Interpretational Ambiguity in Chinese Resultative Constructions

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Abstract

This paper aims to account for various readings including subject-oriented reading and semantic inversion in two Chinese resultative constructions: V-de construction and V-V compounds. Through a case study of zhui-lei ‘chase-tired’ in which V-de construction has two readings, but three in V-V compounds, it is suggested that V-de construction is formed in syntax, while V-V compounds are formed in the lexicon. Also, V-V compounds can be best accounted for by LMT revised by Her(2007) and the readings are correctly predicted with the argument structures of $V_{\text{cause}}$ and $V_{\text{result}}$ being maintained in V-V compounds. It is also suggested that the number of argument structures one lexical item can bear may vary from language to language. In Mandarin Chinese, one lexical item can bear two argument structures.
1. Introduction

In this paper, two resultative constructions -- V-de construction and V-V compounds in Mandarin Chinese are re-examined and through subject-oriented and semantically inversed interpretation one resultative construction can get, a syntactic approach of V-de construction and a lexical approach of V-V compounds are preferred.

First, let’s look at what a resultative construction is. The resultative construction is formed by two predicates, as the primary predicate denotes the event of an action and the secondary predicate denotes the event of a consequence or a state accompanied by the action. As Li (1998) noted, a resultative sentence illustrates a superevent constituted by two subevents, the cause and the result, as (1).

(1) Superevent
    \[\begin{array}{c}
    \text{Cause} \\
    \text{Result}
    \end{array}\]  
    (Li 1998: 293)

The primary predicate is always a verb, while the secondary predicate may vary in lexical categories. In (2), the secondary predicate is a propositional phrase, but in (3), the secondary predicate is an adjective.

(2) a. He broke the vase into pieces.
    b. The audience laughed the performer off the stage.

(3) a. My sister watered the lilies flat.
    b. John sang his children asleep.

Normally, the structurally first NP argument is the initiator of the action or the cause described by the main verb, while the structurally second NP argument is the affected entity predicated by the secondary predicate. The structurally second NP argument is also the object of the main verb if that verb is transitive. In (2a) and (3a), the vase and the lilies are also the objects of ‘break’ and ‘water’ in addition to being the NP
argument of secondary predicate. While in (2b) and (3b), since laugh and sing are intransitive, the performer and his children are only the arguments of the secondary predicates. Let us look at Chinese resultative verb constructions then.

Chinese RVCs are very productive and has abundant combinations of two predicates\(^1\), including \(V_{\text{trans}} + V_{\text{int}}, V_{\text{trans}} + V_{\text{int}}, V_{\text{int}} + V_{\text{trans}}, V_{\text{int}} + V_{\text{int}}, V_{\text{dit}} + V_{\text{trans}}, \) and \(V_{\text{dit}} + V_{\text{int}}\). There are two constructions: \(V-de\) construction and \(V-V\) compounds, as illustrated below:

\[
(4) \quad \text{V-de Construction:} \quad NP_1 \ V_{\text{cause-de}} \ldots \ [\text{Clause} \ V_{\text{result}} ] \\
\text{V-V Compound:} \quad NP_1 \ V_{\text{cause-Vresult-(le)}} \ NP_2
\]

In \(V-de\) construction, \(de\)\(^2\) denotes a resultative marker (Lin 2006). \(V_{\text{result}}\) is embedded in a clause, so there may be more than two arguments in this construction. In contrast, a \(V-V\) compound behaves like a single predicate in a sentence. \(le\) is an aspect marker. Note that in (4), the linear order of \(V_{\text{cause}}\) and \(V_{\text{result}}\) in RVC reflects the actual temporal order of occurrence of the events. This notion is called Temporal Iconicity Condition (Tai 1985, Muysken 1988, Li 1993a).

Normally, only one reading is possible in one RVC:

\[
(5) \quad \text{Meimei cu-de zhentou dou shi le.} \quad \text{(V-de)} \\
\text{Sister cry-de pillow all wet ASP} \\
\text{‘My sister cried and as a result the pillow was wet.’}
\]

\[
(6) \quad \text{Meimei cu-shi-le zhentou.} \quad \text{(V-V)} \\
\text{Sister cry-wet-ASP pillow} \\
\text{‘My sister cried and as a result the pillow was wet.’}
\]

In both (5) and (6), only one interpretation is available: My sister as the initiator of the event of crying made the pillow which is the affected entity by crying all wet. However, in some cases, not o

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\(^1\) I will call the primary predicate as \(V_{\text{cause}}\) and the secondary predicate as \(V_{\text{result}}\) afterwards.
nly one interpretation is possible.

Consider the data below:

(7)  
\[ \text{Youyou zhui-de Taotao tai-bu-dong tui le.} \]  
\[ \text{(V-de, Li 1998: 297)} \]
Youyou chase-de Taotao can’t lift leg le

a. ‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
b. *‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
c. ‘Taotao chased Youyou and as a result Taotao couldn’t move his legs.’
d. *‘Taotao chased Youyou and as a result Youyou couldn’t move his legs.’

(8)  
\[ \text{Youyou zhui-lei-le Taotao le.} \]  
\[ \text{(V-V, Li 1998: 297)} \]
Youyou chase-tired-ASP Taotao le

a. ‘Youyou chased Taotao and as a result Taotao became tired.’
b. ‘Youyou chased Taotao and as a result Youyou became tired.’
c. ‘Taotao chased Youyou and as a result Taotao became tired.’
d. *‘Taotao chased Youyou and as a result Youyou became tired.’

In this zhui-lei ‘chase-tired’ case, both RVCs can have more than one reading. (7a) and (8a) are the reading which normally obtains in RVCs. We will call this reading as object-oriented, since the object of V\text{cause} is the affected argument. (7b) and (8b) are the reading in which the causer of the event is surprisingly the affected argument of the event, and this reading will be called as subject-oriented afterwards. As we see in (7b) and (8b), the subject-oriented interpretation is not allowed in V-de construction but in V-V compounds.

In addition to subject-oriented reading in a RVC, there is also the case of semantic inversion in (7c) and (8c). The subject and object are inversed in the event of cause, but the object of V\text{cause} is still interpreted as the affected argument. However, (7d) and (8d) is not allowed even if it is also the case of semantic inversion, but with the subject of V\text{cause} as the affected argument. The subject-object inversion will be called semantic inversion throughout this paper.

\[ De \text{ can also denote a depictive marker in a depictive V-de construction.} \]
Among the possible readings, (7a) and (8a) is the most common interpretation one can get in one RVC, while the (7c) and (8c) is the least common and native speakers may have great difficulty in interpreting it. That means the object-oriented reading with no inversion is the most accessible, the subject-oriented reading with no inversion in the middle, and the object-oriented reading with inversion is the least accessible.

