National Corpus: http://www.natcorp.ox.ac.uk/, distributed by the University of Oxford on behalf of the BNC Consortium. All rights in the texts cited are reserved.)

Le$_2$ and *laizhe* pose temporal-aspectual restrictions on the event (T.-H. Lin 2011, 2012, 2015; J. Huang 2022 among others), therefore will alter the temporal relation that conflicts with temporal restrictions of a complement class. For instance, temporal anteriority encoded by *laizhe* is incompatible with temporal posterity and simultaneity restrictions encoded by future irrealis *Situation* complements and *Event* complements. Hacquard (2010) suggests that epistemic modal bases require an information state, which is usually provided by the speaker of the speech event if the epistemic modal is in the matrix clause, or by some attitude predicates when it is embedded (Anand and Hacquard 2013). The information state realized by the Operator domain, as Ramchand and Svenonious (2014) indicates, is a signature property of descriptions specific to *Proposition* complements. Therefore, if *Situation/Event* complements maintain their typical interpretations, SFPs and epistemic modals from the Operator domain are excluded.

An example of CP projection in *Situation* complements and *Event* complements that does not yield semantic consequences is the Mandarin complementizer *shuo*. *Shuo* is a clausal introducer that precedes other elements in the clause. N. Huang (2018), J. Huang (2022) propose that *shuo* heads a CP and must cliticize to something on its left. According to Wurmbrand and Lohninger (2023), the existence of CP in *Situation* and *Event* complements in principle indicates the existence of the Operator Domain. What's special with *shuo* is that it can occur in all types of complements, but does not induce PIC violations for internal topicalization and focus fronting.[23] More importantly, even though *Situation* and *Event* complements can project a CP headed by *shuo*, other projections that are available in *Proposition* complements, e.g. epistemic modals, SFPs, and overt referential DPs etc., are still prohibited (N. Huang 2018). No detectable semantic difference is observed in complements with and without *shuo*. Thus *shuo* is semantically vacuous and does not change the interpretation of the complement clause. Following the heterogeneity hypothesis of complementizers (Kratzer 2006, Moulton 2009), He (2020) suggests that *shuo* serves as an identity function "λp.p" (Kratzer 2006) that ships off whatever its input is in the derivation without any semantic contribution. In other words, *shuo* is compatible with a full-fledged CP for *Proposition* complements, as well as a reduced CP for *Situation* or *Event* complements in which certain functional projections are missing. Clausal complements headed by *shuo* serves as an example for the insight in Wurmbrand and Lohninger (2023) that mismatches between syntactic categories and semantic interpretations are possible if a syntactic structure induces no interpretation consequence.

3.2 Alternation of interpretations

Predicates tend to select some type(s) of complement(s), but also involve certain degree of flexibility. English and Mandarin have predicates that are restricted to a certain complement type. For instance, 'try' in English and Mandarin only take an *Event* complement in general, as shown in (34)-(35). Meanwhile, both languages have predicates that flexibly choose different types of complements. For example, *forget* allows a *Proposition* complement as in "I forgot that I watered the plant" or an *Event* complement as in "I forgot to water the plant". Mandarin *wangji* 'forget' shows a similar pattern in (19)-(20), which I will not repeat here.

(34) a. John tried to come earlier.
b. *John tried that he will come earlier.

(35) a. Zhangsan changshi [PRO zuo zhe-dao cai].

[23] Readers can refer to N. Huang (2018), J. Huang (2022) for different syntactic approaches to *shuo*-constructions.

Zhangsan try make this-CL dish
'Zhangsan tried to make this dish.'

b. ??Zhangsan changshi [ta hui zuo zhe-dao cai].
Zhangsan try 3SG FUT make this-CL dish
'Lit: ??Zhangsan tried that he will make this dish.'

