0. Introduction

Like English, Mandarin Chinese has a progressive morpheme (pronounced zai) used to indicate that an event’s runtime contains some (contextually or explicitly supplied) topic time (see e.g. J.W. Lin 2006:16–17 for a formal treatment). In (1), for example, the progressive is used to indicate that the time Zhangsan spent doing his homework precedes and overlaps with the time at which his parents returned home.

(1) (Fumu hui jia de shihou) Zhangsan zai zuo gongke.
   Parent return home Prt\(^1\) time Zhangsan Prog do homework
   ‘(When his parents returned home,) Zhangsan was doing his homework.’

Unlike its English counterpart, however, the progressive morpheme in Mandarin is systematically ruled out in complements to control predicates. This is illustrated in (2) for the subject-control predicate dasuan ‘plan’ and in (3) for the object-control predicate

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1 Abbreviations used in glosses in this paper are: Cl = classifier; Exp = experiential; Poss = possessive; Prf = perfective; Prog = progressive; Prt = particle; 3Sg = third-person singular.
In both cases, the Mandarin sentences are unacceptable when *zai* is present, whereas the English translations are acceptable regardless of the choice of the simple form *do* or the progressive form *be doing*.

(2) Zhangsan dasuan [(fumu hui jia de shihou) PRO (*zai) zuo gongke].
    Zhangsan plan parent return home Prt time Prog do homework
    ‘Zhangsan planned [PRO to (*be) do(ing) his homework (when his parents returned home)].’

(3) Lisi quan Zhangsan [(fumu hui jia de shihou) PRO (*zai) zuo gongke].
    Lisi persuade Zhangsan parent return home Prt time Prog do homework
    ‘Lisi persuaded Zhangsan [PRO to (be) do(ing) his homework (when his parents return home)].’

The purpose of this paper is to investigate this asymmetry between Mandarin and English. In section 1, I will entertain the hypothesis that the Mandarin facts reflect cross-linguistically general semantic properties of control and of the progressive and that English obscures these properties because it allows for coercion, whereas Mandarin — possibly because it is a highly analytic language in the sense of Huang (2015) — does not. Then, in section 2, building on relevant prior work by Huang (1989); Li (1990); T-H. J. Lin (2011); Grano (2012, 2015a), I will entertain an alternative hypothesis whereby the difference between Mandarin and English reflects variation in the structural size of control complements. In section 3, I will argue that the former hypothesis is conceptually more appealing while the latter is empirically more appealing, and I will sketch a possible way of synthesizing the two hypotheses in such a way that their respective strengths are preserved and their respective weaknesses eliminated, achieving a solution that lies at the interface between syntax and semantics. Section 4 concludes and sketches some questions for further investigation.

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2 T-H. J. Lin (2011:59) similarly observes that *zai* is unacceptable in complements to *neng* ‘be able to,’ which Lin analyzes as a control verb that takes a nonfinite complement. More generally, the idea that Mandarin control verbs take nonfinite complements and that nonfiniteness in Mandarin correlates with the unavailability of aspect marking can be traced to Huang (1982: 351). See Grano (2017) for a critical overview of the status of finiteness in Mandarin.

3 The verb *quan* is ordinarily glossed as ‘persuade,’ and I adopt this practice in what follows. But unlike ‘persuade,’ *quan* is atelic (i.e., does not entail that the persuader was successful in getting the persuadee to form an intention), so ‘try to persuade’ is a technically more accurate translation.

4 Here and throughout, I use ‘PRO’ to represent the phonologically unexpressed subject of a control clause. See Landau (2013) for a recent overview of control phenomena and their analysis.
1. A semantic approach: Variation in availability of coercion

The first hypothesis to be considered has four components in it, summarized in (4).

(4) a. Control verbs select for action-denoting complements.
   b. The progressive is a stativizer (function from actions to states).
   c. English allows coercion from states to actions.
   d. Mandarin disallows coercion from states to actions.

