# A DOR-friendly analysis of Mandarin resultative compounds under the constructivist approach

*Abstract:* It is often claimed by Chinese generative researchers (Cheng and Huang 1994, Li 1999, Huang 2006) that Mandarin resultatives do not respect the Direct Object Restriction (DOR). In this squib, we show that there is one way of analyzing resultative compounds that does not incur a violation of the DOR: the second element of the compound is treated as a modifier of the result state, rather than a true resultative predicate.

*Keywords:* resultative compound, Direct Object Restriction, verbal root, event modifier, resultative predicate, m-merger

## 1 Introduction

One of the descriptive generalizations Simpson (1983) made about English resultatives was rephrased by Levin and Rappaport (1995:34) as the Direct Object Restriction (henceforth DOR).

(1) A resultative phrase may be predicated of the immediately postverbal NP, but may not be predicated of a subject or of an oblique complement.

The "resultative phrase" is generally understood as the resultative predicate, the "immediately postverbal NP" as the theme DP, and the "subject" as the external argument (not the surface subject). The DOR has enjoyed much attention since it was proposed as a well-formedness condition on the English resultative. It is generally assumed that the contrast between the following pair of examples is due to the DOR.

(2) a. John hammered the metal flat.

b. *John hammered the metal tired.

Intended reading: ‘John became tired from hammering.’

(Mateu 2005:56)

Although a limited set of apparently exceptional cases have been given in the literature, Mateu (2005) shows that their incompatibility with the DOR is only illusory, analyzing the putative resultative predicates involved in them as adjuncts. Readers are referred to Mateu (2005) for a detailed analysis and the cogent argument that the DOR on English resultatives must be “reinstated” as it is “basic tenet of a number of syntactic accounts of English resultatives”.

As such, one might wonder whether the DOR can be kept as a universal principle holding across language. It is often claimed by Chinese generative linguists (Cheng and Huang 1994, Li 1999, Huang 2006) that the DOR does not apply to Mandarin resultatives, in particular those in which a resultative compound is contained (call it resultative compound construction). We argue, in this squib, that this claim relies on the tacit assumption that the second element of the resultative compound functions as the resultative predicate *in the strict sense*. If we abandon this assumption and treat the second element otherwise, there is a possibility that those apparently exceptional cases of the resultative compound construction are not inconsistent with the DOR. In this squib, we’d like to make such an attempt and to propose a tentative DOR-friendly analysis of the resultative compound construction. The remainder of this squib is organized as follows. Section 2 introduces the exceptional data put forward in the literature. Section 3 makes the proposal whereby the DOR is saved from being violated. Specifically, the second element of the resultative compound is taken as a

modifier of the result state. Section 4 illustrates how this proposal can be technically implemented. Section 5 discusses the potential consequences of this analysis. Section 6 concludes.

## 2 The resultative compound and the DOR

According to Li and Thompson (1981), Mandarin resultative compounds are always composed of two elements. For convenience, we follow the convention and use $V_1$-$V_2$ to represent a resultative compound, with $V_1$ referring to the first element and $V_2$ to the second element. $V_1$ is often said to denote an activity and $V_2$ a state (Lin 2004), as illustrated by *da-po* 'hit-broken' and *ku-xing* 'cry-awake' in the following examples.

(3) a. Lisi **da-po**-le chabei.
Lisi hit-broken-LE teacup
'Lisi broke the teacup.'

b. xiao baobao **ku-xing**-le.
little baby cry-awake-LE
'The little baby cried [herself] awake.'
(Huang 2006:9)

Huang (2006:4) claims that the DOR is "called into question as a potential principle of UG" by such examples of the resultative compound construction as (4a-b), where $V_2$ is clearly predicated of the subject "even in the presence of an object".