Previous literature has noticed Mandarin examples that deviate from the general pattern of *Situation* complements and *Event* complements. These cases are often either taken to argue against the morphosyntactic tests in distinguishing *Proposition* complements from the others, or are reported to be marginal and thus not counterexamples to the general pattern. For instance, *Situation* complements only allow overt subjects in a limited way while *Event* complements do not. However, Hu et al. (2001) suggest that the *cpro* in the *Situation* complement of *zhunbei* 'prepare' and *Event* complement of *shefa* 'try' below can be interpreted as an embedded subject.

(36) a. Wo zhunbei [*mingtian xiawu tian hei yihou* **wo**
I prepare tomorrow afternoon sky dark after I
yi ge ren lai].
one CL man come
'I plan to come alone tomorrow afternoon after it gets dark.'

b. Ni zuihao shefa [*jintian xiawu san le hui*
you had-better try today afternoon end ASP meeting
yihou **ni yi ge ren** lai]
after you one CL person come
'You had better try to come by yourself this afternoon after the meeting is over.'
(Hu et al. 2001:1131)

The fact that these examples do not pass the *lian…dou* test shown in (37) indicates that the *cpro* in (36) is better analyzed as an adverbial instead of an overt subject. When the long adjuncts (italic) in (36) between the matrix predicate and *cpro* are removed, the sentences treating *cpro* as the embedded subject are much more degraded.

(37) a. ??Wo zhunbei [mingtian xiawu tian hei yihou *lian*
1SG prepare tomorrow afternoon sky dark after lian
wo yi ge ren *dou* lai].
1SG one CL person DOU come

b. ??Ni zuihao shefa [jintian xiawu san le hui yihou
2SG had-better try today afternoon end ASP meeting after
lian **ni yi ge ren** dou lai].
lian 2SG one CL person dou come

The judgements of our consultants mainly align with the general pattern that Mandarin *Event* and *Situation* complements tend to be incompatible with overt embedded subjects. They prefer to replace *cpro* with a pure adverbial modifier *yi ge ren* 'on one's own'. If *cpro* is forced to be interpreted as the subject, some consultants prefer to reinterpret *zhunbei* 'plan, prepare to' as *pansuan* 'consider the plan, make the plan' and *shefa* 'try' as 'make an effort to achieve the goal such that...'. When understood as *pansuan* 'consider the plan, make the plan of', *zhunbei* no longer

requires a controlled embedded subject (J. Huang 2017) and future morphemes like *hui/jiang* are possible, as shown in (38), in contrast to typical future irrealis *Situation* complements.

(38) a. Wo zhunbei [tian hei yihou **nimen** xian guolai].
1SG prepare sky dark after 2PL first come-over
'I made the plan that you guys come here first after it gets dark.'

b. Wo zhunbei [mingtian **hui/jiang** you nimen zhuchi zhe-ge huiyi].
1SG prepare tomorrow FUT by 2PL host this-CL meeting
'I made the plan that tomorrow you guys will host the meeting.'

As Wurmbrand and Lohninger (2023) suggest, a verb may shift their interpretations as a last resort option for mismatches between the target complement of the predicate and the actual complement class that its morphosyntactic properties point to. For speakers who accept overt subjects in (36), I propose that coercion (Pustejovsky 1995) plays a role: the predicate changes its meaning slightly to take a proposition-like complement, accommodating the interpretation that the morphosyntactic properties target at. The availability of coercion demonstrates speaker variation. Hence unlike predicates that are flexible in complementation, for which speakers agree on judgements, it is common to observe judgement disagreements that do not show a regular pattern for coercion cases. Moreover, to achieve the coerced reading, stress or extra linguistic context like the long adjunct in (36) is often in need, which is unnecessary for cases of flexible complements like those in (19)-(20). [24]

3.3 Interim summary

In this section, I adopt the synthesis model to account for the syntax-semantics mapping in Mandarin complementation. The containment relation among the syntactic domains realized by the minimal projections explains why *Proposition* complements tend to project a larger clause size than *Situation* complements and *Event* complements. However, larger-than-expected structures such as negation, ye 'also', certain adverbial phrases and *shuo* etc., are also available since these projections do not change the complement class semantically. Predicates also involve certain degree of flexibility in complement selection. Some *Event* complements and *Situation* complements reported to show properties of the *Proposition* class in fact involve coercion.

