

Event Structure and Argument Linking in Chinese^{*}

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This paper is concerned with the linking of arguments to syntax in Chinese resultative verb constructions. It is demonstrated that the linking principles based on event roles can account for the complementary distribution of the *Ba*-construction and the Verb-copying construction, because 'ba+NP' is associated only with the Locus of affect role (an entity that is involved in the endpoint), whereas 'a copied verb+NP' is associated only with the Target of activity role (an entity that undergoes the action). It is predicted that a resultative verb construction, which can occur in the *Ba*-construction, can have a corresponding *Bei*-construction, because both constructions involve the displacement of the Locus of affect role.

Key words: event structure, argument linking, Chinese resultative verb constructions

1. Introduction

This paper discusses five types of resultative verb constructions (RVCs) in Chinese and the syntactic constructions associated with them (e.g., the *Ba*-construction, the *Bei*-construction, and the Verb-copying construction), according to the number of arguments the given verbs take and whether the given arguments refer to the same entity. Following van Voorst (1988), Dowty (1991), van Hout (1993), Tenny (1994), Croft (1998), Rosen (1996, 1999), Van Valin and LaPolla (1997), this paper argues that it is the event role an argument plays in event structure, rather than the thematic role an argument plays, that determines how and where the argument is linked to the syntax. That is, the NP arguments of an RVC are linked to certain syntactic positions according to the event roles these NP arguments play in event structure.

The rest of this paper proceeds in the following order. Section 2 discusses RVCs and their relevant syntactic constructions (e.g., the *Ba*-construction, the *Bei*-construction, and the Verb-copying construction). Section 3 discusses the linking theoretical framework. Section 4 consists of concluding remarks.

^{*} I gratefully acknowledge a fellowship for this research provided by the Chiang Ching-kuo Foundation.

2. Chinese RVCs and their relevant syntactic constructions

In this section, I classify RVCs into five types according to the following two criteria: (a) how many arguments each of the verbs takes (e.g., transitive or intransitive), and (b) whether the arguments from two different verbs denote the same entity. Then, I exemplify in what syntactic constructions the given NP arguments of each type of these RVCs can occur. The first two types of RVCs, in which both V_1 and V_2 are intransitive verbs, are discussed in Section 2.1, whereas the other three types, in which V_1 is a transitive verb while V_2 is an intransitive verb, are discussed in Section 2.2.

2.1 Both V_1 and V_2 are intransitive verbs

RVCs in modern Chinese can be composed of two intransitive verbs. For example, RVCs such as *ku-lei* ‘cry-tired’ and *ku-fan* ‘cry-annoyed’, as given in (1c) and (2c), comprise two intransitive verbs. In these two RVCs, each of the given verbs is subcategorized for one NP argument, as illustrated in (1a) and (1b), and (2a) and (2b), respectively. However, in RVC (1c), each of the two intransitive verbs takes one NP argument, and these two NP arguments denote the same entity; i.e., the subject NP of V_1 and the subject NP of V_2 are identical (Type I). Likewise, in RVC (2c), each of the two intransitive verbs takes one NP argument, but these two NP arguments denote two different entities (Type II). Because the two arguments of the RVC in (1c) denote the same entity, only one of the identical arguments is realized in the syntax, i.e., $NP_1+V_1V_2$, in which the argument of V_1 (i.e., NP_1) is represented in the subject position, while the argument of V_2 is not overtly realized in syntactic structure. The arguments of the RVC in (2c) do not refer to the same entity; therefore, both arguments must appear in syntactic structure, i.e., $NP_1+V_1V_2+NP_2$, in which the argument of V_1 (i.e., NP_1) is represented in the subject position, whereas the argument of V_2 (i.e., NP_2) is represented in the postverbal object position (i.e., after V_2).

(1) RVC in which Subj. of V_1 = Subj. of V_2 (Type I)

- a. *ku* ‘cry’ (V_i): <Zhangsan>
 Zhangsan zai ku.
 Zhangsan ZAI cry
 ‘Zhangsan is crying.’
- b. *lei* ‘tired’ (V_i): <Zhangsan>
 Zhangsan yijing lei le.
 Zhangsan already tired LE
 ‘Zhangsan is already tired.’

- c. *ku-lei* ‘cry-tired’: [V₁<Zhangsan>; V₂<Zhangsan>]
 Zhangsan ku lei le.
 Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’
- (2) RVC in which Subj. of V₁ ≠ Subj. of V₂ (Type II)
- a. *ku* ‘cry’ (Vi): <Zhangsan>
 Zhangsan zai ku.
 Zhangsan ZAI cry
 ‘Zhangsan is crying.’
- b. *fan* ‘annoyed’ (Vi): <Lisi>
 Lisi xianzai hen fan.
 Lisi now very annoyed
 ‘Lisi feels annoyed now.’
- c. *ku-fan* ‘cry-annoyed’: [V₁<Zhangsan>; V₂<Lisi>]
 Zhangsan ku fan le Lisi.
 Zhangsan cry annoyed LE Lisi
 ‘Zhangsan’s crying made Lisi feel annoyed.’

It is worth pointing out that the RVC (Type II) composed of two intransitives such as *ku* ‘cry’ and *fan* ‘annoyed’ in (2c) can have a corresponding *Ba*-construction or *Bei*-construction, as shown in (3) and (4). However, it does not have a corresponding Verb-copying construction, as shown in (5).

- (3) *Ba*-construction
 Zhangsan ba Lisi ku fan le.
 Zhangsan BA Lisi cry annoyed LE
 ‘Zhangsan’s crying made Lisi feel annoyed.’
- (4) *Bei*-construction
 Lisi bei Zhangsan ku fan le.
 Lisi BEI Zhangsan cry annoyed LE
 ‘Lisi felt annoyed from Zhangsan’s crying.’
- (5) Verb-copying construction
 *Zhangsan ku Lisi ku fan le.
 Zhangsan cry Lisi cry annoyed LE
 ‘Zhangsan’s crying made Lisi feel annoyed.’