(4) a. Lisi **kan-dong**-le na-ben shu.
Lisi look-understand-LE that-CL book
'Lisi read that book and understood it.'

b. ni **ting-dong**-le ji-ge ren?
you listen.to-understand-LE how.many-CL person
'You heard how-many persons and understood them?'
(Huang 2006:8)

However, the apparent incompatibility of (4a-b) with the DOR depends on the analysis that $V_2$ is a true resultative predicate: in previous studies, regardless of where $V_2$ is placed in a syntactic structure, its status as a resultative predicate is almost always taken for granted (Li 1993, 1995, 1999, Cheng and Huang 1994, Huang 2006, Williams 2014, Cheng and Yang 2016, Yang 2018). If there is indeed some way of analyzing $V_2$ otherwise, the apparent exceptional cases in (4) do not necessarily incur a violation of the DOR. In the next section, we'll make a tentative proposal in this direction.

## 3 The proposal

The event structure of resultatives, according to Rappaport and Levin (2001), is composed of subevents. We follow Wood and Marantz (2017) in assuming that the event structure of either transitive resultatives or intransitive ones consists of two subevents, namely a causing/becoming event and a result state (see Section 4 for a detailed formal semantic analysis). As such, we propose that a resultative compound involves two verbal roots and both of them function as event modifiers, one (the root of $V_1$) as the modifier of the causing/becoming subevent and the other (the root of $V_2$) as that of the result state[1]. Specifically, these two verbal roots can be understood as describing the *manner* of the subevent they modify (see Embick 2004 for a formal semantic analysis). Take *kan-dong* 'look-understand' in (4a) for instance. *kan* 'look'

describes the manner in which the causing subevent took place. That is, *Lisi* caused *that book* to reach a certain final state by means of his reading it. And *dong* 'understand' describes the manner in which the result state happened. That is, *that book* ended up in a certain final state such that Lisi understood it. For the moment, the final state, where the referent of the theme DP ends up, can be understood as being denoted by a covert resultative predicate, but see Section 4 for the detailed technical implementation.

This analysis of $V_1$ is not new. See Yang (2018), for instance, for a similar argument from the perspective of the head issue of the resultative compound. Actually, it has become a widely accepted consensus, at least among proponents of the constructivist approach[2], that the matrix verbal root of a resultative, such as $V_1$ of the resultative compound, is introduced in a functional structure that carries an independent structural meaning (for analyses of the English resultative, see Embick 2004, Marantz 2013, Alexiadou, Anagnostopoulou, and Schäfer 2015, Harley 2008, Folli and Harley 2020, among others; for analyses of the resultative compound in Mandarin, see Yang 2018; for analyses of the resultative V-*de* construction in Mandarin, see Huang 2006). It does not project its own argument structure in narrow syntax but only modifies the eventuality encoded by this functional structure. To the best of our knowledge, however, no one has explicitly claimed that $V_2$ of the resultative compound is also an event modifier. It is right in this way that the DOR is saved from being broken. As an event modifier, $V_2$ does not have to be predicated of the theme DP, although usually it is. When $V_2$ is interpreted as being predicated of the theme DP, as in (3a-b), it can be attributed to our knowledge about how the world is organized (real-world knowledge).

Actually, $V_2$ is sometimes predicated of neither the external argument nor the theme DP. Consider the following example.

(5) ta da-cuo-le na-dao ti.
he answer-wrong-LE that-CL question
'He answered that question wrong.'

In the example above, the $V_2$ *cuo* 'wrong' is predicated of neither the external argument *ta* 'he' nor the theme DP *na-dao ti* 'that question', but seems to predicate a property of an implicit object resulting from the action described by $V_1$, namely the answer to that question. If our analysis of $V_2$ as an event modifier is correct, the result state involved in (5) can be interpreted in the following terms: *that question* ended up in a certain final state (of being answered, for instance) in the manner that his answer to it was wrong. In this respect, (5) is quite similar to what Washio (1997) calls the spurious resultative in English, where the adjectival predicate also describes a property of an object resulting from the action denoted by the verbal predicate.

