

A refinement of Li's (1998) analysis of the resultative *V-de* construction under the constructivist approach

Abstract: Li (1998) analyzes the *-de* in the resultative *V-de* construction as a preposition, which we argue is largely on the right track. Yet, there are some potential problems that Li's analysis might give rise to. In this article, we hope to refine his analysis under the constructivist approach. In particular, *-de* is treated as a prepositional categorizer instead of a regular preposition. The analysis proposed in this article is shown to fare better than Li's.

Keywords: resultative *V-de* construction; event modifier; prepositional categorizer; small clause

1 Introduction

Mandarin *V-de* constructions, as suggested by their name, are characterized by a post-verb particle *-de*, as illustrated by the following examples. They have enjoyed much attention in previous studies (see Zhu 1982; Huang 1988, 1992, 2006; Huang, Li, and Li 2009; Li 1998; Sybesma 1999; Tang 1997; Cheng and Chi 2017). We follow Huang (1988, 2006), Huang, Li, and Li (2009), and Li (1998), among many others, in categorizing the *V-de* construction like the following ones as a resultative, and referring to it as the resultative *V-de* construction.

- (1) a. ta zou-de qichaunxuxu.
he walk-DE breathe.heavily
'He walked so fast that he breathed heavily.'
(Huang, Li, and Li 2009:84)
- b. Zhangsan ku-de shoupa dou shi le.
Zhangsan cry-DE handkerchief all wet LE
'Zhangsan cried so much that even the handkerchief got wet.'
(Huang 2006:1)
- c. ta da-de wo bu neng dongtan le.
he hit-DE I not can move LE
'He hit me so hard that I cannot move.'

This article aims to revisit the syntactic structure of the resultative *V-de* construction proposed by Li (1998), and to make a refinement of it under the

constructivist approach. The remainder of this article is organized as follows. Section 2 reviews Li's (1998) structural analysis of the resultative *V-de* construction. Section 3 makes a brief remark about the advantage of Li's analysis. Section 3 proposes three major modifications to this analysis and discusses the motivations for these modifications. Section 5 concludes.

2 Li's (1998) analysis of the resultative *V-de* construction

One of the most prominent properties about the resultative *V-de* construction is that the second predicate is contained within a full clause, as evidenced by the sentence-final particle *le* in (1b-c) (see also Huang 1988 and Li 1998). Let's refer to this clause as the post-*de* clause.

Li (1998) argues that in a resultative *V-de* construction the post-*de* DP phrase, if present as in (1b-c), can be diagnosed as either the subject of the post-*de* clause or the object of the first verb. Li uses the insertion of *ya*, an interjection, to distinguish them apart. Take (1b) and (1c) for instance. Their respective behaviors with respect to *ya*-insertion are shown below.

- (2) a. Zhangsan ku-de ya, shoupa dou shi le.
 Zhangsan cry-DE YA handkerchief all wet LE
 'Zhangsan cried so much that even the handkerchief got wet.'
- b. *Zhangsan ku-de shoupa ya, dou shi le.
 Zhangsan cry-DE handkerchief YA all wet LE
- (3) a. *ta da-de ya, wo bu neng dongtan le.
 he hit-DE YA I not can move LE
- b. ta da-de wo ya, bu neng dongtan le.
 he hit-DE I YA not can move LE
 'He hit me so hard that I cannot move.'

The contrast shown above is expected if the post-*de* DP *shoupa* 'handkerchief' in (1b) is the subject of the post-*de* clause, but the post-*de* DP *wo* 'I' in (1c) is the object of the first verb.

Li (1998) follows Huang (1988) in positing a *pro*, which is coreferential with the object of the first verb, in the subject position of the post-*de* clause in (1c). In a similar vein, in (1a), where no DP phrase follows the particle *-de*, the subject of the post-*de* clause is also a *pro*, which is coreferential with the subject of the first verb.

The general ideas presented above can be illustrated with the following very abstract structures of the three sentences in (1a-c).