In what follows, I elaborate on each of these components and show how they account for the relevant facts.

   a. Control verbs select for action-denoting complements. Consider (5) as a prototypical example of a verb taking a full (non-control) clausal complement and (6) as a prototypical example of a verb taking a control complement. There is an intuitive contrast between the kind of relation named by believe in (5) and the kind of relation named by try in (6). Whereas believe names a relation between individuals and propositions (i.e., one believes a proposition), it is not intuitive to think of try as naming a relation between individuals and propositions: one does not try propositions; rather, one tries actions. Taking this at face value, then, let us hypothesize that believe semantically selects for propositions whereas try (following Lasnik & Fiengo 1974) semantically selects for actions.\(^5\)

(5) John believes [that it’s raining]. → John believes some proposition.

(6) John tried [PRO to leave]. → John tried some action.

There is also reason to think that there is a systematic correlation between non-control verbs like believe selecting for propositions and control verbs like try selecting for actions: as illustrated in (7)–(8), some verbs, including persuade, can take both non-control and control complements, with consequences for the kind of relation that is

\(^5\) Semantic category labels like 'proposition' and 'action' are only as useful as the theory they are embedded in, and an adequate theory should explain the analytical relationship that categories like 'proposition' and 'action' bear to each other and to other semantic categories, as well as how the semantic category of a constituent is derived compositionally. For now, though, I simply use 'proposition' and 'action' as intuitive labels for whatever semantic property distinguishes objects of believing from objects of trying. In section 3 below, I will suggest a more theoretically grounded approach using standard type-theoretic notions.
expressed (see Grano 2018 and references therein). I therefore suggest that in general, control verbs select for actions.⁶

(7) John **persuaded** Bill [that it’s raining]. \(\rightarrow\) John caused Bill to believe some **proposition**.

(8) John **persuaded** Bill [PRO to leave]. \(\rightarrow\) John caused Bill to intend some **action**.

**b. The progressive is a stativizer (function from actions to states).** The idea that the progressive is a stativizer is due to Vlach (1981). Vlach's evidence comes from minimal trios like (9)–(11). (9) has an interpretation in which the time of Kim's rejoicing immediately follows the time of Sandy's winning. (10), by contrast, where we replace the action-denoting predicate *rejoice* with the state-denoting predicate *be at home*, has an interpretation in which the time of Kim's being at home precedes and overlaps with the time of Sandy's winning. Crucially, when we take an action-denoting predicate like *rejoice* and put it into the progressive, as in (11), the result patterns unlike its aspectually bare counterpart (9) and instead patterns like the stative example in (10): the time of Kim's rejoicing precedes and overlaps with the time of Sandy's winning. Consequently, (11) would be an inappropriate way of describing a scenario in which Sandy's win caused Kim to rejoice, since causes must temporally precede their effects. I therefore join Vlach (1981) in concluding that the progressive is a stativizer, since then it is fully expected that progressive-marked predicates should pattern with stative predicates with respect to the interpretation of *when*-adjuncts.

(9) Kim **rejoiced** when Sandy won.

(10) Kim **was at home** when Sandy won.

(11) Kim **was rejoicing** when Sandy won.

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⁶There are some obvious exceptions to this generalization, at least in English. The verb *claim* accepts control complements, as in (i), but we would not want to analyze (i) as expressing a relation to an action. It is also not clear that desiderative verbs like *want* as used in sentences like (ii) express relations to actions. Ultimately, a more fine-grained lexical approach to verb meanings and infinitival types is needed (such as Wurmbrand 2014), though it will be beyond the scope of this paper to investigate these finer-grained classes and their behavior with respect to the phenomena investigated here.

(i) John **claims** [PRO to be tall].

(ii) John **wants** [PRO to be tall when he grows up].
Interim conclusion: Taking stock of the two proposals that have now been introduced, if control verbs select for action-denoting complements and the progressive is a stativizer, then the Mandarin facts are fully expected: the progressive should be ruled out in control contexts because of the semantic selectional violation that it incurs. But then, something special has to be said about English, where the progressive is acceptable in control complements. To that end, we proceed to the latter two proposals of the approach under discussion.

c. English allows coercion from states to actions. I suggest that in English, the mismatch between an (action-seeking) control verb and a (state-denoting) progressive clause can be repaired via coercion, i.e., by a contextual reinterpretation of a stative expression like be doing his homework as an action along the lines of make it the case that he is doing his homework (this is reminiscent of de Swart's 1998 'aspect shift'):

(12) John decided [PRO to be doing his homework when his parents return home].
  = John decided [PRO to make it that case that he is doing his homework when his parents return home.]