In the following section, these three properties will be accounted for in three representational works, and I will also provide a method to correctly predict the reading(s) of one RVC.

In section 2, a syntactic approach of both RVCs proposed by Zhang(2001) will be reviewed, and her account of subject-oriented reading in V-V compounds is provided. However, I will point out some problems of a syntactic approach for both constructions. In section 3, a mixed approach of two RVCs is re-examined and three properties mentioned above can be explained. In addition to some strong evidence supported for a mixed approach, I will also revise Her’s LMT approach and predict the number of readings one V-V compound can have. In section 4, I will present a contrast between V-de construction and V-V compounds, which further shows that different approaches of two RVCs should be preferred. Section 5 concludes all the discussion from this paper.

2. A Syntactic Approach for V-de Construction and V-V Compounds

2.1 Zhang’s Analysis

In this section, we will review Zhang’s analyses of V-de construction and V-V compounds which are shown to have similar Deep structures (D-structures), but different Surface structures (S-structures) appear through different syntactic operations. The former is formed by Merge while the latter is formed by Move. She assumes that the secondary predicate of the resultative construction is base-generated
at the position of the complement of vP. Finally, she proposes that in V-de construction, the position of –de is surfaced by attaching a morpheme –de in PF, and that a series of head-raising occurs and causes the s-structure of V-V compounds. These two different syntactic processes may explain the subject-oriented reading in V-V compounds, which is not available in V-de construction. Huang’s and Nishiyama’s syntactic analyses will also be discussed.

The initiative that Zhang calls for a unitary approach for two RVCs is because there are six similarities which strongly suggest they may be formed by similar syntactic operations.

First, if V cause is intransitive, and there is no other overt nominal which can be interpreted as the subject of V result, the subject of V result must be co-referential with that of V cause.

\[(9)\]
\[
a. \text{Youyou cu-de meimei bu zi zheng-me-shou. (V-de)}
\]
\[
\text{Youyou cry-de sister not know what to say}
\]
\['\text{Youyou cried and as a result his sister didn’t know what to say.’}\\
\]
\[
b. \text{Youyou cu-de bu zi zheng-me-shou. (V-de)}
\]
\[
\text{Youyou cry-de not know what to say}
\]
\['\text{Youyou cried and as a result (*somebody) didn’t know what to say.’}\\
\]

\[(10)\]
\[
a. \text{Youyou cu-huang-le meimei. (V-V)}
\]
\[
\text{Youyou cry-anxious-ASP sister}
\]
\['\text{Youyou cried and as a result his sister was anxious.’}\\
\]
\[
b. \text{Youyou cu-huang-le. (V-V)}
\]
\[
\text{Youyou cry-anxious-ASP}
\]
\['\text{Youyou cried and as a result (*somebody) was anxious.’}\\
\]

In (9) and (10), (a) and (b) is only different by the absence of the second argument. Without another nominal except the subject, the affected argument has to be the subject of V cause.
The second similarity is that if $V_{\text{cause}}$ is transitive, but the object is realized covertly, $V_{\text{cause}}$ is detransitivized and the subject of $V_{\text{result}}$ must be coreferential with the subject of $V_{\text{cause}}$.

(11)  
\begin{align*}
a. & \quad \text{Mama } ma-de \ hen \ fang. \quad (V-de) \\
& \quad \text{Mother scold-de very annoyed} \\
& \quad \text{‘Mom}_1 \text{ scolded } X_2 \text{ and as a result } X_1/\ast X_2 \text{ was annoyed.’}
\end{align*}

b. & \quad \text{Mama } ma-fang-le. \quad (V-V) \\
& \quad \text{Mother scold-annoyed-ASP} \\
& \quad \text{‘Mom}_1 \text{ scolded } X_2 \text{ and as a result } X_1/\ast X_2 \text{ was annoyed.’}

Here, the $V_{\text{cause}}$ behaves like an intransitive verb. Similar to (9b) and (10b), the subject of $V_{\text{result}}$ can only be interpreted as the subject of $V_{\text{cause}}$, but not the covert object.

Thirdly, in both constructions, the subject of $V_{\text{result}}$ is not required to be the patient of $V_{\text{cause}}$.

(12)  
\begin{align*}
a. & \quad \text{Ta } xie-de \ shou \ dou \ tong \ le. \quad (V-de) \\
& \quad \text{He write-de hand all hurt le} \\
& \quad \text{‘He wrote so much and as a result his hand was painful.’}
\end{align*}

b. & \quad \text{Ta } xie-tong-le \quad shou. \quad (V-V) \\
& \quad \text{He write-hurt-ASP hand} \\
& \quad \text{‘He wrote so much that his hand was painful.’}

In both constructions, the patient of $xie$ ‘write’ is words or sentences, not $shou$ ‘his hand.’ The subject of $V_{\text{result}}$ is indeed not the patient of $V_{\text{cause}}$. The same phenomenon is testified in English:
Fourth, the subject of $V_{cause}$ can be a causer instead of an agent, as the following:

(14) a. Zheju hua qi-de Youyou ku-le-chu-lai.  \hspace{1cm} (V-de)
    This sentence angry-de Youyou burst into tears
    ‘This sentence enraged Youyou and as a result Youyou burst into tears.’

    b. Zheju hua qi-ku-le Youyou.  \hspace{1cm} (V-V)
    This sentence angry-cry-ASP Youyou
    ‘This sentence enraged Youyou and as a result Youyou cried.’

The fifth similarity is that if the subject of $V_{cause}$ is not a causer or an agent, agentive-oriented adverbials are not allowed. The prohibition of an agentive adverbial if the subject is not a causer or an agent indicates that “vP is not projected in the structure of primary predication” (Zhang 2001: 196), based on Den Dikken & Sybesma (1998). The contrast is shown below. (15) has a non-causer theme, whereas (16) has an agent as the subject.

(15) a. *Niurou youyide zhu-de hen lan.  \hspace{1cm} (V-de)
    Beef intentionally stew-de very pappy
    ‘The beef was intentionally stewed and as a result became pappy.’

    b. *Niurou youyide zhu-lan-le.  \hspace{1cm} (V-V)
    Beef intentionally stew-pappy-ASP
    ‘The beef was intentionally stewed and as a result became pappy.’

