This paper proposes a new syntactic analysis of the Mandarin \textit{zài} progressive, based on the argument that imperfectives and spatial adpositions share a core semantic relation. First, I argue that \textit{zài} is always a locative adposition, based on cross-linguistic diagnostics (Svenonius 2004), distributional evidence, and a novel Mandarin ‘right’-modification test. Then, I show how a unified Figure-Ground semantics for locative adpositions (Talmy 2011, 1978; Svenonius 2006, 2004) can be used to derive the progressive interpretation. Adopting a unified Figure-Ground semantics offers a potential explanation for why some languages encode imperfective aspect using locative adpositions, as opposed to verbal aspectual markers.

1. Introduction

In many different languages, imperfective semantics are encoded using the same phonological form as the locative (i.e. spatial or temporal) adposition (Comrie 1976; Bybee et al. 1994). Because the form of the adposition is used to encode imperfective meaning, I dub this phenomenon “the adpositional imperfective” construction. For example, an adpositional imperfective is present in Basque (Laka 2006), Chol (Coon 2010, 2013a,b), Dutch (Comrie 1976; Boogaart 1991), German (Barrie & Spreng 2009), Icelandic (Thrainsson 2014/1979; jóhannsdóttir 2011; Wood 2012), Japanese (Y. Oseki, p.c.), Jingpo (V. Zu, p.c.), Mêbengokre (Salanova 2007), Scottish Gaelic (Reed 2012), English (Bolinger 1971a,b; Nagano 2014; Kayne 2015; Yang 2015), and (arguably) Mandarin Chinese.

Languages like those above have locative adpositions that can take spatial locations (e.g. ‘the park’, ‘Beijing’, ‘my favorite restaurant’, etc.) as their complements, as in (1)-(3).

\begin{enumerate}
\item \textbf{Zhăngsân \textit{zài} gōng yuán tí \textit{qíu}} \textit{Mandarin Chinese}
\item \textit{Zhangsan at public park kick ball}
\item \textit{(PRS.) ‘Zhangsan is at the public park, playing ball.’}
\item \textit{(HAB.) ‘Zhangsan plays ball in the park.’}
\end{enumerate}
(2) *Ich bin an der Tür*  
German  
1PS be.PRS at the door  
‘I am at the door.’

(3) *Taro-ga gakko-de benkyo-suru*  
Japanese  
Taro-NOM school-at study-do.PRS  
‘Taro is at school studying.’

These adpositions can also take nominals that encodes a span of time (e.g. ‘3 o’clock’, ‘the time when my mom was cooking dinner’, ‘Monday’, etc.) as their complements, as in (4)-(6).

(4) *zài sān-dìan, wǒ tí le qíu*  
Mandarin Chinese  
at 3-CLF I kick ASP_{perf.} ball  
‘At 3pm, I played ball.’

(5) *Am Montag hast du die Uhr repariert*  
German  
at-the Monday have 2PS the clock repair.PTPC  
‘You repaired the clock on Monday.’

(6) *Gakko-ga 3-zi-de ow-aru*  
Japanese  
School-NOM 3-CLF-at end-PRS  
‘School ends at 3 o’clock.’

Crucially, this same form, which has served as a temporal and a spatial locative adposition, can also be used to encode imperfective meaning in these languages, as in (7)-(9).

(7) *wǒ zài tí qíu*  
Mandarin Chinese  
1PS at kick ball  
‘I am playing ball.’

(8) *Ich bin am Lernen*  
German  
1PS be.PRS at-the learn.INF  
‘I am learning.’

(9) *Taro-ga hon-o yon-de-iru*  
Japanese  
Taro-NOM book-ACC read-at-be.PRS  
‘Taro is reading.’

In order to investigate the adposition imperfective more closely, I will take Mandarin Chinese as a case study. After encountering the data above, the next logical question is whether there is one element *zài* in the lexicon that instantiates all of these functions, or whether there are multiple. If there is only one, then there must also be a single meaning that underlies all of the above uses of the term. But, what might this be? For temporal adpositional phrases, they ensure an interval of time overlaps with another interval of time. Spatial adpositional phrases ensure the spatial extent of one entity overlaps with the spatial extent of another. Imperfective aspectual elements situate an interval (i.e., the runtime of a event in progress) within a larger interval that extends into the future, leaving out initial and final subintervals (Dowty 1977, 1979; Landman 1992; Krifka 1992; Smith 1997; Klein 1994; Portner 1998; Hallman 2009), ensuring that the two intervals of time properly overlap.
Looking at the contribution of \textit{zài} in all these cases, there is one semantic component that is shared: \textit{zài} encodes an overlap relation between two elements of the same semantic type. If \textit{zài} is an adposition, then we can rely on prior analyses of the argument structure analyses of locative adpositions (Svenonius 2006, 2004) that apply the notion of Figure-Ground predication (Talmy 2011, 1978; Stowell 2007; Demirdache & Uribe-Etxebarria 2000, 2004; Hale 1986) to predicative locative adpositions. Under these analyses, locative adpositional sentences consist of a Pred. which introduces the Figure and relates it to the Ground (Talmy 1978). In the case of Mandarin \textit{zài}, I take the relevant relation to be overlap. The reasons for this will be discussed in more detail in §3.

Since Figure-Ground semantics can be present in multiple syntactic domains (e.g., locative adpositions, tense, Stowell 2007; Demirdache & Uribe-Etxebarria 2000, 2004), the question arises: what is \textit{zài}’s syntactic category? There is a unified semantic core, but is there unified syntactic behavior as well? This question has sparked a very contentious debate in the Mandarin literature which has raged for the past 50 years (Chen 1978; Smith 1991; Li 1993; Klein et al. 2000; Lin & Liu 2004; Huang et al. 2009; Liu 2009; Chao 1968; Li & Thompson 1974, 1989; Ross 1991; Chan 1980; Woo 2010, 2013); consensus has yet to be reached. Thus, I will devote a portion of this paper to arguing for a locative adposition account for \textit{zài}. If \textit{zài} is a locative adposition, and locative adpositions encode Figure-Ground relations cross-linguistically (Myler 2014; Svenonius 2006, 2004), then \textit{zài} thus encodes a Figure-Ground relation (i.e., overlap).