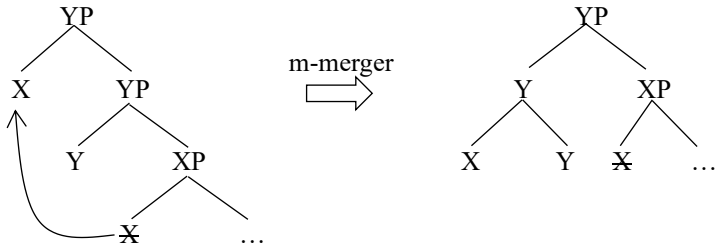
(6) He cut the meat thin.
(Washio 1997:17)

The adjectival predicates in spurious resultatives are often assumed to be akin to adverbials (Washio 1997, Mateu 2000, Kratzer 2005), which in turn suggests that they might also be modifiers of the result state. As Parsons (1990:121) puts it, "… the typical indication of state modification as opposed to event modification is the appearance of the modifier as an adjective instead of an adverb."

**4 Technical implementation**

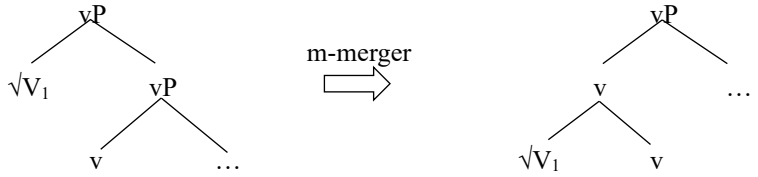
This section is mainly framed within Matushansky's (2006) theory of head movement and its two predictions. She treats the head movement as being composed of two sub-operations, the movement followed by the m-merger[3]. The former is a syntactic operation that targets the root node of a structure, in the same manner that the phrasal movement does, as required by the Cyclicity Condition. And the latter is a morphological operation that adjoins the moved head to the closest local head (lowering), the head of the root phrase. The whole process of head movement can be illustrated below, where X and Y are both heads.

(7)



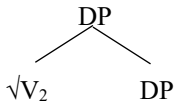

The head X first undergoes movement and adjoins to a root node, YP, and then in the morphological component, it m-merges with Y, the head of the phrase it targets in narrow syntax, forming a complex head. By separating the movement operation from the m-merger operation, this theory of head movement makes two predictions: m-merger without head movement, and head movement without m-merger. Readers are referred to Matushansky (2006) for the empirical data that bear out these predictions. The first prediction is what we'll capitalize on to technically implement the modification of an event by a verbal root, such as that of $V_1$ or $V_2$. Take the root of $V_1$ for instance. It can be adjoined directly to the phrase denoting the event it modifies (the causing/becoming subevent), and then m-merges with the head of this phrase. Since it is v that introduces the event argument of the causing/becoming subevent, the root of $V_1$ can thus be adjoined to the vP directly.

(8)




Coming to the root of $V_2$, we are faced with one question. Which phrase denotes the result state? There seems to be no overt resultative predicate to host the root of $V_2$. This might be one of the reasons why $V_2$ is almost always treated as a resultative predicate. Here, we adopt the analyses of English lexical causatives by Marantz (2013:158) and Wood and Marantz (2017:271). The idea is that the root of $V_2$ can be adjoined directly to the theme DP, as shown in (9a), and in the semantic component this DP is interpreted as a result state via a coercion rule, as given in (9b).

(9) a.



