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RESULTATIVE VERB COMPOUNDS IN CHINESE

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1. INTRODUCTION

In Chinese, resultative verb compounds are formed quite productively. As Li (1995, 1999) discusses, resultative verb compounds apparently allow a violation of the thematic hierarchy where the agent is ranked the highest, because an agent nominal can be realized as a non-subject argument, which is generally believed to be impossible unless certain syntactic operations such as passivization operate on the clause. Li (1995, 1999) attempts to account for the fact that the agent of a resultative verb compound is realized in a non-subject position by positing an additional mechanism of the causative hierarchy, alongside the regular thematic hierarchy (see also Her 2007). This paper proposes an alternative syntactic analysis that dispenses with the assumptions about the double thematic hierarchies.

The major objective of the present paper is to show that exactly how the resultative verb compound construction is interpreted is determined on the basis of its syntax rather than its argument structure, and that the thematic relations of arguments and their possible structural positions are determined according to how they are assigned thematic roles syntactically. We propose that tense can attract the closest argument, where the distance is assessed by a c-command relation with reference to the argument's theta positions. It is argued that with resultative verb compounds, the agent argument of the first verb, which receives an affected theme role from the second result verb, can be realized in a non-subject position on the basis that the theme argument of the first verb can be identified as an argument closer to T than the agent.

Our central claim is that the resultative verb compound constructions which have an agent interpretation on the postverbal argument are not derived by violating the thematic hierarchy, but that its apparent violation comes from the non-agent argument moving to the clause subject position across the agent argument via A-movement. It is shown that our proposed analysis not only captures the basic facts of resultative verb compounds, but also can treat some empirical facts which fall outside the purview of Li's previous lexical analysis.

The discussion in this paper proceeds as follows. Section 2 reviews Li's (1995, 1999) analysis of resultative verb compounds, and discusses some problems with his analysis. In section 3, we propose an alternative syntactic account, and show that our approach has the advantage of accounting for some facts which do not directly follow from Li's (1995, 1999) analysis. Section 4 discusses the affectedness condition that

affects the possible interpretations of resultative verb compounds. In section 5, we discuss some subsidiary cases of resultative verb compounds. Section 6 is a conclusion.

2. THE ISSUE ON RESULTATIVE VERB COMPOUNDS

As Li and Thompson (1981) illustrate, a resultative verb compound (RVC, hereafter) is composed of two verbs V_1 - V_2 , in which the secondary predicate (V_2) signals some result of the action denoted by the first verb (V_1).¹ In the RVC constructions where the first verb (V_1) is transitive, the agent or the theme argument of the first verb is a candidate for serving as the affected theme of the second verb (V_2) (i.e. when V_2 assigns an affected theme to an argument, this argument refers to an entity undergoing a change of state). To be concrete, consider (1).

(1) *Taotao zhui-lei le Youyou.*

Taotao chase-tired ASP Youyou

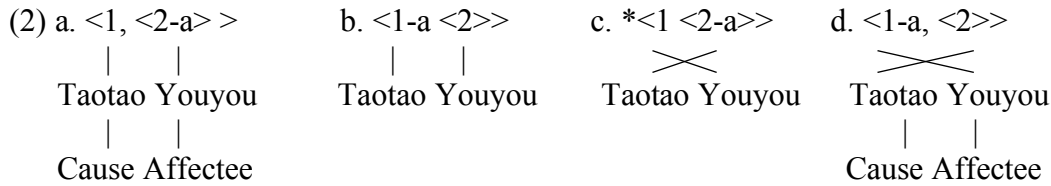
- i. 'Taotao chased Youyou and as a result Youyou got tired.'
- ii. 'Taotao chased Youyou and as a result Taotao got tired.'
- iii. *'Youyou chased Taotao and as a result Taotao got tired.'
- iv. 'Youyou chased Taotao and as a result Youyou got tired.'

Li (1995:265 (translations added by the authors))

In (1), either the argument in subject position or the postverbal argument can be interpreted as the agent of the first verb (V_1). Furthermore, either the agent or the theme of V_1 can be identified as the affected theme of the second result verb (V_2). This leads us to expect that four distinct interpretations will be available for the RVC in (1). This expectation is not fulfilled, however. In (1), the preverbal DP can be understood to be the agent of V_1 regardless of whether it is construed as an affected theme of V_2 , but the postverbal DP can be understood to be the agent of V_1 only when it is identified as the affected theme of V_2 at the same time. This fact raises one important question of why one of the logically possible interpretations is missing, i.e. (1iii).²

The existence of non-subject agent interpretations in RVC constructions has long been discussed in descriptive studies (e.g. Lü 1946: 530, Ren 2005); RVC constructions are taken to constitute one type of causative construction, where the postverbal DP can represent an agent (see also Cheng and Huang 1994, Cheng 1997, Huang 1997, 2006, Williams 2014, Tham 2015). Li (1995, 1999) suggests that the paradigms on the interpretations observed for the RVC in (1) should be accounted for with reference to a causative hierarchy, as well as the usual thematic hierarchy (following Grimshaw's (1990) analysis of English psych-verbs). See also Her (2007), which advances essentially the same solution within the LFG framework.

Specifically, in Li's (1995, 1999) analysis, the agent and the theme roles of V_1 and the affected theme role of V_2 are assigned freely to the two arguments in the clause, which gives rise to the four logical interpretations indicated in (1). Alongside these thematic roles, Cause and Affectee roles are assigned to the two arguments selectively. According to the rules of causative role assignment defined in Li (1999: 453), the first argument *Taotao* receives the cause role from a resultative compound if it receives a theta role only from V_1 , and the second argument the Affectee role from a resultative compound if it receives a theta role from V_2 (=R) (see Li 1999: 453 for the full descriptions of the rules).



Crucially, the Cause and Affectee roles are assigned in (2a) and (2d) but not (2b) and (2c) (Li 1995: 270). When no Cause-Affectee role assignment is involved, the usual thematic hierarchy, in which the agent is ranked over the theme, needs to be respected. But once the two arguments receive Cause or Affectee role, the argument realization may violate the thematic hierarchy as long as the causative hierarchy (Cause > Affectee) is observed (cf. Bresnan and Kanerva 1989, Bresnan and Moshi 1990, Fillmore 1968, Gruber 1965, Jackendoff 1972, Levin and Rappaport Hovav 2005). This provides a lexical account for why (2a), (2b) and (2d) are interpretations available for (1), but (2c) is not.

As seen above, Li's (1995, 1999) analysis can account for the basic fact that three out of four logically possible interpretations are available for the RVC in (1). It is worth mentioning, however, that there is one (potential) conceptual problem with his analysis: The RVC construction in (1) expresses a causative change of state, regardless of how the two arguments are interpreted, but under Li's analysis, the two interpretations in (2a) and (2d) involve Cause-Affectee role assignment, but (2b) does not. In Li's analysis, the device of the causative hierarchy is necessary to rule out the unwanted interpretation represented in (2c), while ruling in the others (i.e. (2a), (2b), (2d)).

Note, however, that the sentence expresses a causative meaning in all possible interpretations (see section 3). If the sentence expresses the causative meaning regardless of a difference in thematic interpretations, we would not expect an asymmetry in Cause-Affectee role assignment, as Li (1995, 1999) postulates. To be a little more concrete, if the causative/affected meaning is encoded via Cause-Affectee role assignment, (2b) should differ from (2a) and (2d), with regard to the causative meaning, but no such semantic difference is detected between them. If, on the other hand, the causative/affected meaning remains unvarying regardless of Cause-Affectee role assignment, there arises a question as to what part the Cause-Affectee role assignment plays in the interpretations of the sentence. Under Li's analysis, if Cause-Affectee role assignment is not available, it is not possible to derive all the possible interpretations, while excluding the impossible one. The hypothesized Cause-Affectee role assignment should, by its nature, affect the semantics of the RVC, but the fact of the matter is that no thematic difference arises between the interpretations (2a-b) and (2d). Given the interpretive facts of the RVC, we can say, at the very least, that the Cause-Affectee role assignment rule is not well-motivated semantically.³

On the empirical side, Li's (1995, 1999) analysis faces one important problem in accounting for (3), where the resultative compound consists of the intransitive verb *pao* 'run' and the resultative *lei* 'tired'.

- (3) *Zhei shuang xie pao-lei le mama.*
 This CL shoes run-tired ASP mother
 'The mother ran and as a result she got tired by this pair of shoes.'

Sentence (3) is similar to (1), in the sense that the postverbal DP *mama* ‘mother’ is the agent of the verb *pao* ‘run’, but unlike (1), the first DP *zhei shuang xie* ‘this pair of shoes’ in (3) is neither the argument of the V *pao* ‘run’ nor the argument of R *lei* ‘tired’. Importantly, in this construction, the agent appears postverbally. According to Li (1995, 1999), this type of argument realization is permitted when the Cause and Affectee roles are assigned, which is possible only if the DPs are assigned a theta role from either the first verb or the second verb. Since the first DP *zhei shuang xie* ‘this pair of shoes’ in (3) is neither the argument of the V *pao* ‘run’ nor the argument of R *lei* ‘tired’, the Cause and Affectee roles cannot be assigned to the two arguments in (3). Thus, under Li’s analysis, the interpretation where the agent is linked to the second DP rather than the first DP should not be available for (3), contrary to fact (see section 5; Cheng and Huang 1994).

In this section, some problems which Li’s analysis confront have been briefly reviewed. In the next section, we shall offer an alternative analysis taking A-movement to be responsible for the formation of RVCs where an agent argument appears in the postverbal position.

3. THE SYNTACTIC STRUCTURE OF RVC CONSTRUCTIONS

In this section, it is argued that in the derivation of the RVC construction in (1), thematic roles are assigned in accordance with the thematic hierarchy, and that the agentive interpretation on the postverbal DP in (1) is derived as a consequence of A-movement, motivated by the EPP requirement of T. Our syntactic analysis can not only account for the facts of RVCs without resorting to the causative hierarchy, but also capture some facts that would fall outside the purview of lexical analyses.

3.1. Eventuality

One peculiar property of RVCs is that, as noted by Li (1990, 1993, 1995), at most two arguments are allowed to appear in the clause (although an additional resultative complement, which we take to be some kind of quasi-argument, can sometimes be added; see section 5). The second verb V_2 is a one-place verb describing a change of state, which is unaccusative (see Gu 1992). When the first verb is a two-argument verb (i.e. transitive), the entire RVC has three theta roles to be assigned to the arguments of the compound. In light of this fact, we can state that one argument of V_1 receives one theta role coming from the first verb and another theta role from the second (section 3.2). Note that this theta role assignment is in violation of the Theta-criterion. Recently, however, the Theta-criterion is called into question, and is often not accepted as a principle governing argument realization. In fact, some researchers (e.g. Bošković 1997, Hornstein 1999, Boeckx, Hornstein, and Nunes 2010) argue that movement of an argument from one theta position to another is possible. Given this, we assume that RVCs allow multiple theta role assignment.

The reason why the number of arguments available in RVC constructions is limited to at most two has to do with the fact that RVC constructions represent one type of causative construction denoting a change of state, which is transitive in nature (Lü 1946, Ren 2005). Observe that verbs expressing a causative change of state, such as *hua* ‘paint’ and *dong* ‘freeze (trans.)’, takes two arguments—one which represents an agent and the other an affected theme. Likewise, since an RVC like *zhui-lei* ‘chase-tired’ in (1) expresses a causative change of state, the clause needs to have arguments possessing the

thematic roles of agent and affected theme. (Note that RVC clauses in unmarked cases need two arguments, but can have only one argument if it receives both the agent role of the first verb and the affected theme role of the second result verb; see section 5 for discussion on the latter cases.)

It is often argued (Levin and Rappaport 1995, Goldberg 1995, Tenny 1987, 1994, and others) that a clause may comprise only one expression indicating the culminating point of a described event (see also section 4). If so, RVCs, which denote a causativized change of state, will not be able to denote a motion event with an achieved endpoint. This expectation is indeed correct, as confirmed by the example in (4), involving a manner of motion verb like *zou* ‘walk’.

- (4) a. *Zhangsan {zou/zou-dao chezhan} le.*
 Zhangsan {walk/walk-arrive station} Asp
 ‘Zhangsan {walked (=went)/walked to the station}.’
 b. *Zhangsan zou-lei le.*
 Zhangsan walk-tired ASP
 ‘Zhangsan walked and as a result he got tired’
 c. **Zhangsan zou-lei dao chezhan le.*
 Zhangsan walk-tired arrive station ASP
 ‘Zhangsan walked to the station and as a result he got tired’

The verb *zou* ‘walk’ is an activity verb, where a goal can be optionally added, as in (4a), (see Vendler 1967, Dowty 1979, and others). In (4a), the goal serves as a delimiting argument, the clause describes a delimited motion event. The examples in (4b) and (4c) in fact indicate that a well-formed RVC cannot be constructed when the verb *zou* ‘walk’ accompanies a goal, but that when the same verb describes just a manner of motion with no goal argument, a well-formed RVC construction can be formed.

That verbs expressing delimited motion events do not square with RVC constructions is further confirmed by the fact that a verb of inherently directed motion like *dao* ‘arrive’ cannot appear as the first verb in RVC constructions, as in (5b).

- (5) a. *Zhangsan dao le (chezhan).*
 Zhangsan arrive ASP station
 ‘Zhangsan arrived (at station).’
 b. **Zhangsan dao-lei le (chezhan).*
 Zhangsan arrive-tired ASP station
 ‘Zhangsan arrived (at the station) and as a result he got tired.’

The verb *dao* ‘arrive’ takes a goal argument optionally, as indicated in (5a), but an RVC construction cannot be formed from *dao* ‘arrive’ regardless of whether the clause contains a goal argument. The inherently directed motion verb *dao* ‘arrive’ specifies an event of reaching a goal as a part of lexical meaning, whether or not the goal is expressed. Accordingly, the verb *dao* ‘arrive’ is not compatible with an RVC construction, which denotes a change of state.⁴

Another fact relevant for the present discussion is found in the verb *tie* ‘paste’, which can take a goal expression optionally. The RVC example in (6) with *tie-ni* ‘paste-

bored’ is fully acceptable without a goal expression, but the addition of a goal expression to the clause leads to unacceptability.

- (6) *Zhangsan (*wang qiang shang) tie-ni le haibao.*
 Zhangsan to wall LOC paste-bored ASP poster
 ‘Zhangsan pasted posters (to the wall) and as a result he got bored.’

In this connection, observe that a locative expression can be added to the RVC construction if it does not specify a goal, as shown in (7).

- (7) *Zhangsan zai xuexiao li tie-ni le haibao.*
 Zhangsan at school LOC paste-bored ASP poster
 ‘Zhangsan pasted posters at the school and as a result he got bored.’

The data suggest that the RVC construction cannot be constructed if the verb describes an achieved change of location. Since an eventuality can only have one delimitation, as often suggested (see Levin and Rappaport 1995, Goldberg 1995, Tenny 1987, 1994, and others), the RVC constructions, which express a change of state, cannot describe an achieved change of location.