The layout of this paper is as follows. After arguing that \textit{zài} is always an adposition (§2), I show that the progressive interpretation falls out from a theory of locative adpositional argument structure built on Figure-Ground semantics, supplemented with the assumption that the adposition takes a null eventive nominal as its complement (§3). Finally, §4 concludes. This work has consequences for the analysis of adpositional imperfectives more broadly, since it gives an argument structure analysis for at least one type of adpositional progressive. It also has consequences for the semantics of the progressive aspect, since it shows that a lexical item can encode an isolated semantic sub-component of the meaning of the progressive (i.e., overlap).

I take as background the minimalist program (Chomsky 1995), updated with the Distributed Morphology framework, following Halle & Marantz (1993) and subsequent works. I adopt a ‘T/Y’ architecture of the grammar under which all structure-building is done in the syntax. Categorizing heads assign a syntactic category feature to category-free ‘roots,’ bundles of abstract features that later receive meaning and phonological form at the interfaces.

2. The category of \textit{zài} — Adposition

2.1. Mandarin-internal arguments that \textit{zài} is a locative adposition

Echoing the cross-linguistic debate on the status of category P (see Baker 2003), the Mandarin Chinese literature takes adpositions to be one of the most poorly defined syntactic categories. Often the distinction between adpositions and verbal/aspectual categories is unclear, because Mandarin has very little affixal morphology that could be used to distinguish verbs from adpositions. Also, many adpositions in Mandarin are etymologically related to verbs (Huang et al. 2009:26), and exhibit stereotypically verbal behavior, like acting as the main sentential predicate (Huang et al. 2009:28). Most authors leave aside its modificational use (with Wu 2015 as a notable exception), positing a homophony between \textit{zài} as adposition and \textit{zài} as an aspectual
The term “co-verb” was historically a typologically-relevant descriptive one that was used when an element could not be unambiguously diagnosed as a verb. Using “co-verb” as a syntactic category label has largely fallen out of fashion, especially in the minimalist framework under which concerns of parsimony drive us to minimize the number of possible syntactic category labels (Chomsky 1995).

By some estimations, there is at least one more, gěi, which is used to form ditransitives, and also can stand alone with the interpretation of ‘give’. We will set this one aside for the moment.
Another test for adpositional-hood in Mandarin is topicalization (Huang 1999). Mandarin adpositions can be topicalized, if the speaker is foregrounding certain information (translations adjusted to reflect the semantic contribution of topicalization):

(17) \texttt{wǒ gēn Zhāngsān hěn chù-de-lái} \hspace{1cm} \textit{Huang (1999:(11a))}
\texttt{1PS with Zhangsan very get-along ‘I get along well with Zhangsan.’}

(18) \texttt{gēn Zhāngsān wǒ hěn chù-de-lái} \hspace{1cm} \textit{Huang (1999:(11b))}
\texttt{with Zhangsan 1PS very get-along ‘With Zhangsan, I get along well.’}

(19) \texttt{Zhāngsān dui Lìsī hěn kèqī} \hspace{1cm} \textit{Huang (1999:(12a))}
\texttt{Zhangsan to Lisi very polite ‘Zhangsan is very polite to Lisi.’}

(20) \texttt{duì Lìsī Zhāngsān hěn kèqī} \hspace{1cm} \textit{Huang (1999:(12b))}
\texttt{to Lisi Zhangsan very polite ‘To Lisi, Zhangsan is very polite.’}

(21) \texttt{wǒ zài zhūozì shàng bāi le yì pén huār} \hspace{1cm} \textit{Huang (1999:(13b))}
\texttt{1PS at table on set ASP\textsubscript{PRF} one pot flowers ‘I set on the table a pot of flowers.’}

(22) \texttt{zài zhūozì shàng wǒ bāi le yì pén huār} \hspace{1cm} \textit{Huang (1999:(13c))}
\texttt{at table on 1PS set ASP\textsubscript{PRF} one pot flowers ‘On the table, I set a pot of flowers.’}

For temporal uses of \texttt{zài}, similar topicalization options are available for (21) and (22). However, such topicalizations are not possible for \texttt{zài}-phrases when there is no overt complement.

(23) \texttt{?* [zài \Ø] Lìsī kàn shū} \hspace{1cm} \textit{Liti read book}
\texttt{at \Ø Lisi (int.) ‘Lisi is reading’ (lit.) ‘At Lisi reading.’}

I do not take this piece of evidence to argue against an adpositional account of \texttt{zài} for two reasons. First, topicalization could fail in (23) for reasons that are independent of category; perhaps it is just anomolous to topicalize a PP that has a phonologically null nominal as its complement. Secondly, topicalization has discourse and information theoretic consequences. It is unclear what sort of interpretation could motivate topicalizing \texttt{zài-Ø}. Based on the examples above, \texttt{zài} passes the topicalization test for adpositional-hood.

\textsuperscript{3}Missing from this example is the imperfective aspectual marker \texttt{zhe}. This marker happens to be acceptable with \texttt{xiàng}, for reasons that are unknown and presumably outside the scope of this project.
The final argument that zài is an adposition comes from modification by a degree specifier zhèng ‘right’. Modification by degree specifiers, like right for English, has been used as a diagnostic for prepositional phrases (Boertien 1997; Emonds 1972). An example of how this diagnostic has been applied in (24) and (25) below.

(24) The fat cat napped right under the couch.
(25) Every day, class begins right at 3 o’clock.

In (24) and (25), right modifies a temporal/spatial locative preposition. right is optional, and requires that the interlocutors be held to a higher threshold of precision (see Lasersohn 1999; Morzycki 2001); e.g., class must begin at precisely 3 o’clock. For our purposes here, the observation that right can only modify prepositions (Boertien 1997; Emonds 1972) is what allows us to apply this diagnostic:

(26) * The fat cat napped under right the couch.
(27) * Every day, class begins at right 3 o’clock.
(28) * He is right kicking a ball
       (int.) ‘He is kicking a ball right now’

Similarly, Mandarin Chinese can also use zhèng ‘right’ to modify zài. My translation of zhèng as ‘right’ is partially based on the translation of zhèng as ‘at this point’ in Sun (2014). This translation encodes a similar notion of exactness of degree, which is crucial for the ‘right’-diagnostic to correctly pick out adpositions cross-linguistically. Just as in English, zhèng ‘right’ is barred from modifying verbs directly as in (29).

(29) * tā zhèng tí qiú
       3PS right kick ball
       (int.) ‘He is kicking a ball right now.’