Because the RVC in (1c) (Type I) does not have an additional overt NP argument, it does not have a corresponding *Ba*-construction or *Bei*-construction, nor does it have a

corresponding Verb-copying construction, as illustrated in (6)-(8).

- (6) *Ba*-construction
 *Ba Zhangsan ku lei le.
 BA Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’
- (7) *Bei*-construction
 *Bei Zhangsan ku lei le.
 BEI Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’
- (8) Verb-copying construction
 *Ku Zhangsan ku lei le.
 Cry Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’

In addition to *ku-lei* ‘cry-tired’, there are many other similar examples in which RVCs are composed of two intransitives, and the NP arguments designated by two different verbs tend to denote the same entity—for example, *xiao-feng* ‘laugh-crazy’, *ke-yun* ‘thirsty-dizzy’, *lei-bing* ‘tired-sick’, *pao-lei* ‘run-tired’, and so on. In contrast, there are many other examples in which RVCs are composed of two intransitives and the arguments designated by both verbs tend to denote different entities—for example, *ku-shi* ‘cry-wet’, *ku-hong* ‘cry-red’, *ku-xing* ‘cry-awake’, *xiao-wan* ‘laugh-bend’, and so on.

2.2 V_1 is a transitive verb while V_2 is an intransitive verb

RVCs in modern Chinese can be composed of a transitive verb (V_1) and an intransitive verb (V_2). Such RVCs can be divided into three different groups. First, the object NP of a transitive verb (V_1) is identical with the subject NP of an intransitive verb (V_2) (Type III). Second, the subject NP of a transitive verb (V_1) is identical with the subject NP of an intransitive verb (V_2) (Type IV). Third, none of the three NP arguments are identical (Type V).

For example, the RVC involving the resultative verb complex *tui-dao* ‘push-fall’, as in (9c), is composed of the transitive verb *tui* ‘push’, which has two arguments (e.g., *Zhangsan* and *Lisi*), and the intransitive verb *dao* ‘fall’, which has one argument (e.g., *Lisi*). In this type of RVC (Type III), the object NP of V_1 is identical with the subject NP of V_2 (e.g., *Lisi*). Sentences with this type of RVC have a corresponding *Ba*- or *Bei*-construction, as in (10) and (11), but they do not have a corresponding Verb-copying construction, as in (12).

(9) RVC with identical arguments (Obj. of V_1 = Subj. of V_2) (Type III)

- a. *tui* ‘push’ (Vt): <Zhangsan, Lisi>
 Zhangsan zai tui Lisi.
 Zhangsan ZAI push Lisi
 ‘Zhangsan is pushing Lisi.’
- b. *dao* ‘fall’ (Vi): <Lisi>
 Lisi dao le.
 Lisi fall LE
 ‘Lisi fell.’
- c. *tui-dao* ‘push-fall’: [V_1 <Zhangsan, Lisi>; V_2 <Lisi>]
 Zhangsan tui dao le Lisi.
 Zhangsan push fall LE Lisi
 ‘Zhangsan pushed Lisi and as a result Lisi fell.’

(10) *Ba*-construction

Zhangsan ba Lisi tui dao le.
 Zhangsan BA Lisi push fall LE
 ‘Zhangsan pushed Lisi and as a result Lisi fell.’

(11) *Bei*-construction

Lisi bei Zhangsan tui dao le.
 Lisi BEI Zhangsan push fall LE
 ‘Lisi fell from Zhangsan’s pushing.’

(12) Verb-copying construction

*Zhangsan tui Lisi tui dao le.
 Zhangsan push Lisi push fall LE

Many more examples of such RVCs (Type III) can be found; for example, *tui-kai* ‘push-open’, *qiao-po* ‘hit-break’, *da-pao* ‘hit-escape’, *sha-si* ‘kill-die’, *shai-gan* ‘dehydrate-dry’, *la-chang* ‘pull-long’, *zhu-shou* ‘cook-cooked’, *qi-ku* ‘angry-cry’, *xi-ganjing* ‘wash-clean’, *jiao-xing* ‘call-awake’, *jiu-huo* ‘save-alive’, *xia-fei* ‘frighten-fly’, and so on.

On the other hand, the RVC, as in (13c), is also composed of a transitive verb and an intransitive verb. The transitive verb *chi* ‘eat’ takes two arguments (e.g., *Zhangsan* and *fan* ‘meal’), whereas an intransitive verb *bao* ‘full’ takes only one (e.g., *Zhangsan*). In this type of RVC (Type IV), the subject NP of V_1 is identical with the subject NP of V_2 . In addition, this type of RVC usually occurs in the Verb-copying construction, as in (16), but it does not occur in the *Ba*-construction or the *Bei*-construction, as in (14) and (15). More examples of this type of RVC are *kan-fan* ‘read-bored’, *kan-lei* ‘read-tired’, *xie-fan* ‘write-bored’, *xie-lei* ‘write-tired’, *chi-ni* ‘eat-fed.up’, *he-zui* ‘drink-inebriated’, among others.

(13) RVC with identical arguments (Subj. of V₁ = Subj. of V₂) (Type IV)

a. *chi* 'eat' (Vt): <Zhangsan, fan>

Zhangsan yijing chi le fan.
 Zhangsan already eat LE meal
 'Zhangsan already ate meal.'

b. *bao* 'full' (Vi): <Zhangsan>

Zhangsan yijing bao le.
 Zhangsan already full LE
 'Zhangsan is already full.'

c. *chi-bao* 'eat-full': [V₁<Zhangsan, fan>; V₂<Zhangsan>]

Zhangsan yijing chi bao fan le.
 Zhangsan already eat full meal LE
 'Zhangsan was full from eating meal.'