4 Tense as the defining property of finiteness in Mandarin

Though Wurmbrand and Lohninger's synthesis model on complementation is attractive in capturing syntax-semantics mismatches, it does not explain why some predicates select a specific morphosyntactic realization of the interpretation but not others, if merge is free, e.g. *try* only takes an infinitive complement but not a finite one in English or Mandarin. One phenomenon that remains unexplained in Table 2 is the prohibition of *hui/jiang/jiang-hui/jiang-yao* in Mandarin *Situation* complements denoting future irrealis interpretations. As one reviewer emphasized, there

[24] It remains an open question about the extent of complement class and predicate meaning switches. Moreover, how the semantics of predicates can be modeled to allow the flexibilities of complements calls for future investigation, see Moulton (2009) for a proposal compatible with this line.

is no evidence for overt future morphemes semantically changing the complement class and their existence satisfies the minimal projection of future irrealis *Situation* complements, thus we would predict that overt future morphemes are compatible with *Situation* complements, contrary to fact. To capture the distribution of overt future morphemes, some version of c-selection is required. This might also be the case for other projections that do not yield semantic consequences, but are characteristically restricted to certain complement classes. In this section, I will correlate the distribution of overt future morphemes with tense and revive the idea that Mandarin exploits tense features to express finiteness. Extending the decomposition view of *will*/*would* to Mandarin, I offer a unified account for the distribution of overt future morphemes in both languages. On top of the empirical and theoretical gains proposed by J. Huang (2022), I further suggest other arguments in favor of relating finiteness to tense and illustrate where Mandarin fits in the cross-linguistic picture.

4.1 Tense and finiteness

A. Li (1985, 1990), T.-H. Lin (2011, 2012, 2015) suggest that as in English, finiteness in Mandarin is syntactically encoded by some (possibly null) tense element. Mandarin being a superficially tenseless language has long challenged the hypothesis of linking finiteness to tense (J.-W. Lin 2006, Grano 2017)[25]. Sun (2014) observes that like many superficially tenseless languages (Matthewson 2006, Thomas 2014, Mucha 2015, Bochnak 2016, Cable 2017 etc.), Mandarin bare predicates in root clauses are feasible with present or past time adverbs, but the combination with future time adverbs is degraded unless overt future markers such as *hui*, *jiang* are present, demonstrated by the examples below.

(39) a. Lulu xianzai hen jusang.
Lulu now very frustrated
'Lulu is very frustrated now.'

b. Lulu gangcai hen jusang.
Lulu just.now very frustrated
'Lulu was very frustrated just now.'

c. Lulu mingtian *(hui/jiang) hen jusang.
Lulu tomorrow FUT very frustrated
'Tomorrow, Lulu will be very frustrated.'

(Adapted from H. Sun 2014: 163-165)

Assuming that time adverbs modify the reference time, Sun proposes that Mandarin possesses a covert non-future tense[26] that constrains the reference time to be present or past, assumed in many other superficially tenseless languages. The existence of a covert semantic tense in Mandarin

[25] What exactly 'tense' refers to is different in the literature. For instance, many researchers assume a tense projection in Mandarin to account for other feature-driven syntactic phenomena (Tsai 2010, T.-H. Lin 2011 etc.). This syntactic assumption is not motivated by evidence supporting a semantic tense operator that constrains the reference time, in the sense of J.-W. Lin (2006).