However, when zài is present preverbally, zhèng-modification is suddenly possible:

(30) tā zhèng zài tí qiú
       3PS right at kick ball
       ‘He is kicking a ball right now.’

zhèng ‘right’ cannot modify any of the aspectual markers, which suggests they are not the same category as zài:

(31) * Mali xùexi zhèng zhe
       Mary study right ASPPFV.
       (lit.) ‘Mary is right studying.’
(32) * Mali kàn zhèng gùo zhè bèn shū
       Mary saw right ASPPRF, this CLF book
       (lit.) ‘Mary is right finished reading the book.’
(33) * Mali yǐjīng kàn zhèng le zhè bèn shū
       Mary already read right ASPPRF, this CLF book
       (lit.) ‘Mary already right read this book.’
Thus, I applied the right diagnostic for adposition-hood in English to Mandarin Chinese; a diagnostic that has never before been applied to Mandarin.

(34) yahu de wèiliài zhèng [zài běijīng] zhìzào
Yahoo DE future right at Beijing manufacture
‘Yahoo’s future is being manufactured right (here) in Beijing.’

(35) mèitiān dōu zhèng [zài sāndiǎn] shāng kè
Every-day DISTR right at 3-CLF attend class
‘(I) attend class every day at 3 o’clock.’

These data suggest that zài is not a verb or an aspectual marker. Thus, this section has argued that zài distributes like other Mandarin adpositions, and passes the right-test in its novel application to Mandarin.

2.2. Generalizations about spatial adpositions — Svenonius (2004)

Another way to argue that zài is an adposition is to show that it behaves like other adpositions in other languages. In recent work on the left periphery of spatial adpositions, Svenonius (2004, 2006, 2010) outlined a set of cross-linguistic generalizations over spatial adpositions.

(36) Typical Characteristics of Spatial Adpositions (Svenonius 2004:12)
1. Project XPs which can function as predicates or sentential adjuncts
2. Do not combine with tense or aspect morphology
3. Form a syntactic constituent with a DP complement
4. C-select and S-select for properties of their complement
5. Express binary relations between entities (events or individuals)

Although this list is by no means intended to be a set of criteria that an element must satisfy to qualify as a spatial adposition, it does supply circumstantial evidence that the element in

4 Complications arise for predicative locative sentences, as was noted by Sun (2014), zhèng-modification is less acceptable with predicative locative uses of zài (original gloss, or lack thereof, maintained):

(1) Lulu zài jiā
Lulu at home
‘Lulu is at home.’

(2) * Lulu zhèngzài jiā
Lulu PROG home

I have two responses to this data. First, in the course of my fieldwork, I have found differences between dialects of Mandarin Chinese that suggest the unacceptability of (2) is only present in certain Northern Mainland (NM) Mandarin dialects, but less egregious or absent in Taiwanese Mandarin (TW). This calls the strength of this objection into question. Secondly, the subset of my informants that do not accept zhèng ‘right’ with predicative locative zài report a sense of “incompleteness” (Lu 2015; Sun 2014; Tsai 2008; Chief 2007; Tang 2000). This incompleteness can be recovered by adding more information to the sentence (e.g., a predicative adjunct as in 34), and is thought to come from Mandarin prosodic requirements (Feng 2003, 2014). Because of this, I take the unacceptability of (2) to result from something orthogonal to right-modification. Thus, it should not be taken as an argument against using the right-modification test to diagnose zài as an adposition.
question is an adposition. Because temporal locative adpositions behave like their spatial counterparts under the Svenonius Generalizations, I will assume the generalizations hold of locative adpositions more generally. Of the typical characteristics in (36), zài has Qualities 1-4. §3 will use Quality 5 to inform the analysis.

2.2.1. Quality 1: XP Predication and Sentential Adjunction

Because it can both project a small clause main predicate (as in (39)), and adjoin to a sentence (as in 40), zài exhibits Svenonius (2004)’s Quality 1. In examples with no overt aspectual marking (i.e., no le, guo, zhe, or habitual interpretation), the AspP projection contributes nothing to the semantic interpretation of the sentence, but is required to maintain rigorous notion of C-selection (although removing this feature of the account would not affect the analysis substantially).

(37) Lisi zài tūshūguān
Lisi at library
(PRS.) ‘Lisi is at the library.’
Small clause predicate zài-PP

(38) Lisi zài tūshūguān kàn shū
Lisi at library read book
(HAB.) ‘Lisi reads in the library.’
Adjoined zài-PP

In (39), the predicative pP is the argument introducer on top of a PP base, following a small clause analysis of predicative PPs (Roy 2013; Bowers 2011; Svenonius 2004; Bowers 1993, i.a.). Virtually any aspectual specification is compatible with PP-adjunction (e.g., perfective).

I follow Myler (2014:30-31) in taking predicative locative sentences to consist of a deficient VoiceP that doesn’t introduce an external argument, under which a semantically vacuous light copular verb v (that is interpreted as an identity function) takes a PredP complement (in this case, a pP). Interestingly, Mandarin and English differ here; the light copular verb in Mandarin is covert (by analogy to Li & Thompson 1981; Ansaldo 2009 for adjectival small clauses; see Kroeger 2005 for cross-linguistic arguments for null copulas). If zài is part of a small clause adposition that in the clausal spine, it cannot be selected for by Asp directly, since in (38) Asp selects for vP. To maintain strong C-selection (i.e., heads always C-select for the same syntactic category), I assume a covert copula in Mandarin.

5Unlike in languages like English, if the P has a temporal complement, only the adunction option is available in Mandarin: wānhuí zài sān-dīan *(kāishǐ), (lit.) the party at 3-CLF *(starts)*.  

6There are two main potential copula candidates in Mandarin (shì, yǒu), but neither of them are acceptable, because shì ‘be’ and yǒu ‘have’ usually select for nominal complements. On the other hand, adjectival small clauses
2.2.2. Quality 2: Tense and Aspectual Morphology

The second quality concerns whether the purported adpositional element can host tense and/or aspect morphology. Descriptively, Mandarin is a "tenseless" language (Lin 2010; Smith & Erbaugh 2001 for discussion). I take this to mean that it has morphology for tense, it is merely covert (following Sybesma 2007). Therefore, I cannot test whether *zài* is compatible with tense morphology. Instead, I focus on whether *zài* can host aspectual morphology. In order to do this, we should take a moment to situate ourselves within the broader context of Mandarin Aspect. When I refer to 'aspect' in this paper, I refer to *Outer* Aspect, which corresponds to grammatical aspect, as opposed to *Inner* Aspect, or *Aktionsart* (see MacDonald 2006, 2008 for an discussion of inner aspect). There are three types of overt (outer) aspectual markers in Mandarin: two types of perfective marking and one imperfective.