Given that RVCs, which describe a caused change of state, cannot describe a motion event with an achieved location, it also falls out that RVC constructions do not square with three-place verbs, which express a change of location with a goal (i.e. an achieved location) or a change of possession with a recipient (which could be construed as a ‘goal’ in a broad sense; Malchukov, Haspelmath, and Comrie 2010). To take a concrete example, consider (8), involving the ditransitive verb *song* ‘give’ (cf. Yu 2012, 2013).

- (8) *Zhangsan song le dajia shengri liwu.*
 Zhangsan give ASP everyone birthday present
 ‘Zhangsan gave everyone a birthday present.’

In (8), the verb *song* ‘give’ takes *dajia* ‘everyone’ as a recipient, *shengriliwu* ‘birthday present’ as a theme, and *Zhangsan* as an agent. An RVC sentence cannot be constructed from the verb *song* ‘give’ taking three arguments, as (9) illustrates.

- (9) **Zhangsan song-ni le dajia shengri liwu.*
 Zhangsan give-bored ASP everyone birthday present
 ‘Zhangsan gave everyone a birthday present and as a result everyone got bored.’

This does not mean that the verb *song* ‘give’ is inherently incompatible with RVC constructions. When the recipient *dajia* ‘everyone’ is not present, a well-formed RVC clause can be constructed, and it is also possible to have the reverse realization of agent and theme, which is characteristic of RVC constructions, as illustrated in (10).

- (10) a. *Zhangsan song-ni le shengri liwu.*
 Zhangsan give-bored ASP birthday present
 ‘Zhangsan gave a birthday present and as a result he got bored.’
 b. *Shengri liwu song-ni le Zhangsan.*

birthday present give-bored ASP Zhangsan
 ‘Zhangsan gave a birthday present and as a result he got bored.’

In (10a) and (10b), *Zhangsan* counts as the agent of *song* ‘give’ as well as the affected theme of *ni* ‘bored’, and *shengri liwu* ‘birthday present’ is the theme of *song* ‘give’. On the other hand, when *dajia* ‘everyone’ instead of *shengri liwu* ‘birthday present’ is present, ungrammaticality results.

- (11) a. **Zhangsan song-ni le dajia.*
 Zhangsan give-bored ASP everyone
 ‘Zhangsan gave everyone (something) and as a result everyone got bored.’
 b. **Dajia song-ni le Zhangsan.*
 everyone give-bored ASP Zhangsan
 ‘Zhangsan gave everyone (something) and as a result everyone got bored.’

With the compound verb *song-ni* ‘give-bored’, *shengri liwu* ‘birthday present’ can be taken as a theme argument of *song* ‘give’, so that (10a) (as well as (10b)) is acceptable. But *dajia* ‘everyone’ cannot be so construed, and thus (11) is unacceptable.⁵ The difference in acceptability between (10) and (11) has to do with the fact that *song* ‘give’ can take *shengri liwu* ‘birthday present’, but not *dajia* ‘everyone’, as its theme argument, as illustrated in (12).

- (12) *Zhangsan song le shengri liwu/*dajia.*
 Zhangsan give ASP birthday present/everyone
 ‘Zhangsan gave a birthday present/*everyone.’

This fact, coupled with the data in (10), shows that RVC constructions can be formed on ditransitive verbs only if they can have the variants in which two arguments appear in the clause (without a goal/recipient arguments, which delimit events denoted by the verb). Crucially, since RVC constructions cannot be formed from ditransitive verbs when they select a goal/recipient argument, it can be stated that RVC constructions with a goal/recipient argument are ruled out due to the affectedness condition.

The following example further illustrates that ditransitive verbs qualify as the first verb of an RVC when no recipient is manifested.

- (13) *Xiao Wang jiao daxuesheng Hanyu.*
 Mr. Wang teach university.student Chinese
 ‘Mr. Wang teach university students Chinese.’

In (13), the ditransitive verb *jiao* ‘teach’ takes *daxuesheng* ‘university students’ as a recipient and *Hanyu* ‘Chinese’ as a theme. With *jiao* ‘teach’, unlike *song* ‘give’, RVC sentences can be formed by taking either *daxuesheng* ‘university students’ or *Hanyu* ‘Chinese’, but not both.

- (14) a. *Xiao Wang jiao-ni le daxuesheng.*
 Mr. Wang teach-bored ASP university.student
 ‘Mr. Wang taught university students and as a result he got bored.’

- b. *Xiao Wang jiao-ni le Hanyu.*
 Mr. Wang teach ASP Chinese
 ‘Mr. Wang taught Chinese and as a result he got bored.’
- c. **Xiao Wang jiao-ni le daxuesheng Hanyu.*
 Mr. Wang teach-bored ASP university.student Chinese
 ‘Mr. Wang taught university students and as a result he got bored.’

In (14a) and (14b), both of which involve the verb *jiao* ‘teach’, the two arguments can be switched, as is the case with the RVC construction with the verb *song* ‘give’.

- (15) a. *Daxuesheng jiao-ni le Xiao Wang.*
 university.student teach-bored ASP Mr. Wang
 ‘Mr. Wang taught university students and as a result he got bored.’
- b. *Hanyu jiao-ni le Xiao Wang.*
 Chinese teach-bored ASP Mr. Wang
 ‘Mr. Wang taught Chinese and as a result he got bored.’

This behavior of the ditransitive verb *jiao* ‘teach’ in (14) is naturally expected, because both *daxuesheng* ‘university students’ and *Hanyu* ‘Chinese’ can stand as the sole complement to the verb *jiao* ‘teach’ as in (16).

- (16) a. *Xiao Wang jiao daxuesheng.*
 Mr. Wang teach University.students
 ‘Mr. Wang taught university students.’
- b. *Xiao Wang jiao Hanyu.*
 Mr. Wang teach Chinese
 ‘Mr. Wang taught Chinese.’

The fact illustrates that *daxuesheng* ‘university students’ or *Hanyu* ‘Chinese’ can count as the theme argument of the verb *jiao* ‘teach’.⁶ Given that the two sentences in (16) are acceptable, it is naturally expected that the two kinds of RVCs can be formed on the verb *jiao* ‘teach’.

In a nutshell, RVC constructions carry the meaning of a caused change of state. Owing to their semantic properties, predicates carrying the meaning of achieved change of location or a change of possession with a recipient argument are inherently incompatible with RVCs. This is due to the delimitedness constraint that an eventuality can be delimited only once (see Tenny 1987, 1994, Levin and Rappaport Hovav 1995). Given that three-place predicates with a goal or a recipient, which indicates an endpoint of a motion or transfer event, are excluded from RVCs, it follows that RVC constructions can take at most two arguments.

3.2. Locality of A-Movement

In this section, we first show that the first argument appearing to the left of the complex predicate in the RVC constructions, which may be DP₁ or DP₂ depending on how A-movement to TP takes place, represents the subject of the clause, and then argue that the theme argument appears in the subject position of the clause (Spec-TP) if it counts as an

argument closer to T than the agent. In this case, the agent argument of the first verb is realized in the postverbal position.

We suggest in this section that the possibility of the interpretations in RVC constructions like (1) (repeated here as (17)) can be characterized in structural terms.

- (17) *Taotao zhui-lei le Youyou.*
 Taotao chase-tired ASP Youyou
 i. ‘Taotao chased Youyou and as a result Youyou got tired.’
 ii. ‘Taotao chased Youyou and as a result Taotao got tired.’
 iii. *‘Youyou chased Taotao and as a result Taotao got tired.’
 iv. ‘Youyou chased Taotao and as a result Youyou got tired.’

The main claim is that the possible interpretations given in (17i), (17ii), and (17iv) are determined according to how the leftmost argument in (17), which appears to the left of the verbal complex, is moved by A-movement, and that (iii) is not generated as a possible interpretation due to the absence of legitimate A-movement.

Before proceeding, let us first confirm that in the RVC construction in (17), the leftmost DP occurring to the left of the resultative verb compound counts as the subject, regardless of how it is interpreted. This fact is confirmed, for instance, by looking at reflexive binding. This is because, as Tan (1991) and Huang et al. (2009) argue, only subjects can be the antecedent of the reflexive *ziji* ‘self’, as (18) shows.

- (18) *Mary_i gaosu John_j Tom_k xihuan ziji_{i/*j/k}.*
 Mary_i tell John_j Tom_k like self_{i/*j/k}
 ‘Mary_i told John_j that Tom_k likes self_{i/*j/k}.’Tan (1991: 26)

Example (18) shows that the matrix subject *Mary* and the embedded subject *Tom*, but not the matrix object *John*, can be the antecedent of the reflexive *ziji* ‘self’. This indicates that the reflexive *ziji* ‘self’ can take a subject as its antecedent (under c-command). With this fact as a background, let us consider the RVC example below.

- (19) *Taotao_i zai ziji_{i/*j} de yuanzi li zhui-lei le Youyou_j.*
 Taotao at self Poss garden in chase-tired ASP Youyou
 i. ‘Taotao chased Youyou and as a result Youyou got tired at Taotao’s garden.’
 ii. ‘Taotao chased Youyou and as a result Taotao got tired at Taotao’s garden.’
 iii. *‘Youyou chased Taotao and as a result Taotao got tired at Taotao’s garden.’
 iv. ‘Youyou chased Taotao and as a result Youyou got tired at Taotao’s garden.’

In (19), it is the leftmost DP *Taotao*, but not the other DP *Youyou*, that serves as the antecedent of the subject-oriented reflexive *ziji* ‘self’ in all the possible interpretations. Importantly, even when the postverbal DP *Youyou* is interpreted as the agent of the first verb *zhui* ‘chase’, the DP *Taotao* occurring in the sentence initial position, which counts as the theme of the first verb, serves as the subject of the clause. Moreover, the example in (20) shows that when the DP *Youyou* is fronted by topicalization, it does not serve as the antecedent of the reflexive *ziji* ‘self’.

- (20) *Youyou_j, Taotao_i zai ziji_{i/*j} de yuanzi li zhui-lei le.*

- Youyou, Taotao at self POSS garden in chase-tired ASP
- i. ‘Taotao chased Youyou and as a result Youyou got tired at Taotao’s garden.’
 - ii. ‘Taotao chased Youyou and as a result Taotao got tired at Taotao’s garden.’
 - iii. *‘Youyou chased Taotao and as a result Taotao got tired at Taotao’s garden.’
 - iv. *‘Youyou chased Taotao and as a result Youyou got tired at Taotao’s garden.’

In (20), the topicalized DP *Youyou* c-commands *ziji* ‘self’. Nevertheless, this fronted DP cannot be the antecedent of *ziji* ‘self’, because it does not serve as the subject of the clause. Note that in the RVC construction in (17), even if the postverbal DP is interpreted as the agent of the verb *zhui* ‘chase’, the preverbal argument behaves as the subject. This entails that the clause in (17) does not involve inversion instantiated by A’-movement, but the leftmost argument appears in TP via A-movement, i.e. the non-agent DP is not moved across the agent DP appearing in TP via A’-movement.

Now, given that an argument located in TP serves as the antecedent of the subject-oriented reflexive in (17), it is fair to state that an argument acquires subject properties if it is raised to TP via A-movement to fulfill the EPP requirement imposed on T in the RVC constructions. The assumption that T has an EPP requirement in RVC constructions is feasible, for unacceptability results if the RVC constructions do not have arguments (subjects) appearing to the left of the predicates.

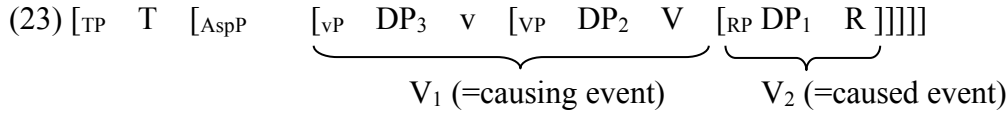
- (21) **Tiao-fan le Youyou.*
 jump-bored ASP Youyou
 Intended reading: ‘Youyou jumped and got bored/(Someone caused) Youyou to jump and got bored.’

Incidentally, it is often claimed that the EPP does not apply to Chinese as it does in English, in the presence of examples like (22a) and (22b), where no argument appears to the left of the predicates.

- (22) a. *Yijing si le hen duo ren le.*
 already die ASP very many person ASP
 ‘Many people have already died.’
 b. *Xia yu le.*
 fall rain ASP
 ‘It has rained.’

The examples in (22) are acceptable even if the subject position of the clause, i.e. Spec-TP, is not filled. This fact does not indicate that the EPP requirement is lacking entirely in Chinese. Rather, the fact suggests that the EPP requirement is imposed selectively (depending on the grammatical context). At least, it is fair to say here that the EPP requirement is imposed on T in the RVC constructions because they need to have subjects appearing to the left of the predicates, as the unacceptability of (21) shows.

Let us now proceed to address the question of how the possible interpretations in (17) are derived syntactically. First of all, we presume, in line with Huang et al. (2009), that in Chinese, an aspectual phrase (AspP) is projected over vP in a clause, and we posit the structure (23) for an RVC like (17).

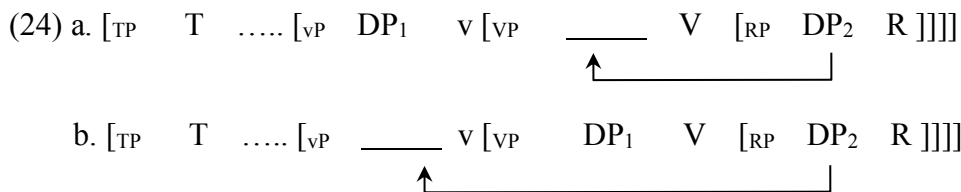


In the RVC clause in (17), the vP-VP structure representing a causing event (i.e. the ‘chasing’ event described by *zhui* ‘chase’) is projected over RP, which represents a caused event (i.e. the event described by *lei* ‘tired’).

Under the split vP hypothesis, a single verb comprises two projections of vP and VP, but some researchers (e.g. Ritter and Rosen 1998, 2000, Ramchand 2008, Travis 2010) suggest that a verbal structure should be a little more articulated, reflecting an event structure more directly. We will assume, following the latter line of research, that a verb can potentially include three verbal projections that represent an event structure: namely, vP and VP, which respectively represent an instigation and a process of an action (or an event), as well as RP, which represents its resultant state. With an RVC like *zhui-lei* ‘chase-tired’, an activity is described by the first verb, and a resultant state, by a second resultative predicate. Accordingly, we assume that the first verb *zhui* ‘chase’, which describes a causing event, i.e. an activity, projects vP and VP. On the other hand, the second verb *lei* ‘tired’, which describes a caused event, i.e. a resultant state, can be assumed to project RP. This suggests that RVC constructions have the verbal structure depicted in (23).

In regard to the assignment of thematic roles, we assume that the v head assigns an agent role (Ag), the V head a theme role (Th), and the R head an affected theme role (Th_[+aff]) (indicating an argument undergoing a change of state of the clause). Under the view held here, a head with an argument structure needs to assign its theta role to an argument located in its specifier position, and the derivation crashes if any of the theta roles available in the clause structure fails to be assigned to the arguments. Since a theta role is assigned to an argument appearing within the projection of the theta-role bearing head, we can state that an EPP requirement is imposed on a theta-role bearing head, and that the EPP requirement can be fulfilled by either base-generating an argument in the projection of the relevant head or by attracting the closest argument available to that projection (in a way similar to T with an EPP requirement).