(14) *Ba*-construction

*Zhangsan ba fan chi bao le.
 Zhangsan BA meal eat full LE

(15) *Bei*-construction

*Fan bei Zhangsan chi bao le.
 meal BEI Zhangsan eat full LE

(16) Verb-copying construction

Zhangsan chi fan chi bao le.
 Zhangsan eat meal eat full LE
 'Zhangsan was full from eating meal.'

Though the object *fan* 'meal' of the transitive verb *chi* 'eat' in (13c) is placed in the position immediately following the second verb, it should be pointed out that examples like this (e.g., NP₁+V₁V₂+NP₂) are not common. In addition, the replacement of *fan* 'meal' with *mian* 'noodles', as in (17), or the replacement of the indefinite NP *fan* 'meal' with the definite one such as *na dun fan* (that Cl. meal) 'that meal', as in (18), will cause the sentences to become ungrammatical.

(17) *Zhangsan yijing chi bao mian le.
 Zhangsan already eat full noodles LE
 'Zhangsan was full from eating noodles.'

(18) *Zhangsan yijing chi bao na dun fan le.
 Zhangsan already eat full that Cl. meal LE
 'Zhangsan was full from eating that meal.'

The RVC, as in (19c), is composed of a transitive verb such as *xi* ‘wash’ and an intransitive verb such as *shi* ‘wet’. In this type of RVC (Type V), the two verbs take three NP arguments, and none of them are identical. Note that these three NP arguments occur in different syntactic positions. The NP argument of V_2 (e.g., *xiezi* ‘shoes’) occurs in the position immediately following the second verb; the subject of V_1 (e.g., *Zhangsan*) occurs in the subject position of the RVC, whereas the object of V_1 (e.g., *yifu* ‘clothes’) occurs in the position immediately following the first of the two identical verbs. Sentences with this type of RVC have a corresponding *Ba*-construction or *Bei*-construction, but it must also involve the Verb-copying construction, as in (20) and (21).¹

- (19) RVC with no identical arguments (Type V)
- a. *xi* ‘wash’ (Vt): <Zhangsan, yifu>
 Zhangsan zai xi yifu.
 Zhangsan ZAI wash clothes
 ‘Zhangsan is washing clothes.’
- b. *shi* ‘wet’ (Vi): <xiezi>
 Zhangsan-de xiezi shi le.
 Zhangsan’s shoes wet LE
 ‘Zhangsan’s shoes got wet.’
- c. *xi-shi* ‘wash-wet’: [V_1 <Zhangsan, yifu>; V_2 <xiezi>]
 Zhangsan xi yifu xi shi le xiezi.
 Zhangsan wash clothes wash wet LE shoes
 ‘Zhangsan washed his clothes and his shoes got wet as a result.’
- (20) RVC with Verb-copying construction + *Ba*-construction
 Zhangsan xi yifu ba xiezi xi shi le.
 Zhangsan wash clothes BA shoes wash wet LE
 ‘Zhangsan washed his clothes and his shoes got wet as a result.’
- (21) RVC with Verb-copying construction + *Bei*-construction
 Xiezi bei Zhangsan xi yifu xi shi le.
 Shoes BEI Zhangsan wash clothes wash wet LE
 ‘The shoes’ getting wet results from Zhangsan’s washing clothes.’

Because Chinese is a pro-drop language, it permits an NP argument of a verb to be inferred from discourse context; therefore, the given NP argument can be left empty. For example, the RVC in (22) is composed of a transitive verb and an intransitive verb.

¹ For more discussions on the RVCs and their related syntactic constructions (e.g., the *Ba*-construction, the *Bei*-construction, and the Verb-copying construction), see L. Li (1986:181-204).

The transitive verb *da* ‘hit’ takes two NP arguments (e.g., *Zhangsan* and *wangqiu* ‘tennis’), whereas the intransitive verb *huai* ‘broken’ takes only one (e.g., *san fu wangqiu pai* ‘three pairs of tennis rackets’). As mentioned previously, all three arguments can be represented in syntactic structure. The subject of V_1 (e.g., *Zhangsan*) occurs in the subject position of the RVC; the object of V_1 (*wangqiu* ‘tennis’) occurs in the position immediately following the first of the two identical verbs; and the subject of V_2 (e.g., *san fu wangqiu pai* ‘three pairs of tennis rackets’) occurs in the position immediately following the second verb, as in (22). Because the subject of V_2 can also occur in the position immediately following *ba* (i.e., the *Ba*-construction), sentence (22) has a corresponding counterpart, as shown in (23). However, the omission of the NP object of V_1 (e.g., *wangqiu* ‘tennis’) prevents the occurrence of the Verb-copying construction. That is, when the NP object of V_1 is omitted due to discourse-pragmatic factors, the RVC in question does not involve the verb-copying device, as (24) and (25) show. This suggests that the NP object of V_1 has a close relationship with the Verb-copying construction. Note, however, that the omission of arguments is influenced by discourse-pragmatic considerations.

- (22) *da-huai* ‘hit-broken’: [V_1 <*Zhangsan*, *wangqiu*>; V_2 <*san fu wangqiu pai*>]
Zhangsan da wangqiu da huai le san fu wangqiu pai.
Zhangsan hit tennis hit broken LE three Cl. tennis racket
 ‘Zhangsan ruined three pairs of tennis rackets by playing tennis.’
- (23) RVC with Verb-copying construction + *Ba*-construction
Zhangsan da wangqiu ba san fu wangqiu pai da huai le.
Zhangsan hit tennis BA three Cl. tennis racket hit broken LE
 ‘Zhangsan ruined three pairs of tennis rackets by playing tennis.’
- (24) RVC without Verb-copying construction
Zhangsan da huai le san fu wangqiu pai.²
Zhangsan hit broken LE three Cl. tennis racket
 ‘Zhangsan ruined three pairs of tennis rackets (by playing tennis).’
- (25) RVC with *Ba*-construction but not Verb-copying construction
Zhangsan ba san fu wangqiu pai da huai le.
Zhangsan BA three Cl. tennis racket hit broken LE
 ‘Zhangsan ruined three pairs of tennis rackets (by playing tennis).’