![Mandarin Outer Aspect Diagram](image)

**Figure 1**: Schematic of Mandarin Aspectual Markings

Crucially, all of the overt markers obligatorily appear post-verbally, as in (41)-(43) (see §2.3). If *zài* were a verb, it should able to host aspectual markers like verbs do; if *zài* were an adposition or an aspectual marker, it should not.

(41)  
\[ tā chang zhe gē \]  
\[ \text{he sing ASP_IPFV song} \]  
\[ \text{‘He was singing.’} \]  

(42)  
\[ wǒ huí le jiā \]  
\[ \text{I return ASP_PRF home} \]  
\[ \text{‘I went home.’} \]  

(43)  
\[ zhè ge rén shā gōu láohū \]  
\[ \text{this CLF person kill ASP_PRF tiger} \]  
\[ \text{‘This person has killed a tiger.’} \]  

None of the aspectual markers can appear on *zài*, suggesting that *zài* is not a verbal predicate.\(^7\)

---

\(^7\)have been argued either to have a covert copula (Li & Thompson 1981; Ansaldo 2009) or not to require one at all (Pustet 2003:3). Thus, it isn’t unexpected to assume there is an analogous covert copula in adpositional predication sentences in Mandarin.

\(^7\)However, I found one case where *zài* superficially appears to host verbal aspect in some dialects of Northern Mainland Mandarin Chinese:

(1)  
\[ yīfū gaā-zài le qiāng shāng \]  
\[ \text{clothes hang-at ASP_PRF wall on} \]  
\[ \text{‘The clothes were hung on the wall.’} \]
2.2.3. Quality 3: Locative adpositions take nominal complements

The third property of locative adpositions is that they take nominal complements. The behavior of \( \text{zài} \) under this test will allow us to rule out the possibility that \( \text{zài} \) is an aspectual marker. Although the Svenonius (2004) generalizations call for a DP complement, DP-hood in Mandarin is notoriously hard to diagnose with any precision (Lin 1997), so I will show that the complements to \( \text{zài} \) must be nominal in nature. To do this, I will apply three diagnostics for nominal-hood: modification by demonstratives, individual classifiers (i.e., classifiers for objects), and phrases headed by \text{DE} \ (e.g., possession and relative clauses, Xiong 2005):

\[
\text{(46) qiăng-wân bù nêng ràng hãi zi dái zài zhè sâng ge dîfàng! absolutely NEG. can let children alone stay at these three places (i.e. in the street, in a car, and on the escalator)! http://baby.163.com/15/0415/16/AN8MHME200362USS.html}
\]

\[
\text{(47) Lîsì zài bàbà de bângōngshì Lisi at dad DE office 'Lisi is at his dad’s office.'}
\]

\[
\text{(48) zài Lîsì zuò fàn de shìhòu Zhângsăn kàn le yi bèn shū at Lisi do food DE time, Zhangsan read one book 'At the time when Lisi was making food, Zhangsan read a book.'}
\]

Locative \( \text{zài}-\)phrases pass the above tests for adposition-hood. The naturally occurring example in (46) shows that \( \text{zài} \) takes a nominal complement, since the spatial complement has been modified by a demonstrative, a numeral, and an object classifier. Spatial locative nominals can be modified with possession, suggesting a nominal character in (47). For temporal complements to \( \text{zài} \) like (48), they can embed a (head-final) relative clause below a nominal complement, suggesting that there is a nominal complement in temporal cases as well. For the progressive interpretation, it is impossible to apply the tests for nominal-hood. It’s possible that null nominals cannot be modified by demonstratives, classifiers, and \text{DE}-phrase for a different reason. It could be because they have no phonological material, or because their semantics doesn’t allow for this.

---

(2) \( \text{Lîsì bâ zhè bèn shù fâng-zài le} \) \( \text{BA this CLF book put-at} \) \( \text{ASP_PERF table on} \) 'Lisi put the book on the table.'

I don’t take \( \text{zài} \) to be a verb itself in these cases because verbal aspect and \( \text{zài} \) can only be linearly adjacent with certain verbal predicates are present; “verbs of putting (in a spatial configuration)” (Levin 1993:111-112; e.g., \( \text{fâng ‘put’}, \text{giâ ‘hang’}, \text{dái ‘stay/reside’} \) etc.). Thus the verb itself is contributing heavily in these sentences. Also, the same (truth conditional) meaning is obtainable with various topicalizations of the PP without the aspect marker (see 21, 22), which suggests that \( \text{zài} \) doesn’t host the aspect itself in these cases.
sort of modification. This is an open question; therefore, the evidence doesn’t argue against a nominal in the aspectual version.

2.2.4. Qualities 4 and 5: Selection and Interpretation

Locative adpositions C- and S-select their complements (Svenonius 2004). Some examples of C-selection concerns idiosyncratic case assignment in languages like Russian and Icelandic, or idiosyncratic of-selection in English (Svenonius 2004:14(30)):

(49) in (*of) the house
(50) out *(of) the house

However, C-selection tests must be language specific and a more relevant diagnostic for Mandarin concerns whether adpositional zài always select for the category of its complement. As discussed above, there is some tentative evidence that zài always selects for a nominal complement. We will take this to be the case. As for S-selection, it usually holds between complements, and pertains to the presuppositions of certain prepositions. For example, in English, ‘in’ presupposes that its complement is a container, while ‘on’ presupposes its complement is a surface (Svenonius 2004:14). zài requires that its complement be something which has temporal or spatial extent (e.g. a span of time, a location in space, an event). For example, if zài takes a complement which denotes an abstract concept (e.g., ‘justice’ zhèngyì, ’equity’ gōngpíng), the result is very anomalous. A more in depth discussion of semantic restrictions on zài-∅ will be discussed later in §3.