(16) a. Ta youyide zhu-de niurou lan-diao-le.  \hspace{1cm} (V-de)
    He intentionally stew-de beef pappy-ASP
    ‘He intentionally stewed the beef so that it became pappy.’

    b. Ta youyide zhu-lan-le niurou.  \hspace{1cm} (V-V)

3 Some transitive verbs can have intransitive counterparts, which have covert objects, like the verb
He intentionally stew-pappy-ASP beef
‘He intentionally stewed the beef so that it became pappy.’

The sixth property shared by two RVCs is that if \( V_{\text{cause}} \) is transitive, the object of \( V_{\text{cause}} \) can be operated by A’-movement, and if \( V_{\text{cause}} \) is intransitive, the object of \( V_{\text{cause}} \) is unable to undergo A’-movement. Consider (17) and (18) of Topicalization:

(17) a. \((\text{Na ge ren})i \text{ Taotao kan-de t, dou ni le.}\) \hspace{1cm} (V-de)
    That person Taotao see de all fed-up ASP
    ‘Taotao saw that person too frequently that Taotao was fed up.’

b. \((\text{Na ge ren})i \text{ Taotao kan-ni-le t.}\) \hspace{1cm} (V-V)
    That person Taotao see-fed-up-ASP
    ‘Taotao saw that person too frequently that Taotao was fed up.’

(18) a. *(\text{Na gen ren})i \text{ Taotao ku-de t, dou fan le.}\) \hspace{1cm} (V-de)
    That person Taotao cry de all annoyed ASP
    ‘Taotao cried too much and as a result that person was annoyed.’

b. *(\text{Na gen ren})i \text{ Taotao ku-fan-le t.}\) \hspace{1cm} (V-V)
    That person Taotao cry-annoyed-ASP
    ‘Taotao cried too much and as a result that person was annoyed.’

In (17) and (18), if the subject of \( V_{\text{result}} \) is also the object of \( V_{\text{cause}} \), then topicalization is possible; if the subject of \( V_{\text{result}} \) is not co-referential with the object of \( V_{\text{cause}} \), then topicalization is impossible. The transitivity of \( V_{\text{cause}} \) indeed affects the whole RVCs and will be discussed later.

In order to account for the syntactic approach for both RVCs, Zhang adopts two assumptions from Hornstein & Lightfoot (H & L 1987) and Bowers (1993, 1997, 2000) that in V-de construction and V-V compounds, the secondary predicate is the complement of a functional phrase and the functional phrase is vP.
Zhang provides two reasons for $V_{result}$ as a complement of $vP$. First of all, the resultative phrase or $V_{result}$ is at the right of the $V_{cause}$. The behavior of the resultative part is identical to that of a complement.

Second, two resultative parts cannot co-occur in one resultative construction (Simpson 1983, Rothstein 1985). This prohibition of two resultative parts also agrees with the general assumption that an element cannot be complemented by more than one complement of the same lexical category. This is evident in English as well as in Mandarin Chinese data:

(19) a. *Mary broke the window open to pieces.

   He scold-de Youyou blubber speechless
   ‘He scolded Youyou as a result Youyou blubbered and speechless.’

Winkler (1997:7) has a semantic account for the ungrammaticality of two resultatives. Since a resultative predicate denotes a delimited expression, and thus, a subevent in a whole resultative construction can only be delimited once by one resultative predicate.

In the following analysis, similar to Li’s (1998) and Huang’s (1992), Zhang proposes different structures for Transitive Resultative Construction (TRC) and Intransitive Resultative Construction (IRC) in terms of transitivity of $V_{cause}$. The former is an obligatory-control basis, whereas the latter is an ECM-like structure. But different from Li and Huang, in IRC, the second argument undergoes raising and has the property like an object of $V_{cause}$. TRC or IRC will refer to $V$-$V$ compounds as well as $V$-$de$ construction.

Zhang states that TRC is an obligatory-control structure:

(20) Youyou ma-de Taotao, [CP PRO, dou bu xiang qu xue]
   Youyou scold-de Taotao all not want go up school
   ‘Youyou scolded Taotao and as a result Taotao didn’t want to go to school.’
(20) is a case of object control. Semantically, the object of V\textsubscript{cause} is co-indexed with the subject of V\textsubscript{result}. Syntactically, the object of V\textsubscript{cause} Taotao obligatorily controls PRO which is the subject of V\textsubscript{result} inside the CP. The control relation between the antecedent and PRO can be captured by the Minimal Distance Principle (MDP, Rosenbaum 1970, Larson 1990, Huang 1992):

(21) \textbf{MDP}: PRO is controlled by the nearest c-commanding noun phrase.

However, if the object of a resultative construction is covert, PRO will be controlled by the subject.

(22) a. \textit{Youyou zhui-de lian laoshi} \textit{[\textsubscript{CP} PRO\textsubscript{i} dou lei le.]}  
    Youyou chase-de even teacher all tired le  
    ‘Youyou chased the teacher so hard that the teacher was exhausted.’

b. \textit{Youyou\textsubscript{i} zhui-de} \textit{[\textsubscript{CP} PRO\textsubscript{i} dou lei le.]}  
    Youyou chase-de all tired le  
    ‘Youyou chased X so hard that Youyou/*X was exhausted.’

This subject-control result follows Bach’s Generalization (Bach 1979) that objects can only be omitted with subject-control predicates, but not with object-control ones. Bach’s Generalization echoes with the constraint that PRO must be controlled by an overt c-commanding antecedent (H & L 1987: 36).

Somehow, MDP seems to be unable to predict subject-control verbs, as (23).

(23) \textit{Youyou\textsubscript{i} xiang-de Taotao\textsubscript{j}} \textit{[ PRO\textsubscript{i,j} che-ye-nan-mian.]}  
    Youyou think-de Taotao sleepless  
    ‘Youyou missed Taotao so much that Youyou/*Taotao could not sleep.’

It is proposed that PRO is not c-commanded by the object of V\textsubscript{cause} in a subject-control construction, in which the object of V\textsubscript{cause} occurs inside the adjunct (Hornstein 2001, Nishiyama 1998) as the following structure:
Adopting Bower’s (1993: 622, 1997:45, 200:325) analysis of ECM of IRC, Zhang claims that the subject of $V_{\text{result}}$ has theta-role relation locally, but is assigned Case by $V_{\text{cause}}$ and thus acts like the object of $V_{\text{cause}}$, as the following ECM example:

(25) a. The runners ran their sneakers$_{i}$ [PRP ti threadbare].
    b. John cried himself$_{i}$ [PRP ti blind].

