

Mandarin Resultative Verb Compound Involves VP Complementation

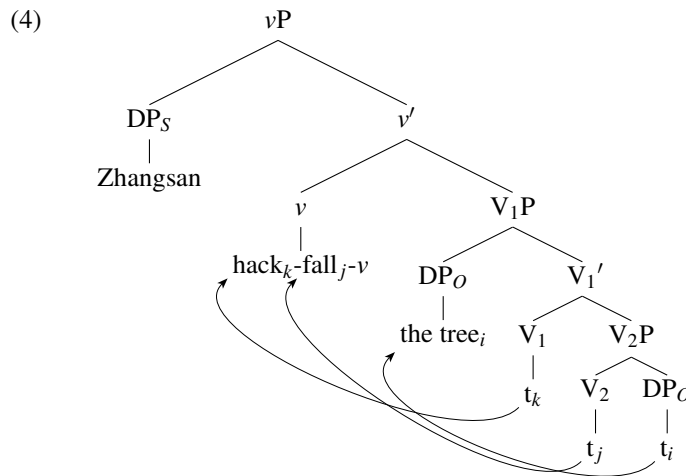
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1 Introduction

Resultative verb compounds (RVC) are verbal compounds of the form V_1 - V_2 , where V_1 intuitively denotes an activity and V_2 the result of that activity (hence the name resultative, see Thompson 1973). (1), (2) and (3) are given below as examples of typical Mandarin RVCs. As for its syntax, previous literature either assigns to RVC a Complex Verb structure [_v V_1 - V_2] (Li 1990, Williams 2011) or a Small Clause structure [_{VP} V_1 [_{SC} V_2]] (Sybesma 1999).

- | | | | |
|--|---|---------------|-------|
| | S | V_1 - V_2 | O^1 |
|--|---|---------------|-------|
- (1) Zhangsan **kan-dao** le da shu.
Zhangsan hack-fall PRF big tree
'Zhangsan hacked tree and the tree fell as a result.'
- (2) Zhangsan **ku-shi** le shoupa.
Zhangsan cry-wet PRF handkerchief
'Zhangsan was crying and his handkerchief got wet as a result.'
- (3) Zhangsan **kan-dun** le fuzi.
Zhangsan hack-blunt PRF axe
'Zhangsan hacked something and the axe got blunt as a result.'

In this paper, I argue for a VP Complementation syntax for Mandarin RVC [_{VP} V_1 [_{VP} V_2 P]] (similar to Sybesma 1999 but contra Williams 2011) and present new data to support it. Specifically, the data involves two sorts of event modifiers *duratives* and *locatives*, and I will show that these event modifiers can modify either V_1 or V_2 , **independently**; also, I will show that the positions of these modifiers determine their interpretations and that certain positions of durative are not allowed, both of which are predicted by the VP Complementation syntax. The syntactic proposal is spelled out in (4 – 6).



A more linearized version of (4) is (5), and (6) lists crucial features of this syntax.

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¹S means the syntactic subject of the RVC, while O means the syntactic object of the RVC. This way of representation follows from Williams 2011.

- (5) S V₁ -V₂ O
 [_{TP} Zhangsan_j T [_{VP} t_j < hack_k-fall_{i-v} > [_{VP} <the big tree_i> t_k [_{VP} t_i t_j]]]]]

(6) *How the syntax works:*

- a. DP_O starts out as an argument (specifically, a complement) of V₂;
- b. V₁ takes V₂P as its complement; crucially, V₂P is a bare VP;
- c. DP_O moves to Spec of V₁ to check its Case and get a theta role from V₁;
- d. *v* introduces the external argument of V₁;
- e. there are two head-movements V₁-*v* and V₂-*v*.

Two things need to be said about (6). First, (6b) and (6c) together entail that DP_O receives two theta roles,² but this doesn't violate the **theta-criterion**, which only requires each argument to bear one and only one theta role with respect to **a single verb**; since there are two verbs here, the theta-criterion is not violated. Second, here I am following an idea proposed in Collins 2002 and mentioned in Kratzer 2005 (her footnote 27) in positing two separate head-movements V₁-*v* and V₂-*v*. This preserves the left-adjunction nature of head-movement and explains the observed surface order [V₁-V₂] by making V₁ first move to *v* and then V₂ to *v*, allowing V₂ to be 'sandwiched' between V₁ and *v*.