² Notice that we can interpret the sentences in (24) and (25) as ‘Zhangsan ruined three pairs of tennis rackets by hitting them’, if the missing argument is not inferred from discourse context. But in this way, these RVCs are treated as Type III RVCs, in which the object of V_1 is identical with the subject of V_2 .

2.3 Summary

I have discussed five types of RVCs according to the number of arguments the given verbs take, and whether the given arguments refer to the same entity. The syntactic distribution of these RVCs can be summarized as follows:

Table 1: Different types of RVCs and syntactic constructions associated with them

Type	Arguments of verbs	Surface form	Ba-construction	Bei-construction	Verb-copying construction
I	V1(Vi)+V2(Vi) Subj. of V ₁ = Subj. of V ₂	<i>ku-lei</i> ‘cry-tired’ NP ₁ +V ₁ V ₂	No	No	No
II	V1(Vi)+V2(Vi) Subj. of V ₁ ≠ Subj. of V ₂	<i>ku-fan</i> ‘cry-annoyed’ NP ₁ +V ₁ V ₂ +NP ₂	Yes	Yes	No
III	V1(Vt)+V2(Vi) Obj. of V ₁ = Subj. of V ₂	<i>tui-dao</i> ‘push-fall’ NP ₁ +V ₁ V ₂ +NP ₂	Yes	Yes	No
IV	V1(Vt)+V2(Vi) Subj. of V ₁ = Subj. of V ₂	<i>chi-bao</i> ‘eat-full’ NP ₁ +V ₁ V ₂ +NP ₂ (rare) NP ₁ +V ₁ +NP ₂ +V ₁ V ₂	No	No	Yes
V	V1(Vt)+V2(Vi) No identical Arguments	<i>xi-shi</i> ‘wash-wet’ NP ₁ +V ₁ +NP ₂ +V ₁ V ₂ +NP ₃	Yes	Yes	Yes

From Table 1, we can see that all the RVCs in Types II to IV can occur in the surface form of NP₁+V₁V₂+NP₂. However, Type II (e.g., *ku-fan* ‘cry-annoyed’) and Type III (e.g., *tui-dao* ‘push-fall’) have a corresponding *Ba*- or *Bei*-construction, but they do not have a corresponding Verb-copying construction; whereas Type IV (e.g., *chi-bao* ‘eat-full’) has a corresponding Verb-copying construction, but it does not have a corresponding *Ba*- or *Bei*-construction. In addition, in Type V (e.g., *xi-shi* ‘wash-wet’), the occurrence of either the *Ba*- or the *Bei*-construction is also associated with the Verb-copying construction. That is, a sentence must contain the Verb-copying construction and the *Ba*-construction, or the Verb-copying construction and the *Bei*-construction at the same time, when no NP argument occurs in the position immediately following the second verb.

Two questions arise from the above discussion. First, why do RVCs with the verb complex *ku-fan* ‘cry-annoyed’ occur only in the *Ba*- and the *Bei*-constructions, but not in the Verb-copying construction, whereas RVCs with the verb complex *chi-bao* ‘eat-full’ occurs only in the Verb-copying construction, but not in the *Ba*- and *Bei*-constructions? Second, why does the *Ba*-construction share the same interpretation with the *Bei*-construction, but not with the Verb-copying construction?

The answers to these questions will be provided in the sections that follow. I shall

point out that the analysis based on event roles/participants can systematically account for the linking of arguments to syntactic positions in Chinese RVCs, while it can likewise provide solutions to the puzzles that have been pointed out.

3. Linking theoretical framework

3.1 Representation of event structure

Before discussing how event roles are linked to syntax, let me first illustrate how event structure is represented. Dowty (1979) uses *states* as primitives, representing the end state of an event, and reformulates Vendler's (1967) four categories, using logical definitions and the primitives BECOME, DO, and CAUSE. In his aspectual calculus, achievements are derived from states, and accomplishments are derived from achievements. Activities are often part of accomplishments and often involve 'unmediated self-control' by the agent.

Referring to Dowty (1979), Van Valin and LaPolla (1997) also paraphrase aspectual categories in terms of primitive elements—for example, the verb *kill* can be paraphrased into something like 'cause to die', and then the verb *die* can be broken down into 'become dead'. Thus, the lexical representation of *kill* would be something like 'x causes [y become dead]'. To support their analysis, Van Valin and LaPolla (1997:90) take Lakhota as an example, explaining that verbs of killing in Lakhota can be formed from the verb *t'a* 'die, be dead' by adding instrumental prefixes, as illustrated in (26a)-(26e). The evidence shows that all of these verbs of killing are derived from a base verb meaning 'die' or 'be dead' via causativization, which illustrates that the addition of the instrumental prefix can causativize the verb and code a type of causing action.

- (26) Lakhota (Van Valin and LaPolla 1997:90)
- a. *t'a* 'die, be dead'
 - b. *ka-t'a* 'cause to die by striking' (ka- 'by striking')
 - c. *yu-t'a* 'strangle' (yu- 'with the hands')
 - d. *ya-t'a* 'bite to death' (ya- 'with the teeth')
 - e. *wo-t'a* 'shoot to death' (wo- 'by action from a distance')

According to Van Valin and LaPolla (1997), the derivational relationships between Vendler's (1967) four aspectual categories are given as follows.