The details will not be discussed since IRC is not directly related to our data (see Zhang 2001: 205-208).

After TRC and IRC being introduced, Zhang proposes that in V-V Compounds, a series of head-raising contributes to the S-structure of $V_{\text{cause}}$-$V_{\text{result}}$-ASP, and also suggests that the movement does not involve Phonetic Form (PF) operation. The process of head-raising is illustrated in (26):

(26) *Ta shuai-huai-le na ge beizi.*
    He throw-broken-ASP that CL cup
    ‘He threw the cup and as a result the cup is broken.’
Step 1: $V_{\text{result}}$ huai ‘broken’ is raised to v.

Step 2: $V_{\text{result}}$ moves to the right of $V_{\text{cause}}$ shuai ‘throw’, which selects the vP.

Step 3: The compound shuai-huai ‘throw-broken’ is raised to Asp, and the surface form shuai-huai-le is borne out.

In order to prove that V-V compounding is not operated in PF, she tests V-V compounds by a syntactic operation A-not-A formation, a yes-no question form in Mandarin Chinese. The formation is: a yes-no [Q] feature is integrated into a verb, then the verb is partly or exactly reduplicated, and finally a negation word is inserted between the verb and its copy. The test is successful as (27):
The idea here is that if an item has been targeted by PF operation, it is opaque to any syntactic operation.

Opposite to V-V compounds, V-de construction fails in the A-not-A formation:

(28)   a. *Youyou cu-de meimei huang le qi-lai.
    Youyou cry-de sister anxious le up
   ‘Youyou cried so hard and as a result his sister became anxious.’

    b. *Youyou cu-de bu cu-de meimei huang le qi-lai?
    Youyou cry-de not cry-de sister anxious le up

    c. *Youyou cu bu cu-de meimei huang le qi-lai?

In addition to the failure in A-not-A formation, an aspect marker cannot be inserted in the V\text{cause} subpart in V-de construction:

(29)   Youyou cu (*le) de (*le) meimei huang le qi-lai.
    Youyou cry-de sister anxious ASP up
   ‘Youyou cried so hard and as a result his sister became anxious.’

V-de construction fails the above two syntactic tests, so Zhang further proposes that de surfaces to the right of V\text{cause} by the movement at PF level. Therefore, after V-de formation, de-cluster is opaque and unable to undergo any syntactic operation.

Seeing that V-V compounds and V-de construction are formed differently, it may account for the subject-oriented reading in V-V compounds, but not available in V-de construction. Recall the data (7) and (8) repeated below:

(30)   Youyou zhui-de Taotao tai-bu-dong tui le.   (V-de, Li 1998: 297)
Youyou chase-de Taotao can’t lift leg le

a. ‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
b. *‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
c. ‘Taotao chased Youyou and as a result Taotao couldn’t move his legs.’
d. *‘Taotao chased Youyou and as a result Youyou couldn’t move his legs.’

(31) Youyou zhui-lei-le Taotao le. (V-V, Li 1998: 297)

Youyou chase-tired-ASP Taotao le

a. ‘Youyou chased Taotao and as a result Taotao became tired.’
b. ‘Youyou chased Taotao and as a result Youyou became tired.’
c. ‘Taotao chased Youyou and as a result Taotao became tired.’
d. *‘Taotao chased Youyou and as a result Youyou became tired.’

To account for the ambiguity, Zhang adopts Chomsky’s (1993, 1995: 298) claim of movement of equidistance. In (32), the positions of Spec₁ and Spec₂ are in the minimal domain of the sequence [Y-t], so they are in equal distance to ZP, or any nominal in ZP. ZP or the nominal within ZP can therefore be raised by movement and target the equally distant Spec₁ or Spec₂. This movement notion then may well be extended to control (Hornstein 1999, 2001). In V-V TRC, the head-raising enables the subject and the object of V\textit{cause} to be in equal distance from the PRO, which is the subject of V\textit{result}. On the contrary, V-de TRC does not undergo head-raising and the object of V\textit{cause} is always closer to PRO than the subject of V\textit{cause}. MDP is then observed by this account.

(32)

```
                   XP
                  /    \
               Spec₂  X'
               /        \
          [Y-X]       XP
                /    \        \
           Spec₁ Y'        t
                    \     /  \
                         ZP
```
2.2 A Problem of Syntactic Approach for both RVCs

Zhang provides a holistic and integrated analysis adopted from many crucial notions. She also accounts for the subject-oriented reading which is interpreted only in V-V compounds, but not in V-de construction. But the semantic inversion remains unsolved, and the problematic proposal of V-de cluster formed by PF operations needs to be re-examined.

V-de cluster formed by the PF movement seems to be testified by the failure of two syntactic operations. But if V-de cluster is formed in PF level, it cannot undergo any syntactic operation. Consider the following example:

\[
\begin{align*}
(33) & \quad \text{a. } Ta \ he-de \ naicha \ dou \ mei-yiou-le. \\
& \quad \text{He \ drink-de \ milk tea \ all \ empty} \\
& \quad \text{‘He drank milk tea and as a result the milk tea was all finished.’} \\
& \quad b. *Ta \ he-de \ naicha \ hen \ ni. \\
& \quad \text{He \ drink-de \ milk tea \ very \ fed-up} \\
& \quad \text{‘He drank too much milk tea and as a result felt fed up by drinking it.’}
\end{align*}
\]

In (33a), the subject of V\(_{\text{result}}\) is coindexed with the object of V\(_{\text{cause}}\) naicha ‘milk tea’. Like other object-control structure, PRO is controlled by the nearest NP nominal, and (33a) is grammatical. In (33b), the subject of V\(_{\text{result}}\) is coindexed with the subject of V\(_{\text{cause}}\) ta ‘he’. PRO is controlled by the subject instead of the nearest object, and so in terms of MDP, (33b) is ungrammatical. To put differently, (33a) only has one complement, while (33b) has two complements: one is the object, the other is the resultative clause.

According to Phrase Structure Constraint, a verb cannot take more than one type of complement at the same time in Modern Chinese. In Chinese RVC, this means that V\(_{\text{cause}}\) cannot take an object and a resultative phrase as complements at the same time (Huang 1982, S. Huang 1984, Li 1975). Therefore, verb reduplication occurs to satisfy the requirement that one verb can only take one kind of complement at a time.
(34)  

a. Ta chi-le fan.  
   He eat-ASP rice  
   ‘He ate the meal.

b. Ta chi-le liang ge xiaoshi le.  
   He eat-ASP two CL hour ASP  
   ‘He has been eating for two hours.’

c. *Ta chi [fan] [liang ge xiaoshi] le.  
   He eat rice two CL hour ASP  
   ‘He has been eating the meal for two hours.’