Note that since RVCs can have at most two arguments in the clause, it is necessary to assume that a single argument can receive two theta roles from two distinct verbs, i.e. two verbs share an argument. Thus, we postulate, following Hornstein (1999, 2001) (see also Boeckx, Hornstein, and Nunes 2010), that an argument can receive more than one theta role by moving from one theta position to another theta position. The requirement for thematic assignment can be satisfied in (17) if the derivation proceeds as follows: one argument is base-generated in Spec-RP and the other argument in Spec-vP or Spec-VP. Further, the argument merged with RP is moved into a theta position where the other argument does not appear.⁷ This means that the two derivations in (24) are possible for the purpose of theta assignment to arguments.



In (24a), the DP₁ gets an agent role from *v*, and the DP₂ gets an affected theme role from *R* and a theme role from *V*. In (24b), the DP₁ gets a theme role from *V*, and the DP₂ gets an agent role from *v*, and an affected theta role from *R*.

One question that arises at this moment is how the argument can be moved into Spec-vP across DP₁, as in (24b), in apparent violation of a minimality constraint. It is often suggested (e.g. Baker 1988, Chomsky 1995, den Dikken 2007) that locality constraints are relaxed by virtue of head movement. In this light, we propose that in RVCs, head movement makes it possible for an argument to move from Spec-RP to either Spec-vP or Spec-VP. To make this point, let us consider how the surface structure of an RVC like (25) is derived.

- (25) *Wo (you) ti-kai na ge men.*
 I have kick-open that CL door
 Lit. ‘I (have) kicked the door open’

In a transitive RVC like (25), the complex verb appears to the right of the initial argument and to the left of the second argument regardless of their interpretations. The fact suggests that the resultative verb complex resides in the Asp-head position as a consequence of verb raising (Huang et al. 2009), as illustrated in (26).

- (26) [TP WO [AspP (you)-ti-kai [vP ...nage men]]]

Note that in order to derive the correct surface order of the two verb sequence, it is necessary to assume that a moved head is adjoined to the right of a higher head by a ‘tucking-in’ operation (see Richards 2001). In the RVC construction, the expected word order, in which the second argument follows the VV complex (with or without *you* ‘have’), is derived if *R* raises to Asp while picking up the upper verbal heads on the way, as (27) illustrates.

- (27) [TP T [AspP Asp-v-V-R [vP v-V-R [vP V-R [RP R]]]]]

We propose that Spec-VP and Spec-RP are rendered equidistant from *v* if *R* is moved up to *v*, forming a complex head *v-V-R*, and hence that these two positions are equally visible to *v*, which attracts an argument (cf. Miyagawa 2001; Baker 1988). Accordingly, in (24b), the argument DP₂ in Spec-RP can be moved into Spec-vP for receiving an agent role even if another argument DP₁ occupies Spec-VP. In addition, DP₂ can also be moved into Spec-VP for receiving a theme role when DP₁ occupies Spec-vP, as in (24a) (cf. Sybesma 1999 and Shen and Sybesma 2010).⁸

In RVC constructions, an EPP requirement is imposed on *T*. Logically, either of the two arguments merged within the verbal projections could be attracted by *T*. Nevertheless, the empirical fact is that only one argument can appear in TP. Here, we propose that *T* attracts the closest argument, where the ‘closeness’ is assessed with reference to the argument’s theta-marking position. (Note that the compound verb is not raised to *T*, so that only the closest argument is visible to *T* due to the locality constraint.) In RVC constructions, the argument assigned an affected theme role by *R* moves to either Spec-vP or Spec-VP via A-movement. When DP₂ is generated in Spec-vP, DP₁ in Spec-RP is moved to Spec-vP, as in (28).

(28) [T [vP DP₁ [vP DP₂ [RP DP₁]]]]

In regard to the question of which argument T can attract when the structure in (28) is derived, observe first that DP₂ c-commands the lower copy of DP₁ in Spec-vP, but is c-commanded by the upper copy of DP₁. Importantly, the lower and the upper copies of DP₂, both of which appear in theta-marking position, are nondistinct—i.e. the same syntactic entity—because they form a chain. This suggests that DP₂ c-commands DP₁ and DP₁ c-commands DP₂ at the same time, which means that ambiguity emerges for the assessment of the closeness of the two arguments from T, so that it is not possible to determine which argument T can attract. We submit that in such cases, grammar allows either the upper or the lower copy to be chosen as a potential goal to resolve this ambiguity (by making one copy invisible for the purpose of the locality calculation).

(29) a. [TP ____ T [vP DP₁ [vP **DP₂** [RP **DP₁**]]]]
 ↑
 b. [TP ____ T [vP **DP₁** [vP **DP₂** [RP DP₁]]]]
 ↑

In (29a), where the upper copy of DP₁ is made invisible for locality calculation, DP₁ is identified as an argument to be attracted by T. On the other hand, when the lower copy is made invisible, as in (29b), DP₁ is identified as an argument to be attracted by T. Accordingly, in the configuration (28), T can attract either DP₁ or DP₂. On the other hand, when DP₂ appears in Spec-vP, DP₁ in Spec-RP is moved to Spec-VP.

(30) [TP ____ T [vP **DP₂** [vP DP₁ [RP DP₁]]]]
 ↑

In (30), DP₂ unambiguously c-commands DP₁ whether the upper or the lower copy of DP₁ is chosen as a potential goal, because DP₂ c-commands both the upper and the lower copies of DP₁, so that T can attract only DP₂.

Before proceeding, note that it is not possible in (17) for one argument to be assigned both agent and theme roles by the first verb, the other argument getting an affected role from the second verb. If this way of theta role assignment were possible, (17) would have the interpretation that Youyou chased Youyou with the result that Taotao got tired or the interpretation that Taotao chased Taotao with the result that Youyou got tired. The unavailability of these interpretations suggest that a single argument cannot receive two theta roles from the same verb, i.e. an argument located in Spec-VP cannot be moved to the position marked by Spec-vP, as (31) illustrates.

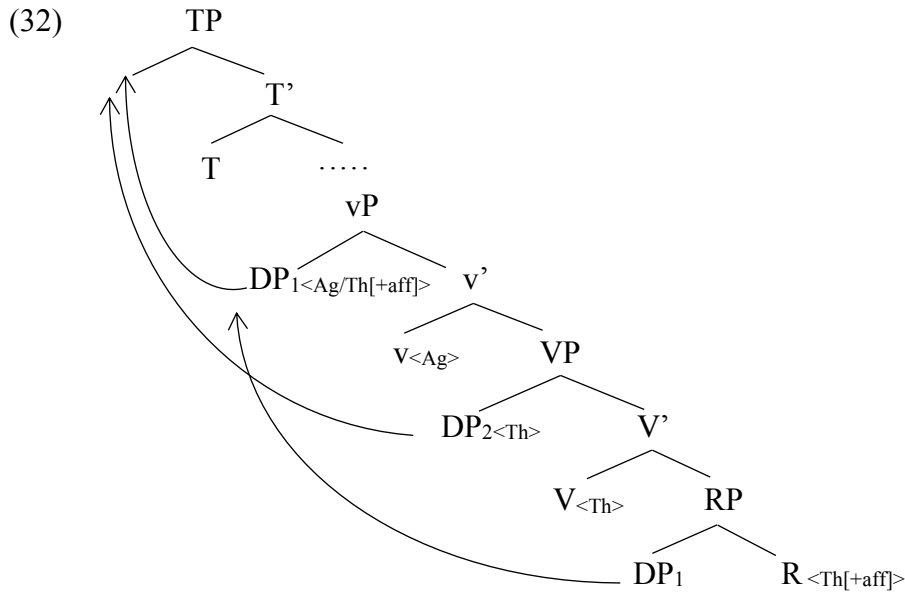
(31) [TP T [vP DP₁(Case) v [vP DP₂(Case) V [RP DP₃ R]]]]
 ↑ X

The ban on the DP-movement indicated in (31) is motivated by Case theory. Even though, in Chinese, arguments do not manifest case marking morphologically, it can be postulated that an argument needs to be Case-licensed to function as the subject or object of a sentence. Here, we assume, following Chomsky (2000, 2001, 2004, 2008), that arguments are Case-licensed if Case features are appropriately valued by their Case-licensing head, and that T is the licenser of nominative Case, and v, the licenser of accusative Case. Note

that the licenser of accusative Case is a head that is directly selected by T (see also section 5). In RVC constructions, T and v Case-license arguments (or values the Case features of arguments) in Spec-vP and Spec-VP, respectively, under local c-command, given that a verbal head (v) that is first associated with T (with no intervening verbal head) has the ability to Case-license an object in RVCs. Case-licensing of an argument is implemented in the position where the assignment of theta roles is completed. Thus, in the transitive RVC construction, T values the Case feature on the argument in Spec-vP and v the Case feature on the argument in Spec-VP.⁹

A single argument may not be doubly Case-marked, even if it can receive more than one theta role, as discussed by Hornstein (1999), which suggests that Case features cannot be valued twice (by distinct heads). If an argument in Spec-VP whose Case feature is valued by v is moved to Spec-vP, as in (31), it will be Case-valued by T again. (Recall that the argument in that position can appear either by base-generation or by movement from within RP.) Accordingly, the derivation involving movement of an argument from Spec-VP to Spec-vP crashes, due to a conflicting double valuation of the Case feature on the moved argument, showing that an argument appearing in Spec-VP cannot move to Spec-vP to receive a theta role from v. This in turn shows that in the transitive RVC construction, only the argument in Arg₃ in Spec-RP can be moved to Spec-vP or Spec-VP, and hence the movement of DP₂ indicated in (31) is not possible.¹⁰

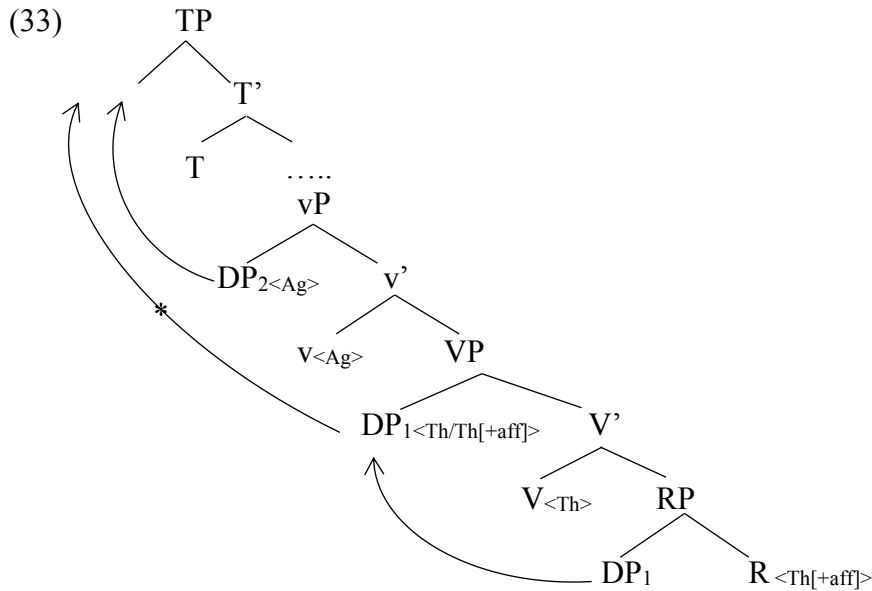
Theoretically, the derivations in (29) and (30) can create all the possible combinations of thematic roles that are assigned to the arguments in RVC constructions. To lend concreteness, let us illustrate how the interpretations available for (17) are constructed. First, given that the argument DP₁ is merged with RP to receive an affected theme role, two options are available for generating the other argument DP₂, which does not appear in the RP projection. One option is to generate DP₂ in Spec-VP to receive a theme role, as in (29). If this option is chosen, two distinct derivations are available, as illustrated in (32), abstracting away from some irrelevant details.



If DP₁, which has <Ag/Th_[+aff]>, is moved to Spec-TP, (17) has the thematic interpretation represented in (17ii). If, on the other hand, DP₂ with <Th> is moved to Spec-TP, (17) has

the thematic interpretation in (17iv). Note that when the theme argument, which is Case-valued by *v*, is moved to Spec-TP, the agent DP, whose Case feature is valued by T as nominative, appears in postverbal position. This derivation yields the sentence with the interpretation (17iv). Thus, when the sentence has the interpretation (17iv), it may be regarded as involving a kind of inversion where the order of an external argument (the agent) and an internal argument (the theme) is reversed via A-movement. This argument reversal is possible because the distance of the internal argument to T may be determined in reference to the lower copy of the external argument, i.e. DP₁ in Spec-RP. In this case, the external argument superficially appears in a position following the verbal complex in AspP, which is projected above vP. For Case-licensing of arguments, it can be stated that T Case-licenses DP₁ in Spec-vP and DP₂ in Spec-VP.

Another option of deriving the sentence in (17) is to generate DP₂ in Spec-vP to receive an agent role from *v*. In this case, the DP₁ in Spec-RP bearing <Th_[+aff]> is moved into Spec-VP to receive a theme role, as in (30). In (30), DP₂ is identified as the only argument to be attracted by T, because DP₂ in Spec-vP c-commands both DP₁ in Spec-VP and its copy in Spec-RP. The relevant derivation is illustrated in (33).



If DP₂ in Spec-vP (that has received <Ag>) is moved to Spec-TP, (17) has the interpretation (17i). (T Case-licenses DP₂ in Spec-vP, and *v* Case-licenses DP₁ in Spec-VP.) If DP₁ is moved to Spec-TP instead, (17) should have the non-agent subject interpretation (17iii). But this is not a possible interpretation, because DP₁ does not qualify as an argument to be attracted by T, i.e. no copy of DP₁ commands DP₂. Hence, the construal needed for establishing the thematic relations of the two arguments given (17iii) cannot be constructed.