- (27) Event structures for different aspectual categories
- a. State:
predicate' (x) or (x, y)
 - b. Achievement:
[BECOME **predicate'** (x) or (x, y)]
 - c. Activity:
[**do'** (**predicate'** (x) or (x, y))]
 - d. Accomplishment:
[**do'** (**predicate'** (x) or (x, y))] CAUSE [BECOME (**predicate'** (y) or (z))]

Van Valin and LaPolla (1997:102) present *constants* (which are normally predicates) in boldface followed by a prime, whereas they present *variable elements* in normal typeface (e.g., x, y, etc.). The elements in both boldface and with a prime are part of the vocabulary of the semantic metalanguage used in the decomposition; they are not words from any particular human language. The elements in uppercase, CAUSE and BECOME, are modifiers of the predicate in the event structure. Note that there is no special formal indicator when a predicate is stative. All activity event structures contain the generalized activity predicate **do'**, which serves as the marker of membership in this class.

The English examples in (28)-(30) illustrate how an accomplishment expression, an achievement expression, and a state expression are represented in event structure. Note that the accomplishment expression in (28) tells us that John did the breaking and the window broke, but it does not specify exactly what John did to break the window. Such an unspecified action is represented in logical structure as '**do'** (x, \emptyset)'.

- (28) Accomplishment
- a. John broke the window.
 - b. Event structure
[**do'** (John, \emptyset)] CAUSE [BECOME **broken'** (window)]
- (29) Achievement
- a. The window broke.
 - b. Event structure
[BECOME **broken'** (window)]
- (30) State
- a. The window is broken.
 - b. Event structure
broken' (window)

Unlike the English accomplishment verb *break*, which is coded by a single lexical verb, its Chinese counterpart, as given in (31), is expressed by a resultative verb complex *da-po* ‘hit-broken’, which involves a causing activity *da* ‘hit’ and a resulting state *po* ‘broken’. The event structure of (31a) is represented as in (31b).

- (31) a. Zhangsan da po le chuangzi.
 Zhangsan hit broken LE window
 ‘Zhangsan broke the window.’
 b. Event structure
 ([do' (**hit'**(Zhangsan, chuangzi))]) CAUSE [BECOME **broken'** (chuangzi)]

The RVCs in (32a) and (33a) are composed of two intransitive verbs; (33a) differs from (32a) in that there are no identical arguments. The event structures of these two examples can be represented in (32b) and (33b), respectively.

- (32) a. Zhangsan ku lei le.
 Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’
 b. Event structure
 ([do' (**cry'**(Zhangsan))]) CAUSE [BECOME **tired'** (Zhangsan)]
- (33) a. Zhangsan ku fan le Lisi.
 Zhangsan cry annoyed LE Lisi
 ‘Zhangsan’s crying made Lisi feel annoyed.’
 b. Event structure
 ([do' (**cry'**(Zhangsan))]) CAUSE [BECOME **annoyed'** (Lisi)]

The RVCs in (34a), (35a), and (36a) are composed of a transitive verb and an intransitive verb. Each of these RVCs has three arguments associated with it. In (34a) the object NP of V₁ and the subject NP of V₂ are identical, in (35a) the subject NPs of both V₁ and V₂ are identical, whereas in (36a) none of the NP arguments are identical. Their event structures are shown in (34b), (35b), and (36b), respectively.

- (34) a. Zhangsan tui dao le Lisi.
 Zhangsan push fall LE Lisi
 ‘Zhangsan pushed Lisi and as a result Lisi fell.’
 b. Event structure
 ([do' (**push'**(Zhangsan, Lisi))]) CAUSE [BECOME **fall'** (Lisi)]

- (35) a. Zhangsan yijing chi bao fan le.
 Zhangsan already eat full meal LE
 ‘Zhangsan was full from eating meal.’
 b. Event structure
 ([do' (eat'(Zhangsan, fan))] CAUSE [BECOME full' (Zhangsan)])
- (36) a. Zhangsan xi yifu xi shi le xiezi.
 Zhangsan wash clothes wash wet LE shoes
 ‘Zhangsan washed his clothes and his shoes got wet as a result.’
 b. Event structure
 ([do' (wash'(Zhangsan, yifu))] CAUSE [BECOME wet' (xiezi)])

3.2 Event roles

In the previous section, I have shown lexical representations of events for RVCs in Chinese and the NP arguments associated with them. In this section I shall discuss the event roles (i.e., event participants) that NP arguments play in event structure, holding that event roles have significant grammatical consequences and are the entities that grammatical rules refer to primarily.³

But how to identify event roles? According to Croft (1991, 1998), an event structure consists of a one-dimensional linear sequence of subevents or segments, each of which is in a causal relation with the following segment. Subevents are individuated at the relevant level of granularity by causal, aspectual, and other qualitative properties. For example, a process leading to a resulting state causes that state, and is treated as a distinct segment in the causal sequence even though the participant is the same. This sequence is called the *causal chain*. Following Croft (1998:59), I suggest that event roles or participants are situated at the beginning or the endpoint of the subevents where they enter into the causal chain. That is, if the role is involved in the initiation of the event, the given event role is called *Initiator* (i.e., Initiation-point participant). If the role is involved in the endpoint of the event, it is called *Locus of affect* (i.e., Endpoint participant). In other words, the Initiator role is used to indicate cause or instigation of an event, whereas the Locus of affect role is used to indicate the delimitation or endpoint of an event. Because Chinese RVCs allow the event role that undergoes the action to occur overtly in syntactic structure, the given event role is called *Target of activity*. The event role Initiator has many different names—for example, the Antagonist (Talmy 1988), originator (Borer 1994), trajector (Langacker 1987), instigator, or the causer.

³ For the discussions of why thematic roles are not preferred in linking arguments to syntax, see van Voorst (1988), Dowty (1991), van Hout (1993), Tenny (1994), Croft (1998), Rosen (1996, 1999), Van Valin and Lapolla (1997), and Chang (2001:207-212).