The final quality of adpositions across languages has to do with their interpretation: they encode binary relations that hold between entities, as long as they are both of the same semantic type. This view assumes that all locative adpositions have constant argument structure: they encode a binary relation that holds between the ‘Figure’ and the ‘Ground’ (for further discussion, see Talmy 2011, 1978; Svenonius 2006, 2004; Demirdache & Uribe-Etxebarria 2000, 2004; Hale 1986, among others).

(51) PredP
    /\      \      /
   Figure  Pred’  Ground
       /\      /
    Pred

We will return to the implications of generalization (5) in §3 below.

2.3. Progressive zài is not an aspectual marker or a verb—Distributional Evidence

To argue that zài is an adposition, I must show that its syntactic behavior differs from the behavior of aspectual markers and verbs. Since modificational uses of zài are unanimously taken to be adpositional, I will set them aside for the moment. To take aspect markers first, there are four elements which contribute to aspectual interpretations in Mandarin (Klein et al. 2000; Lin 2004; Huang et al. 2009; Li 2012, see above §2.2): zài; zhe, an imperfective marker; le, which has a range of perfective meanings; and guò, an experiential perfective. Of these, only zài occurs preverbally. It also cannot appear post-verbally (without a complement, see fn.7), contra the other elements in the list:
(52)  Zhāngsàn zài xuéxì  
Zhangsan at study  
‘Zhangsan is studying.’

(53)  * Zhāngsàn xuéxì zài  
Zhangsan study at  
(int.) ‘Zhangsan is studying.’

For the other three aspectual markers, the ASP element obligatorily appears after the verb, and cannot appear pre-verbally.

(54)  * Zhāngsàn zhe xuéxì  
Zhangsan ASP_{IPFV} study  
(int.) ‘Zhangsan is studying.’

(55)  Zhāngsàn xuéxì zhe  
Zhangsan study ASP_{IPFV}  
‘Zhangsan is studying.’

(56)  * Zhāngsàn guò kan zhè běn shū  
Zhangsan ASP_{PRF} saw this CLF book  
(int.) ‘Zhangsan is finished reading this book.’

(57)  Zhāngsàn kan guò zhè běn shū  
Zhangsan saw ASP_{PRF} this CLF book  
‘Zhangsan is finished reading this book.’

(58)  * Zhāngsàn le kàn zhè běn shū  
Zhangsan ASP_{PRF} read this CLF book  
(int.) ‘Zhangsan read this book.’

(59)  Zhāngsàn kàn le zhè běn shū  
Zhangsan read ASP_{PRF} this CLF book  
‘Zhangsan read this book.’

Thus, zài has a different distribution than the other aspectual elements in Mandarin, supporting my argument that it should have a different syntactic category.

The final option is that zài is a verb. Since Mandarin is light on inflectional morphology and lacks overt nominalizers and verbalizers, it is hard to diagnose verbal category. The main test for verb-hood is whether the element can host aspectual morphology (Huang et al. 2009). This test corresponds to Quality 2 from our generalizations of locative adpositions, see §2.2.2.

2.4. Interim Summary

This section has shown that zài is most productively analyzed as an adposition, based on cross-linguistic evidence discussing the behavior of adpositions, as well as distributional evidence and the application of the novel Mandarin ‘right’-modification test. Taking zài to be adpositional goes against analyses of progressive uses of zài, which label zài an aspectual marker or particle (Li & Thompson 1974; Chen 1978; Li & Thompson 1989; Ross 1991; Smith 1991; Klein et al.
2000; Lin & Liu 2004, 2009; Huang et al. 2009; Sun 2014). A consequence of this account is that there is an explanation for why zài has a different syntactic distribution from the other aspectual elements in Mandarin. It is pre-verbal because it is a high adposition and Mandarin high adpositions are pre-verbal.

3. The analysis

Now that I have motivated the choice to analyze zài as an adposition, I return to Quality 5 from §2. If this generalization is on the right track, zài should always take its innermost argument as its ground, and encode a relation between it and a figure that is introduced elsewhere (by a Pred.). For our purposes, let’s assume that the adposition combines first with its complement, and based on the semantic type of that complement, it seeks a figure of the same type to relate. Also, I will adopt the notion that trace function type shifts are available, and can apply (Krifka 1998). If the adposition first takes a location entity (e.g., ‘the library’, x) with spatial extent s (which is accessible via the trace function σ, which takes entities to their spatial traces; Krifka 1998) as its ground, it then seeks another entity (e.g., Zhāngsān, y) with spatial extent s’ as its figure. Then, it asserts that the spatial extent s’ OVERLAPS with the spatial extent s. If we define overlap as a PROPER subset relation (i.e., the subset must not be equal to the set), then we get the interpretation of containment where Zhangsan is physically in the library.

Similarly, if the adposition first encounters an interval of time (e.g., ‘yesterday’, i), it seeks another interval of time. It will encounter an event (e.g., Zhāngsān kàn le yī běn shū, ‘Zhangsan was reading a book’, e) from which it can access a runtime i’ (which is accessible via the trace function τ, which takes events to their runtimes; Krifka 1998); it then asserts that the runtime i’ of e’ OVERLAPS with i.

If the adposition encounters an event first, it will seek another event, resulting in a progressive interpretation. For example, the progressive use of the adposition zài takes an event e in progress in our world w at time interval i (e.g. ‘Zhangsan is reading’, e), and seek another event. It then encounters e’, which is the FUTURE CULMINATION of e (at a reference time i’ in the future and at accessible world w’); it also asserts that e is a sub-event of e’, relative to i, i’, w, and w’ (Bennett & Partee 1978; Dowty 1977, 1979; Parsons 1990; Landman 1992; Portner 1998; Hallman 2009). Since the trace function τ can apply to each event, the runtime of e also OVERLAPS with the runtime e’. By asserting this overlap, this sentence will get the interpretation that e has not yet completed (since e’ is the completed event which has e as a proper sub-event). These specifications for figure-ground are summarized below in Table 1. Thus, we have the three different interpretations of zài resulting semantically from the type system.