This is even (marginally) possible in imperatives, another environment that demands an action-denoting expression. Just as Be happy! is readily interpreted as 'Make it the case that you are happy!', I suggest a similar process with progressive-marked imperatives as in (13):

(13) (?)Be doing your homework now!
  = Make it the case that you are doing your homework now!

d. Unlike English, Mandarin disallows coercion from states to actions. We have now explained why control verbs should generally be incompatible with progressive complements and why English is nonetheless exceptional in this regard. The final question to ask is: Why is Mandarin not exceptional in this regard? I suggest that it reflects a more general property of Mandarin grammar: an overall resistance to coercion. As documented by Lin and Liu (2005), some of the coercion phenomena identified by Pustejovsky (1995) for English fail to work in Mandarin. For example, as illustrated in (14), aspectual verbs in Mandarin cannot combine with nominal complements, whereas in English this is possible. Pustejovsky argues that this involves coercion: begin demands an eventive complement, so a book is reinterpreted as 'read a book' or 'write a book' (see, though, Piñango and Deo 2016 for a somewhat different approach with greater empirical coverage). Similarly, Lin and Liu (2005) show that the Mandarin attributive modifier structure in (15) is unambiguously interpreted as intersective modification, whereas the English equivalent is ambiguous between an intersective interpretation and an
interpretation in which the modifier is relativized to the kind of event associated with the head nominal (see Larson 1998).

(14) *Zhangsan kaishi yi-ben shu.
   Zhangsan begin one-Cl book

(15) piaoliang de wuzhe
    beautiful Prt dancer
    ‘dancer who is beautiful’
    NOT: ‘dancer who dances beautifully’ (Lin and Liu 2005:18)

Huang (2015) goes so far as to suggest that the systematic unavailability of coercion in Mandarin is itself something that falls out of a broader property of Mandarin grammar, namely that it is highly analytic, imposing a relatively transparent mapping between form and meaning. From the perspective of the goals of this paper, this is a highly attractive proposal: the narrow puzzle concerning the asymmetric distribution of the progressive across Mandarin and English then falls out from something much more basic.

2. A syntactic approach: Variation in the structural size of control complements

The hypothesis considered in the previous section makes a clear prediction: all stative predicates (even ones that do not involve the progressive) should be unacceptable in Mandarin control complements. This prediction is borne out for predicates headed by you 'have' and shi 'be' as illustrated in (16)–(17), but the prediction fails when it comes to some other stative predicates such as ones headed by zhu 'live' or ai 'love', as in (18)–(19).

(16) *Lisi quan  Zhangsan you che.
    Lisi persuade  Zhangsan have  car
    *Intended: ‘Lisi persuaded Zhangsan to have a car.’

(17) *Lisi quan  Zhangsan shi ta-de pengyou.
    Lisi persuade  Zhangsan  be  3Sg-Poss friend
    *Intended: ‘Lisi persuaded Zhangsan to be his/her friend.’

(18) Lisi quan  Zhangsan zhu zai Beijing.
    Lisi persuade  Zhangsan  live at  Beijing
    ‘Lisi persuaded Zhangsan to live in Beijing.’
(19) Lisi quan Zhangsan ai ta muqin.
Lisi persuade Zhangsan love 3Sg mother
‘Lisi persuaded Zhangsan to love his/her mother.’