   He eat rice eat-ASP two CL hour ASP

In (34a & b), the verb ‘eat’ is followed by a nominal and an adverbial phrase respectively, and both are grammatical. However, the verb cannot take one nominal and one adverbial phrase at the same time as two complements, so (34c) is ungrammatical. To avoid this ungrammaticality, the main verb, which is the verb with an aspect marker, is copied, and the copy takes the first complement. One may argue that the one without an aspect marker is the main verb, but it is evidently suggested in the current literature that one with the aspect marker should be the main verb (Huang 1982, Li 1975). With the verb reduplicated ((33b) repeated below), the ungrammatical sentence becomes grammatical.

(35)  

a. *Ta he-de naicha hen ni.  
   He drink-de milk tea very fed-up  
   ‘He drank too much milk tea and as a result felt fed up by drinking it.’

b. Ta he naicha he-de hen ni.  
   He drink milk tea drink-de very fed-up  
   ‘He drank too much milk tea and as a result was disgusted by drinking it.’
If V-de cluster is formed at PF level and thus opaque to any syntactic operation, verb reduplication is not allowed and (35b) should be ungrammatical. One may argue that verb reduplication may be formed in syntax before PF movement takes place. Then A-not-A form of V-de construction should be grammatical since it also involves verb copying at the second step.

To briefly conclude, though the semantic ambiguity may be captured by the head-raising of V-V compounding, the problematic analysis of V-de construction indeed poses a question to whether the matter of subject-oriented reading can really be accounted for by a syntactic approach for both RVCs.

3. A Mixed Approach of V-de Construction and V-V Compounds

In this section, we will review Li’s and Her’s analyses of resultative V-V compounds which are considered formed in the lexicon. Both of their approaches appropriately explicate the resultative constructions.

3.1 Li’s Analysis

Li compares and contrasts V-V resultative compounds and V-de resultative constructions. By doing so, he demonstrates the former is formed in the lexicon whereas the latter in the syntax. He first adopts Baker’s Uniformity of Theta Assignment Hypothesis (1988: 46) – “Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.” He then shows that even though the two constructions have similar semantics and appearances at the level of S-structure, some essential differences indicate they are formed differently, either morphologically or syntactically. Li also concludes that identical thematic relationships between arguments may not necessarily represent their structural relationships being the same. Let us see how Li’s analysis of two RVCs shows this point.
First of all, Li analyzes that V-de Construction has two syntactic structures depending on transitivity of V\textsubscript{cause}. If V\textsubscript{cause} is transitive, the NP following it is the object of V\textsubscript{cause}; if V\textsubscript{cause} is intransitive, the NP following it is the subject in the clause. Li tests the validity of two different syntactic structures by the possibility of fronting of question words\textsuperscript{4} and the insertion of ya \textsuperscript{5}, respectively illustrated in the following: (Li 1998: 287-288)

(36) a. *Youyou kua-de shenme huor Taotao dou bu xiang gan. (V\textsubscript{1}: trans.)
Youyou praise-de what work Taotao all not want do
‘Youyou praised Taotao and as a result Taotao didn’t want to do any work.’

b. Youyou ku-de shenme hour Taotao dou bu xiang gan. (V\textsubscript{1}: int.)
Youyou cry-de what work Taotao all not want do
‘Youyou cried and as a result Taotao didn’t want to do any work.’

(37) a. *Youyou kua-de ya, Taotao bu xiang gan hour le. (V\textsubscript{1}: trans.)
Youyou praise-de ya Taotao not want do work ASP
‘Youyou praised Taotao and as a result Taotao didn’t want to do any work.’

b. Youyou ku-de ya, Taotao bu xiang gan hour le. (V\textsubscript{1}: int.)
Youyou cry-de ya Taotao not want do work ASP
‘Youyou cried and as a result Taotao didn’t want to do any work.’

In (36), certain question words can be moved to the clause-initial position. Compared (36a) and (36b), in (36a) the question word is fronted between V\textsubscript{cause} and its object and therefore disallowed, while in (36b), the grammaticality suggests that the position between the intransitive V\textsubscript{cause} and the second NP is a clause-initial position. The idea

\textsuperscript{4} Some question words in Mandarin Chinese can be put in front of a clause, and in some context interpreted as quantifiers.

\textit{Shenme dongxi meimei dou bu yuenyi chi.}
‘What thing sister all not want eat
My sister doesn’t want to eat anything.’

\textsuperscript{5} Ya is exclamation marker, which can be inserted in the middle of a sentence as a pause. The insertion may create the effect of stressing certain words in a sentence.
of *ya*-insertion is similar. *Ya* cannot be inserted between a verb and its object. So, it is also disallowed in (37a), but not in (37b).

After demonstrating that transitivity of V\textsubscript{cause} affects the sentence structure, Li further adopts Huang’s (1988) analysis that if V\textsubscript{cause} is transitive, the following NP is its object and the subject of V\textsubscript{result} is a PRO coindexed with the object of V\textsubscript{cause}, and obligatorily controlled by it:

(38) \textit{Youyou ma-de Taotao, [\text{CP PRO,} \text{dou bu xiang qu shang xue}]}  
Youyou scold-de Taotao all not want go up school 
‘Youyou scolded Taotao and as a result Taotao didn’t want to go to school.’

But if V\textsubscript{cause} is intransitive, the succeeding NP will be the subject of V\textsubscript{result} inside the CP:

(39) \textit{Youyou cu-de [CP Taotao bu zhidao zhenme zhuo].}  
Youyou cry-de Taotao not know what do 
‘Youyou cried so hard and as a result Taotao didn’t know what to do.’

Having analyzed the structure of V-\textit{de} construction, Li reviews two common traits of both the constructions. First, NP arguments receive either Causer or Causee reading in both constructions. The argument which initiates the action or the event is called Causer, while the argument affected by this action or event is called Causee. Li thus predicts one argument in a resultative construction as a Causer or a Causee: (Li 1998: 293)

(40) In a resultative construction,  
\begin{itemize}  
  \item[a.] the Causer reading is associated with the subject NP that is semantically related only with V\textsubscript{cause}, and  
  \item[b.] the Causee reading is associated with the structurally second prominent NP argument that is semantically related at least with V\textsubscript{result}.  
\end{itemize}

The second similarity is that both RVCs allow argument inversion ((7) & (8) repeated):
In order to account for the conditionally allowed case of inversion, Li puts forth a notion from Grimshaw (1990):

(43) The two arguments of \( V_{\text{cause}} \) can have semantic inversion only if the argument in the subject position can be interpreted as a Causer and the other in the object position can be interpreted as a Causee.