Now we proceed to evidence supporting the above claims.

2 Support 1: Independent Modification

In this section, I will try to use positions and interpretations of Duratives Phrases with respect to RVC to support the VP Complementation Syntax proposed in the previous section.

Specifically, I try to make the following empirical claims in (7),³ and then show (7) can only be explained by a VP Complementation Syntax.

- (7) a. There are Post-RVC durative phrases modifying only V₂ and having a **result**-related meaning.
 b. There are Pre-RVC durative phrases modifying only V₁ and having a **process**-related meaning.

To see this generalization, let's look at Mandarin durative phrase (DurP) first.⁴

Mandarin Chinese DurP (this name comes from Lin 2008) has the form of Number + (Classifier) + Temporal.Measurement.Word, and no prepositions are needed. This differs from English that uses different prepositions to introduce different kinds of temporal phrases (such as *for an hour* versus *in an hour*). Examples of Mandarin DurP are given in (8).

(8) **Mandarin DurPs:**

yi tian, san ge xiaoshi, wu fenzhong, liu miao ...
 one day, three CL hours, five minutes, six seconds ...

²For motivations of doing this, see Lin 2004. His arguments crucially rely on the fact that both V₁ and V₂ put semantic/thematic constraints on DP_O. For opposing view, see Williams 2011.

³The reason that I am not making the stronger claim that All Post-RVC duratives modify V₂ and All Pre-RVC duratives modify V₁ is that there are Post-RVC duratives with a Since-Completion reading and there are Pre-RVC duratives with a temporal frame reading (Parsons 1990). But (7) is enough to argue for a VP Complementation syntax for RVC.

⁴The name DurP is only a descriptive name for the Mandarin [Number + Time] phrase. It does not have the theoretical implication such as English duratives that distinguish themselves from time-span adverbials. As will be clear later, DurP can either express a duration of an atelic process, or the time span of a telic event; further, it can also express the duration of the resultant state of an event, and the time interval between the event and the speech time. It seems the positions of DurP and the aspectual types of the main verbs together will determine the interpretations of DurPs.

DurPs can appear both before and after the RVC, but different positions incur different interpretations. See (9) and (10).⁵

- (9) S V₁-V₂ O DurP
- a. *Zhangsan zuotian da-kai le men san xiaoshi*
Zhangsan yesterday hit-open PRF door three hours
'Yesterday, Zhangsan opened the door, and the door remained open for 3 hours.'
- b. *Zhangsan zuotian cai zhui-lei le Lisi wu fenzhong*
Zhangsan yesterday only chase-tired PRF Lisi five minutes
'Yesterday, Zhangsan chased Lisi, and Lisi was only tired for 5 minutes.'
- c. *Zhangsan zuotian chang-ku le wo yi ge xiaoshi*
Zhangsan yesterday sing-cry PRF me one CL hour
'Yesterday, Zhangsan was singing, and I was crying for 1 hour because of his singing.'
- (10) S DurP V₁-V₂ O
- a. *Zhangsan zuotian san xiaoshi cai da-kai le men*
Zhangsan yesterday three hour then hit-open PRF door
'Yesterday, Zhangsan tried to open the door for three hours, and then, the door got open.'
- b. *Zhangsan zuotian wu fenzhong jiu zhui-lei le Lisi*
Zhangsan yesterday five minutes then chase-tired PRF Lisi
'Yesterday, Zhangsan chased Lisi for only 5 minutes, and then Lisi got tired.'
- c. *Zhangsan zuotian san fenzhong jiu chang-ku le wo*
Zhangsan yesterday three minutes only sing-cry PRF me
'Yesterday, Zhangsan sang for only three minutes and I began to cry as a result.'

For all the cases in (9), where DurPs come after the RVC, they only mean the duration of the resultant state;⁶ while for sentences in (10) where DurPs come before the RVC, they can only be interpreted as describing the duration of the process.⁷ This justifies the generalization in (7).

Below, I show the generalization in (7) is predicted by the VP Complementationsyntax in (4).