Apparently, then, we need to seek an account that rules out progressive complements to control verbs without ruling out stative complements in general. An existing account that carries this out is one proposed by Grano (2012, 2015a, 2017), who argues that control verbs in Mandarin combine with vP complements. On this view, the progressive is ruled out because it requires the projection of AspP, which is structurally higher than vP. And we account for the grammaticality of examples like (18) and (19) since stative predicates headed by lexical verbs like zhu 'live' and ai 'love' are compatible with a vP analysis. A remaining question for this approach is what rules out (16)–(17). Possibly, it could be argued that you and shi have a functional auxiliary-like status that places them higher than vP, though more research would be needed to determine the plausibility of such an approach.8

As pointed out by Grano (2017), independent support for the vP approach to Mandarin control complements comes from the behavior of object fronting. Fu (1994) (see also Lu 1994; Ernst & Wang 1995; Paul 2002, 2005; T.-H. J. Lin 2011, 2015) observes that full (non-control) clausal complements in Mandarin can undergo object fronting, whereby the ordinarily post-verbal direct object is displaced to a preverbal position, as in (20), whereas this is not possible in control complements, as in (21). If we follow Paul (2005) in analyzing object fronting as movement to the specifier position of a dedicated functional head (InnerTop) which projects above vP, then the vP approach to Mandarin control complements immediately explains the facts: there is simply not enough structure in a control complement to support object fronting.

(20) Lisi renwei [Zhangsan hanbao chi-le].
Lisi believe Zhangsan burger eat-Prf
‘Lisi believes that Zhangsan ate the burger.’ (cf. T.-H. J. Lin 2011:60, ex. 43)

(21)*Lisi quan Zhangsan [PRO hanbao chi].
Lisi persuade Zhangsan burger eat
Intended: ‘Lisi persuaded Zhangsan to eat the burger.’ (cf. Lin 2011:60, ex. 45)

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7 A similar idea is proposed by Xue and McFetridge (1996, 1998). Cf. also the view that Mandarin control complements lack Aux (Huang 1988) or are otherwise nonfinite (Li 1990, T.-H. J. Lin 2011).
8 Huang (1988) proposes that shi 'be' and you 'have' have dual uses as transitive predicates and (intransitive) raising auxiliaries. In their capacity as raising auxiliaries, assigning them a structural position above vP seems plausible. But the examples in (16) and (17) both involve what Huang would analyze as transitive uses. I thank Sze-Wing Tang for drawing my attention to this point.
3. Synthesizing the two hypotheses?

In spite of its empirical advantages, the syntactic approach just sketched in section 2 faces a conceptual challenge: Why should Mandarin control verbs be unlike their English counterparts in combining with vP complements? This is ultimately a stipulation, even if a well supported one. The semantic approach sketched in section 1, in contrast, despite its empirical shortcomings, is conceptually much more appealing: it grounds the facts in general principles concerning control, the progressive, and a large-scale parametric difference between Mandarin and English.

In this light, I attempt in the section to sketch (at least in broad strokes) an approach that synthesizes insights from both of the two approaches just considered, preserving their respective advantages while avoiding their shortcomings as much as possible.

To begin with, I follow many scholars including e.g. Kratzer (1996) in supposing that vPs (including not only eventive ones but also stative ones) denote properties of eventualities (type $<$ε,t$>$, where ε is the type of eventualities). Second, let's modify the idea from above that control verbs select for action-denoting complements and instead entertain the idea that control verbs select for type $<$ε,t$>$ complements. This seems sensible insofar as $<$ε,t$>$ may be the closest formal type-theoretic analogue of the ordinary understanding of 'action,' while at the same time it is an explicitly more inclusive notion, encompassing not just actions in the narrow sense but also states. In this way, we avoid the empirical shortcomings of the approach from section 1. Next, let's follow another popular idea in the literature and suppose that aspecual morphemes denote functions of type $<<$ε,t$>$,$<$i,t$>$> (see e.g. Kratzer 1998), i.e., functions from properties of eventualities to properties of time intervals. A consequence is that AspP is type $<$i,t$>$ (a property of time intervals), and is therefore type-theoretically unable to combine with a control verb, which is looking for a property of eventualities. This forms the basis of the explanation for the Mandarin pattern, and then we explain English by appealing again to its greater tolerance for coercion: English can use Aspect to build a type $<$i,t$>$ expression but then coerce it back into a type $<$ε,t$>$ meaning to satisfy the selectional demands of a control verb, whereas in Mandarin this is not possible. This is schematized in (22)–(23).