It is important to note that syntactic head raising provides a key to understanding why an RVC like (17) can have the three interpretations (17i), (17ii), and (17iv). These interpretations are derived by virtue of the fact that the argument in RP can be moved across the other argument in apparent violation of a local c-commanding constraint. In our proposal, this movement is made possible by the syntactic head raising of the second verb to the first verb, which results in the formation of V-V compound. This in turn

suggests that the reversal of arguments is not possible unless a compound verb is formed via syntactic head raising in argument-sharing constructions. For instance, in Romance and Germanic languages, the phenomenon of argument sharing by two verbs is observed in causative constructions (i.e. constructions with the causative verb plus the main verb (e.g. *John made Mary work.*), but their arguments are not allowed to be reversed in the way as is done in Chinese RVCs. This fact naturally follows since causative constructions in Romance and Germanic languages generally have ‘causative verb + infinitive verb’ forms, and compound verbs are not formed (by raising the main verb to the causative verb) (see, e.g. Huddleston and Pullum 2002 for English, Kayne 1975 for French, Zagona 2002 for Spanish, Gunkel 1999 for German). If the two argument-sharing verbs are not compounded via syntactic head raising, the locality constraint on movement is not relaxed, and hence no argument reversal is possible.¹¹

The upshot of the proposed analysis for Chinese RVCs, coupled with the restriction on the number of arguments available in RVCs, is that the possible combinations of thematic interpretations (17i), (17ii), and (17iv) for the arguments of *zhui-lei* ‘chase-tired’ can be derived, while excluding the unavailable interpretation (17iii). In transitive RVC constructions, one argument is base-generated in Spec-RP, and the other argument in either Spec-vP or Spec-VP; the argument appearing in Spec-RP moves to either Spec-vP or Spec-VP, which has not been filled by the other argument, so as to receive a theta role from the first verb. After these movement operations, one of the two arguments is further raised to the clause subject position in TP. The derivations in (31) and (32) allowed by these operations will give rise to all the possible interpretations for the transitive RVC construction in (17). (The interpretation (17iii) is not available on the grounds that, in (32), DP₁ originating from RP is moved to a syntactic position lower than the one occupied by DP₂. In this configuration, DP₁ is prevented from undergoing movement to Spec-TP.)

As an alternative analysis, one might argue that the argument of RP is realized as PRO controlled by a DP in a higher position, obtaining the control construal like [TP [VP DP₁ [VP DP₂ [RP PRO]]]]. This analysis would be less restrictive, in the sense that the argument of RP is identified as one of the two arguments (DP₁ or DP₂) via control (often without requiring a c-command relation). Since arguments with control relations are ‘distinct’ entities having two distinct chains rather than a single chain, DP₂ cannot be a candidate for attraction by T. Then, the control analysis will predict that T can attract only the agent DP₁ generated in Spec-vP. If this is the case, (17) can only have the interpretations (17i) and (17ii), where the first argument is taken to be an agent, and not (17iii) and (17iv). But the fact is not keeping with the control analysis. Thus, our movement analysis, which takes non-distinct copies to be created by A-movement in RVCs, is favored over the control analysis.¹²

Under the present proposal, we can also provide a ready account for the fact that the inverse realization of agent and theme is impossible in a simple non-RVC clause, where only one predicate appears, as in (34).

- (34) *Taotao zhui le Youyou.*
 Taotao chase ASP Youyou
 i. ‘Taotao chased Youyou.’
 ii. *‘Youyou chased Taotao.’

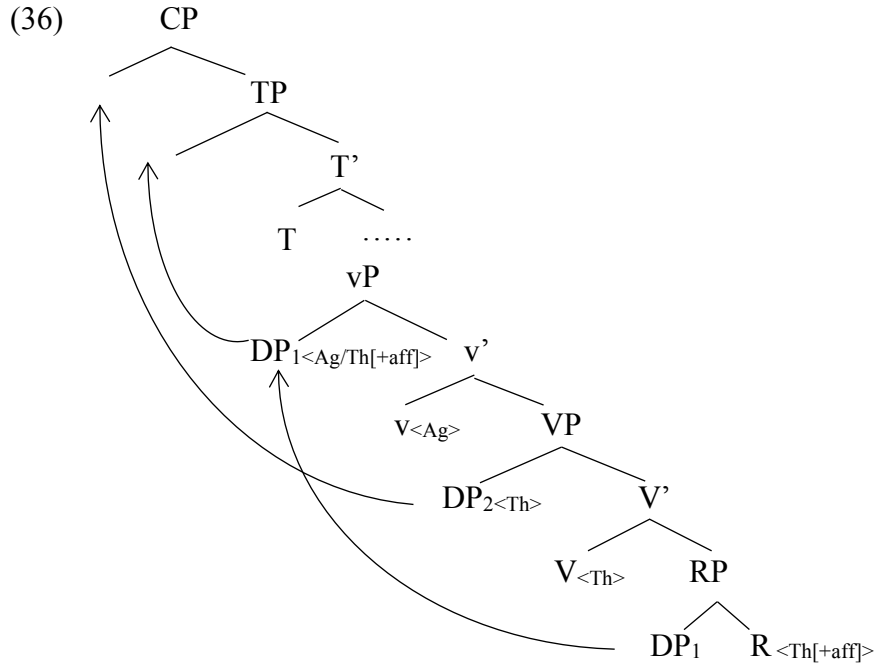
In (34), the object of *zhui* ‘chase’ cannot count as an agent. This fact follows straightforwardly, because the agent DP in Spec-vP c-commands the theme DP in Spec-VP, and there is no copy of the agent argument c-commanded by the theme DP. In (34), since the agent DP is the closer argument to T, T can attract only this agent DP for the purpose of fulfilling its EPP requirement.

Note at this point that topicalization affects the possibility of thematic interpretations in RVC constructions. Observe that the topicalized sentence in (35) allow only two interpretations.

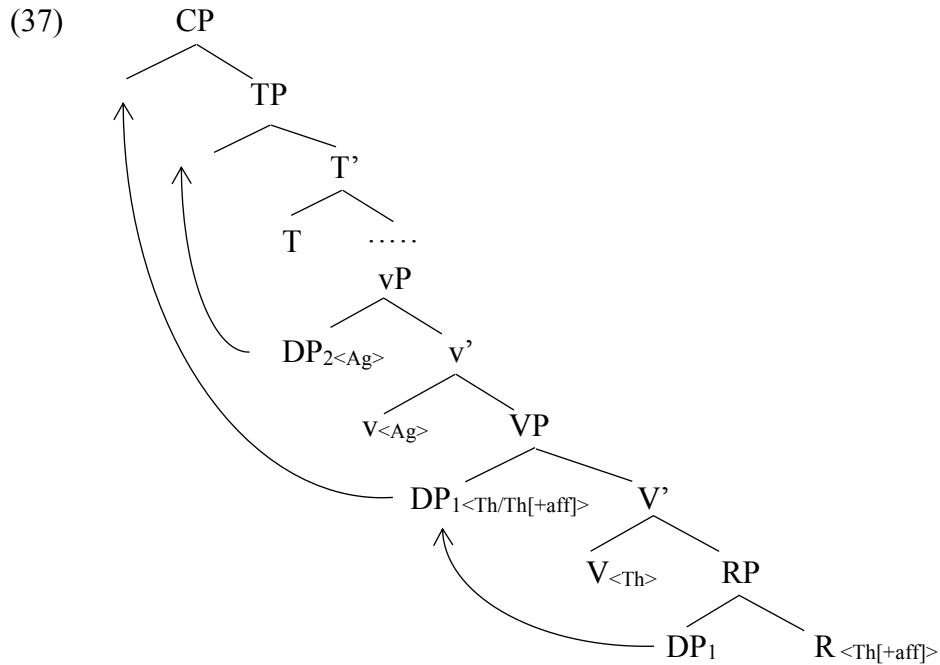
- (35) *Youyou, Taotao zhui-lei le.*
 Youyou, Taotao chase-tired ASP
 i. ‘Taotao chased Youyou and as a result Youyou got tired.’
 ii. ‘Taotao chased Youyou and as a result Taotao got tired.’
 iii. *‘Youyou chased Taotao and as a result Taotao got tired.’
 iv. *‘Youyou chased Taotao and as a result Youyou got tired.’

The interpretation in (35iv) is not obtained for the topicalized sentence in (35), but this interpretation is available for its non-topicalized counterpart in (17). This fact follows naturally, given that topicalization at issue targets an object, i.e. an argument in Spec-VP.¹³

To be concrete, in (35), the topic is located in a higher position than the subject occupying Spec-TP (and topicalization involves A’-movement to Spec-CP). This means that topicalization invokes the fronting of an object, i.e. an argument in Spec-VP. This being the case, the only argument that can be raised to Spec-TP via A-movement is one located in Spec-vP, where the agent role is assigned. Then, in (35) involving object topicalization, the argument in Spec-TP must be interpreted as the agent of the first verb. There are two structural positions from which the argument in Spec-TP could be originated. In the first place, the agent argument can start from within RP, as represented in (36).



The derivation in (36) gives rise to the interpretation in (35ii), where the agent is identified as the affected theme of the second verb, and the topicalized argument is assigned a theme role by the first verb. In (36), T Case-licenses DP₁ in Spec-vP, and v Case-licenses DP₂ in Spec-VP. Another possible derivation is that the agent is base-generated in Spec-vP, while the affected theme argument moves into Spec-VP, as represented in (37).



In (37), the topic DP₁ starts out from Spec-RP and is raised to Spec-CP via Spec-VP. This topic receives a theme role from V and an affected theme role from R. In this case, T Case-licenses DP₂ in Spec-vP, and v Case-licenses DP₁ in Spec-VP. This derivation gives

rise to the interpretation in (35i). In the topicalized sentence in (35), the theme cannot be moved into Spec-TP, so the interpretation in (35iv) is not available, although this interpretation is obtained in the non-topicalized RVC sentence in (17). (Needless to say, the interpretation in (35iii) is not obtained in the non-topicalized as well as the topicalized sentence, because, in both cases, T cannot attract an argument counting as the theme of the first verb as well as the affected theme of the second verb.)

The important point to be made here is that topicalization eliminates one of the possible interpretations obtained for transitive RVCs, despite the fact that the lexical meanings conveyed by the RVCs do not differ between topicalized and non-topicalized sentences. Obviously, Li's (1995) lexical analysis falls short of accounting for the fact that the syntactic operation of topicalization affects the possibility of the interpretations available for RVCs. Thus, it is fair to say that it is necessary to appeal to a syntactic analysis to account for the facts about the change in the interpretations of the RVC construction brought about in accordance with topicalization.¹⁴

In this section, we have discussed how the possible interpretations for the RVC construction in (17) should be derived, while ruling out the unavailable one. In our analysis, syntactic structures available for RVCs are responsible for deriving all the available thematic relations for the RVC, and theta role assignment strictly follows the thematic hierarchy, since an agent role is assigned to Spec-vP projected above Spec-VP where a theme role is assigned. In our proposal, the available interpretations are derived without positing the mechanism of the causative hierarchy allowing a thematic hierarchy violation. Furthermore, our analysis can easily handle the fact that possible interpretations for RVCs are affected by topicalization, which falls outside the realm of Li's lexical analysis.

4. AFFECTEDNESS

The representative RVC construction in (17) (=1)) with the verb compound *zhui-lei* 'chase-tired' discussed in section 2 displays the maximal argument realization patterns, in that three out of four logically possible interpretations are available. There are cases, however, where some conceivable argument realization patterns are not available. In the previous section, we have discussed RVC constructions involving topicalization and the placement of QP in object position. In this section, we discuss *ba-* and *bei-*constructions, where the affectedness condition plays an important role (e.g. Chao 1968, Li and Thompson 1981).

Ba-constructions and *bei*-constructions can be constructed from RVCs. As argued by Levin and Rappaport (1995), Goldberg (1995), Tenny (1987, 1994), and others (see also section 3.1), a clause may comprise only one expression indicating the culminating point of a described event. It is suggested that the interpretive facts of *ba-* and *bei-*constructions formed on RVCs follow the affected condition in (38).

(38) The affectedness condition: An RVC clause can have only one affected argument. Specifically, we suggest that the argument realization patterns of *ba-* and *bei-*constructions naturally fall out by our proposed analysis, provided the affectedness is taken to be encoded as a syntactic feature associated with a certain type of thematic role (i.e. affected theme).

4.1. *Ba*-constructions

At the outset, by way of discussing how the different interpretive patterns of *ba*-constructions are derived, observe that the *ba*-construction in (39) can have the two interpretations (i) and (ii), but not the interpretations (iii) and (iv).

- (39) *Taotao ba Youyou zhui-lei le.*
 Taotao BA Youyou chase-tired ASP
 i. ‘Taotao chased Youyou and as a result Youyou got tired.’
 ii. ‘Youyou chased Taotao and as a result Youyou got tired.’
 iii. *‘Taotao chased Youyou and as a result Taotao got tired.’
 iv. *‘Youyou chased Taotao and as a result Taotao got tired.’

Li (1995:271; (iv) is added by the authors)

The descriptive generalization on the range of possible interpretations in *ba*-sentences like (39) is that the argument occurring with *ba* must count as an affected theme of the second result verb regardless of whether it is construed as the agent or the theme of the first verb. Li (1995) suggests that in (39), the interpretations in (iii) and (iv) are not allowed, because *ba* needs to take an affected argument. This means that the affectedness condition constrains the possible interpretations of *ba*-constructions constructed from RVCs. In the following paragraphs, we shall provide a ‘syntactic’ analysis of the *ba*-sentence, more or less in line with the spirit of Li’s (1995) proposal.

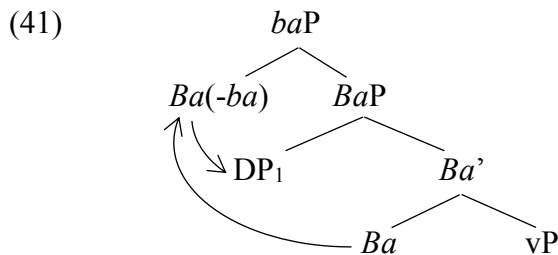
To begin, it has often been mentioned (see e.g. Wang 1954, Chao 1968) that *ba* originates as a lexical verb that roughly means ‘hold, take, handle’. Nevertheless, in modern Chinese, *ba* does not behave as a full-fledged lexical verb, but displays a number of intricate properties that crosscut verbs and prepositions (see Huang, et al. 2009: 153-167), and thus, there are many different proposals in the literature as to how *ba* should be analyzed. Given that verbs are often grammaticalized into post/pre-positions, it would be reasonable to state, at the very least, that *ba* is now in the process of grammaticalization into a preposition, but still, this process has not been complete. In order to account for the syntactic behavior of RVCs in the *ba*-construction, it is necessary to consider the syntactic status of *ba*, and attend to the question of how *ba*-constructions are formed.

In Chinese, serial verb constructions can have the sequence [V₁+DP+V₂(+DP)] (cf. Li and Thompson 1981:594). Likewise, the *ba*-construction has a similar [*ba*+DP+V] sequence. As Huang et al. (2009: 154-174) and Whitman and Paul (2005) remark, *ba* and the subsequent vP form a constituent. This can be seen by the fact that the sequence DP+V that occurs after *ba* can be coordinated.

- (40) a. *Ba [fan chi-wan], (Ba) [jiu he-guang] le, women jiu hui jia.*
 BA [food eat-finish] BA [liquor drink-empty] ASP we at once go home
 ‘When finished eating food and drank up the liquors, we would go home at once.’
 b. *Zai [xuexiao zuo-wan zuoye], * (Zai) [jia chi-wan fan] le,*
 at [school do-finish homework] at [house eat-finish food] ASP
 wo jiu shuijiao.
 I at once sleep
 ‘When finished homework at school and finished eating food at home, I would sleep at once.’