- (4) a. ta_i zou-de [CP pro_i qichaunxuxu].
 he walk-DE breathe.heavily
 b. Zhangsan ku-de [CP shoupa dou shi le].
 Zhangsan cry-DE handkerchief all wet LE
 c. ta da-de wo_i [CP pro_i bu neng dongtan le].
 he hit-DE I not can move LE

What is innovative about Li's (1998) analysis of the resultative V-*de* construction is that he builds on Huang (1988) to argue that the post-*de* clause is the complement of -*de* and that -*de* is a preposition. Specifically, he first corroborates Huang's (1988) Secondary Predication hypothesis that the post-*de* clause is an embedded clause instead of a matrix one by showing that an adjunct in the topic position of the whole construction can be associated with the first verb but not the second predicate.

- (5) yong zheige banfar, Youyou ku-de [CP Taotao mei xinsi gan huor].
 With this way Youyou cry-DE Taotao don't-have mood do work
 Interpreted as: 'Youyou used such a way to cry that Taotao lost the mood to work.'
 Not: 'Youyou cried and as a result Taotao lost the mood to work in this way.'
 (Li 1998: 289)

Then, he shows that an argument can be extracted from the post-*de* embedded clause.

- (6) Neijian huor, Youyou ku-de [CP Taotao mei xinsi gan t le].
 that-piece work Youyou cry-DE Taotao don't-have mood do LE
 'Youyou cried and as a result Taotao didn't want to do that piece of work.'
 (Li 1998: 289)

The fact that an argument, but not an adjunct, can be extracted from the post-*de* embedded clause, as shown by (5) and (6), indicates that this clause constitutes a weak island. Li (1998:289-290) cites Li (1993) in claiming that a weak island has to meet two conditions. "First, it must be the complement of some head X; second, its category must be different from that of X." If this is on the right track, the post-*de* clause being a weak island not only proves that it is in the complement position, instead of being an adjunct (see also Huang, Li, and Li 2009), but also indicates that it is not the direct complement

of the first verb (the matrix verb) since a complement clause is verbal in nature (cf. Grimshaw 2005 [1991]). Therefore, Li (1998) proposes that the post-*de* clause is the complement of -*de* and that -*de* is a preposition. There is indeed evidence from the spoken Beijing dialect that -*de* is a preposition.

- (7) Youyou he Taotao zou-de Beihai le.
Youyou and Taotao walk-DE Beihai LE
'Youyou and Taotao walked (and got) to Beihai.'
(Li 1998:291)

As shown above, the Goal argument is also introduced by the particle -*de* in the spoken Beijing dialect. If the Goal argument is generally introduced by a preposition, then this particle is best analyzed as a preposition. It is by no means implausible to assume that the -*de* in the resultative V-*de* construction in Mandarin is of the same category as the -*de* in (7) since they have the same phonological exponent and are both suffixed to the matrix verb.

Thus, according to Li (1998), -*de* in the resultative V-*de* construction in Mandarin heads a prepositional phrase, which in turn functions as the complement of the matrix verb. The structure that Li provides for the resultative V-*de* construction is roughly as follows. The preposition -*de* is subsequently incorporated to the matrix verb.

- (8) ... [VP (DP) V [PP -de CP]]