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9 For Grano (2012, 2015a), the vP status of control complements is not specific to Mandarin but rather reflects something cross-linguistically stable: building on Cinque (2004), Grano proposes that some control verbs — those that display restructuring effects — realize functional heads in the inflectional layer of the clause and thereby combine with vP complements. But this approach is not fine-grained enough to capture the difference between English and Mandarin, unless we countenance cross-linguistic variation in the structural height of progressive aspect, so that it is relatively low in English (low enough to be included in vP) but relatively high in Mandarin (too high to be included in vP). This is not inconceivable, though I will not pursue this possibility here.
(22) [control verb]_{<\varepsilon, t>, <i, t>}[vP...]_{<i, t>} ← OK!

(23) [control verb]_{<\varepsilon, t>, <i, t>}[AspP...]_{<i, t>} ← mismatch! (fixable in English only)

In summary, on this account, the notion 'action' is recast type-theoretically as 'property of eventualities,' which encompasses not just events but also states and thereby avoids the faulty predictions of the hypothesis from section 1. Moreover, on this hybrid approach, the semantic type 'property of eventualities' maps onto the syntactic category vP, bringing in the insights from the hypothesis in section 2 and achieving a solution that rests at the interface between syntax and semantics.

4. Conclusions and open questions

I started this paper with the observation that progressive marking is possible under control verbs in English but not in Mandarin. I explored two possible ways of making sense of this difference between English and Mandarin, the first relating it to the idea that coercion is possible in English but not Mandarin and the second relating it to the idea that Mandarin control complements are structurally smaller than their English counterparts. I ultimately suggested that a synthesis of these two accounts may be the most desirable, wherein a difference in the availability of coercion drives the pattern but in such a way that it has syntactic ramifications as well.

Many open questions remain. Here I will mention just two. The first has to do with variation among control predicates. As alluded to in note 6 above, it is ultimately an oversimplification to say that all control verbs select action-denoting complements. And if we adopt the refinement in section 3 and say instead that control verbs select for complements that denote properties of eventualities, that comes with it the need to develop diagnostics for distinguishing properties of eventualities from other type-theoretic objects such as propositions. Then we can ask: do all control verbs in English and Mandarin select for properties of eventualities? And if the answer is no and we instead find variation, does the variation correlate in the expected way with the availability of progressive aspect in Mandarin?

A second open question has to do with aspectual morphemes other than the progressive. Whereas the approach sketched in section 2 is predictively limited to the behavior of progressive aspect, both the approach in section 3 and that in section 4 make predictions about aspect marking in general, at least insofar as all aspectual markers sit in AspP (for the approach in section 3) and all aspectual markers are type \langle \langle \varepsilon, t \rangle, \langle i, t \rangle \rangle (for the approach in section 4). In particular, they predict that all aspectual markers should be disallowed in Mandarin control complements, not just the progressive. But this prediction is challenged by the fact that some speakers of Mandarin accept sentences like (24), wherein the perfective marker -le or the experiential marker -guo is found embedded in a control complement.
(24) %Lisi quan Zhangsan [PRO chi-le/-guo fan].
   Lisi persuade Zhangsan eat-Prf/-Exp food
   ‘Lisi persuaded Zhangsan to eat.’

There are at least a couple of ways of making sense of (24) within the broader context of the proposals in this paper. One would be to say that perfective and experiential aspect are structurally lower than progressive aspect, possibly with a corresponding type-theoretic difference (perhaps, $<<\varepsilon,t>,<\varepsilon,t>>$) that would explain their compatibility with control complements. The idea that aspectual markers occupy different positions in the structure of the clause is not new; see e.g. Travis 2010. But it remains to be seen whether this is the right approach for the case at hand. Another possibility is that sentences like (24) instantiate non-local realization of matrix aspect and are therefore not counterexamples after all. Such an approach has been suggested by Huang 1989; Li 1990; Grano 2015b; cf. also Hu et al. 2001 for criticism. For a further investigation of the status of experiential -guo in Mandarin control complements, including relevant experimental data, see Grano and Zhang (this volume).

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