In (40a), two instances of *ba* appear, and the *ba*-phrases are coordinated. When the second *ba* is omitted, the sequences *fan chi-wan* ‘finish eating food’ and *jiu he-guang* ‘drink up liquors’, both of which are comprised of DP + V, are coordinated under *ba*. This means that the two sequences are constituents. In (40b), the two instances of *zai* ‘at’ are allowed, but when the second *zai* is omitted, unacceptability results. This shows that the sequences *xuexiao zuo-wan zuoye* ‘finish homework school’ and *jia chi-wan fan* ‘finish eating food home’ cannot form constituents under *zai*. (Note that the linear sequence *jia chi-wan fan* is well-formed when *zai* precedes it, and thus the unacceptability of (40b) without *zai* is not simply a matter of illicit linear order.) Importantly, the sort of coordination that is allowed in the *ba*-construction in (40a) shows that *ba*, unlike *zai*, includes the entire sequence *fan chi-wan*, suggesting that vP is included under the projection of *ba*, i.e. *baP* is placed above vP. If *ba* appeared below vP, like *zai*, (as suggested by Li 1990, which analyzes *ba* as a preposition) the coordinate structure in (40a) would not be formed.

In light of these considerations, we postulate that *ba* takes vP as its complement, and that *ba* projects to *BaP* (and its associated light verb, *baP*), and that these projections are placed over vP.¹⁵ Since a post-*ba* DP must be an argument referring to an affected entity, as discussed by Huang et al. (2009) and others, it is assumed that *ba* assigns an affected theme role to an argument moved into its specifier position. Note that the structure resulting from these operations does not give rise to the right order of *ba* and the post-*ba* DP. We thus suggest that their right order be derived via head movement of *ba* to a higher light *baP* which *ba* is associated with, and further, that the raised *ba* is cliticized onto the DP₁ that immediately follows, as illustrated in (41).¹⁶



We assume here that the higher light *ba* head assigns inherent Case to DP₁ in Spec-*BaP*. If cliticization takes place in the syntax, *ba* and a post-*ba* DP form a tight constituent which cannot be separated (see Huang et al. 2009), and this makes it possible for the two elements to undergo movement together, as seen in (42).¹⁷

- (42) a. *Zhangsan ba Lisi da-shang le.*
 Zhangsan BA Lisi hit-injured ASP
 ‘Zhangsan injured Lisi.’
 b. *Ba Lisi_j, Zhangsan_i zai ziji_{i/*j} de jia li da-shang le.*
 BA Lisi Zhangsan at self Poss house Loc hit-injured ASP
 ‘Lisi, Zhangsan injured him at his house.’

Note that *ba* and the post-*ba* DP initially do not form a constituent that can be susceptible to syntactic operations. Nevertheless, syntactic cliticization brings out the consequence that these two elements can undergo movement together (in a way similar, though not identical, to the English contracted negation *n’t*, as in *Wouldn’t it be interesting?*).

In some respects, *ba* shows a preposition-like behavior, which should follow straightforwardly if *ba* undergoes cliticization, as suggested above. In Chinese, there is a constraint that prepositions cannot be stranded, as shown in (43a).

- (43) a. **Xuexiao_i, Zhangsan zai t_i da-shang le Lisi.*
 school Zhangsan at hit-injured ASP Lisi
 Lit. ‘School, Zhangsan injured Lisi at.’
 b. **Lisi_i, Zhangsan ba t_i da-shang le.*
 Lisi Zhangsan BA hit-injured ASP
 ‘Lisi, Zhangsan injured.’

Likewise, it is not possible to prepose a post-*ba* DP by separating it from *ba*, as shown in (43b). Note that an object of a transitive verb can be preposed to the sentence initial position.

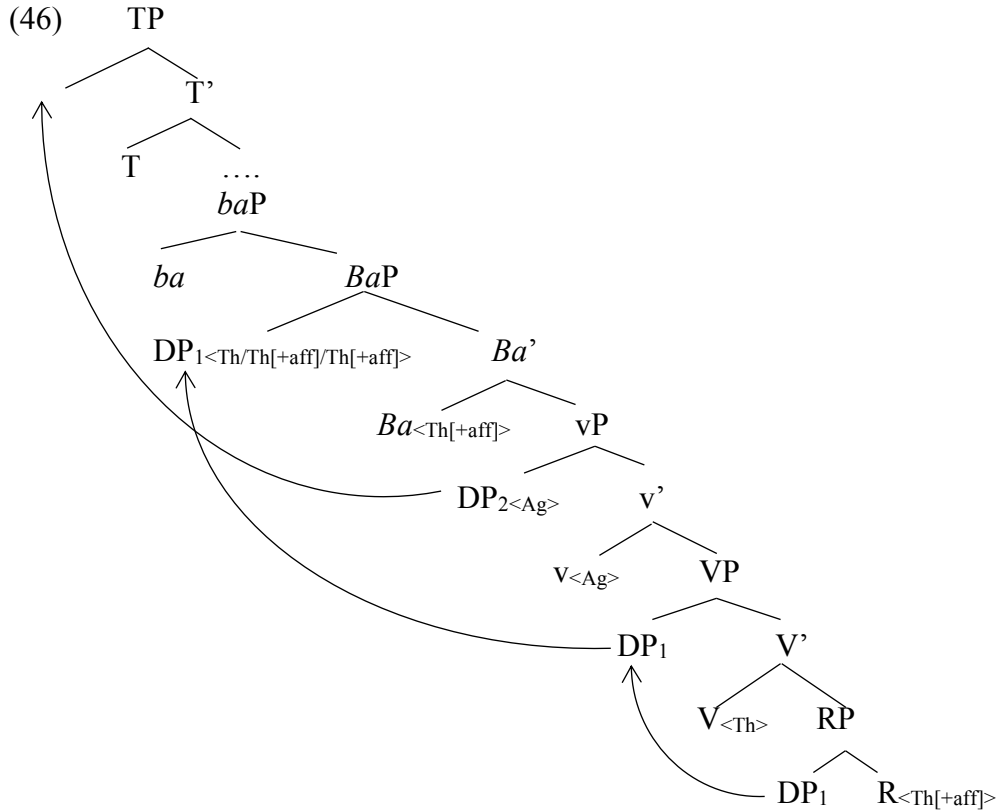
- (44) *Lisi, Zhangsan xihuan.*
 Lisi Zhangsan like
 ‘Lisi, Zhangsan likes.’

Thus, *ba* behaves differently from regular transitive verbs in this respect. Furthermore, PPs are not susceptible to subject raising to Spec-TP, as seen by the examples in (45).

- (45) a. *Lisi_j zai Zhangsan jia_i xie-wan le ziji_{*i/j} de lunwen.*
 Lisi at Zhangsan house write-finish ASP self POSS paper
 ‘Lisi_j finished self_{*i/j}’s paper at Zhangsan’s house_i.’
 b. *Zai Zhangsan jia_i Lisi_j xie-wan le ziji_{*i/j} de lunwen.*
 at Zhangsan house Lisi write-finish ASP self POSS paper
 ‘At Zhangsan’s house_i Lisi_j finished self_{*i/j}’s paper.’

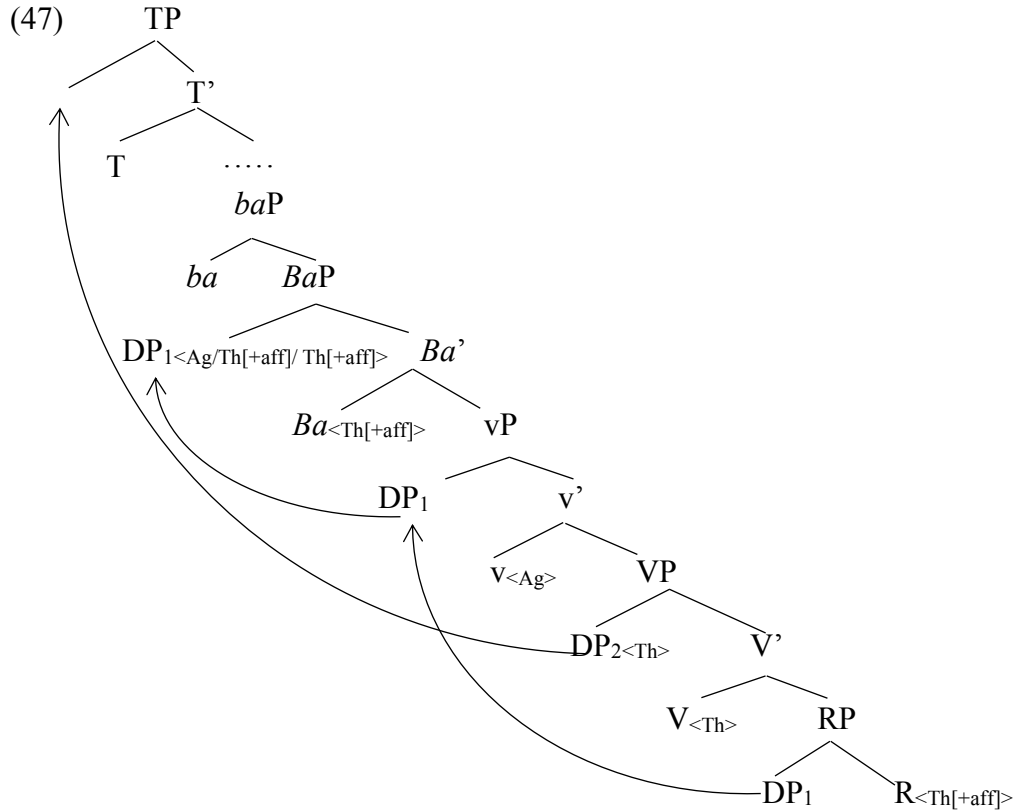
In (45), *Lisi* serves as the antecedent of *ziji* ‘self’ regardless of the position of the PP *zai Zhangsan jia* ‘at Zhangsan’s house’. This fact shows that PPs cannot undergo raising to Spec-TP to serve as subjects. The same is true of the *ba*-phrase, since the fronted *ba*-phrase cannot be the antecedent of *ziji* ‘self’, as seen in (45b). This shows that the *ba*-phrase, just like PPs, cannot be moved to Spec-TP.

Given the affectedness condition in (38), requiring that there be only one affected argument in an RVC construction, a post-*ba* DP must originate from RP. This is because the lowest argument appearing in Spec-RP receives an affected theme role from the second result verb. If so, one possible derivation for the *ba*-sentence in (39) is given in (46).



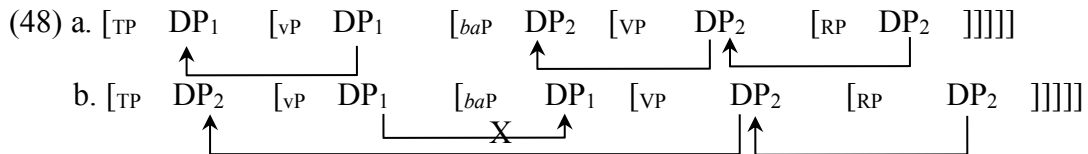
P_1 merged with RP can be moved into either Spec-vP or Spec-VP after receiving an affected theme role from the resultative R. When DP_1 is moved into VP, as in (46), DP_1 has the theta role specification $<Th/Th[+aff]>$ and DP_2 is base-generated in Spec-vP to receive $<Ag>$. DP_1 is Case-licensed by *ba* by virtue of inherent Case assignment, and T Case-licenses DP_2 in Spec-vP.¹⁸ Further, given that *ba* has an affected theme role, DP_1 with $<Th/Th[+aff]>$ is moved to Spec-*BaP* (Needless to say, the derivation where *ba* does not attract an affected theme to Spec-*BaP* necessarily crashes, due to the affectedness condition that RVCs can have only one affected argument. Since the *ba* phrase is not qualified as an argument to be attracted by T, only DP_2 with $<Ag>$ can be moved to Spec-TP. The derivation in (46) gives rise to the interpretation in (39i). (Furthermore, given that the *ba*-phrase or DP_1 with *ba* cannot be attracted by T, it follows that the *ba*-sentence does not have the interpretation in (39iv).)

Another possible derivation for (39) is to raise DP_1 in RP to vP, where it receives an agent role from *v*. This configuration is derived when the other DP_2 appears in Spec-VP to receive a theme role from V, as in (47).



In (47), DP₁ has the theta role specification <Ag/Th[+aff]>. Again, since *ba* needs to attract an affected theme, DP₁ with <Ag/Th[+aff]> is moved to *BaP*. In (47), DP₁ is assigned inherent Case by *ba*, and T Case-licenses DP₂ in Spec-VP under c-command. (Note that DP₁ is not a potential goal for Case licensing by T). In (47), since T attracts the DP₂ in Spec-VP rather than the *ba*-phrase (the DP₁ combined with *ba*), the derivation yields the interpretation (39ii) (and since the DP₁ combined with *ba* cannot be attracted by T, the interpretation in (39iii) is not available).¹⁹

Our analysis takes *BaP* to project above vP, but there is another approach treating *ba* as a light verb projecting below vP, which selects an external argument (Whitman and Paul 2005). Under this analysis, since the agent needs to be merged in vP located above *BaP*, only the affected theme can be moved into *BaP*. This automatically derives part of the affectedness effects obtained in the *ba*-construction.



This analysis can derive the structure in (48a), which gives rise to the interpretation in (39i). Since the derivation in (48b) is deemed impossible on the standard assumption that lowering movement is not allowed, the interpretation in (39ii), where the initial argument counts as the theme of the first verb cannot be derived under this analysis, however. Thus, our proposed analysis of the *ba*-construction, which takes *baP* to be projected over vP is favored over an alternative analysis taking *baP* to be located below vP. The fact that only

the two interpretations in (39i) and (39ii) are available for the *ba*-sentence in (39) follows naturally from our syntactic analysis positing the affectedness condition (38) together with the syntactic configuration where *ba*P is projected above vP.

4.2. *Bei*-constructions

The *bei* construction, which functions as a (long) passive in Chinese, presents yet another pattern of argument realization. Li (1995) notes that an example like (49) has the interpretation given in (i) but not those in (ii), (iii) and (iv).

- (49) *Taotao bei Youyou zhui-lei le.*
 Taotao BEI Youyou chase-tired ASP
 i. 'Taotao was chased by Youyou and as a result Taotao got tired.'
 ii. *'Youyou was chased by Taotao and as a result Youyou got tired.'
 iii. *'Taotao was chased by Youyou and as a result Youyou got tired.'
 iv. *'Youyou was chased by Taotao and as a result Taotao got tired.'
 Li (1995:271; translations added by the authors)

Descriptively, the only interpretation available for (49) is one where the first argument in the subject position is understood to be the affected theme of the result verb *lei* 'be tired', while serving as the theme of the first verb at the same time.