First, let's look at the Post-RVC DurPs in (9). The fact that there are Post-RVC DurPs modifying only the resultant state denoted by V₂ is predicted by the VP Complementationsyntax. In a VP-complementation structure such as (4) and (5), these Post-RVC DurPs can be analyzed as modifying the lower V₂P consisting of the result V₂ (and its complement) only (for the assumption that DurP

⁵Some speakers might find (9) not very natural; I think it's because it violates a well-know (perhaps phonological) 'Postverbal Constraint' which prefers only one constituent following the verb in Mandarin Chinese. Thus, moving the object preverbally as in (i) makes (9) perfect, and crucially, the DurP still modifies the V₂ after the object moves, thus not affecting the argument made here.

(i) *Zhangsan yesterday BA door hit-open PRF three hours.*

⁶The result-related meaning of DurP has been described and analyzed by Lin (2008), but he only discusses simple verbs, not RVCs.

⁷There always exists the difficulty of distinguishing whether these Pre-RVC DurPs are modifying V₁ only or they are modifying the entire causal event. The former will roughly have the meaning 'doing V₁ for x time causes V₂', while the latter roughly means 'within x time, V₁ causes V₂'. But notice, there might be evidence showing that the idea of DurP modifying V₁ is the correct one. One of the evidence involves Negative Potential Form of RVC like (i).

(i) *Zhangsan shi fenzhong kan- bu- dao da shu*
Zhangsan 10 minutes hack-NOT-fall big tree

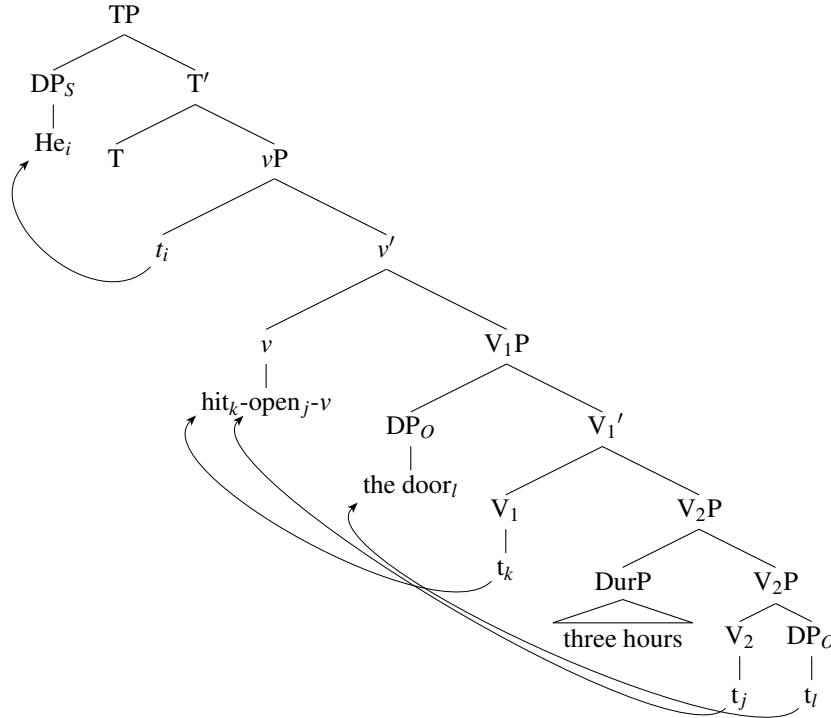
(a) Zhangsan's hacking the tree for 10 minutes cannot make it fall.

(b) Zhangsan can't hack the tree down within 10 minutes.

The (a) interpretation in (i) represents the meaning derived by a DurP-modifying-V₁ analysis, while the (b) interpretation in (i) represents the meaning assigned by a DurP-modifying-Causal-event analysis. The former allows DurP to be generated above the Negation, while the latter requires Negation to be generated higher than the DurP. The second option is not compatible with the fact that Negation seems to be very low in the Negative Potential Form of RVC (as can be seen from its surface position, also see Williams 2005, 2011 for independent evidence showing that negation is generated low in the Negative Potential Form of RVCs.).

adjoins to VP in Mandarin Chinese, see Soh 1998, Lin 2008).⁸ Further, the obligatory post-verbal position of R-related DurP is also expected, since they attach to the lowest V₂P whose head V₂ will eventually move out (to little *v*). This can be shown by (11) and (12) below.

(11) **Post-RVC DurP**



(12) *ta da-kai le men san ge xiaoshi*

He hit-open PRF door three CL hour

‘He opened the door, and the door remained open for three hours.’