Likewise, the event role Locus of affect has many other names—for example, the Agonist (Talmy 1988), event measure (Borer 1994), landmark (Langacker 1987), or delimiter (Ritter and Rosen 1998). The definitions of these event roles proposed in the present work are given in (37).

- (37) Definitions of event roles
- a. **Initiator**: an entity that is involved in the initiation or bringing about of an object.
 - b. **Target of activity**: an entity that undergoes an action.
 - c. **Locus of affect**: an entity that is involved in the endpoint or resulting state.

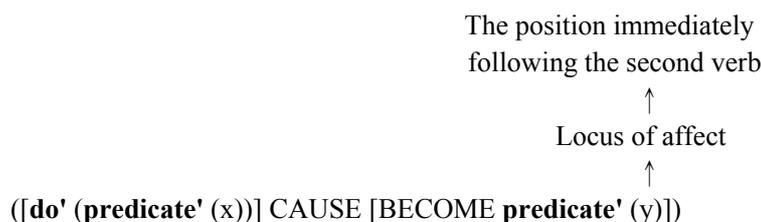
In (38), there are two event roles (i.e., Initiator and Locus of affect) in the RVC, and they refer to the same entity (e.g., *Zhangsan*), while in (39), there are also two event roles (i.e., Initiator and Locus of affect) in the RVC, but they refer to different entities (e.g., *Zhangsan* and *Lisi*).

- (38) a. Zhangsan ku lei le.
 Zhangsan cry tired LE
 ‘Zhangsan was tired from crying.’
- b. Event structure and event roles
- | | | |
|--|--|-----------------|
| Initiator | | Locus of affect |
| ↑ | | ↑ |
| ([do' (cry'(Zhangsan))] CAUSE [BECOME tired' (Zhangsan)]) | | |
- (39) a. Zhangsan ku fan le Lisi.
 Zhangsan cry annoyed LE Lisi
 ‘Zhangsan’s crying made Lisi feel annoyed.’
- b. Event structure and event roles
- | | | |
|--|--|-----------------|
| Initiator | | Locus of affect |
| ↑ | | ↑ |
| ([do' (cry'(Zhangsan))] CAUSE [BECOME annoyed' (Lisi)]) | | |

Each of the RVCs in (40)-(42) involves three event roles: Initiator, Target of activity, and Locus of affect, but they differ in the following respects. In RVC (40), the Target of activity role and the Locus of affect role refer to the same entity, while in RVC (41), the Initiator role and the Locus of affect role refer to the same entity. The RVC in (42) has three distinct event roles and none of them refers to the same entity.

(46) a. **Linking Rule 2:** the NP argument with the Locus of affect role is linked to the position immediately following the second verb.

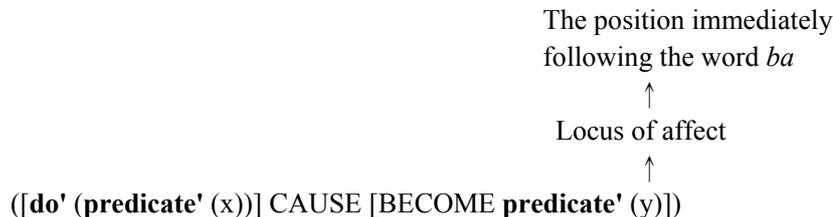
b.



It should be noted that in addition to the position immediately following the second verb, the Locus of affect NP argument in Chinese can be linked to the position immediately following the word *ba* (Linking Rule 3), as illustrated in (47).

(47) a. **Linking Rule 3:** the NP argument with the Locus of affect role is linked to the position immediately following the word *ba*.

b.



In the literature, the word *ba* has been treated in many different ways. For example, it is treated as a case marker for direct objects (Liang 1971, Goodall 1986, J. Huang 1992, Y.Y. Huang 1991), as a preposition (J. Huang 1982, L-Y. Huang 1990, Y.-H. Li 1990, Li and Thompson 1976, McCawley 1992), as a coverb (Li and Thompson 1981), as a verb (Hashimoto 1971, Ross 1991, Yang 1995, Bender 2000), as a secondary topic marker (Tsao 1987b), and as a functional category heading its own projection (Zou 1993, Sybesma 1999). In my analysis, the word *ba* is used to mark the displaced NP argument denoting the endpoint of the event (i.e., the Locus of affect NP).⁴

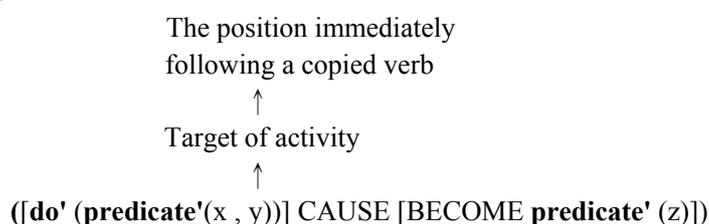
Note, however, that Chinese RVCs can overtly express the third argument (i.e., the

⁴ For the relationship between RVCs and *ba*, see Gao (1997), Zou (1995), Y.Y. Huang (1996), among others, whereas for the relationship between delimitedness/boundedness and *ba*, see Cheng (1988), Szeto (1988), Yong (1993), and F-H. Liu (1997), among others.

NP argument with the Target of activity role) in syntax, in addition to the argument with the Initiator role or the Locus of affect role. As to how the Target of activity role is linked to syntax, I propose that it is linked to the position immediately following a copied verb (Linking Rule 4), as illustrated in (48). In my analysis, the copied verb refers to the first of the two identical verbs in an RVC (e.g., *Zhangsan chi_(copied) fan chi_(original) bao le* ‘Zhangsan was full from eating meal.’).