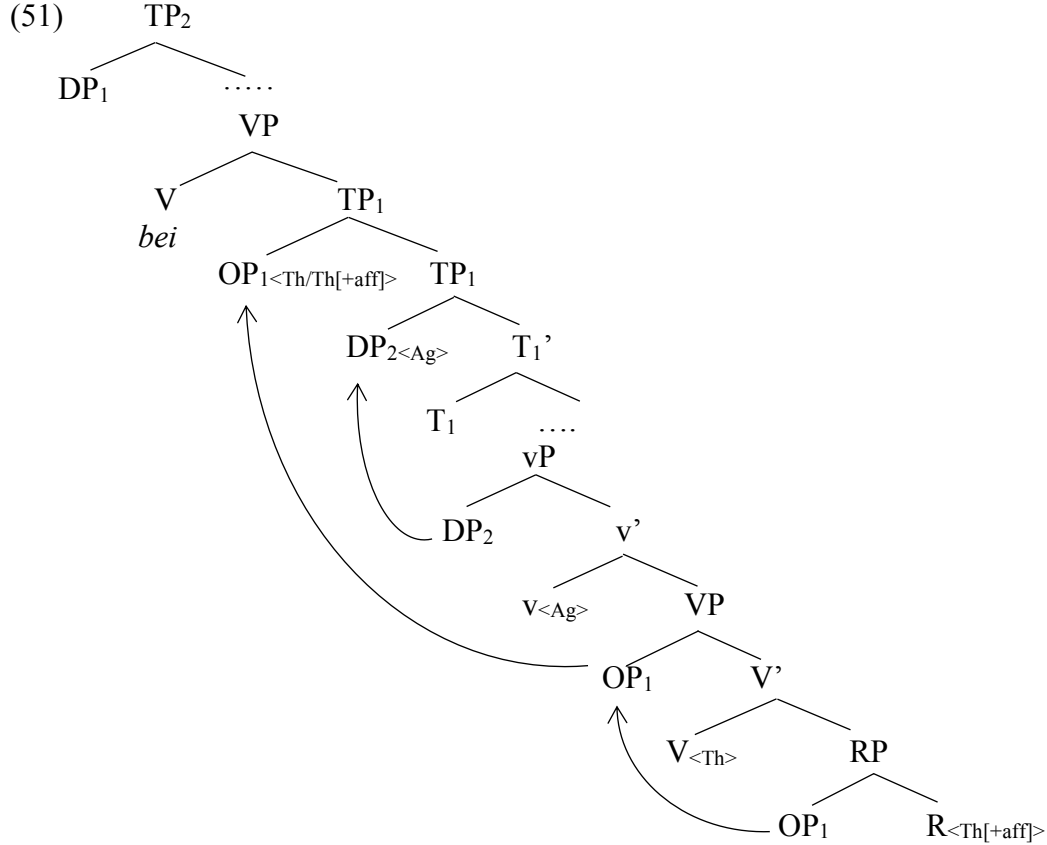
Li (1995) argues that the fact follows from his analysis on the assumption that *bei* operates on verbs taking an affected internal argument, which is rendered as the subject of a *bei*-sentence. Huang et al. (2009: 154-160) shows, however, that while *ba*-sentences require that a post-*ba* DP refers to an entity directly affected, the subject of a *bei*-sentence can be an unaffected argument, i.e. what is affected need not be expressed as its subject, as exemplified in (50).

- (50) a. *Ta bei women kandao le.*
 he BEI us see ASP
 'He was seen by us.'
 b. **Women ba ta kandao le.*
 we BA him see ASP
 'We saw him.'

Example (50b) is not acceptable, because the theme argument selected by *kandao* 'see', which appears as a complement to *ba*, is not an affected theme. Nevertheless, the same argument can appear in the subject position of the *bei*-sentence in (50a), suggesting that the pre-*bei* subject need not be an affected argument. If this is the case, it is necessary to pursue a line of inquiry different from Li's to account for the interpretive facts.

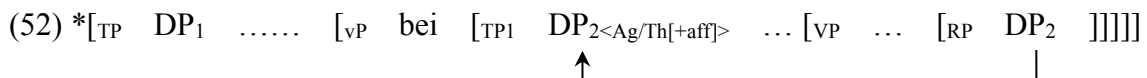
It is observed (see e.g. Huang et al. 2009) that *bei*-sentences possess a number of properties suggesting the presence of A'-movement, unlike short passives (without *bei* phrases); for instance, *bei*-sentences allow long distance dependencies which would not be available if the derivation involved only A-movement. Thus, for *bei*-sentences, we assume, in line with Huang et al. (2009:113-129) and Ting (1998), that *bei* takes TP as its complement, and that null operator movement is implemented. Since the *bei*-clause has the effect of turning an object into a subject, the null operator must be moved to its operator position from an object position. If *bei*-sentences invoke this kind of movement,

a post-*bei* DP must be an external argument, i.e. an unaffected argument. This suggests that the post-*bei* argument must first appear in Spec-vP by base-generation. Thus the structure in (51) can be posited for the *bei*-sentence in (49).



The derivation proceeds as follows. The argument in Spec-RP, which is represented as OP_1 , receives the affected theme role of R, and then moves to Spec-VP to receive a theme role, obtaining the thematic structure of $\langle Th/Th[+aff] \rangle$.²⁰ This argument further undergoes operator movement and is adjoined to the lower TP. The agent DP_2 is base-generated in Spec-vP (i.e. DP_2 must be merged there to be an unaffected agent), and this argument is moved to Spec-TP. In (51), T_1 Case-licenses DP_1 in Spec-vP and v Case-licenses OP_1 in Spec-VP. This derivation gives rise to the ‘anti-affectedness’ effect for the post-*bei* DP, i.e. the effect that the lower T appearing below *bei* must be a non-affected agent. The subject DP_1 located in Spec-TP of the higher clause is understood to bear $\langle Th/Th[+aff] \rangle$, because it is co-indexed with the null operator (that has been assigned an affected theme role by R and a theme role by V). This null operator appears in Spec-TP of the lower clause located below the VP (headed by *bei*). The derivation is well-formed, while the affectedness condition in (38) being satisfied.

Next, suppose that the argument appearing in Spec-RP is moved into Spec-vP. If this movement takes place, the argument in Spec-vP has the thematic role specification $\langle Ag/Th[+aff] \rangle$ and hence, does not qualify as an external argument.



In a *bei*-sentence, the argument appearing in the embedded Spec-TP₁ must be an unaffected one, and only a non-affected argument counts as an external argument for the purpose of external versus internal argumenthood. This being the case, no well-formed derivation is available when the argument in Spec-RP is raised to Spec-vP. From this, it follows that the argument in Spec-RP needs to be moved to Spec-VP (via A-movement), and to the lower Spec-TP₁ (via operator movement), as depicted in (51). Given that (51) is the only possible derivation for (49), it turns out that (49i) is the only interpretation available for the sentence.

4.2. Summary

The affectedness condition constrains possible interpretations for RVC constructions, and there are cases where full-fledged argument realization patterns are not available. Our proposed analysis can capture the fact that the intrinsic properties of *ba* and *bei* restrict possible derivations of *ba*- and *bei*-sentences, respectively, in such a way that the *ba*-construction in (39) allows two out of four logically possible interpretations, where the affected argument occurs with *ba*, whereas the *bei*-construction in (49) allows only one interpretation, where the pre-*bei* subject in the matrix TP serves as an affected theme argument.

5. INTRANSITIVE RVC CONSTRUCTIONS

Thus far, our discussion has focused on RVC constructions consisting of a transitive V₁ and a resultative V₁. In this section, we will turn to cases where RVCs consisting of an intransitive verb plus a resultative verb. The intransitive variants of RVC constructions allow different argument realization patterns. The syntactic behavior of intransitive RVCs fall out naturally in our proposed analysis.

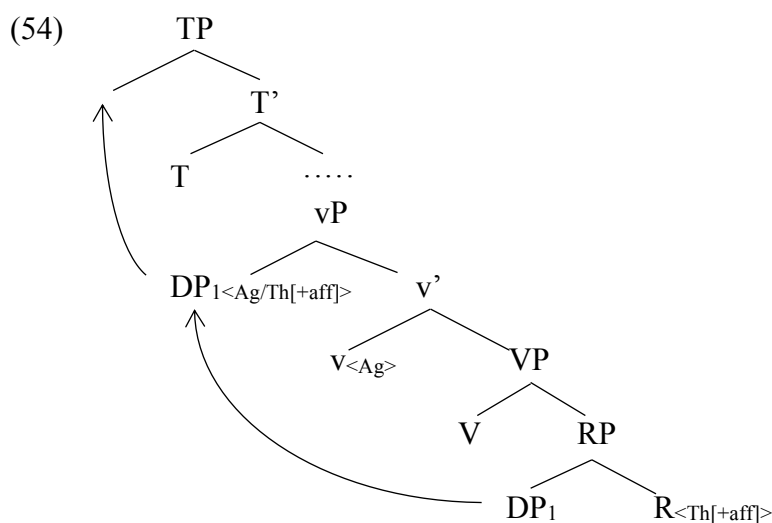
To begin, observe that at least three different variants of RVC constructions can be constructed from intransitive RVCs (like *tiao-fan* ‘jump-bored’, *pao-po* ‘run-worn.out’ and *ku-xing* ‘cry-awake’), where the first verb is intransitive, as (53) illustrates.

- (53) a. *Zhangsan tiao-fan le.*
 Zhangsan jump-bored ASP
 ‘Zhangsan jumped and as a result he is bored.’
 b. *Zhangsan pao-po le zhei shuang xie.*
 Zhangsan run-worn.out ASP this CL shoes
 ‘Zhangsan ran and as a result this pair of shoes is worn out.’
 c. *Emeng ku-xing le mama.*
 nightmare cry-awake ASP mother
 ‘The mother cried and as a result she woke up by a nightmare.’

In (53a), *Zhangsan* is the agent of *tiao* ‘jump’ and the theme of *fan* ‘bored’. In (53b), *Zhangsan* is the agent of *pao* ‘run’ and *zhei shuang xie* ‘this pair of shoes’ is the theme of *po* ‘be worn out’. In (53c), *mama* ‘mother’ counts as the agent of *ku* ‘cry’ and the theme of *xing* ‘awake’, where *emeng* ‘nightmare’ is identified as an external causer. Obviously, the first DP *emeng* ‘nightmare’ is neither the argument of *ku* ‘cry’ nor the argument of *xing* ‘awake’ because it is not *emeng* ‘nightmare’ but *mama* ‘mother’ that performs the action of crying, resulting in the state of being awake.

The three intransitive RVC variants in (53) are made available on the basis that the first intransitive verb selects only one argument. As we will see below, the intransitive V_1 leaves one argument slot open in the vP-VP structure, and thus, allows some extra non-selected arguments to appear in the RVC constructions. To make this point, recall that RVCs can include up to two arguments in the clause. This means that intransitive RVCs can include only one argument selected by V_1 , or can introduce an extra argument, which is not thematically related to V_1 , alongside the thematic argument of V_1 .

Let us now discuss how the sentences in (53) are derived. First, (53a) has only one argument, and thus, the DP_1 *Zhangsan* in (53a) must first appear in Spec-RP (to receive an affected theme role) and raised to Spec-vP (to receive an agent role). Given the premise that unergative verbs include vP as well as VP projections (Chomsky 1995, Hale and Keyser 1993), (54) can be posited for (53a).



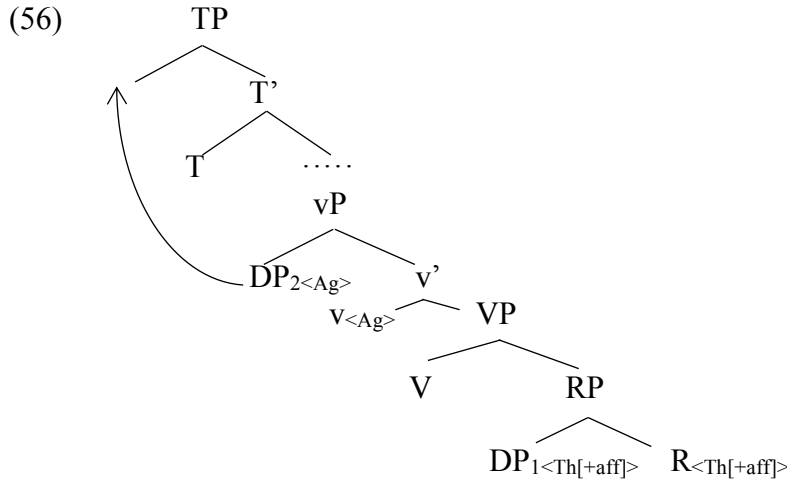
The first verb *tiao* ‘jump’ is an unergative verb, so V does not bear any theta role to assign to an argument. In (54), DP_1 is merged with RP and moves to vP, and as a result, it carries the theta roles <Ag/Th[+aff]>. As illustrated in (54), if DP_1 is further moved to TP to satisfy the EPP requirement imposed on T, (53a) is derived. DP_1 is the only argument available in (53a), and T Case-licenses DP_1 in Spec-vP.²¹

Needless to say, if the EPP-driven movement of DP_1 does not take place, ungrammaticality results (see also (21)).

- (55) **Tiao-fan le Zhangsan.*
 jump-bored ASP Zhangsan
 Intended: ‘Zhangsan jumped and as a result he is bored.’

In (55), the agent argument cannot appear in the postverbal position, unlike cases involving transitive RVCs, in the absence of another argument that can fill the subject position. Thus, (54) is the only derivation available when the clause headed by an intransitive RVC like *tiao-fan* ‘jump-bored’ has one argument.

Secondly, (53b) is a case where two arguments appear in the intransitive RVC clause. In this case, one argument (i.e. DP_1) is base-generated in Spec-RP, and the other argument (DP_2) in Spec-vP, and we can posit the structure (56) for (53b).



In (56), DP₂ in Spec-vP is assigned an agent role, and is attracted to Spec-TP, while DP₁ remains in the position where it is merged (i.e. in Spec-RP). In (56), only the DP₂ can be moved to Spec-TP, since DP₂ c-commands DP₁ and not conversely. Note that DP₁ is not an argument selected by the upper verb, i.e. it does not receive a theta role from the verb (v or V). As argued by Hale and Keyser (1983), unergative verbs are capable of taking a non-subcategorized object in English, which means that v associated with unergative verbs can Case-license it (see also Levin and Rappaport Hovav 1995). This also happens in Chinese when the first verb is intransitive. Since the first verb is an unergative verb, which can Case-license an argument that it does not select, it is reasonable to assume here that in (56), T and v Case-license DP₁ in Spec-vP and DP₂ in Spec-RP, respectively, although DP₂ is not assigned a thematic role by the first verb. The derivation in (56) gives rise to the intransitive RVC clause in (53b).

Under the present analysis, it is further predicted that no reverse realization of the arguments is possible with (53b), i.e. the argument interpreted as an agent cannot appear in postverbal position. This prediction is borne out, as (57) is unacceptable.

- (57) **Zhei shuang xie pao-po le Zhangsan.*
 this CL shoes run-worn.out ASP Zhangsan
 Intended: 'Zhangsan ran and as a result he was worn out by this pair of shoes.'

The affected theme *zhei shuang xie* 'this pair of shoes' does not appear in a structural position higher than the agent *Zhangsan* in the derivation, and hence is not construed as an argument that can be attracted by T. Accordingly, for the type of RVC in (53b), the reversed realization of agent and theme is not possible.