With this notion, (41c) and (42c) can be explained. Though Youyou in the subject position is the chasee, it is semantically only related to \( V_{\text{cause}} \). Therefore, by the criterion (40), it is interpreted as a Causer. Taotao in the object position is the chaser, but it is the one who bears the consequence and is semantically linked with \( V_{\text{result}} \). Hence, it is interpreted as a Causee. There is a typical scenario for (41c) and (42c): “Youyou is so good at running long distance that Taotao was exhausted from chasing her.” This scenario implies that no matter Youyou was in front of or behind Taotao at the start point, his speed was too fast that eventually Taotao fell behind and chased him exhaustedly.

Though two RVCs have two similarities, three differences between two RVCs more strongly suggest that they are indeed formed differently at the level of D-structure.
The third difference is the different behaviour of a coreferential relation, but it will not be discussed here for the shortage of space.

First, as recapped in introduction, zhui-lei ‘chase-tired’ V-V compound is potentially three-way ambiguous (see (41) & (42)), while the V-de construction is only two-way ambiguous.

Li states that the difference between two RVCs is actually made by the lexical formation of V-V compounds. Through theta-identification as the first step, the application is as the following:

\[
\begin{align*}
zhui & \quad <\theta_1<\theta_2>> \\
lei & \quad <\theta_a> \\
zhui-lei & \\
a. & \quad <\theta_1<\theta_2-\theta_a>> \\
b. & \quad <\theta_1-\theta_a<\theta_2>> \\
c. & \quad <\theta_2<\theta_1-\theta_a>> \\
d. & \quad <\theta_2-\theta_a<\theta_1>
\end{align*}
\]

Since three theta-roles will be assigned to two arguments, there are four possible theta-identifications for the compound zhui-lei ‘chase-tired’. Li then adopts thematic hierarchy to eliminate ungrammatical ones. The idea of thematic hierarchy is that every predicate has its own thematic hierarchy which is identical to the order of its theta-role. The Thematic hierarchy is represented by the brackets. The more brackets embed a theta-role, the less prominent it is. Since in V\textsubscript{cause} zhui, \(\theta_1\) is more prominent than \(\theta_2\), after theta identification, it still should be more prominent than \(\theta_2\) respecting the original thematic hierarchy of the verb zhui. (44c) and (44d) which corresponds to the inversed readings (42c) and (42d) are ruled out.

However, (44c) is a grammatical one. Li explains according to (43), \(\theta_2\) as the most prominent theta-role in (44c), which associates only with the V\textsubscript{cause}, is interpreted as a

---

\(6\) Theta identification is if two predicates together assign theta-roles to arguments, without enough arguments for theta-role assignment, two theta-roles may be linked and assigned to a single argument. Theta-roles of the two predicates are identified freely.(Higginbotham 1985)
Causer; \(<\theta_1-0_1,>\) which associates with the \(V_{\text{result}}\) at the object position is interpreted as a Causee. The inverted reading is therefore grammatical.

On the contrary, (44d) is still ungrammatical for the reason that \(<\theta_2-0_2,>\) at the subject position associated with both \(V_{\text{cause}}\) and \(V_{\text{result}}\) cannot be interpreted as a Causer, and \(\theta_1\) associated with \(V_{\text{cause}}\) also cannot be interpreted as a Causee. (44d) is hence being ruled out.

The second difference between the two constructions is the selectivity of \(ba\)-construction. Here, Li makes an assumption of \(ba\)’s property:

(44) \(Ba\) must introduce the Causee argument in a resultative construction.

(Li 1998: 301)

When there are only two arguments in both RVCs, the objects are both introduced by \(ba\), so the semantic readings are identical, shown in (45) and (46):

(45) \(Youyou \ ba \ Taotao \ zhui-de \ [\text{PRO \ tai-bu-dong \ tui \ le}].\) \(\text{Youyou } ba \ Taotao \ chase-de \ can’t \ lift \ leg \ le.\)

a. ‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
b. *‘Youyou chased Taotao and as a result Taotao couldn’t move his legs.’
c. ‘Taotao chased Youyou and as a result Taotao couldn’t move his legs.’
d. *‘Taotao chased Youyou and as a result Youyou couldn’t move his legs.’

(46) \(Youyou \ ba \ Taotao \ zhui-lei-le.\) \(\text{Youyou } ba \ Taotao \ chase-tired-ASP.\)

a. ‘Youyou chased Taotao and as a result Taotao became tired.’
b. *‘Youyou chased Taotao and as a result Youyou became tired.’
c. ‘Taotao chased Youyou and as a result Taotao became tired.’
d. *‘Taotao chased Youyou and as a result Youyou became tired.’

Note that since \(ba\) introduce the Causee which is Taotao here, the subject-oriented reading (46b) is unavailable (cf. (42b)).
However, as V-de construction is bi-clausal and may contain two objects, *ba* can introduce an object either from the main clause or from the embedded one. Consider the examples (46) and (47):

(47)  *Youyou ba Taotao ma-de [PRO bu xiang chi fan].*
Youyou *ba Taotao scold-de not want eat rice*
‘Youyou scolded Taotao so bad, and as a result Taotao didn’t want to eat anything.’

(48)  *Youyou ma-de Taotao [PRO dou bu xiang ba fan chi-le].*
Youyou *scold-de Taotao all not want ba rice eat-ASP*
‘Youyou scolded Taotao so bad, and as a result Taotao didn’t want to eat anything.’

Li argues that unlike V-de construction, *ba* is unable to focus on part of V-V compounds. Ba has to introduce the affected argument of the whole V-V compounds, and cannot only operate the object of V_{cause} or the subject of V_{result} for the reason that V-V compounds are indecomposable and cannot be operated separately at the syntactic level. This notion is referred to as Lexical Integrity Hypothesis. (Chomsky 1972, Grimshaw 1982)

Seeing differences caused by their formations at different levels, Li further puts forth a hypothesis regarding resultative constructions:

(49)  A resultative construction is formed with Causer and Causee readings already decided.

3.2 Advantages and Assessment of Li’s Analysis

Li has demonstrated that the differences between V-de constructions and V-V compounds originate from the former being a syntactic product and the latter a lexical formation. He also introduces the Causer and Causee readings to semantically clarify the S-structure and explicates the semantic inversion. In addition, he analyses the semantic and syntactic function of *ba*-insertion in a resultative construction. At the
end of his analysis, he further claims that even though these two constructions are
formed at different levels, they can be applied to the same criterion of semantic
inversion.