3. A small note on Li's (1998) analysis

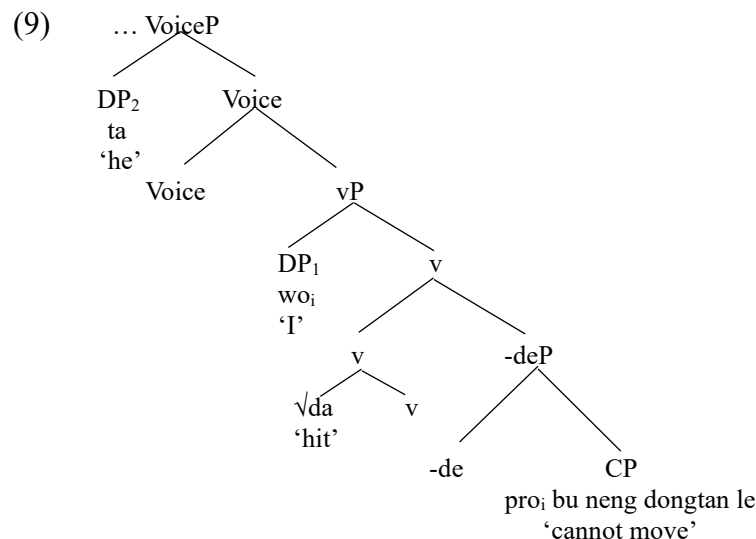
The event structure of a resultative, according to Rappaport and Levin (2001), is composed of some subevents, one of which is the result *subevent*. For instance, the event structure of a causative resultative consists of at least a causing subevent and a result subevent. As such, there is a related conceptual advantage that Li's (1998) analysis of the resultative V-*de* construction has over that where the post-*de* clause is the direct complement of the matrix verb. Whereas in the former the result is represented by a PP, namely the -*de*P, it is indicated by a CP in the latter. Since the CP only denotes a *proposition* but not a *subevent* without being coerced, Li's (1998) analysis has the desirable consequence of aligning the resultative V-*de* construction in Mandarin with the PP resultative in English and avoiding a conflict between identifying this construction as a resultative on the one hand and making a structural analysis that does not correctly reflect the event structure of a resultative on the other.

Notwithstanding, there is still room for improvement in Li's analysis. In the next section, we would like to propose some modifications to his analysis. In the course of doing this, we'll also discuss the motivations for these modifications and show in what respects the present analysis fares better than Li's.

4. Modifications to Li's (1998) analysis

4.1 The verbal root as an event modifier

We propose to treat the root of the matrix verb as a modifier, say a manner modifier, of the eventuality encoded by a functional structure that determines the argument structure of the resultative *V-de* construction, as in the constructivist approach¹ to verb frame alternations. That is, the matrix verbal root does not take any argument in narrow syntax. The technical implementation is to adjoin the verbal root directly to the little *v*, which introduces an eventuality such as an activity or a state. Assuming that the external argument is introduced by Voice (Kratzer 1996), (1c) has the following structure:



For the convenience of discussion, let's define the transitive resultative *V-de* construction as one with both an external argument and a *structural* object DP (the theme DP). Otherwise, it is intransitive. As such, (1a) and (1b) are intransitive, and (1c) is transitive.

The above treatment of the matrix verb of the resultative *V-de* construction is not new. It dates back at least to Huang (2006) who analyzes the matrix verb as a “manner/means adjunct”. Actually, it has become a widely accepted consensus, at least

¹ 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.

among proponents of the constructivist approach, that the argument structure of the resultative, either in English or in Mandarin, is determined by an underlying functional structure (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 comopund in Mandarin, see Yang 2018; for analyses of the resultative *V-de* construction in Mandarin, see Huang 2006). One of the reasons is that the resultative construction is canonically interpreted as expressing a (caused) change of state or location, and if we do not sever the arguments from the verbal root but analyze the argument structure as being projected from the lexicon in the traditional way, the semantic composition rules would lead us to the conclusion that the semantics of (caused) change of state or location is part of the encyclopedic knowledge of the verbal root, arising either from the verbal root itself or from the interplay between the verbal root and its arguments. As a consequence, we would have to make a distinction between the verbal root $\surd da$ ‘hit’ in (1c) and the one in (10), since the latter does not denote the semantics of caused change of state inherently but the former does. This is obviously undesirable compared to the constructivist approach where we can take the two verbal roots in (1c) and (10) as a single one while attributing the semantics of caused change of state conveyed by (1c) to a functional structure common to all transitive resultative constructions.

(10) ta jingchang da wo.

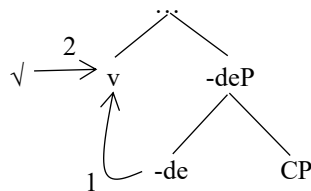
He often hit I
‘He often hits me.’

It should be noted that the structure of (9) allows us to avoid a minor problem in Li’s (1998) analysis that is associated with the morpheme order. Given the structure of (8) that Li proposes, the incorporation of *-de* to the matrix verb would hardly derive the right linear relation involving the particle *-de* and the matrix verb without violating Baker’s (1985, 1988) Mirror Principle. Let’s assume that the VP in (8) serves as the complement of the little *v*, one of whose functions is to introduce the external argument (EA), a plausible assumption given the Predicate-Internal Subject Hypothesis (see McCloskey 1997 for a review of this hypothesis). The more fully-fledged structure under Li’s (1998) analysis is thus as follows.