[26] As one editor points out, the current account for the distribution of overt future morphemes only relies on the existence of tense, without preference to a non-future tense. In fact, as far as the data presented here are concerned, non-future tense vs. an English-like tense system (Sybesma 2007) make no different predictions (He 2020), though the latter is more controversial. Since my proposal does not hinge on the kind of tense, I simply highlight that there is independent evidence in support of semantic tense in Mandarin.

makes it reasonable to assume a tense projection in syntax, thus paves the way for linking finiteness to tense.[27]

Abusch (1985, 2004), Kaufmann (2005), Wurmbrand (2014) etc., suggest that English *will* and *would* are decomposed into two parts: a true tense and a future modal *woll* that shifts the reference time to the future. *Will* is the spell-out of the present tense and *woll,* while *would* is the spell-out of the same modal and the past tense. English future irrealis infinitives only contain *woll* but not tense, thus neither *will* nor *would* is available. Similarly, most Mandarin future irrealis *Situation* complements semantically require posteriority but never allow overt future modals. This pattern is not due to semantic restrictions and must be attributable to other reasons. If the presence of *will/would* indicates the presence of tense in English, given the parallel between English and Mandarin, it is reasonable to assume that the incompatibility with *hui/jiang/jiang-hui/jiang-yao* in future irrealis *Situation* complements follow the same pattern: *hui/jiang/jiang-hui/jiang-yao* are the morphological spell-out of tense and the future modal *woll*, which is unavailable in *Situation* complements that lack tense.

Correlating overt future morphemes like *hui* or *jiang* with tense in Mandarin is not a new idea. A. Li (1990) suggests that *hui* is the future tense in Mandarin, and N. Huang (2015) argues that *jiang* is. Therefore *hui/jiang* is allowed in finite clauses but not in non-finite ones. Instead of treating *hui/jiang* as a future tense, I believe that it is better to analyze *hui/jiang* (as well as *jiang-hui/jiang-yao*) as a modal that signals the presence of tense. If we admit that *hui/jiang* are future tenses, then sentences denoting non-future readings without future tenses probably contain tenses, too (N. Huang 2015). In other words, English and Mandarin are fundamentally similar except that the tense in Mandarin non-future sentences is covert. Since Chomsky (1957), many linguists do not assume a tripartite (i.e. present, past and future) but a dual tense system (i.e. present and past) for English. Future markers are often treated as modals with temporal constraints in the literature (Partee 1973, Coates 1983, Enç 1996, Palmer 2001, Condoravdi 2002, Bochnak 2019 etc.) due to their similar performances with modals and their non-deictic nature, which is unlike that of present and past tense. Mandarin *hui/jiang* should not be different, either. One reviewer questioned whether not treating *hui* as a future tense fails to capture the non-future restrictions on time adverbs demonstrated in (39), based on the assumption that a non-future tense stands in paradigmatic opposition with overt future markers. I do not think that the constraint on temporal adverbs relies on how we treat future markers. Non-future tense does not necessarily stand in paradigmatic opposition with future tense, either. Let's take a closer look at what it means for *hui/jiang* to be the output of a non-future tense and *woll*. The modal *woll* shifts a given time to the future. Here we call this given time 'evaluation time'. Structurally, the tense operator c-commands *woll*. Thus compositionally, the evaluation time of *woll* is supplied by tense (Rullmann and Matthewson 2018), hence we can obtain a present future reading if the tense operator is present or a past future reading if a past tense is supplied. If a non-future tense exists, then together with *woll* both the present future reading like *will* and the past future reading like *would* are possible. Without elements involving *woll* that shifts the time to the future, the covert non-future tense is the only restrictor of the reference time, which is reflected on the selection of time adverbs.

The decomposition view of overt future morphemes and the tenseless hypothesis of *Situation* and *Event* complements provide one unified way for Mandarin and English to capture the distribution of overt future markers. *Proposition* complements are tensed, hence *hui/jiang/jiang-hui/jiang-yao* can show up for future irrealis readings. In contrast, future irrealis *Situation* complements, though semantically compatible with overt future morphemes, are syntactically

[27] Sun (2014) also indicates a correlation between non-future tense and finiteness in complement clauses.

tenseless, and so cannot license *hui/jiang/jiang-hui/jiang-yao*, which contain tense (by the decomposition hypothesis). For *Event* complements, they are temporally simultaneous with the matrix event, and thus semantically disallow a future-shifting modal, whether it is *woll* or *hui/jiang/jiang-hui/jiang-yao*. On the other hand, given their parallel syntactic performances with *Situation* complements in Mandarin and infinitives in English, it is reasonable to assume them to be syntactically tenseless. The fact that *hui/jiang/jiang-hui/jiang-yao* is not licensed in *Event* complements is also predicted.