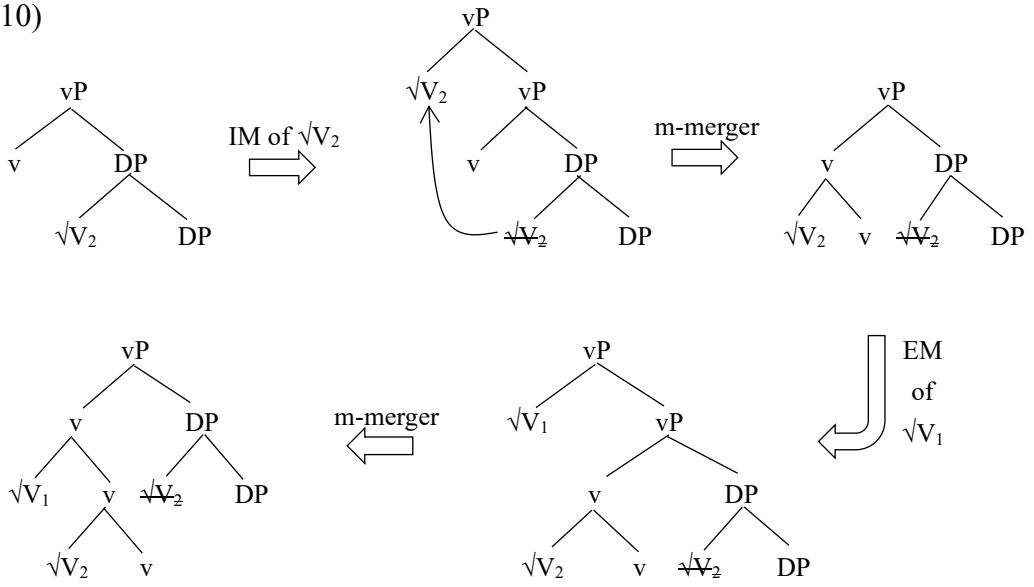

b. $[\![DP]\!] \rightarrow STATE([\![DP]\!]) = (\lambda x \lambda s.\ state(s, x))([\![DP]\!])$

(Wood and Marantz 2017:271)

According to Embick and Marantz (2008), every root must be categorized by combining with a category-defining functional head. Otherwise, it cannot be pronounced or interpreted. If the root of $V_2$ undergoes m-merger immediately after it adjoins to the theme DP, it would m-merge with D, the head of DP. Since D is not a category-defining head, the root of $V_2$ would not thus get categorized. Therefore, the root of $V_2$ must also get categorized by v, as with that of $V_1$. Recall that movement of a head without m-merger is also predicted by Matushansky's (2006) theory. As such, the root of $V_2$ does not have to undergo m-merger once it adjoins to the theme DP, but instead moves directly. If the operation of m-merger left adjoins the lowering head to the hosting head, to derive the right morpheme order, we need to assume that the

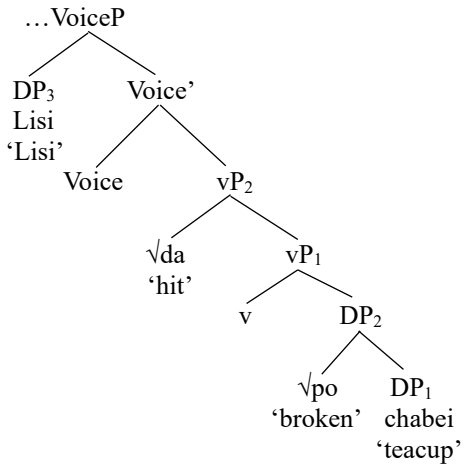
movement (internal merge, IM) and m-merger of the root of $V_2$ take place before the adjunction (external merge, EM) and m-merger of the root of $V_1$[4]. This derivational process can be illustrated below from the point of the merger of v.

(10)




We are now in a position to provide a fully-fledged compositional semantics for the resultative compound construction in Mandarin. Take the transitive (3a) and the intransitive (3b) for instance. Assuming that the external argument is introduced by Voice (Kratzer 1996), their structural trees[5] and compositional semantics are shown respectively as follows.

(11) *Transitive*



a. $[\![DP_1]\!] \rightarrow STATE([\![DP_1]\!]) = (\lambda x \lambda s.\ state(s, x))([\![DP_1]\!]) = \lambda s.\ state(s,$ the teacup)

*(a) comes as a result of the coercion rule*

b. $[\![\sqrt{po}]\!] = \lambda s.\ broken(s)$

c. $[\![DP_2]\!] = \lambda s.\ state(s,$ the teacup) & $broken(s)$

*(c) comes from (a) and (b) by Predicate Modification*

d. $[\![v]\!] = \lambda P_{<s, t>} \lambda e.\ \exists s[P(s) \ \&\ CAUSE(s, e)]$

e. $[\![vP_1]\!] = \lambda e.\ \exists s[state(s,$ the teacup) & $broken(s) \ \&\ CAUSE(s, e)]$