[_{TP} He_i T [_{vP} t_i <hit_k-open_{j-v}> [_{vP} <the door_l> t_k [_{vP} <**three hours**> [_{vP} t_jt_l]]]]]]

Similarly, for Pre-RVC DurPs modifying only the activity denoted by V₁, they can be analyzed as attaching to the vP, as can be seen by (13).

Notice, this analysis requires that head-movement does not have any semantic effect. This is compatible with Chomsky’s (2000) proposal that head-movement occurs on the phonological branch of the derivation, after Spell-Out.⁹

In the way sketched above, we have shown that under the VP Complementation syntax we are considering, Generalization (7) can be easily explained by (11) and (13). Further, in this account, the only information needed to interpret a DurP is its syntactic sister,¹⁰ thus maintaining a transparent syntax-semantics interface.

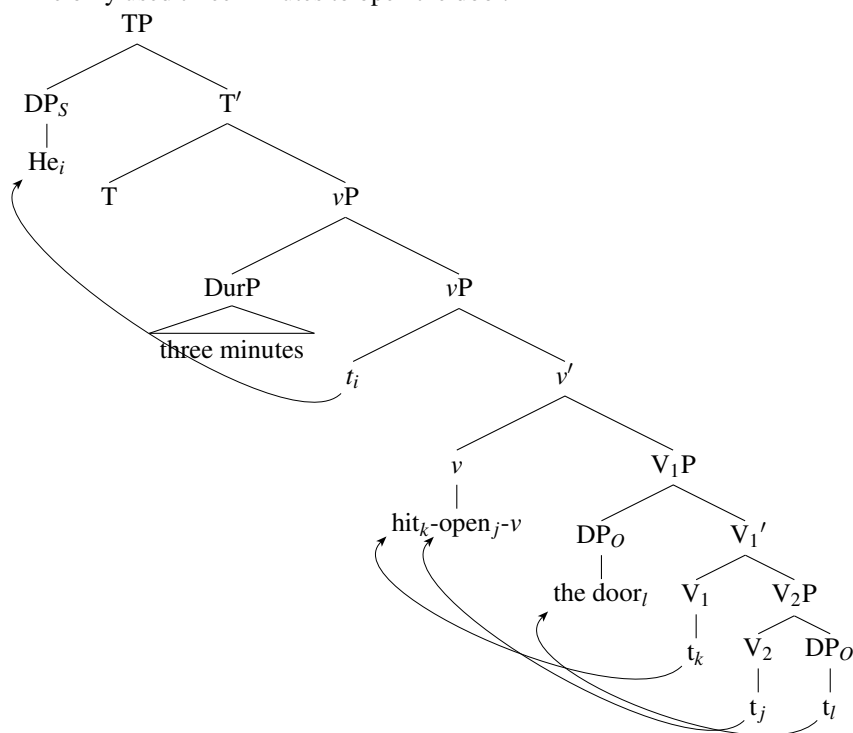
⁸DurP might also be a Specifier of some aspectual projection (Thanks to Jane Grimshaw for pointing this out to me), but this option does not affect my claim that DurP is generated between V₁ and V₂, thus modifying only V₂.

⁹Thanks to Veneeta Dayal for asking me to make this explicit.

¹⁰Here, a potential problem for pre-RVC duratives is: the pre-RVC Process-related durative is not a sister of the V₁P per se, and actually, it cannot attach to the V₁P (see Footnote 12). So it seems that I am allowing a DurP to attach to a vP but to modify V₁ only. To solve this problem, I have to assume: 1), head movement does not create semantic effects. 2), vP is an extended projection of the V₁. Thus, a DurP attaching to vP which itself is an extended projection of V₁, is still modifying V₁. An alternative way to see this problem will be looking at the semantic representation of RVC; by the time vP is interpreted, its semantics will be $\lambda e_1 \exists e_2 [V_1'(e_1) \text{ wedge } V_2'(e_2)]$ (abstracting away individual arguments and see Kratzer 2005); taking Durative as a predicate of events $\lambda e [\text{Duration}(e) = i]$, the two predicates can be interpreted by Predicate Modification (Heim and Kratzer 1998); and crucially, only V₁ is accessible for modification, since the event represented by V₂ is always existentially bound.

(13) **Pre-RVC DurP**

ta san fenzhong jiu da-kai le men
 He three minute only hit-open PRF door
 'He only used three minutes to open the door.'