(11) ... [_{VP} (EA) *v* [_{VP} (DP) V [_{PP} -de CP]]]

The particle *-de* undergoes successive head movement, up through V and v. As such, the Mirror Principle predicts only two possible linear relations involving the three morphemes, namely *de-V-v*, via left adjunction, and *v-V-de*, via right adjunction. Whereas the former possibility is ruled out by the fact that the particle *-de* is actually suffixed to the matrix verb in the resultative *V-de* construction, as shown in (1a-c), the latter is incompatible with the fact that the little v in Mandarin is also a suffix, not a prefix, as evidenced by the existence of such verbs as *mei-hua* ‘to make beautiful’, *chou-hua* ‘to make ugly’, *lǜ-hua* ‘to make green’ etc., where *-hua* is usually taken as the exponent of the little v by Chinese generative linguists. Under the present analysis, however, to derive the correct morpheme order without incurring a violation of the Mirror Principle, all we have to assume is that the incorporation (head movement) of *-de* takes place before the matrix verbal root adjoins to v and that both *left* adjoins to the node of v.

(12)



4.2 *-de* as the phonological exponent of the prepositional categorizer

Li's (1998) analysis of *-de* as a *regular* preposition, though quite insightful, gives rise to a question that hardly has an answer. Why does *-de* undergo incorporation in the resultative *V-de* construction but other prepositions, which occupy the same position in a resultative as *-de*, don't? For instance, the following examples are classified by Sybesma (1999:9-10) as belonging to the “locative resultative”, whose resultative predicate denotes a location. The presence of the theme DP between the matrix verb and the preposition indicates that the preposition is not incorporated to the matrix verb.

(13) a. wo fang-le yi-xie shu **zai** shujia-shang.

I place-LE some book at bookshelf-top

‘I put some books on the shelves.’

(Sybesma 1999:10)

b. ta dai-le yi-xie shu **dao** tushuguan.

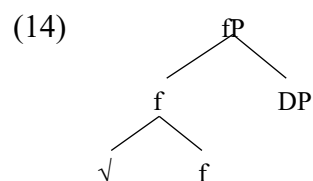
he take-LE some book to library

‘He took some books to the library.’

Furthermore, it is known that the *-de* of the resultative V-*de* construction is found only in the resultative but never in adverbial modifiers where a *regular* preposition typically appears.

Therefore, it's best to analyze *-de* as something different from the *regular* preposition. Now we are in a dilemma. On the one hand, the major conclusion drawn from Li's (1998) cogent argument is that *-de* has the general properties of a preposition, namely being able to take a CP or DP complement and being of a non-verbal category. On the other hand, we want to analyze it as being different from a *regular* preposition.

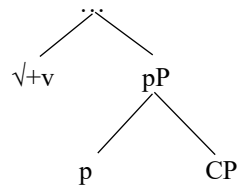
Before making our proposal, we'll first introduce the structural analysis of a *regular* prepositional phrase by the recent constructivist literature (Wood and Marantz 2017; Haselbach and Pitteroff 2014; Acedo-Matellán 2010). The structures proposed by them, although slightly different among themselves, can be reduced to a single one shown below.



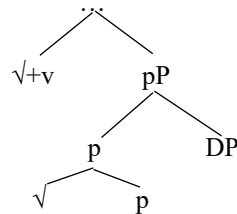
“f” stands for a functional head that has a category-neutral root directly adjoined to it and that introduces a DP complement. It is the category-determining functional head p for Haselbach and Pitteroff (2014), and the argument introducer P for Wood and Marantz (2017). Abstracting away from the details, we follow Haselbach and Pitteroff (2014) in taking it to be the prepositional categorizer p, on a par with the verbal categorizer v. In this regard, the structure of a prepositional phrase is parallel to that of a verbal phrase shown in (9).