<table>
<thead>
<tr>
<th>OVERLAP</th>
<th>Ground</th>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial zài</td>
<td>Spatial Span s of an entity x</td>
<td>Spatial Span s’ of an entity y</td>
</tr>
<tr>
<td>Temporal zài</td>
<td>Time Interval, i</td>
<td>Runtime i’ of an event e’</td>
</tr>
<tr>
<td>Aspectual zài</td>
<td>An event e</td>
<td>An event e’</td>
</tr>
</tbody>
</table>

Table 1: Figure-Ground Argument Structure, by subtype

With this semantics for zài, I will go through the main examples one by one, and provide each with a syntactic structure, based on the figure-ground argument structure in Table 1.
3.1. **Spatial z`ai-phrases**

For spatial uses of z`ai, the complement is a spatial location. The figure is introduced by little p, or voice higher in the structure, as we see in (60) below. Here, the pP associated with z`ai introduces ‘Lisi’ as the figure, and situates it with respect to its internal argument of the PP, ‘the library’ (i.e. ‘the ground’). The same holds for spatial adjuncts (61), except that instead of the little p introducing the figure in its specifier, the figure is the specifier of voice. This analysis expands on existing work using Pred.; classically, voice Pred. is used for the main sentential predicate (e.g. unergative sentences with predicative adjectives, see Myler 2014:33), which are part of the clausal spine. Here, the ground is contained within an adjunct.

\[\text{(60)} \quad \text{L˘ıs`ı z`ai t`ush¯ugu˘an} \quad \text{Lisi at library} \]
\[\quad \text{‘Lisi is at the library.’} \]

\[\text{(61)} \quad \text{L˘ıs`ı z`ai t`ush¯ugu˘an k`an le sh¯u} \quad \text{Lisi at library read ASP_perm book} \]
\[\quad \text{(PRF.) ‘Lisi read in the library.’} \]

3.2. **Temporal z`ai-phrases**

In order to analyze adjoined temporal locative PPs, we must expand the theory of Pred. Semantically, temporal locative PPs encode a relation between their complement and a structurally higher entity corresponding to a span in time. The next accessible point in time is the runtime of matrix verbal predicate (see Stowell 2007 for arguments that the event time is encoded as the complement of T, above voiceP). I assume that there is a ZP (a temporal analogue of DP) headed by Z (the temporal analogue of D) that corresponds to the runtime of the event (Stowell 2007, 1996). This ZP is introduced in a specXP (the temporal analogue of argument-introducing voiceP, perhaps corresponding to an i* of Wood & Marantz To appear) that occurs above the external argument position, following (Stowell 2007:443(8)). Thus, Pred. in the temporal case is the head of a category XP, as in (65).

\[\text{(64)} \quad \text{z`ai Lisi zuò f`an de sh¯ıh`ou, ZS k`an sh¯u} \quad \text{at Lisi do food DE time, ZS read book} \]
\[\quad \text{(HAB.) ‘When Lisi cooks, Zhangsan reads.’} \]

\[\text{(65)} \quad \text{XP} \quad \text{XP} \]
\[\quad \text{PP} \quad \text{PP} \]
\[\text{P} \quad \text{P} \]
\[\text{ZAI} \quad \text{ZAI} \]
\[\text{GROUND} \quad \text{GROUND} \]
\[\text{} \quad \text{voiceP} \]
\[\text{Pred.} \quad \text{Pred.} \]
\[\text{ZP} \quad \text{X} \]
\[\text{Figures} \quad \text{Figure} \]
\[\text{AspP} \quad \text{AspP} \]
\[\text{V} \quad \text{V} \]
\[\text{Asp[PRF.]} \quad \text{Asp[PRF.]} \]
\[\text{read book} \quad \text{read book} \]

The temporal PP adjoins in the low TP-domain following (Demirdache & Uribe-Etxebarria 2004; Cheung 2012, 2013, 2015; Todorović & Wurmbrand 2015), but above the adjunction site of their spatial counterparts. Support for this view comes from PP-topicalization: only the
highest PP element can topicalize to PP-topic position (Rizzi 2004, 1997, i.a.). If there is a spatial PP adjunct and a temporal one in Mandarin, only the temporal one can topicalize.

3.3. Aspectual zài-phrases

For the structure of aspectual zài sentences, I follow the semantics literature on the progressive (Bennett & Partee 1978; Dowty 1977, 1979; Parsons 1990; Landman 1992) and (Neo-)Davidsonian event semantics (Davidson 1969; Parsons 1990; Krifka 1992, among others) that I described above. Since there is no overt nominal complement in aspectual zài sentences, I take there to be a covert one. This covert nominal corresponds to the event that our semantics of the progressive supplied us with; the one that may culminate in the future. Please see §3.4 for discussion of the identity of the covert nominal and related issues.

(66)  
Lìsì zài kàn shū  
Lisi at read book  
‘Lisi is reading book(s).’

Like temporal locative zài phrases, I take the figure for aspectual zài to be the runtime of the matrix event. Similarly, the figure corresponds to the runtime of the matrix event. The progressive interpretation arises from situating the runtime of the matrix event in progress with respect to the future event that might culminate (which is large enough by definition, since it corresponds to the completed version of the matrix event).

I have been calling this reading a “progressive” the whole time, but haven’t yet explained why. The reason is that aspectual zài is subject to further semantic restrictions than temporal locative zài sentences that lead us analyze it as a progressive: the main predicate of the sentence must be a ‘dynamic’ event (Smith 1991, 1997; Yeh 1993), i.e., an activity or accomplishment in the Vendler Classification (Vendler 1967). This restriction arises because zài is incompatible with states (Smith 1991:273, Klein et al. 2000, among others); both states and achievements in the Vendler Classification have a stage or sub-event that is stative (Smith 1991).

I take this stative restriction to arise from a combination of the semantics of the event nominal and the semantics of the overlap relation encoded by zài. This semantic restriction isn’t s-selection in the usual sense (Chomsky 1965; Grimshaw 1979; Chisholm 1981; Van Valin 2001, and others), because S-selection usually holds between predicates and their arguments (Grimshaw 1979), and I take zài-∅ to be an adjunct. Thus, we have some kind of semantic relationship where an adjunct PP requires that the phrase it is adjoined to has the correct Aktionssart; this kind of relationship is much less local than classic s-selection. Luckily, this is not the only instance in language where adjoined PPs share a semantic relationship with something in the clausal spine that is independent of local predicate-argument configurations. For example, temporal PP adjuncts often require that the tense of sentence match the time they denote.
(68) (Today is the 13th of June) [On the 15th of June]_{PP}, I will go to the movies

(69) ?? (Today is the 15th of June) [On the 15th of June]_{PP}, I went to the movies

One consequence is that this sort of semantic restriction should be predicated to hold for aspectual sentences in Mandarin, since Mandarin, as a ‘tenseless’ language, uses aspect to encode most temporal meanings.