*(e) comes from (c) and (d) by Functional Application*

f. $[\![\sqrt{da}]\!] = \lambda e.\ hit(e)$

g. $[\![vP_2]\!] = \lambda e.\ hit(e) \ \&\ \exists s[state(s,$ the teacup) & $broken(s) \ \&\ CAUSE(s, e)]$

*(g) comes from (e) and (f) by Predicate Modification*

h. $[\![Voice]\!] = \lambda x \lambda e.\ AGENT(x, e)$

i. $[\![Voice']\!] = \lambda x \lambda e.\ AGENT(x, e) \ \&\ hit(e) \ \&\ \exists s[state(s,$ the teacup) & $broken(s) \ \&\ CAUSE(s, e)]$

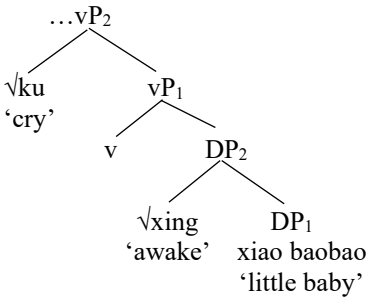
*(i) comes from (g) and (h) by Event Identification*

j. $[\![DP_3]\!] =$ Lisi

k. $[\![VoiceP]\!] = \lambda e.\ AGENT($Lisi$, e) \ \&\ hit(e) \ \&\ \exists s[state(s,$ the teacup) & $broken(s) \ \&\ CAUSE(s, e)]$

*(k) comes from (i) and (j) by Functional Application*

(12) *Intransitive*




a. ⟦$DP_2$⟧ = λs. state(s, the little baby) & awake(s)

b. ⟦v⟧ = $\lambda P_{<s, t>}\lambda e.\ \exists s[P(s)$ & BECOME(s, e)]

c. ⟦$vP_1$⟧ = λe. ∃s[state(s, the little baby) & awake(s) & BECOME(s, e)]

*(c) comes from (a) and (b) by Functional Application*

d. ⟦√ku⟧ = λe. cry(e)

e. ⟦$vP_2$⟧ = λe. cry(e) & ∃s[state(s, the little baby) & awake(s) & BECOME(s, e)]

*(e) comes from (c) and (d) by Predicate Modification*

The compositional semantics presented above are primarily based on Wood and Marantz's (2017) analysis of Icelandic figure reflexives. Note that the becoming subevent is not syntactically represented in the transitive, but rather, according to Wood and Marantz (2017:271-272), the "change" meaning arises as the interpretation of the relation between the causing subevent and the result state. Note also that the presence or absence of an external argument correlates with the different interpretations of v. Thus, although v is interpreted differently in the transitive than it is in the intransitive, there is no need to posit such different flavors such as $v_{CAUSE}$ or $v_{BECOME}$ in narrow syntax (cf. Wood and Marantz 2017:256).

## 5 Consequences

The above analysis is consistent with the spirit of the *radical* constructivist approach (Borer 2005, Marantz 2013) in that all verbal roots are treated as event modifiers. This analysis may have two consequences.

First, verbal roots are usually classified into two categories in the recent constructivist literature (Embick 2004, Rappaport and Levin 2010, Alexiadou and Anagnostopoulou 2013), namely the manner root and the result root. The former adjoins to v (pair merge) and the latter is the complement of v (set merge), as shown below.