(48) a. **Linking Rule 4:** the NP argument with the Target of activity role is linked to the position immediately following a copied verb.

b.



Opinions differ as to which of the two identical verbs is a copied verb, and why it should be copied. J. Huang (1982) suggests that in a Verb-copying construction, the first of the two identical verbs is the original verb, while the other is the copy. Tsao (1987a) also assumes that the second of the two identical verbs in the Verb-copying construction is a copy of V₁, the original verb. According to Tsao (1987a), the first verb and the NP argument are treated as a topicalized matrix V, which is moved out of the matrix VP. After the movement, the second dummy verb is inserted to fill the empty verb position left behind by verb topicalization. In contrast to J. Huang (1982) and Tsao (1987a), Y. Li (1990) argues that in the Verb-copying construction the second verb is in fact the original verb; the first verb is copied for Case assignment. The copied verb is inserted during syntactic derivation in the same way the English *of* is inserted for the purpose of Case assignment in the sentence *he is proud of his brother*.⁵ Following Y. Li (1990), I suggest that in the Verb-copying construction the first of the two identical verbs is a copied verb, but in contrast to Y. Li's (1990) analysis, I propose that the verb is copied to mark the event role (i.e., Target of activity), rather than to assign Case.

Though both the Target of activity role and the Locus of affect role can be linked to the positions before a resultative verb complex, expressed by a copied verb and the word *ba*, respectively, the Target of activity role marked by a copied verb must occur

⁵ For further discussion of the Verb-copying construction in Chinese, see Tsao (1987a), Chang (1991), Hsieh (1992), Paris (1988), and X. Liu (1997), among others.

before the Locus of affect role marked by *ba*. Why is there such a constraint? According to Croft's (1991, 1998) causal chain, an event structure consists of a one-dimensional linear sequence of subevents (also known as *segments* in Croft's analysis), each of which is in a causal relation with the following subevent. That is, an activity leading to a result state causes that state, and is treated as a distinct subevent in the causal sequence. Because in the linear sequence, the Initiator role occurs before the Target of activity role, which occurs before the Locus of affect role, the linking of these event roles to syntax also follows the order of the event roles in the causal chain. This accounts for why the Locus of affect role in the position immediately following *ba* or the second verb always follows the Target of activity role marked by a copied verb. Because event roles are represented according to the order in the causal chain, the order of the event roles: *Initiator*→*Target of activity*→*Locus of affect* in the syntactic structure is an iconic reflection of event structure in Chinese.

As discussed in Section 2.2, an RVC comprising a transitive verb and an intransitive verb is allowed to have three distinct NP arguments, in which no NP arguments refer to the same entity, or it can have three NP arguments, two of which refer to the same entity. In addition, I have pointed out that when two NP arguments refer to the same entity, one is syntactically expressed while the other is not. But which NP argument is syntactically expressed and which is not? It is suggested that when two NP arguments refer to the same entity, the NP argument with an event role in a higher hierarchy is syntactically expressed, while the other one with an event role in a lower hierarchy is not. The hierarchy of event roles is defined in (49).

(49) **Hierarchy of Event Roles**

Initiator > Locus of affect > Target of activity

For example, if an RVC has two identical NP arguments and specifies them as Initiator and Locus of affect, respectively, the NP argument with the event role of Initiator is syntactically expressed, because the Initiator role is higher than the Locus of affect role in the hierarchy. Note that the NP argument with the event role Locus of affect is suggested to be satisfied by binding and is not syntactically realized, because it is bound to the NP argument with the Initiator role. Because the NP argument with the Locus of affect role is bound to the NP argument with the Initiator role, the former makes reference to the latter for interpretation. But if an RVC has two identical NP arguments and specifies them as Locus of affect and Target of activity, respectively, then only the NP argument with the Locus of affect role is syntactically expressed, since the Locus of affect role is higher than the Target of activity role in the hierarchy. The NP argument with the Target of activity role is satisfied by binding and is not syntactically expressed, because it is bound to the NP argument with the Locus of affect role.

This phenomenon is also shown in English. For example, NP arguments such as *beer* in activity expressions such as *drink beer* do not have definite reference and are called *inherent arguments* in Van Valin and LaPolla (1997). They cannot be interpreted as having any specific reference, and are treated quite differently from normal, referential arguments in two different ways. First, they can be freely omitted in English and in many other languages, and second, they are often incorporated into the verb. English is not usually thought of as a language with noun incorporation, but it is possible to have expressions like *beer drinking* as in the expression *she's gone beer drinking* (Van Valin and LaPolla 1997:122-123).

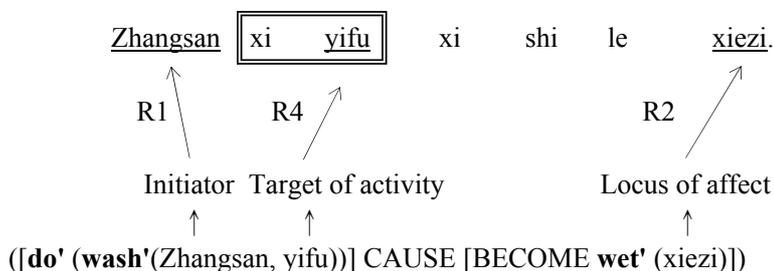
In RVC (57), the omission of the NP *fan* 'meal' does not change the meaning of the sentence, which supports the claim made by Van Valin and LaPolla (1997) that NP arguments with no definite reference can be freely omitted. According to Y. Y. Huang (1991:140), the NP argument *fan* 'meal' in the position immediately following the second verb is a pseudo-object, because (a) it cannot be replaced with other objects or definite NPs, and (b) the deletion of the object is acceptable (no change of meaning). It is thus suggested that an NP argument with the Target of activity role can occur in the position immediately following the second verb in a Chinese RVC, only when it expresses an intrinsic facet of the meaning of the verb. This accounts for why the replacement of the NP expressing an intrinsic facet of the meaning of the verb with other NPs is not permitted.