If we are on the right track, there are at least two technical ways of implementing 'tenselessness' in syntax. One way is to assume that there is no TP projection at all in 'tenseless' clauses. The other way is to follow the traditional analysis for infinitives in early Generative Grammar, namely, TP is projected but its head bears a deficient tense feature, represented as [-T]. I am open to both hypotheses given that the current proposal does not rely on whether TP is projected or not, and there is no evidence to help us choose between the two alternatives. For the convenience of illustration, I assume the projection of TP with different feature values to represent the finiteness distinction (Sybesma 2007, T.-H. Lin 2011, J. Huang 2022). The values of T features under consideration at this stage are not in fact the various tenses, but simply plus and minus, in the sense of Pesetsky and Torrego (2007) in which different tense semantics (present, past and non-future) stand to the positive value for T while the lack of those stands to a negative value.[28] One technical question arising from the selection of finite/non-finite complements is how it is established across projections beyond TP, assuming that c-selection is local. Following N. Huang (2018), I assume that the matrix verb selects the topmost projection, e.g. CP, which in turn selects the embedded TP. For instance, the complementizer *shuo* comes in two varieties: finite and non-finite. Finite *shuo* occurs with a constituent that can host a tensed clause while non-finite *shuo* does not.

Another piece of arguments in favor of linking finiteness to tense in Mandarin is the theoretical benefits of accounting for the distribution of overt embedded subjects. In many languages, tensed clauses license overt subjects while non-finite clauses do not; hence tense and agreement features often link to subject licensing (Chomsky 1981, Landau 2004; Adger 2007 etc.). As shown in Table 2, overt future morphemes and overt referentially independent subjects share the same environment. If Mandarin *Proposition* complements are tensed while the other two groups are tenseless, overtness of subjects in Mandarin complement clauses is borne out following the same mechanism as in English.[29] Therefore, linking finiteness to tense in Mandarin is not only feasible given the evidence supporting the existence of tense, but also theoretically beneficial since subject licensing can also be derived through syntactic means with little cost to the grammar (see also J. Huang's (2022) interesting discussion on tense, finiteness and binding, once we link finiteness to tense).

[28] This treatment is similar to the proposal by T.-H. Lin (2011: 54) in which T^0 in Mandarin can have a value or have no value, in the former case the TP is finite and in the latter it is non-finite. I will leave the details of temporal anchoring in a compositional way to another occasion.

[29] Unlike English, some future irrealis *Situation* complements in Mandarin occasionally license bound pronouns, *cpro* and reflexive *ziji* as overt embedded subjects (at least no strong evidence suggests that they are not), and *hui/jiang /jiang-hui/jiang-yao* are still not preferred. Given the current proposal, the prohibition of overt future morphemes indicates that these complements are tenseless. Note that *cpro*, bound pronouns, *ziji* and PRO form a group termed as bound minimal pronouns in Zhang (2016) and demonstrate semantic and syntactic differences from other referentially independent overt DPs. Thus it is reasonable to assume that the licensing of minimal pronouns in non-finite environments might undergo a different process.

To recap, following A. Li (1990) and N. Huang (2015), I propose that Mandarin future markers signal tense that defines finiteness in the language. Rather than treating future markers as tense morphemes as in A. Li (1990) and N. Huang (2015), I assume that they are future modals that indicate the presence of tense because they are the morphological spell-out of tense and *woll*, extending the decomposition analysis of English will/would (Absch 1985, 2004) to Mandarin. This proposal offers a unified account for the parallel distribution of future markers in English and Mandarin, with the potential theoretical benefits of accounting for the distribution of overt subjects.