(13) a. modifiers of v, e.g. *hammer* b. complements of v, e.g. *flatten*


(Alexiadou and Lohndal 2017:220)

However, for one thing, it is canonically the lexicalist way to classify verbs into different categories. Furthermore, it is known among Chinese generative linguists that a productive number of verbs can be licensed as either $V_1$ or $V_2$ in the resultative $V_1$-$V_2$ compound, such as *ku* 'cry' in ***ku***-*xing* 'cry-awake' and *xia*-***ku*** 'frighten-cry', and *lei* 'tired' in ***lei***-*dao* 'tired-fall' and *pao*-***lei*** 'run-tired'. In our analysis, $V_1$ corresponds to the manner root and $V_2$ to the result root. The flexibility exhibited by the Mandarin verbal roots to appear as either the manner root or the result root suggests that the manner/result distinction is not the inherent property of a verbal root. That is, verbal roots do not *inherently* belong to the category of the manner root or the result root. Rather, they only encode the idiosyncratic encyclopedic knowledge that makes them easier to function as one or the other. Under the *radical* constructivist approach we have adopted in this squib, they do not differ with respect to the manner of merge with v: they are both event modifiers and are both introduced in syntax via adjunction.

They differ only in the event that they modify and thus the positions that they adjoin to: the manner root modifies the dynamic event and adjoins to the vP; the result root modifies the result state and adjoins to the phrase that denotes the result state.

Second, analyzing $V_1$ and $V_2$ as event modifiers not only keeps resultative compounds consistent with the DOR but also has the additional advantage of accounting for their productivity. As Williams (2014:316) puts it, "many combinations [of $V_1$-$V_2$] are attested and new combinations are readily formed." Since they are only modifiers of the event encoded by a functional structure, the verbal roots whose encyclopedic knowledge in combination with the semantic interpretation of the functional structure is compatible with the real-world knowledge can all be licensed as $V_1$ or $V_2$ in the resultative compound. Notwithstanding, this analysis brings about a concomitant issue that we need to deal with, namely the issue of over-generation. For instance, although the resultative compound is largely productive, some verbs are systematically disallowed as $V_2$, such as *tiao* 'jump', *han* 'shout', *da* 'hit', etc. The reason can be attributed to the interplay between the lexical semantics of the verbal root, the semantic interpretation of the functional structure, and the real-world knowledge (cf. Borer 2005). In particular, we could say that the encyclopedic knowledge of the verbal root √*tiao* 'jump' is incompatible with the semantics of the result state from our real-world knowledge.

## 6 Conclusion

We do not intend to cover all the issues associated with Mandarin resultative compounds within such a short squib. Neither do we claim that the analysis presented above is fully correct since we've not given enough supporting evidence. It is just an

attempt to explore the possibility that there exists some potentially plausible analysis of the resultative compound construction that does not incur a violation of the DOR and that we'd like to call for attention to. Whether this analysis is on the right track remains to be corroborated by further studies. Since the (non-)validity of the DOR has some major consequences, we think this attempt is worthwhile and meaningful. For instance, the validity of the DOR would argue in favor of the small clause approach to the structure of resultatives. The non-validity of the DOR, on the other hand, would directly rule out the small clause approach. In addition, if the analysis proposed in this squib turns out to be plausible, the conclusions drawn in previous studies that rely on the claim that the DOR is regularly broken by Mandarin resultatives will be untenable.

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[1] Note that resultatives are sometimes divided into strong ones and weak ones (Washio 1997, Mateu 2012, Williams 2014). Weak resultatives in English can be illustrated by *He painted the car red*, where the first predicate implies a particular result associated with the state implied by the second predicate. To the extent that the resultative compound constructions in Mandarin can also be weak, we do not exclude the possibility that the root of $V_1$ can be the modifier of both subevents. But whether this is plausible is still a controversial issue under investigation (cf. Marantz 2013:157). We leave it open here. At any rate, it makes no big difference to our main claim that the root of $V_2$ is the modifier of the result state.

[2] The constructivist approach to argument structure is defined against the projectionist/lexicalist approach. Whereas the former emphasizes the role of syntax in determining the argument structure, the latter assumes that the argument structure is projected from the lexicon via various linking rules. See Ramchand (2008:1-11) for a detailed distinction between them.

[3] The *m-* in *m-merger* is short for *morphological*.

[4] It should be noted that according to Matushansky's (2006:95), her theory of head movement needs to assume "a strongly cyclic view of syntax, where each newly

merged node is a phase (Merge and Spell-Out).”

[5] All the operations of movement and m-merger are left out, since they do not give rise to any semantic effect that we are concerned with.