The RVC in (58) has three distinct NP arguments. Because these three NP arguments refer to three different entities, all of these arguments should be overtly expressed in syntax. By Linking Rule 1, the NP argument with the Initiator role (e.g., *Zhangsan*) is linked to the subject position; by Linking Rule 2, the NP argument with the Locus of affect role (e.g., *xiezi* 'shoes') is linked to the position immediately following the second verb, while by Linking Rule 4, the NP argument with the Target of activity role (e.g., *yifu* 'clothes') is linked to the position immediately following a copied verb (e.g., *wash*). Recall that, in addition to the position immediately following the second verb, the NP argument with the Locus of affect role can be linked to the position immediately following *ba* (Linking Rule 3). Therefore, the RVC in (58) has a corresponding *Ba*-construction, as given in (59).

(58) RVC with Verb-copying construction

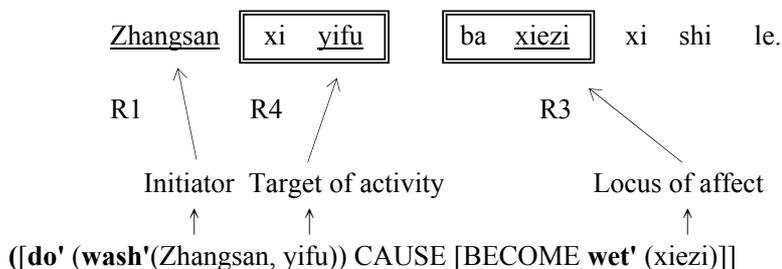
Zhangsan	xi	yifu	xi	shi	le	xiezi.
Zhangsan	wash	clothes	wash	wet	LE	shoes

'Zhangsan washed his clothes and his shoes got wet as a result.'



(59) RVC with Verb-copying construction + *Ba*-construction

Zhangsan xi yifu ba xiezi xi shi le.
 Zhangsan wash clothes BA shoes wash wet LE
 ‘Zhangsan washed his clothes and his shoes got wet as a result.’



In this section, I have shown that RVCs with three NP arguments can have three different possibilities. First, all three NP arguments can refer to three different entities; second, the Locus of affect NP argument is identical with the Initiator NP argument; and third, the Target of activity NP argument is identical with the Locus of affect role NP argument. This difference accounts for the following facts. First, RVCs can involve the *Ba*-construction and the Verb-copying construction at the same time when the three NP arguments are distinctive in an RVC. Second, RVCs do not occur in the Verb-copying construction when the Target of activity NP argument is identical with the Locus of affect NP argument, because the Target of activity NP argument is not syntactically realized. Third, RVCs do not occur in the *Ba*-construction when the Locus of affect NP argument is identical with the Initiator NP argument, because the Locus of affect NP argument is not syntactically realized.

3.3.3 Passivization of RVCs in Chinese

In most linguistic analyses, passivization is an operation that restructures the linking relations between thematic roles and grammatical relations, ‘downgrading’ the element

that would otherwise have been the subject and (usually) ‘upgrading’ the element that would otherwise have been the direct object (O’Grady 1996). Example (60) is an active sentence, whereas example (61) is the resulting sentence of passivization. In Relational Grammar, ‘upgrading’ is referred to as ‘promotion’ and ‘downgrading’ as ‘demotion’. In Foley and Van Valin (1984, 1985), the former is labeled ‘foregrounding’ and the latter ‘backgrounding’.

- (60) Active sentence
Harvey made that discovery.
 | |
 agent theme
 | |
 SUBJECT DIRECT OBJECT
- (61) Passive sentence
That discovery was made by Harvey.
 | |
 theme agent
 | |
 SUBJECT OBLIQUE

The NP *Harvey* is the subject in the active sentence and is realized as an oblique in the passive sentence (‘downgrading’), while the NP *that discovery*, which is the direct object in the active sentence, is realized as subject in the passive sentence (‘upgrading’). According to Bresnan (1982), O’Grady (1996), and many others, passivization is thought of as an operation that has the following effect in the case of ‘basic’ passives.

- (62) The Passivization Operation
 subject => oblique
 direct object => subject

Because in my analysis of Chinese RVCs thematic roles play no primary role in determining the linking of arguments to syntax, to account for the passives of RVCs in Chinese, I redefine passivization as an operation that restructures the linking relations between event roles and grammatical relations, permitting the Locus of affect NP argument to occur as subject, and the Initiator NP argument to appear in the periphery as object of *bei* or is omitted (Linking Rule 5), as given in (63) (for the functions and status of *bei*, see D. Shi 1997).

two identical verbs (V_1) is a copied verb, used to indicate the event role Target of activity, whereas in the *Ba*-construction, the word *ba* is used to indicate the event role Locus of affect. The verb-copying device in the Verb-copying construction and the *ba*-marking device in the *Ba*-construction actually have the same function—namely, they are used to mark the displaced NP arguments in an RVC.

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Jung-hsing Chang

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[Received 14 October 2002; revised 13 December 2002; accepted 16 December 2002]

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漢語的事件結構與論元聯結

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本文旨在探討漢語結果動詞結構中的論元與句法聯結。作者認為以事件角色為基礎的聯結原則能夠解釋把字句和動詞重複句的互補現象，因為把字句中的「把＋名詞組」只和受影響角色（到達動作終點的實體）相關，而「重複動詞＋名詞組」只和動作目標角色（歷經整個動作的實體）相關。本文另提出若一個結果動詞結構有把字句結構，那它也會有相對應的被字句結構，因為這兩個句法結構都涉及到受影響角色的位移，只是表現有所不同。

關鍵詞：事件結構，論元聯結，漢語結果動詞結構