4.2 Mandarin finiteness in the cross-linguistic picture

In the previous section, I have argued that taking tense as the defining property for finiteness in Mandarin is a productive move in empirical coverage and theoretical parsimony. *Proposition* complements project at least the Operator domain on top of a tensed TP. *Event* complements only possess a deficient T^0 (if TP is projected at all) and Mandarin *Situation* complements often follow the *Event* class. However, we do observe that some *Situation* complements pattern similarly with *Proposition* complements rather than their fellows in some aspects. For instance, like its English counterpart in (40a), *jueding* 'decide' can also allow referentially independent overt subjects and overt future morpheme *jiang-hui* in (40b). Similarly, *(hen) houhui* 'regret' only licenses referentially dependent subjects, like *Situation* complements typically do. However, *ziji* 'self' or pronouns in the complement are interpreted as subjects, and aspect markers are required as they are in *Proposition* complements, as illustrated in (40c).

(40) a. Clara decided that she would leave. (Wurmbrand and Lohninger 2023)

b. Gongsi jueding [**Zhangsan** **jiang-hui** jieshou zhe-ge
company decide Zhangsan FUT take-over this-CL
xiangmu].
project
'The company decided that Zhangsan will take over this project.'

c. Zhangsan$_i$ hen houhui [**ziji$_i$/tamen$_{i+}$** dangshi **zai** canguan
Zhangsan vey regret self/they at-that-time PROG visit
bowuguan].
museum
'Zhangsan regratted that he/they went to the museum at that time.'

Like factive *wangji* 'forget' and *jide* 'remember' that take a *Proposition* complement, *houhui* 'regret', *jueding* 'decide' can also take a complement that denotes a proposition. But they are different in temporal and subject referential independence. Past, present and future interpretations are available for the complement of *wangji* and *jide*, if the right morphology shows up. However, the complement of *houhui* 'regret', *jueding* 'decide' are temporally dependent, thus belong to the *Situation* class. The embedded subject of *houhui* 'regret' must be controlled, while factive *wangji* 'forget', *jide* 'remember' do not impose controlled subjects. I suggest that it is so because predicates like *houhui* 'regret', *jueding* 'decide' select a *Situation* complement in the finite form. Thus the complement follows the *Situation* class in temporal and/or subject referential dependency, but is finite like *Proposition* complements, licensing overt subjects and regular temporal marking.

To sum up, Mandarin *Proposition* complements select a finite form while *Event* complements select a non-finite form. *Situation* complements in general prefer non-finiteness, but some can or

must choose a finite version. Table 3[30] includes Mandarin in the cross-linguistic data discussed in Wurmbrand et al. (2020), Wurmbrand and Lohninger (2023) about finiteness preferences in clausal complementation.

Table 3
Mandarin finiteness in the cross-linguistic picture
(Adapted from Wurmbrand et al. (2020), Wurmbrand and Lohninger (2023))

Language	Proposition	Situation	Event
Bulgarian, Macedonian, Greek	finite	finite	finite
Romanian, Akan	finite	finite	(non-)finite
English	(non-)finite	(non-)finite	non-finite
Serbian	finite	(non-)finite	(non-)finite
Slovenian, Mandarin	finite	(non-)finite	non-finite
Croatian	finite	non-finite	non-finite

As Table 3 shows, since in Bulgarian, Macedonian and Greek, *Event* complements are finite, then other complements to its left in ICH, i.e. *Proposition* and *Situation* complements are also finite. It is impossible for *Proposition* and *Situation* complements to be non-finite. If *Event* complements are non-finite, then the finiteness option is open for other complements to its left. For instance, English has finite and non-finite forms for both *Proposition* and *Situation* complements. Croatian has non-finite *Situation* complements and finite *Proposition* complements. Mandarin and Slovenian, leave both options open for some *Situation* complements but only choose the finite form for *Proposition* complements. The cross-linguistic pattern in Table 3 reveals an implicational universal, as defined in (41) by Wurmbrand et al. (2020).