3 Support 2: *V+ Durative phrase + Object

In this section, I will present another argument involving the position of DurP with respect to RVC's direct object to show that the VP Complementation analysis makes the right prediction.

As observed previously (Soh 1998, Lin 2008, etc.), Chinese Post-verbal DurP can appear at two positions: between the verb and its object, or after the object. The two orders can be schematized as V + DurP + Object and V + Object + DurP, and can be illustrated by (14) and (15) below.

(14) V + DurP + Object

- a. *wo (yijing) kai ershi nian jichengche le*
 I (already) drive twenty years taxi PRF
 'I have (already) driven taxi for twenty years.' (Lin 2008)
- b. *wo (yijing) kan le liang ge xiaoshi zhe ben shu le*
 I (already) read PRF two CL hour this CL book PRF.
 'I have (already) read this book for two hours.'
- c. *wo (yijing) xiang le san tian zhe ge wenti le*
 I (already) think PRF three day this CL question PRF.
 'I have (already) thought about this question for 3 days.'

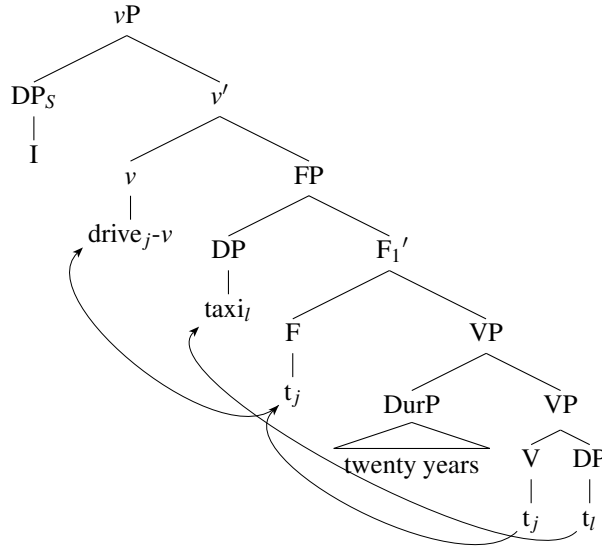
(15) V + Object + DurP

- a. *wo (yijing) kai jichengche ershi nian le*
 I (already) drive taxi twenty years PRF
 'I have (already) driven taxi for twenty years.' (Lin 2008)
- b. *wo (yijing) kan le zhe ben shu liang ge xiaoshi le*
 I (already) read PRF this CL book two CL hour PRF.
 'I have (already) read this book for two hours.'

- c. *wo (yijing) xiang le zhe ge wenti san tian le*
 I (already) think PRF this CL question three day PRF.
 'I have (already) thought about this question for 3 days.'

The V + DurP + Object in (14) and V + Object + DurP in (15) usually do not involve a meaning difference (Soh 1998). I will follow Soh (1998) in treating the V + DurP + Object as the underlying order and derive the V + Object + DurP order via *object scrambling*. Reasons of why object scrambling happens include various prosodic and discourse factors and it is assumed to be optional (see Soh 1998 for details). See (16).¹¹

(16) **Object Scrambling**



Now turning to RVC, interestingly RVC does not allow the V + DurP + Object order. Compare (17) and (18).

(17) RVC + Object + DurP

- a. *Zhangsan da-kai le men san fenzhong*
 Zhangsan hit-open PRF door three minutes
 'Zhangsan has opened the door and the door opened for three minutes.'
- b. *Zhangsan chang-ku le Lisi san fenzhong*
 Zhangsan sing-cry PRF Lisi three minutes
 'Zhangsan had sung, and Lisi cried for three minutes as a result.'
- c. *Zhangsan shuai-kai le Lisi shi fenzhong*
 Zhangsan throw-away PRF Lisi ten minutes
 'Zhangsan got rid of Lisi for ten minutes.'