Furthermore, note that *ba*- and *bei*-sentences can be built from the variant of the intransitive RVC in (53b), as (58) indicates.

- (58) a. *Zhangsan ba zhei shuang xie pao-po le.*
 Zhangsan BA this CL shoes run-worn.out ASP
 'Zhangsan ran and as a result this pair of shoes was worn out.'
 b. *Zhei shuang xie bei Zhangsan pao-po le.*
 this CL shoes BEI Zhangsan run-worn.out ASP
 'This pair of shoes was worn out by Zhangsan's acting of running.'

The facts follow without further ado. First, since the argument *zhei shuang xie* ‘this pair of shoes’ appears in Spec-RP, it is possible for this argument to occur with *ba*, as in (58), for *ba* selects an affected argument as its post-*ba* DP, as discussed in section 4.1. Secondly, *zhei shuang xie* ‘this pair of shoes’ can appear in the subject position of the *bei*-construction, i.e. this argument is co-indexed with the null operator originated from within RP, because the other DP *Zhangsan*, which is an unaffected agent, is combined with *bei*. As discussed in section 4.2, an argument base-generated in Spec-vP counts as an unaffected argument, and hence *Zhangsan* can be rendered as a post-*bei* argument in *bei*-sentences, as in (58b)

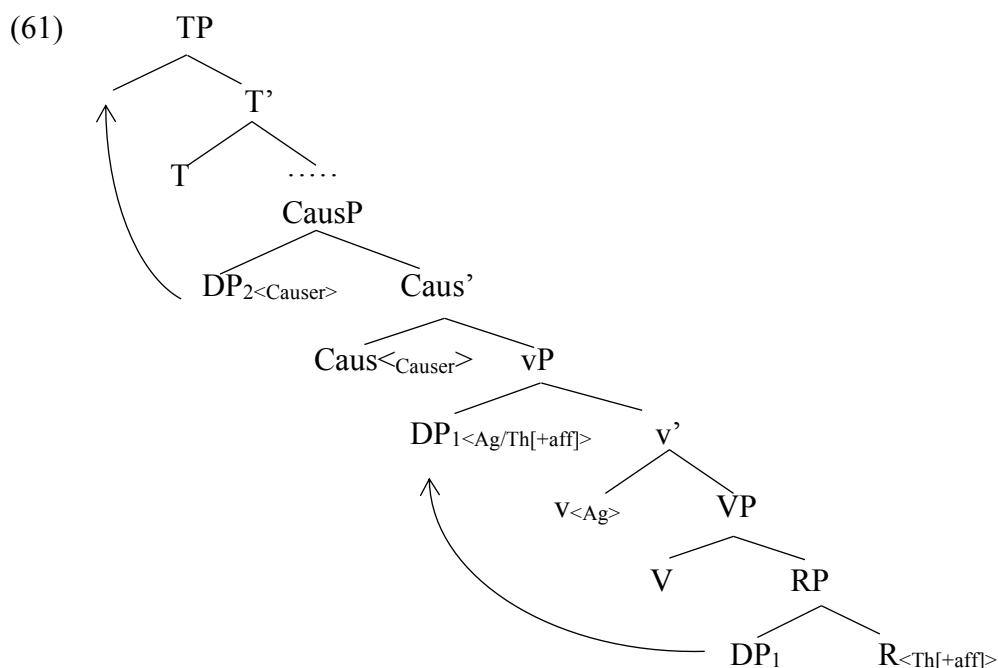
In the variant of the intransitive RVC in (53c), repeated here as (59), the agent appears to the right of the complex verb, and an external causer to the left of it.

- (59) *Emeng ku-xing le mama.*
 nightmare cry-awake ASP mother
 ‘The mother cried and as a result she woke up by a nightmare.’

Although the external causer is neither the argument of the first verb nor the argument of the second, (59) is a grammatical sentence. Then, the question is why such an external causer can appear in the third type of intransitive RVC construction. By way of answering this question, observe that the same causer argument can appear in a causative sentences like (60).

- (60) a. *Zhei shuang poxie rang mama pao de henbushufu.*
 this CL worn-out shoes CAUS mother run DE sick
 ‘The mother run on this pair of worn-out shoes and as a result she got sick.’
 b. *Emeng rang mama ku de henbushufu.*
 nightmare CAUS mother cry DE sick
 ‘The nightmare made the mother cry and as a result she got sick.’

In (60), the arguments are realized in a way similar to those in (59), in the sense that the causer appears preverbally, and the agent argument of the verb *ku* ‘cry’ postverbally. In addition, (59) has a causative meaning on a par with the causative sentences in (60). Given these similarities in argument realization patterns, we propose that an invisible causative head appears above the vP in the RVC construction in (59), and that the external causer is assigned a thematic role of ‘causer’ in CausP projected above TP (cf. Li 1995).



In (61), the argument DP_1 is merged with RP, and moved to vP; hence this argument is understood to be the agent of *ku* ‘cry’ and the affected theme of *xing* ‘awake’. The external causer, which has a causer role, is merged in CausP. Needless to say, in this type of RVC sentence, T cannot attract the agent DP_1 , since the causer DP_2 is the argument closer to T than DP_1 that is the agent of the verb *ku* ‘cry’. Given that the transitive V_1 selects only one argument, there is a sense in which the invisible causative verb introduces a causer argument in the intransitive RVC construction. In (61), T Case-licenses the causer argument DP_2 in CausP. In addition, the agent argument of *ku* ‘cry’ is Case-licensed by the Caus head. (The Cause-head is a Case-licenser of accusative Case, since it is a verbal head directly linked to T, i.e. the Cause-head is the first head positioned below T (cf. section 3).) Since (61) is a legitimate derivation, (59) turns out to be a well-formed RVC sentence.

Li (1995) argues, on the basis of a sentence like (62a), which seems to be a similar type of (53c), that the causer subject actually receives a thematic role from V_1 , although it does not look like the argument of V_1 .

- (62) a. *Taotao de gushi xiao-si wo le.*
 Taotao POSS story laugh-die me ASP
 ‘Taotao’s story made me laugh to death.’ Li (1995:262)
- b. *Taotao de gushi zui xiao ren.*
 Taotao POSS story most laugh people
 ‘Taotao’s story made people laugh most (=was the funniest).’ Li (1995:263)

Li (1995) argues that *xiao* ‘laugh’ can have a causative use, and can express the meaning of ‘make...laugh’ in (62b). In light of this fact, he claims that *xiao* ‘laugh’ can assign a causer role to *Taotao de gushi* ‘Taotao’s story’ in (62a), which means that this causer subject is construed as an argument of V_1 . Attractive Li’s analysis may seem at first sight, the fact is not general enough to cover a case like (53c), and hence, his account for (62a)

cannot be extended to (53c). In fact, the unacceptability of the example in (63) suggests that the subject in (53c) should not receive a causer role from V_1 *pao* ‘run’.

- (63) **Emeng zui ku ren.*
 nightmare most cry people
 Intended: ‘Nightmare made people cry most.’

The example in (63), where *ku* ‘cry’ is intended to take *emeng* ‘nightmare’ as its argument, is not acceptable. This fact illustrates that in a sentence like (53c), *ku* ‘cry’ does not license the occurrence of the external causer *emeng*, and thus, the agent cannot appear in postverbal position.

Given the facts discussed above, it should be apparent that Li’s (1995, 1999) analysis cannot provide an account for the fact that the agent argument appears in the postverbal position in (59). In Li’s characterization of Cause-Affectee role assignment, the Cause role can be assigned only to an argument that has been assigned a theta-role from the first verb. Then the causer argument in (59) cannot receive this Cause role. In addition the agent cannot receive an Affectee role, either, since it does not receive a theta role from the second verb. Then, Li’s analysis leads to the wrong prediction that in the RVC construction comprising a non-thematic external causer, as in (59), the agent cannot be positioned in postverbal position, contrary to fact.

Observe at this point that the RVC construction in (53c) only permits the construal where the external causer appears in the subject position and the agent in the postverbal position. In effect, it is not possible to derive from (53c) a sentence like (64), where the agent is placed in TP in lieu of the external causer.

- (64) **Mama ku-xing le emeng.*
 mother cry-awake ASP nightmare
 Lit. ‘The mother cry-awake nightmare.’

The external causer with an inherent thematic role is not thematically related to vP, VP or RP, but is inserted directly into CausP. Since the external causer c-commands the agent from its thematic position, the agent can never count as an argument to be attracted by T. Hence, (64), where the agent has been attracted by T, is unacceptable.

Furthermore, given that the DP_1 , which corresponds to *mama* ‘mother’ in (53c), is an affected argument, it is expected that the DP_1 will be able to occur with *ba*. This expectation is in fact correct, as shown in (65).²²

- (65) *Emeng ba mama ku-xing le.*
 nightmare BA mother cry-awake ASP
 ‘The mother cried and as a result she woke up by a nightmare.’

The sort of distribution observed above for the intransitive RVC clauses with non-thematic external causers is naturally expected if the external causer is base-generated in CausP. Note that the availability of *ba*-constructions constructed from (53c) does not automatically follow from Li’s account, where argument realization patterns are determined on the basis of the thematic roles of V_1 and V_2 .

Finally, in RVCs, the second result verb is most typically a one-place verb describing a change of state, as Gu (1992) observes. Nevertheless, there are cases where R apparently takes two arguments, as in (66).

- (66) *Nei pan qi ba Taotao xia-shu le yi dong fangzi.*
 that CL chess BA Taotao play-lose ASP one CL house
 ‘Taotao played that chess game and lost, and as a result he lost a house.’

In (66), it looks as if the resultative complement DP *yi dong fangzi* ‘a house’ is selected by the resultative R *shu* ‘lose’, together with *Taotao*. It is interesting to note at this point that the resultative complement can appear only in *ba*-constructions.

- (67) **Taotao xia-shu le nei pan qi yi dong fangzi.*
 Taotao play-lose ASP that CL chess one CL house
 ‘Taotao played that chess game and lost, and as a result he lost a house.’

According to Liu et al. (1983), an extra DP is allowed to appear when it denotes the resultant state of the affected post-*ba* DP. If so, the resultative complement should be licensed semantically in relation to the post-*ba* DP rather than serving as an argument to the result verb.

Importantly, there are cases where a postverbal DP clearly does not count as an argument to the predicate, as in (68a). The DP *yi kuai qingban* ‘a bruise’ in (68a) is not an argument of the verb *da* ‘hit’, and thus (68b) is not acceptable.

- (68) a. *Ta ba wo de tui da le yi kuai qingban.*
 he BA I POSS leg hit ASP one CL bruise
 ‘He hit my leg and as a result my leg got a bruise.’
 b. **Ta da le yi kuai qingban.*
 he hit ASP one CL bruise
 ‘He hit a bruise.’

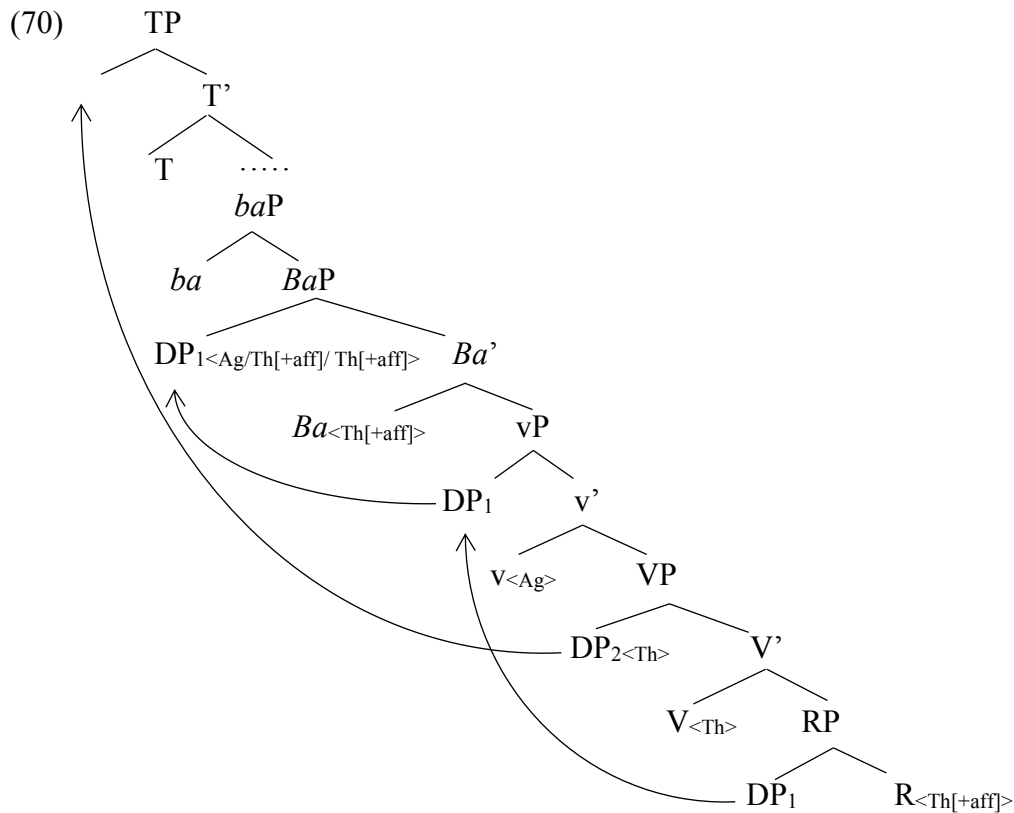
The DP *yi kuai qingban* ‘a bruise’ in (68a) is semantically licensed by virtue of bearing a part-whole relation with the post-*ba* DP *wo de tui* ‘my leg’, and provides a further specification of the resultant state of the post-*ba* DP (cf. Levin and Rappaport 1995). If *yi kuai qingban* ‘a bruise’ in (68a) is not an argument to the verb *da* ‘hit’, it is plausible to say that the resultative complement *yi kuai qingban* is generated with an inherent theta role.

We presume here that the resultative complement is added in a postverbal position after a *ba*-construction is formed, because it is not possible to derive a non-*ba*-sentence from the RVC with a resultative complement, as in (69).

- (69) **Ta da le wo de tui yi kuai qingban.*
 he hit ASP I POSS leg one CL bruise
 ‘He hit my leg a bruise.’

A resultative complement, i.e. a quasi-argument, is allowed only in the *ba*-construction. Note that with the verb *da* ‘hit’, which takes *wo de tui* ‘my leg’, *v* should Case-license a non-selected quasi-argument, i.e. the resultative complement. Needless to say, this Case licensing is made possible because the post-*ba* DP *wo de tui* ‘my leg’ is Case-licensed by receiving inherent Case from *ba*. The quasi-argument can be Case-licensed by *v* if it is added after the DP *wo de tui* ‘my leg’ is rendered as an argument assigned inherent Case by the predicate *ba*. The RVC construction in (66) displays a syntactic behavior parallel to the one in (68a), in not allowing the occurrence of a resultative complement in its non-*ba* counterpart, as shown in (68b). If so, it is also plausible to say that the resultative complement DP *yi dong fangzi* ‘a house’ in (66) is not a full-blown argument that is assigned by a theta role by the second resultative predicate *shu* ‘lose’. Rather, *yi dong fangzi* ‘a house’ should serve as a quasi-argument syntactically, which is licensed by bearing an inherent theta role, just like *yi kuai qingban* ‘a bruise’ in (68a), while expressing the result of *Taotao*’s losing the chess game semantically.