With the above analysis of a *regular* prepositional phrase in mind, we turn back to *-de* in the resultative V-*de* construction. Given the aforementioned dilemma we are facing, we propose that *-de* is the phonological exponent of the prepositional categorizer p. It introduces a CP complement and there is no root that is directly adjoined to it. The idea that *-de* is a functional morpheme and does not involve any root is consistent with the properties it exhibits, namely that it is suffixal, that it is phonologically light (neutral tone), and that it does not have much substantive semantics (semantically void). As such, a resultative V-*de* construction has an abstract structure shown in (15a) and for comparison, that of a locative resultative, such as (13a-b), is given in (15b).

(15) a.



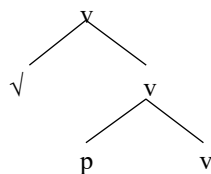
b.



Assuming that the prepositional categorizer *p* is affixal in nature (modelled on Chomsky's 2015 idea about *v*) and cannot be spelt out if stranded alone, *-de*, or technically the prepositional categorizer *p*, needs to undergo head movement (or incorporation) in the resultative *V-de* construction, whereas the *regular* prepositions in (13a-b) do not have to since they contain a root that the prepositional categorizer *p* can be affixed to, as shown in (15b). The question raised by Li's (1998) analysis is thus answered.

Recall that to derive the correct linear relation, the head movement of *-de* is assumed to take place before the matrix verbal root adjoins to *v*. The complex head formed in this way is given below.

(16)



This complex head would be linearized as $\sqrt{-p-v}$ in the PF component. Adopting the late insertion of Distributed Morphology, namely that functional morphemes are supplied with phonological material only in the PF component, we are now in a position to give the Vocabulary Items for the prepositional categorizer *p* in Mandarin.

(17) Vocabulary Items for *p* in Mandarin, ordered

- a. $p \leftrightarrow -de/\sqrt{\text{ } } v$
- b. $p \leftrightarrow \emptyset$

The reason why *-de* is not found in adverbial modifiers can be couched in the following terms. The contextual condition under which the Vocabulary Item with the *-de* exponent

may apply to the prepositional categorizer *p* is not met elsewhere but only in a resultative.

A word is in order before we leave this subsection. Is the prepositional categorizer *p* the only candidate for a functional morpheme that is non-verbal and that can take a CP complement? The answer seems to be negative. For instance, Sybesma (1999) analyzes *-de* as what he calls *Extent*, which should also meet the requirement. However, the prepositional categorizer *p* seems to be the best candidate that we can think of. For one thing, it is not a construction-specific functional head, but one universally provided by the UG so that we do not have to invent any new features or semantic content associated with it. More importantly, analyzing *-de* as being prepositional in nature allows us to treat the resultative *V-de* construction on a par with the PP resultative that exists in both English and Mandarin, such as the locative ones in (13a-b). It also offers us the potential option to make a small clause analysis of the resultative *V-de* construction, which we'll talk about in the next subsection.

4.3 To contain a small clause or not?

There has been much debate in the literature on whether a resultative construction contains a small clause (henceforth SC) or not (see Bruening 2018 and the references cited therein). Take the transitive resultative *V-de* construction (1c) for instance. Adapted to the present analysis, its abstract structure under the SC approach to resultatives is shown in (18a) and for comparison, its abstract structure under the non-SC approach is given again in (18b).

- (18) a. ...[VoiceP EA Voice [_{VP} √-V [_{SC} DP pP]]]
 b. ...[VoiceP EA Voice [_{VP} DP [_{V'} √-V pP]]]

In the SC structure (18a), it is the theme DP (or the structural object in the transitive) and the resultative predicate (namely the pP or *-deP* in the resultative *V-de* construction) that serve as the SC subject and the SC predicate respectively.

We do not take a firm stand in this article on whether a resultative construction contains a SC or not. But we would like to point out some arguments in favor of the SC analysis, of which the Direct Object Restriction (henceforth DOR) has been discussed a lot in the literature but the other empirical evidence is raised for the first time.

4.3.1 The DOR

Levin and Rappaport (1995:34) rephrased a descriptive generalization about the

resultative construction discovered by Simpson (1983) (the Simpson's law) as the DOR.