(41) (Hypothetical) Finiteness Universal
If a language {allows/requires} finiteness in a type of complement, all types of complements further to the left on ICH also {allow/require} finiteness.

One reviewer suggests that for Mandarin, it is simpler to merge *Situation* complements into *Proposition* complements and *Event* complements respectively, so that the mapping is equivalent to finite/non-finite clauses. Or alternatively, it is more reasonable to assume that a *Proposition* complement maps to a full CP, a *Situation* complement maps to a subjunctive clause with a subjunctive tense, and an *Event* complement maps to a real infinitival clause, which is untensed. I agree that if we are only concerned about finiteness, indeed concrete cases of the *Situation* class are either classified as finite, like *Proposition* complements, or as non-finite, like *Event* complements. That is exactly how I treat the data. But the three types of complements are observed cross-linguistically, independently characterized based on (mainly) temporal independence and subject independence. They are not categorized according to finiteness. Cross-linguistic data do show that it is common for members of a certain complement class to c-select a finite or a non-finite form, or both. If we agree with the cross-linguistic three-way classification of complementation, there is no reason to treat Mandarin differently only because we are talking

[30] 'Finite' and 'non-finite' in Table 3 means that only the finite or the non-finite form is available. '(Non-)finite' means that both finite and non-finite form are observed. The discussion in Wurmbrand et al. (2020) also include Bosnian, but they have not been able to conclusively allocate it to a category in Table 3. Therefore, I remove it from the table.

about finiteness. Furthermore, the alternative hypothesis suggested by the reviewer is problematic. It is unclear how to define 'subjunctive tense' in Mandarin, in which arguing for the existence of tense is already controversial. How 'subjunctive tense' differs from normal 'tense' is even more difficult to test. If a 'subjunctive tense' means the pre-specified temporal dependency, i.e. the 'semantic tense' in the sense of Stowell (1982), Chomsky and Lasnik (1993), Landau (2000) etc., Wurmbrand (2014) and Landau (2015) provide convincing arguments against this approach. Moreover, empirical facts also challenge the suggested alternative. The modal *hui* is felicitous in Mandarin subjunctive clauses, as shown in (42). But it is infelicitous in future irrealis *Situation* complements. If *Situation* complements involve a 'subjunctive tense', it is a puzzle why *hui* is fine in subjunctive clauses but not in *Situation* complements. Therefore, we have to admit the relative flexibility of finiteness coding in Mandarin *Situation* complements.

(42) Ruguo wo shi ni, wo hui haobuyouyu-de zou.
if 1SG COP 2SG 1SG HUI without-hesitation-DE leave
'If I were you, I would leave without hesitation.'

5 Conclusions

This article recategorizes some of the significant properties argued to reflect the finiteness distinction in Mandarin into the scale of (in)dependency, complexity and transparency, and demonstrates that clausal complementation in Mandarin also follows the ICH. I argue that the synthesis model of complementation (Wurmbrand and Lohninger 2023) succeeds in capturing a wide range of facts, including clause sizes, transparency, projections of modals, SFP and *shuo*. Taking into account coercion and the flexibility of finiteness coding, I address why some finiteness diagnostics in the literature do not consistently single out a class of finite/non-finite complements.

Furthermore, I suggest that taking tense as the defining property for finiteness in Mandarin (A. Li 1985, 1990) is not only possible given independent evidence supporting the existence of tense in the language (Sun 2014), but also productive given that the distribution of overt future modals *hui/jiang/jiang-hui/jiang-yao* and overt embedded subjects can be properly addressed with little cost to the grammar. The finiteness preference in Mandarin complementation is closer to that in Slovenian: *Proposition* complements only select finite clauses while *Event* complements select non-finite clauses. *Situation* complements mostly choose the non-finite version, but some cases (*jueding* 'decide', *houhui* 'regret') can or must choose a finite form. This pattern also aligns with ICH in the sense that the complements to the left on ICH is always 'equally or more finite' than those to the right.

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