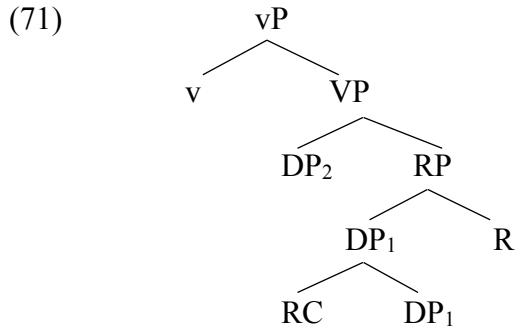
Now, given that a resultative complement is added after the *ba*-construction is formed, the derivation of (66) first proceeds as in (70).



The derivation here is the same as the derivation of the *ba*-construction without an additional resultative complement. In (70), DP_1 in RP is raised to vP, and then it is further raised to BaP. On the other hand, DP_2 in VP is raised to TP. In regard to the licensing of Case, DP_1 is assigned inherent Case by *ba*, and thus, T values the Case of DP_2 in VP. (Note that *v* does not Case-license DP_2 , and DP_2 is assigned inherent Case by *ba*).

After the *ba*-construction in (70) is derived, the resultative complement is added to it (as a modifier) in a counter-cyclical manner (see e.g. Chomsky 1995, Lebaux 1991, Fox

and Nissenbaum 1999 for discussion of counter-cyclic merger). Since, as noted earlier, the occurrence of a resultative complement, which should be generated with an inherent theta role, is licensed by the argument in RP, we assume that it is adjoined to the copy of DP₁ in RP, as (71) illustrates.



In the *ba*-construction, the Case-licensing function of *v* (associated with the first verb) is suspended at the initial point, which means that it is not used for Case-licensing the arguments of the two verbs. Nevertheless, the *v* head, which is associated with the first transitive verb, has the potential to serve as a Case-licenser. Since the *ba*-construction in (66) has an additional quasi-argument in RP, it must be the case that *v* is used for the Case-licensing of this quasi-argument as a rescue strategy. Given this, we can assume that when (71) is formed, *v* is activated and Case-licenses the quasi-argument, which is generated via delayed merger. Note that DP₂ has been Case-licensed by *T* before (71) is derived, and thus it does not count as a potential goal for Case-licensing by *v* at this point. If the quasi-argument RC in VP is Case-licensed by *v*, the derivation converges. Accordingly, the RVC construction in (65) turns out to be legitimate.

In brief, intransitive RVC constructions have derivations that are not available for transitive RVC constructions, since the first verb is intransitive and takes only one argument. In such RVC constructions, the sole argument can serve as the agent of the first verb and the affected theme of the resultative *R* at the same time, as in (53a). Alternatively, the intransitive RVC can have an affected theme argument selected by a second result verb, independently of an agent argument of the first verb, as in (53b). When an independent resultative argument is merged with RP, the single argument of the first verb counts as an unaffected argument. In contrast, if a causer is added to TP for the intransitive RVC, as in (52c), the agent argument of the first verb must count as an affected theme of the resultative *R*. These facts are accounted for straightforwardly in our proposed analysis.

6. CONCLUSION

In this paper, we have argued that the behavioral patterns of resultative verb compounds in Chinese are fixed syntactically, and that the thematic relations of arguments and their syntactic positions are determined according to where they are assigned theta roles. We propose that tense can attract the closest argument, where the distance is assessed by a c-command relation with reference to the argument's theta positions (cf. Chomsky 1995). With RVCs, one argument is generated in Spec-vP or Spec-VP, and syntactic head raising makes both *v* and *V* accessible to the argument residing in Spec-RP, so that the argument

in Spec-RP can be moved to either Spec-vP or Spec-VP, provided it is unfilled by the first argument. The agent argument appearing in vP, which receives an affected theme role from the second result verb, can be realized in non-subject position, because, in this case, the other argument in Spec-VP may be construed as closest to T if its closeness is evaluated relative to the copy of the agent argument left in RP.

While transitive RVC constructions with *zhui-lei* ‘chase-tired’ can have three out of four logically possible interpretations, there are cases where not all conceivable interpretations are available. It has been seen that object topicalization affects their possible interpretations. We have argued that if the affectedness condition is treated as a syntactic feature, the interpretive facts of *ba*- and *bei*-constructions can be accounted for in syntactic terms. Further, it has been shown that with intransitive RVCs, three distinct patterns of argument realization are available, owing to the fact that the first verb is intransitive, which takes only one argument.

In our proposal, the argument realization patterns of RVCs are accounted for with reference to their syntactic structure. The proposed syntactic analysis allows us to dispense with the assumption about an extra Causee-Affectee role assignment rule involving the causative hierarchy, by way of which Li (1995, 1999) attempts to account for the argument realization patterns of resultative verb compounds. One important consequence derived from the present proposal is that the non-agent subject RVCs are not derived by violating the thematic hierarchy, but that their apparent violation comes from a non-agent argument moving across the agent argument. The non-agent subject RVCs represent the cases of argument reversal, where one argument is moved across another via A-movement.

NOTES

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¹ The term compound refers not to a word, but a V-V complex whose internal structure is visible to the syntax.

² Other RVCs that can have the three interpretations include *qi-si* ‘get.angry-dead’, *da-lei* ‘hit-tired’, *ma-fan* ‘scold-irritated’, *xia-hun* ‘frighten-dizzy’, and *zhui-ni* ‘chase-bored’. On the other hand, RVCs like *dong-si* ‘freeze-dead’, *kan-si* ‘chop-dead’, *dong-shang* ‘freeze-injured’, and *da-shang* ‘hit-injured’ can only have one interpretation (Yu 2018). The interpretive pattern obtained for the latter group of RVCs is exemplified in (i).

- (i) *Zhangsan dong-si/da-si le Lisi.*
 Zhangsan freeze-dead/hit-dead ASP Lisi
 a. ‘Zhangsan froze/hit Lisi and as a result Lisi is dead.’
 b. *‘Zhangsan froze/hit Lisi and as a result Zhangsan is dead.’
 c. *‘Lisi froze/hit Zhangsan and as a result Zhangsan is dead.’
 d. *‘Lisi froze/hit Zhangsan and as a result Lisi is dead.’

The crucial difference between the two groups of RVCs is that with the *V*₂ in the first group, it is easy to imagine a situation where the resultant state described by the *V*₂ applies to either of the two arguments of the *V*₁, while it is difficult to imagine such a situation with *V*₂ in the second group. For example, with the *V*₂ *lei* ‘tired’, it is easy to imagine either the agent or the theme can be an exhausted individual. But the state described by *si* ‘dead’ or *shang* ‘injured’ is normally conceived of as happening to the theme to which the action of *V*₁ is directed. Given this fact, it is plausible to assume that in the second group of RVCs, their possible interpretations are constrained by the semantic properties of *V*₂ alongside the syntactic conditions discussed in the main text. Under this view, it can be stated that the example (i) can syntactically generate the three interpretations available for the first

group of RVCs, but in actuality, only one interpretation in (ia) survives due to the semantic properties of V_2 . Note further that the choice is not determined by the particular lexical items, because the RVC *qi-si* ‘get angry-dead’, which comprises the V_2 *si* ‘dead’, belongs to the first group. With this RVC, *si* does not carry a literal meaning, but has a figurative meaning, which roughly means ‘intensely’. If this meaning is expressed, it is easy to imagine that *si* describes a situation pertaining to either an agent or a theme.

- ³ For the interpretations on (1), (ii) normally implicates that *Taotao* got exhausted as a result of his repeated actions of chasing *Youyou*, while (i) and (iv) could mean that *Youyou* got exhausted by virtue of a single act of his chasing. One question that arises here is whether the interpretation in (ii) should be treated on a par with those in (i) and (iv). Here, the observed difference is motivated pragmatically. As far as the thematic relations go, all the interpretations represent causative relations, so their logical meanings can be regarded as the same. Accordingly, the same kind of affectedness is encoded syntactically even though the degree of affected meaning might differ semantically.
- ⁴ In English as well, a resultative phrase does not occur with the clause headed by an inherently directed motion verb, as in **Willa arrived breathless*. See Levin and Rappaport (1995) and Tortora (1998) for discussion on this point.
- ⁵ According to Yu (2018), the ungrammaticality of (11) is attributed to the Unique Path constraint that states that “if an argument *X* refers to a physical object, then no more than one distinct path can be predicated of *X* within a single clause” (Goldberg 1995:82). In (11), *dajia* ‘everyone’ indicates an endpoint of movement, and hence cannot be added to the clause denoting an entity undergoing a change of state, owing to the Unique Path constraint. While this is another possible account, the crucial point here is that a goal is barred from appearing in RVC constructions; (10a) and (10b) are grammatical since the goal argument is omitted.
- ⁶ A similar fact holds true for the English verb *teach*, because the two sentences *John taught students* and *John taught Chinese* are both well-formed.
- ⁷ Here, we adopt the commonly-held assumption that only upward movement is allowed.
- ⁸ In principle, Agr is allowed to attract DP_1 or DP_2 , but this type of movement does not occur, since Agr does not bear any theta role to assign to the arguments.
- ⁹ In transitive RVCs, the subject of the lower resultative verb cannot be Case-licensed by the verbal head in RP, because it does not c-command the subject. Therefore, an external Case licenser is necessary to Case-license the subject of the lower verb. Nevertheless, the higher transitive verb Case-licenses its object, and not the subject of the lower resultative verb, so that the subject position of the lower predicate is necessarily a non-Case-marking position.
- ¹⁰ Movement of an argument from Spec-VP to Spec-vP should be permitted if the argument is not Case-valued in Spec-VP.
- ¹¹ In a language like Japanese, which has compound verbs, argument reversal is not observed in compound verb constructions, owing to the fact that the verbal compounds are formed either lexically or morphologically, without syntactic head raising.
- ¹² Under the movement theory of PRO (Hornstein 1999, 2001, and others), movement of PRO does not necessarily target the position which c-commands a copy of PRO left by movement. This postulation is necessary due to the fact that some control construals can be established without a c-command relation. By contrast, a c-command relation is required for movement of arguments in RVCs, and thus, we take it that the derivation in question does not involve PRO or movement of PRO.
- ¹³ Subject topicalization is possible, in which case a resumptive pronoun is placed in the subject position, i.e. Spec-TP (see Huang et al. 2009). In this case, the possible interpretations on RVC constructions are not affected.
- ¹⁴ The agent argument in vP cannot be topicalized even if it is located in postverbal position. This fact follows, given that an argument Case-licensed by T does not reside in the domain where the syntactic operation of object topicalization applies.
- ¹⁵ We will not address the question of whether *ba* should be categorized a preposition or not. At least, *ba* behaves differently from postpositions like *zai* syntactically, and our proposed analysis can account for the fact, independently of whether or not *ba* is classified into the preposition class, i.e. the categorial status of *ba* is not relevant for the present analysis. The exact grammatical status of *ba*

is still a matter of controversy: *ba* is treated as a functional category in Zou (1993), Sybesma (1999), and Huang et al. (2009), as a verb in Hashimoto (1971), Ross (1991), Yang (1995), and Bender (2000), as a case marker in Goodall (1987) and Huang (1992), as a preposition in Huang (1982), Li (1990), and McCawley (1992), and as a “coverb” in Li and Thompson (1981).

- ¹⁶ The contracted negative *n't* is cliticized onto a modal head, so it can undergo head movement. By contrast, since *ba* is attached to a DP, it can be moved by phrasal movement, such as topicalization. Cliticization is normally a post-syntactic operation, but cliticization can take place in the syntax, as evidenced by the English contracted negation *n't*. A syntactic clitic construction can take a coordinated complement, as in *I will not walk or go by bus*.
- ¹⁷ In the *ba*-construction, an erstwhile object behaves as if it is turned into an adjunct, and it is possible for an extra DP to appear in *ba*-constructions. This fact suggests that *v* does not Case-license the post-*ba* DP.
- ¹⁸ The *ba* construction where *ba* takes a *vP* as its complement behaves like an intransitive construction. As will be argued in section 5, since intransitive *v* can optionally Case-license an argument, it is reasonable to assume that when there is no argument for *v* to Case-license, as in (46), *v* does not act as a Case-licenser.
- ¹⁹ Huang et al. (2009: 182-183) suggest that the subject of a *ba*-clause should be generated in the specifier position of *baP*.

(i) a. *Tamen dou ba Linyi da le yidun.*
 they all BA Linyi hit ASP once
 ‘They hit Linyi once.’

b. **Tamen ba Linyi dou da le yidun.*
 they BA Linyi all hit ASP once
 ‘They hit Linyi once.’

On the assumption that *dou* ‘all’ needs to be licensed standing in the vicinity of its associated DP, they propose that the subject should appear in *BaP*. Their proposal is motivated by examples like (ii), which involve topicalization and subject raising.

(ii) a. *Tamen_i Linyi shuo e_i dou lai le.*
 they Linyi say all come ASP
 ‘They_i, Linyi say that e_i all came.’

b. *Tamen_i bu keneng e_i dou zuo na-jian shi.*
 they not likely all do that-CL matter
 ‘The are not all likely to do that work.’

Interesting though this analysis is, there is one theoretical problem, because the post-*ba* DP is an argument originally selected by the verb. Such being the case, the post-*ba* DP should first appear in the lower subject position of *vP*. In any event, what the examples in (ii) suggest seems to be that *dou* ‘all’ cannot be associated with a DP which undergoes A-movement (but not A'-movement) across another argument. If this is the case, the facts of *dou* ‘all’ can be captured even if it starts out from within *vP*. Both (iia) and (iib) are ruled in, since no A-movement crossing another argument is instantiated. The subject of a *ba*-sentence cannot be linked to *dou* ‘all’ placed to the right of the post-*ba* DP, as in (ib), since the subject crosses the post-*ba* DP via A-movement. (Needless to say, *dou* ‘all’ can be associated with the subject if it is placed to the left of the post-*ba* DP, as in (ia).)

- ²⁰ Under this analysis, the agent and the theme arguments appearing in the embedded clause can be assumed to be Case-licensed by *T* and *v*, respectively.
- ²¹ This type of Case-licensing bears close resemblance to Case-licensing implemented in ECM constructions.
- ²² We can assume that (68) has the syntactic structure in (i), where the *BaP* (and *baP*) is projected over *vP*, abstracting away from irrelevant details (cf. Sybesma 1999).

(i) [_{TP}...[_{CausP} CAUS [_{baP} [_{BaP} *ba* [_{vP} *V* [_{VP} *V* [_{RP} *R*]]]]]]]

In (68), the causer *emeng* ‘nightmare’ cannot appear in the *BaP*, because it does not count as an affected argument.

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