- (19) 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 gives a nice account of the contrast between the following examples in English.

- (20) a. John hammered the metal flat.

- b. *John hammered the metal tired.

Intended reading: ‘John became tired from hammering.’

(Mateu 2005:56)

Although a small number of apparently exceptional cases have been provided in the literature since the postulation of the DOR, Mateu (2005) analyzes the putative resultative predicates involved in them as adjuncts and argues that their incompatibility with the DOR is only illusory. Readers are referred to Mateu (2005) for the argument that the DOR on English resultatives must be “reinstated”.

As for the resultative *V-de* construction in Mandarin, Li (1999:448) claims that (21a) violates the DOR, as the predicate embedded within the post-*de* CP, namely *zuo-li-bu-an* ‘restless’, is not predicated of the theme DP *ta* ‘he’, but of the external argument *wo* ‘I’. Its abstract structure, in accordance with the analysis in Section 2, is given in (21b).

- (21) a. *wo deng-de ta zuo-li-bu-an.*

I await-DE he restless

‘I became restless from awaiting him.’

- b. *wo_i deng-de ta [_{CP} pro_i zuo-li-bu-an].*

I await-DE he restless

That the embedded predicate is predicated of the external argument, not of the theme DP, can also be couched in such terms that the *pro* subject of the post-*de* CP is coreferential with the former, not with the latter. As such, (21) seems to be a counter-example to Huang's (1989, 1992, 2006) Generalized Control Theory, which states that “an empty pronoun (PRO or *pro*) takes the closest potential antecedent as its antecedent”

(Huang 2006:13). But as Huang (2006) puts it, this is only limited to a small class of verbs, and native speakers prefer to use the verb-copying construction to express the same meaning: *wo deng ta deng-de zuo-li-bu-an*. At any rate, even if the Generalized Control Theory is challenged, we argue that it does not bear on the issue of the validity of the DOR under the present analysis of the resultative V-*de* construction, because it is the -*de*P/pP, neither the post-*de* CP nor the predicate embedded within it, that is the resultative predicate. The fact that the embedded predicate is not predicated of the theme DP, as in (21), does not mean that the -*de*P is not either. For instance, there is no reason to conclude that the -*de*P in (1b) or (4b) is not predicated of the matrix subject *Zhangsan* from the fact that the embedded predicate *shi* ‘wet’ is clearly not predicated of it, but of the overt subject of the post-*de* CP, namely *shoupa* ‘handkerchief’. In this respect, although -*de* is semantically void, it can be treated as having a semantics similar to that of *to the point that* in English.

If the DOR can indeed be extended to the resultative V-*de* construction, it would argue in favor of the SC structure of (18a). However, note that the DOR would rule out unergative resultatives, as it presupposes the existence of the theme DP. That is, the intransitive resultatives, such as (1a-b), are always unaccusatives. Whether this is indeed the case will be left open here. But see Huang (2006) for analyzing the putative unergative type of the resultative V-*de* construction as being fundamentally unaccusative.

4.3.2 The empirical evidence

Apart from the conceptual motivation presented above, there is also empirical evidence that supports the SC structure of (18a). The resultative V-*de* construction shows the same behavior as the construction that is canonically assumed to contain a SC (call it SC construction)² with respect to *ba*-alternation: whereas the transitive resultative V-*de* construction and SC construction can both easily participate in the *ba*-alternation, the simple transitive construction cannot without the support of the verb-*le*³.

(22) Transitive resultative V-*de* construction

a. Non-*ba*-variant

ta da-de wo bu neng dongtan le. (from (1c))

² Some researchers even deny the existence of the SC construction in Mandarin, such as Paul (2021). We follow Tang (1998) in assuming that (23) is a canonical SC construction.

³ The verb-*le* is a particle suffixed to the verb, as shown in (24). Be careful not to confuse it with the sentence-final particle *le* in (1b-c).

he hit-DE I not can move LE

b. *Ba-variant*

ta ba wo da-de bu neng dongtan le.

he BA I hit-DE not can move LE

Both a and b: ‘He hit me so hard that I cannot move.’