3.4. The identity of the null event nominal — eventive pronominal ‘it’

Thus far, I have said the aspectual zài sentences feature a null nominal, this section will clarify what sort of syntactic element it is. I take the null event nominal to be a null eventive pronominal, similar to ‘it’ in English. Evidence supporting this view comes from a comparison with English. In a pair of short squibs in Linguistic Inquiry, Bolinger (1971b,a) introduces a colloquial and eventive use of the English pronoun ‘it’ that receives a progressive interpretation when it is the complement of the locative preposition ‘at’.

(70) He was working an hour ago, and I guess he’s still at it. Bolinger (1971b:246)

(71) That idiot dog keeps chewing on my shoes, and from the slobbery sounds coming from the closet, I know he’s at it again!

(72) So, you’re going to mow the lawn. While you’re at it, could you trim the hedge too?

The examples above have an ongoing, progressive interpretation, since they are incompatible with continuations to the sentence which indicate that the event has completed.

(73) ?? He (only) went to work an hour ago, and I think he’s still at it. But, he already stopped working for the day.

(74) He (only) went to work an hour ago. But, he already stopped working for the day.

In (73), there is the distinct impression that the final sentence contradicts the previous part of the sentence, this is because the completive nature of the continuation contradicts the progressive interpretation of ‘at it’. If that portion of the utterance is removed, as in (74), the sentence is grammatical. Even the dynamic semantic restriction that we see for Mandarin is present in the English ‘at it’ construction:

(75) * Bob was sleeping when I went into his room earlier, and I guess he’s still at it

(76) * Jim knew the answer to my last question, so when I ask him another I’m sure he will be at it again!

I take this eventive pronominal use of ‘it’ in English to be an overt counterpart of the null event pronominal I postulate for Mandarin. Based on the data above, the English ‘at it’ construction shares (at least) two similarities with Mandarin progressive zài (i.e., complement of a locative adposition and stative incompatibility), supporting the idea that the Mandarin null eventive nominal is an eventive pronominal. One prominent difference between the two is that Mandarin zài progressives require the pronominal to be covert: 8

8There is at least one more difference between the two: in order for ‘at it’ to be felicitously used in English, there must be strong contextual support. For example, (70) becomes ungrammatical out of the blue or without still, as does and (71) without again. This is not true of the Mandarin zài progressive.
Why is the eventive pronominal obligatorily null in Mandarin? Perhaps this question is a bit deeper: what is it that allows the pronominals to be null in general? At least some researchers have suggested that covert object pronouns are pragmatically licensed; they can be left unsaid when there is strong contextual support uniquely identifying their referent (Perlmutter 1971; Chomsky 1981; Sperber & Wilson 1986; Cole 1987; Holmberg 2005; Biberauer et al. 2010; Scott 2013, among others). Evidence for this comes from silent arguments (e.g. null pronominals) in languages like Spanish (Ordóñez & Treviño 1999) and Mandarin (Huang 1984, 1985, 1987, 1989).

One might expect that perhaps pragmatic concerns on the pronunciation of pronouns might also effect whether null eventive pronominals ever surface in Mandarin. We already have evidence that they don’t surface in the progressive, but perhaps they show up elsewhere. This is not the case. Even in sentences where one might expect cross-sentential reference to an event, the null eventive pronominal can never be overt in Mandarin.

Example (80) is only grammatical without a pronominal; if it present the sentence is uninterpretable and very anomalous. Thus, it’s possible this is another case in Mandarin where we might want a null eventive pronominal, making the idea that Mandarin has a covert version of action-referring it more credible.

A final potential explanation is that Mandarin doesn’t have an eventive pronominal in its lexical inventory. But, it is unsatisfying to merely postulate a lexical gap, especially since this analysis is predicated on the null eventive nominal contributing to the interpretation of the sentence. Another option would be to postulate a difference between the lexical entries for the object and eventive pronomininals. This difference could stem from the presence of person features on the pronominal. Object pronomininals have person features that get spelled out, while the eventive pronominal lacks a person feature and likewise has no a phonological form. Some tentative evidence may come from the fact that the Mandarin object pronomininals cannot be used for eventive uses (77, 80). Because of this and also because the presence of a null eventive nominal in Mandarin allows us to analyze the meaning of these sentences in a fashion that give zài a unified meaning (i.e., as PROPER OVERLAP), I will adopt the null eventive pronominal analysis. However, to fully address the questions raised in this section, a more in depth survey of Mandarin null pronominals will ultimately be required.

---

9Mandarin object pronominals do not distinguish between genders, but only in number.
3.5. *Adjunction v. Clausal Spine Analyses of Progressive zài*

In explicating the current analysis, I will argue further in favor of an adjunction analysis of progressive zài like in (81), by arguing against a clausal spine analysis like (82). To arbitrate between (81) and (82), we must first situate ourselves with the full range of data. To do this, I will re-label three types of relevant sentences that we have considered previously: Type 1 where zài acts as the main predicate, the contentious Type (the focus of this section), and the Type 3 progressive use.

(81)

\[
\begin{array}{c}
\text{DP} \\
\text{voiceP} \\
\text{AspP} \\
\text{Asp} \\
\text{voice} \\
\text{PP} \\
\text{DP} \\
\text{ZAI} \\
\text{read book(s)} \\
\end{array}
\]

(82)

\[
\begin{array}{c}
\text{AspP} \\
\text{vP} \\
\text{pP} \\
\text{P} \\
\text{DP} \\
\text{ZAI} \\
\text{read book(s)} \\
\end{array}
\]

Once again, Mandarin PPs are preverbal (see 10), whereby the string corresponding to (84) is ambiguous (e.g., Chao 1968; Chen 1978; Woo 2010, 2013) between a habitual interpretation with an adjoined locative PP, and the progressive interpretation of Type 2 sentences that I will focus on. There are two ways to view these data: either you group Type 2 with Type 1 (which is the view I take here), or you can group Type 2 with Type 3 (Woo 2010, 2013; Chen 1978; Chao 1968). Grouping Type 1 and Type 2 together takes its lead from cross-linguistic work on “predicative adjuncts” (e.g., English, Borgonovo & Neeleman 2000), which mimic the progressive interpretation despite being stative sentences with eventive adjuncts. This view leads to the structures below, which correspond to the adjunction analysis in (81) above.