(18) *RVC + DurP + Object

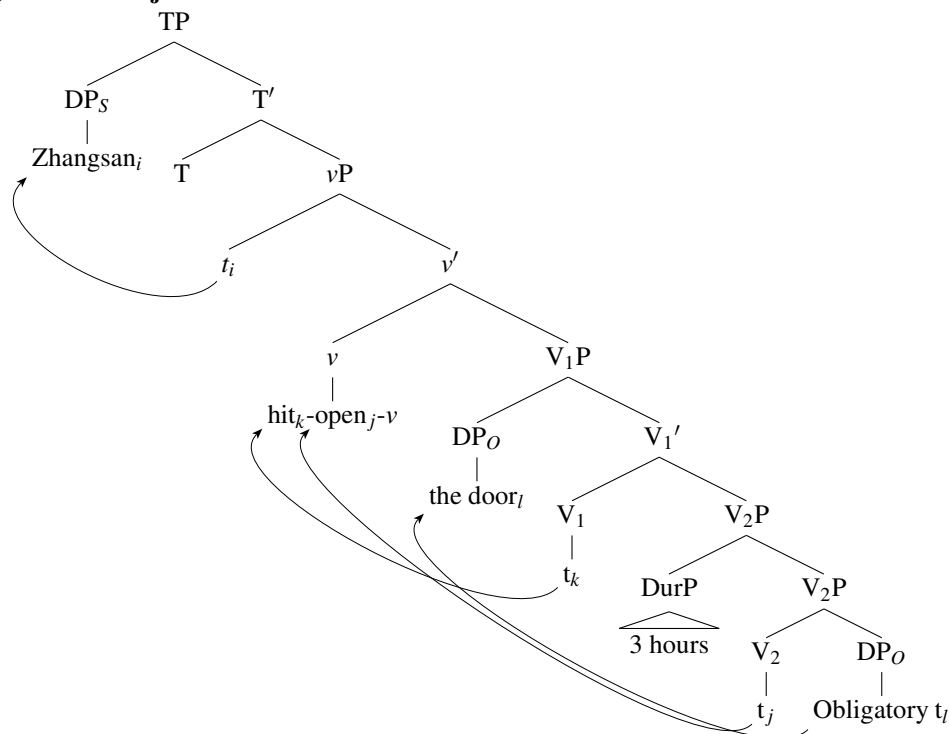
- a. **Zhangsan da-kai le san fenzhong men*
 Zhangsan hit-open PRF three minutes door
 'Zhangsan has opened the door and the door opened for three minutes.'
- b. **Zhangsan chang-ku le san fenzhong Lisi*
 Zhangsan sing-cry PRF three minutes Lisi
 'Zhangsan had sung, and Lisi cried for three minutes as a result.'
- c. **Zhangsan shuai-kai le shi fenzhong Lisi*
 Zhangsan throw-away PRF ten minutes Lisi
 'Zhangsan got rid of Lisi for ten minutes.'

Below, we will show that our VP Complementation syntax offers a ready explanation for (18).

¹¹F is the functional projection Soh (1998) posits whose Spec is the scrambled position.

First, remember the V + DurP + Object is the default order and the V + Object + DurP order is derived by object scrambling (Soh 1998). Then, if we look at the structure in (19) we notice (remember (4)) that the object DP_O **obligatorily** scramble out of the lower V_2P because it cannot get Case (and a theta role from V_1) from there. Thus, it is easily understood that it is the obligatory scrambling of the object DP_O that results in the default order V + DurP + Object always not surfacing. This can be clearly illustrated by (19).

(19) **RVC + Object + DurP**



In (19), the object DP_O has to move out of V_2P (a bare VP) to get Accusative Case from the upper little v , so RVC + Object + DurP is obligatory.¹² On the other hand, in (16) for simple transitive verbs, the object DP can either receive Accusative Case in-situ, or be optionally scrambled out to a higher position (Sepc of FP in Soh 1998), so both V + DurP + Object and V + Object + DurP can be observed. The crucial difference between the two is that the former is syntactic in nature, while the latter is discourse-related.

This analysis relies on the following two assumptions (20).

- (20) a. Accusative Case is assigned by little v .
 b. V_1 selects for a bare VP (V_2P) as its complement in an RVC.

(20a) has been proposed in the literature (Chomsky 1995:352, Kratzer 1996:126), and I will adopt it. I further assume transitive and unergative verbs always have little v (Chomsky 1995:352). This makes it possible for a simple transitive verb to assign Accusative Case via little v to its in-situ

¹²This analysis also requires that DurP should not attach to V_1P . Here I am following Lin 2008 in assuming DurP has to satisfy a *homogeneity* condition which forbids it to attach an event of change, and I assume V_1P is an event of change. This assumption finds support from *frequentives*, which do not require the homogeneity condition and thus can appear between RVC and its object. An example is given in (i). The attaching site of this frequentive is supposed to be V_1P .