(23) *Transitive SC construction*

a. *Non-ba-variant*

wo dang ta shagua. (Tang 1998:142)

I consider he fool

b. *Ba-variant*

wo ba ta dang shagua.

I BA he consider fool

Both a and b: ‘I consider him a fool.’

(24) *Simple transitive construction*

a. *Non-ba-variant*

ta manyouyou-de dasao-(le) fangjian.

he slow-DE sweep-LE room

b. *Ba-variant*

ta manyouyou-de ba fangjian dasao-*(le).

he slow-DE BA room sweep-LE

Both a and b: ‘He swept/sweeps the room slowly.’

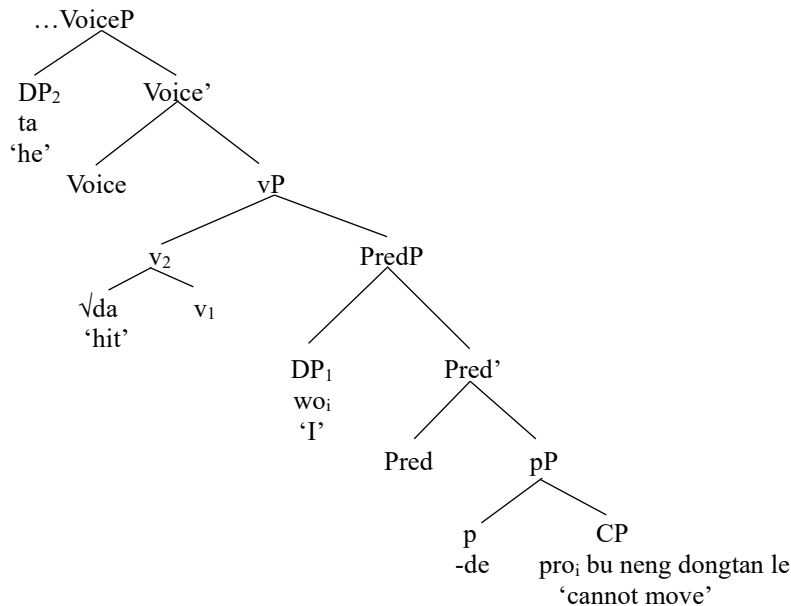
If Sybesma’s (1997) analysis of the verb-*le* as a resultative predicate is correct, the picture here is very clear: the ability to participate in the *ba*-alternation distinguishes the transitive resultative V-*de* construction and SC construction on the one hand and the simple transitive construction on the other. It is therefore reasonable to infer that the resultative V-*de* construction and SC construction form a class in terms of syntactic structure. That is, they should both contain a SC.

If the SC analysis of the resultative V-*de* construction is indeed on the right track, we are now in a position to provide a finer-grained structure and compositional semantics for it. Assuming that the SC subject is introduced by Pred⁴ (Bowers 1993,

⁴ Pred is a mnemonic for predication. Note that whatever connotations this term might have, it is used here only for introducing the SC subject, just as the external argument of vP is introduced by Voice. See Wood and Marantz (2017) for a unified treatment of argument-introducing heads. But see Matushansky (2019) for arguments “against the PredP

2001), the respective analyses of the transitive (1c) and the intransitive (1b) are shown as follows.

(25) *Transitive*



Suppose $q = \textit{pro bu neng dongtan le}$ ‘cannot move’

a. $\llbracket pP \rrbracket = \lambda s. \text{DE}(q, s)$

b. $\llbracket \text{Pred} \rrbracket = \lambda x \lambda s. \text{THEME}(x, s)$

c. $\llbracket \text{Pred}' \rrbracket = \lambda x \lambda s. \text{THEME}(x, s) \ \& \ \text{DE}(q, s)$

(c) comes from (a) and (b) by Event Identification

d. $\llbracket \text{DP}_1 \rrbracket = I$

e. $\llbracket \text{PredP} \rrbracket = \lambda s. \text{THEME}(I, s) \ \& \ \text{DE}(q, s)$