Under my account, the only difference between Type 1 (88) and Type 2 (89) is that (89) has a verbal adjunct to vP (here labeled XP), which corresponds to the English gerundive.

(86)  
\[
\begin{array}{c}
\text{Lisi} \\
\text{zài tǔshāguān} \\
\text{library} \\
\end{array}
\]

Lisi at the library

(PRS.) ‘Lisi is at the library.’

(84)  
\[
\begin{array}{c}
\text{Lisi} \\
\text{zài tǔshāguān kàn shū} \\
\text{library} \\
\text{read book} \\
\end{array}
\]

Lisi at the library reading

(PROG.) Lisi at the library reading

(HAB.) ‘Lisi reads at the library.’

(85)  
\[
\begin{array}{c}
\text{Lisi} \\
\text{zài kàn shū} \\
\text{read book} \\
\end{array}
\]

Lisi at reading

(PROG.) ‘Lisi is reading.’
‘Lisi is at the library.’

_Type 1: Predicative Locative_

(87)  
\[
\text{Lîsî zàî tǔšhûguăn kàn shú}
\]
Lisi at library read book

‘Lisi at the library reading.’

_Type 2: Pred. Loc. + Adjunct_

If Type 2 and Type 3 are grouped together, every structure with a progressive interpretation would have the same syntactic structure; (Woo 2010, 2013) adopts a version of the structure in (82) for Type 2 sentences, following a small-clause pP analysis of predicative locatives (Roy 2013; Bowers 1993, 2011) (event time introducing XPs omitted\(^{10}\)). There are several issues that arise when analyzing the verb in Type 2 structures as the main predicate. The first issue with (82) arises from our theoretical assumption. I have assumed strong C-selection, which requires that elsewhere in Mandarin and in other languages, voiceP selects for a verbal element (following Fox & Hopper 1994, here AspP), and AspP selects for vP, even in sentences with predicative adpositional small clauses.\(^{11}\) Assuming strong C-selection, adopting a clausal spine account results in an interesting little dance. Take (82) as an example; at the bottom of the tree there is a verb, then it gets nominalized, wrapped in a PP and a pP, and finally, the null copula effectively verbalizes the whole thing again with little \(v\). Why go through all the nominal and prepositional layers to make the thing verbal again in the end? This seems like an unlikely set of contortions for the grammar to engage in.

Even if we accept all the category shifts necessary to maintain a nominalization/clausal spine account, there should be evidence of nominalization, perhaps by being able to modify it with possession, count it with classifiers, or apply relative clause modification to it. None of these are grammatical.

Finally, the question arises, how does the progressive interpretation arise here? I have argued that it arises by encoding a _PROPER OVERLAP_ relation via the figure-group argument structure in the adposition. For (82), the argument structure of our the figure-ground relationship cannot

---

\(^{10}\)The original structures in Woo (2010, 2013) do not specify a category label for the lowest nP, but since the first half of this paper was dedicated to arguing for an adpositional analysis of z	ext{"a}i, I will call this an nP.

\(^{11}\)Myler (2014:28-30) argues from data on English and Quechua that copular sentences minimally consist of a VoiceP which doesn’t introduce the external argument, and a copular \(v\) takes an adpositional PredP complement.
be preserved. As argued earlier in §3, the runtime of the matrix event (as the figure) to be related with respect to the runtime of the larger intensional event (as the ground), but in (82), the matrix event is the ground (because it combines directly with the P-head), yielding the wrong semantics. We end up getting the argument structure exactly backwards. One could try to get around this by making OVERLAP symmetric (i.e., if x OVERLAPS y, then y OVERLAPS x). This would force us to abandon the notion that the OVERLAP encoded by zài is PROPER OVERLAP (i.e., a notion of proper set-containment or proper part-hood of events Dowty 1977, 1979; Landman 1992; Portner 1998; Hallman 2009). Based on these considerations, I conclude that the clausal spine analysis for zài is untenable.

4. Conclusion

This paper has proposed a novel syntactic analysis of the Mandarin adposition imperfective, zài. Utilizing a theoretical linguistic framework where structure feeds meaning, I have argued that zài is adpositional in all its uses, and that when it is interpreted as a progressive, its complement is a null event nominal. This account also postulates a unified argument structure for zài following a figure-ground semantics for spatial adpositions (Talmy 2011, 1978; Svenonius 2006, 2004; Demirdache & Uribe-Etxebarria 2004; Hale 1986), under which zài encodes an overlap relation between two semantically similar elements. This overlap relation was influenced heavily by semantic work on the interpretation of the progressive, which encodes overlap between an event in progress and its expected completed counterpart in another possible world (Dowty 1977, 1979; Landman 1992; Portner 1998). This account lays the ground-work for a thorough account of prepositional imperfectives cross-linguistically, while offering up unified semantics as a potential explanation for why some languages abandon the traditional clausal option for encoding aspect (e.g., periphrastic progressive) for the cross-linguistically robust option to encode imperfective aspect using spatial adpositions.

Acknowledgements

First and foremost, thank you to my patient and amazing informants without whom this project would not have been possible: Jeff Shi-yueh Lin (TW), Linmin Zhang (NM), Shengfu Wang (TW), Haoze Li (NM), Vera Xin Zu (NM, Jinpo), Yohei Oseki (Japanese), Lucas Champollion (German), and Katharina Maisel (German). Special thanks to Stephanie Harves, as well as to Richard Kayne, Alec Marantz, and Anna Szabolcsi for indispensable comments on early versions. I would also like to thank the audiences and abstract reviewers of NYU Syntax Brown Bag, International Workshop on Syntactic Cartography 2015 (IWSC 2015, Beijing), & ConSOLE XXIV. Finally, thanks to the editors and reviewer of this volume for helpful comments on the final version. This research was supported in part by the New York University Student Senator’s Council Conference Fund.
Abbreviations

ACC Accusative Case
ASP Aspect
CLF Classifier
COP Copula
DEM Demonstrative
DISTR Distributive Marker
HAB Habitual
IPFV Imperfective
INF Infinitive
NEG Negation
NOM Nominative Case
PTCP Participle
PST Past tense
PRF Perfective
P Person
PL Plural
POSS Possession Marker
PRS Present tense
PROG Progressive
Q Question particle
S Singular

Adina Williams
New York University
adinawilliams@nyu.edu

References