- (i) *Zhangsan zuotian da-kai le liang ci men*
 Zhangsan yesterday hit-open PRF two time door
 ‘Yesterday, Zhangsan opened the door twice.’

complement; then it follows that the object of simple transitive verb does not have to obligatorily move (for Case), and optional scrambling of object in (16) is observed.

On the other hand, (20b) is just the syntax I am proposing for RVC. If (20b) holds, V_2P will be a bare VP without its own little v ; then it follows from (20a) that the DP argument can never get a Case within V_2P , and obligatory scrambling of this DP (to get Case) would be observed.

In simple words: if we assume that Accusative Case is assigned by little v , the DP arguments of those VPs lacking a little v must move up. Combining this result with (20b), we get the obligatory scrambling of the object O of RVC.

We can also find independent evidence to support assumption (20b). One piece of evidence involves the *aspectual* restrictions on possible V_2 of RVCs, as can be shown by (21).

(21) Aspectual restrictions

Stative V_2	<i>pao-lei</i> (run-tired) <i>xie-kun</i> (write-sleepy) <i>xiao-hun</i> (laugh-unconscious)
Achievement V_2	<i>pao-dao</i> (run-arrive) <i>da-pao</i> (hit-run.away) <i>kan-dao</i> (hack-fall.off)
*Activity V_2	* <i>pao-tiao</i> (run-jump) * <i>xie-shui</i> (write-sleep) * <i>xiao-chuan</i> (laugh-breath.heavily)
*Accomplishment V_2	* <i>shuo-kan</i> (tell-read) * <i>da-sha</i> (hit-kill) * <i>pian-ni</i> (lie-drown)

(21) shows V_2 can be stative and achievement verbs, but not activity and accomplishment verbs. This fact can be derived from assumption (20b) that requires V_2P to be a bare VP. Assuming activity/accomplishment verbs always have a little v , they can never be complement of V_1 in an RVC; and assuming stative and achievement verbs do not have a little v , they can always be the complement of V_1 by being a bare VP.

4 Further Support: Locatives

In this section, I show behaviors of another type of modifiers—*locatives*—to strengthen my point that there are modifiers independently modifying V_1 or V_2 and that this phenomenon is robust. The analysis of these locatives is similar to the analysis presented in Section 2 for duratives. Just like examples given there, these cases show again that Mandarin RVCs have a VP complementation syntax.

To be more specific: post-RVC locative phrases can only modify V_2 and have a Result-related meaning (see (22)), while pre-RVC locative phrases can be regarded as modifying V_1 and having a Process-related meaning (see (23)).

(22) Post-RVC locatives modifying V_2

- | S | V_1 - V_2 | O | Locative Phrase |
|----|-------------------------|-----------|--|
| a. | <i>Zhangsan da-sui</i> | <i>le</i> | <i>beizi zai di-shang</i>
Zhangsan hit-broken PRF cup on floor-surface
'Zhangsan broke the cup and the broken cup is on the floor.' |
| b. | <i>Zhangsan tui-dao</i> | <i>le</i> | <i>Lisi zai di-shang</i>
Zhangsan push-fall PRF Lisi on ground-surface
'Zhangsan push Lisi, and Lisi fell on the ground as a result.' |
| c. | <i>Zhangsan ti-fei</i> | <i>le</i> | <i>qiu zai ban kongzhong</i>
Zhangsan kick-fly PRF ball in half air
'Zhangsan kicked the ball, and the ball flew away in the air as a result.' |

- (23) Pre-RVC locatives modifying V₁:
 S Locative Phrase V₁-V₂ O
- a. *Zhangsan zai chufang da-sui le beizi*
 Zhangsan in kitchen hit-broken PRF cup
 ‘Zhangsan broke the cup in the kitchen.’
- b. *Zhangsan zai jiaoshi tui-dao le Lisi*
 Zhangsan in classroom push-fall PRF Lisi
 ‘Zhangsan pushed Lisi in the classroom, and Lisi fell as a result.’
- c. *Zhangsan zai qiuchangshang ti-fei le qiu*
 Zhangsan on playground kick-fly PRF ball
 ‘On the playground, Zhangsan kicked the ball, and the ball flied away as a result.’

Analyses for (22) and (23) are similar to (9)–(11) and (10)–(13) discussed in Section 2.

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