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

f. $\llbracket v_2 \rrbracket = \lambda P_{\langle s, t \rangle} \lambda e. \text{hit}(e) \ \& \ \exists s[P(s) \ \& \ \text{CAUSE}(s, e)]$

g. $\llbracket vP \rrbracket = \lambda e. \text{hit}(e) \ \& \ \exists s[\text{THEME}(I, s) \ \& \ \text{DE}(q, s) \ \& \ \text{CAUSE}(s, e)]$

(g) comes from (e) and (f) by Functional Application

h. $\llbracket \text{Voice} \rrbracket = \lambda x \lambda e. \text{AGENT}(x, e)$

i. $\llbracket \text{Voice}' \rrbracket = \lambda x \lambda e. \text{AGENT}(x, e) \ \& \ \text{hit}(e) \ \& \ \exists s[\text{THEME}(I, s) \ \& \ \text{DE}(q, s) \ \& \ \text{CAUSE}(s, e)]$

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

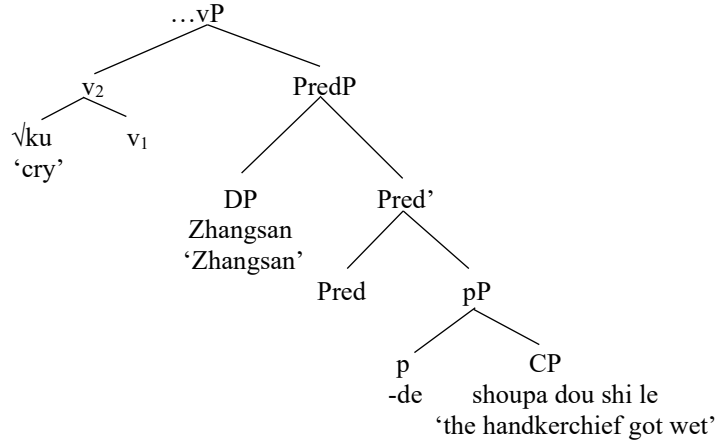
j. $\llbracket \text{DP}_2 \rrbracket = \textit{he}$

k. $\llbracket \text{VoiceP} \rrbracket = \lambda e. \text{AGENT}(\textit{he}, e) \ \& \ \text{hit}(e) \ \& \ \exists s[\text{THEME}(I, s) \ \& \ \text{DE}(q, s) \ \& \$

CAUSE(s, e)]

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

(26) *Intransitive*



Suppose $q = shoupa dou shi le$ 'the handkerchief got wet'

- a. $\llbracket \text{PredP} \rrbracket = \lambda s. \text{THEME}(\text{Zhangsan}, s) \ \& \ \text{DE}(q, s)$
- b. $\llbracket v_2 \rrbracket = \lambda P_{\langle s, t \rangle} \lambda e. \text{cry}(e) \ \& \ \exists s[P(s) \ \& \ \text{BECOME}(s, e)]$
- c. $\llbracket vP \rrbracket = \lambda e. \text{cry}(e) \ \& \ \exists s[\text{THEME}(\text{Zhangsan}, s) \ \& \ \text{DE}(q, s) \ \& \ \text{BECOME}(s, e)]$

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

The compositional semantics above are modelled on Wood and Marantz's (2017) analysis of Icelandic figure reflexives. The reader is referred to them for details. Note that the v involved in the transitive is interpreted differently than it is in the intransitive. In spite of this, we do not have to posit such different flavors as v_{CAUSE} or v_{BECOME} in narrow syntax, because according to Wood and Marantz (2017), these different interpretations of the v correlate with the syntax (in complementary distribution), and the formal semantic component would automatically match them with the presence or absence of an external argument.

5 Conclusion

In this article, we have revisited Li's (1998) structural analysis of the resultative *V-de* construction, and to avoid the problems that might arise under this analysis, we have proposed three major modifications to it, generally in line with the constructivist approach: a) the matrix verbal root is taken as an event modifier that does not project its own argument structure in narrow syntax and that adjoins directly to v ; b) *-de* is considered to be the phonological exponent of the prepositional categorizer p ; c) the result state is tentatively analyzed as being denoted by a small clause.

Competing Interests

The authors have no competing interests to declare.

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