There is some more evidence of *ba*-construction that shows the two RVCs indeed are
formulated differently.

Firstly, the function of *ba* in a resultative construction can be defined more carefully.
As Li (1998) mentions that *ba* can introduce a non-Causee object in V-de
construction:

(50) a. *Youyou ma-de Taotao [lian Taotao de mama dou shengqi le].*
Youyou scold-de Taotao even Taotao poss. mother all angry ASP
‘Youyou scolded Taotao and as a result Taotao’s mom was angry.’

b. *Youyou ba Taotao ma-de [lian Taotao de mama dou shengqi le].*
Youyou ba Taotao scold-de even Taotao poss. mother all angry ASP
‘Youyou scolded Taotao and as a result Taotao’s mom was angry.’

In (50), Youyou is interpreted as Causer, whereas neither Taotao nor Taotao’s mother
can be interpreted as Causee, for the reason that Taotao is not associated with V_result,
and Taotao’s mother is not the structurally second prominent NP argument. Therefore,
the basic idea here is if in V-de construction, *ba* can function as a Case assigner to a
non-Causee argument as well as an introducer of Causee argument.

(51) 1. *Ba* must introduce a Causee argument in V-V compounds.
2. *Ba* must introduce a Causee argument, if there is only one NP argument
except the subject of V_cause in V-de construction. Otherwise, it is a Case
assigner to non-Causee argument.

This criterion then is testified:

(52) a. *Ta he-zuei hongjiu le.*
He drink-dunk red wine ASP
‘He drank red wine and as a result he was drunk.’

b. *Ta ba hongjiu he-zuei le.
   He ba red wine drink-drunk ASP

In (52), the structurally second argument hongjiu ‘red wine’ is not associated with V_result, and therefore is not interpreted as Causee. Then, ba-construction fails. The similar example in V-de construction is shown below:

(53) a. Ta he hongjiu he-de zuei-xun-xun.
   He drink red wine drink-de so drunk
   He drank red wine and as a result he was so drunk.

b. *Ta ba hongjiu he-de zuei-xun-xun.
   He ba red wine drink-de so drunk

In (53a), since V_cause cannot take more than one type of complement at one time, V_cause of V-de cluster is copied. If replaced by ba in (53b), hongjiu ‘red wine’ is not Causee and there is only one NP argument except the subject of the matrix verb, ba-construction is again ungrammatical. One may argue that (53b) should be grammatical because the non-Causee theme hongjiu ‘red wine’ can be assigned Case by ba. But here it is not only a NP argument but a complement of V_cause.

In addition to ba-construction, a syntactic operation for passivization— bei-construction can also capture the difference between V-de construction and V-V compounds.

In passivization, bei must introduce the Causee in V-V compounds. Otherwise, the object of the compound cannot be passivized. Consider (54) and (55). In (54), meimei ‘his sister’ associated with both V_cause and V_result is interpreted as Causee, and bei-

---

7 Bei-construction normally conveys a negative meaning (Lin 2006: 89).

*Zhe ge liwu bei meimei howhow de zhenxi.
   This present by sister well de cherish
   ‘This present was cherished by my sister.’

- 28 -
construction is possible. While in (55), fan ‘rice’ which is only related with $V_{cause}$ cannot be interpreted as Causee, and therefore the passivization is illegitimate.

\[(54)\]
\[
a. Ta \ da-cu-le \ meimei. \\
He beat-cry-ASP sister \\
‘He beat his sister and as a result she cried.’ \\
b. Meimei bei ta da-cu-le. \\
Sister by him beat-cry-ASP \\
‘His sister was beaten by him and as a result she cried.’
\]

\[(55)\]
\[
a. Ta chi-bao-le fan. \\
He eat-full-ASP rice \\
‘He ate the meal and as a result he was full.’ \\
b. *Fan bei ta chi-bao-le. \\
Rice by him eat-full-ASP
\]

The same contrast of $ba$-construction between two RVCs is also seen in $bei$-construction. In $V$-$de$ construction, $bei$ can also introduce a non-Causee theme:

\[(56)\]
\[
a. Ta da-de meimei shou zhi fadou. \\
He hit-de sister hand continuously shake \\
‘He hit his sister so hard and as a result her hands kept shaking.’ \\
b. Meimei bei ta da-de shou zhi fadou. \\
Sister bei he hit-de hand continuously shake \\
‘His sister was hit by him and as a result her hands kept shaking.’
\]

In $V$-$de$ construction as (56), the structurally second NP argument meimei ‘sister’ is not associated with $V_{result}$ and therefore cannot be interpreted as Causee. But $bei$ still can introduce a non-Causee theme in passivization.
By the application of *ba-*construction and *bei-*construction to two RVCs, a non-unitary approach of two constructions should be preferred.

In Li’s analysis, though the structures of both RVC are exhibited and the case of semantic inversion is explained in terms of Causer and Causee relations, the various readings one resultative construction can have are unpredictable by Li’s account. In most cases, even if the condition of semantic inversion is satisfied, the inversed reading is still unavailable. Therefore, in the following section, Her’s (2007) analysis will be reviewed, and a revision of Her’s account will be made to correctly predict the semantic readings of one V-V compound.

3.3 Her’s Analysis of V-V Compounds

Her introduces a new machinery Lexical Mapping Theory (LMT) to account for the case of semantic inversion in resultative compounds. He also uses this machinery to explain why some readings are more accessible than others. Though he does not mention the contrast between V-*de* construction and V-V compounds, he provides a simpler and more precise way to predict the semantic interpretations of V-V compounds.

Her first introduces the basic notion of Lexical Mapping Theory (LMT), and the terminology for the later application. LMT is “the module in LFG that poses an argument structure, which interfaces between the lexical semantic structure and the syntactic structure of a predicator.”(Her 2007: 227) Before mapping, Her adopts a specific thematic hierarchy to facilitate lexical mapping:

\[(57) \quad \text{Thematic Hierarchy:} \quad (\text{Bresnan & Kanerva, 1989 & 1992})\]
\[
ag > ben > \text{go/exp} > \text{inst} > pt/th > loc
\]

Grammatical functions will also have a hierarchical feature corresponding to thematic hierarchy. For example, subject will be the most prominent and the least marked in grammatical functions, while object is the opposite. The hierarchy is classified in (56),
[± r] as the feature of thematic restrictness; [± o] as the feature of objectiveness: (Her 2007: 228, Dowty 1991)

(58) Markedness Hierarchy of Argument Functions:

\[
\text{SUBJ}(-r - o) > \text{OBJ}(-r + o) / \text{OBL}_{0}(+r - o) > \text{OBJ}_{0}(+r - o)
\]

Her further assumes the roles of pt/th: (Her 2007: 228)

(59) Intrinsic Classification of Argument Roles for Functions (IC):

\[pt/th \rightarrow [-r] \]

This classification in (59) is proposed (Perlmutter 1978) that \(pt/th\) role is considered an unrestricted function, which can be either subject or object.

Her then adopts Unified Mapping Principle in LMT for lexical mapping:

(60) The Unified Mapping Principle (UMP): (Her 2007: 229)

Map each argument role, from the most prominent to the least, onto the highest Compatible Function (CF) available.

With all the conditions and constraints for lexical mapping, let us look at how one-to-one mapping to be analyzed next.

In resultative compounds, \(V_{\text{cause}}\) and \(V_{\text{result}}\) both assign \(\theta\)-roles to arguments, UMP, which strictly assigns one argument role to one grammatical function, will be violated. Her, instead of Li’s theta-identification, binds two composing roles\(^8\) into a composite role and suppresses one of the two composing roles to accomplish the task of lexical mapping.

By means of binding and suppression, only one of two composing roles will receive a grammatical function, and the other will not. However, the suppressed one still can function as a syntactic adjunct, depending on different constructions. For example, if

\(^8\) Composing roles are the theta-roles inherited from \(V_{\text{cause}}\) and \(V_{\text{result}}\).
the external role is suppressed by passivization, it can appear as a by-adjunct (Bresnan 1994: 81), and some agentive adverbs may turn out to be grammatical, as (61a) and (61b). On the contrary, suppressed roles will not be allowed to appear semantically in a middle construction, as (62a) and (62b):

(61) a. The table was wiped clean by the cleaning lady.
    b. The table was wiped clean intentionally.

(62) a. *This wagon sells quite well by the salesman.
    b. *This wagon sells quite well intentionally.

The resultative compounding is like a middle construction, which does not allow a suppressed composing role to surface as a syntactic adjunct or a subject-oriented adverbal.

Having the basic idea of LMT application, recap our data:

(63) \[ \text{Youyou } \text{zhui-lei-le } \text{Taotao le.} \] (Li 1998: 297)
    \[ \text{Youyou chase-tired-ASP Taotao le} \]
    a. ‘Youyou chased Taotao and as a result Taotao became tired.’
    b. ‘Youyou chased Taotao and as a result Youyou became tired.’
    c. ‘Taotao chased Youyou and as a result Taotao became tired.’
    d. *‘Taotao chased Youyou and as a result Youyou became tired.’

The compounding operation makes two verbs merge and their argument structures (a-structure) are inherited. After binding and suppression (represented by crossing-out), four possible a-structures of resultative compounding are listed: (Her 2007: 232)

(64) \[ V_{\text{cause}} <x \ y> + V_{\text{result}} <z> \rightarrow V_{\text{cause}} V_{\text{result}} <\alpha \ \beta>, \]
    where \[ <\alpha \ \beta> = (a) <x \ y-z> \]
    (b) \[ <x \ y-z> \]
    (c) \[ <x-z \ y> \]
    (d) \[ <x-z \ y> \]
Let’s apply the LMT to zhui-lei ‘chase-tired’ data, as (64a) and (64b) are shown in (65):

(65) Reading of (64a & b): ‘Youyou chased Taotao and as a result Taotao became tired.’ (= (63a))

\[ x = \text{ag}, \ y = \text{pt/th} \quad (\text{CF= Compatible Function}) \]

<table>
<thead>
<tr>
<th>64a</th>
<th>(&lt;x \ y-z&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC</td>
<td>([-r])</td>
</tr>
<tr>
<td>CF</td>
<td>S/O</td>
</tr>
<tr>
<td>UMP</td>
<td>S \quad O</td>
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<tr>
<td></td>
<td>=Youyou</td>
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<td></td>
<td>=Taotao</td>
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</tbody>
</table>

\[ x= \text{ag}, \ z= \text{pt/th} \]

<table>
<thead>
<tr>
<th>64b</th>
<th>(&lt;x \ y-z&gt;)</th>
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</thead>
<tbody>
<tr>
<td>IC</td>
<td>([-r])</td>
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<tr>
<td>CF</td>
<td>S/O</td>
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<tr>
<td>UMP</td>
<td>S \quad O</td>
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<tr>
<td></td>
<td>=Youyou</td>
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<td></td>
<td>=Taotao</td>
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</tbody>
</table>

Though (64a & b) produce two a-structures but only one reading because the grammatical function of \(\theta_y\) and \(\theta_z\) is identical, both [-r] role and therefore both linked to OBJ.

(64c & d) are shown as (66) below:

(66) Reading of (64c): ‘Youyou chased Taotao and as a result Youyou became tired.’ (= (63b))
The competition between two composing roles now leads to two grammatical readings. In (64c), since θ₂ is suppressed, θₓ is still assigned to SUBJ and θᵧ assigned to OBJ. But (64d) is a different story. With θₓ being suppressed, both θᵧ and θ₂ are [-r] roles, and should be of equal prominence. For the desired reading, θᵧ must be more prominent than θ₂ to receive SUBJ. The notion of Causativity (Her 1997) is employed next to prove that θᵧ is indeed more prominent than θ₂. The reading (63d) is unavailable because the linking of a-structure and argument function is never possible.

Li (1999) mentions that causative roles are already determined when a resultative construction is formed. In a causative argument structure, the most natural and default place for [af] to be linked to is θ₂, the only role acquired from Vcause. Also to extend Her’s (1997) idea that if the only role from Vresult is suppressed, then the resultative compounding cannot be causative, the following generalization for Causativity in Mandarin Chinese is borne out:
Causativity Assignment in Resultative Compounding:  

An unsuppressed role from $V_{\text{result}}$ receives [af]\(^9\) iff an unsuppressed role from $V_{\text{cause}}$ exists to receive [caus].

Now turn to (64d) again. With $\theta_x$ suppressed, $\theta_z$ from $V_{\text{result}}$ receives [af] and $\theta_y$ from $V_{\text{cause}}$ receives [caus]. As Dowty(1991) mentions that the role receiving [caus] has a proto-role property of being an Agent, while the role receiving [af] has a proto-role property of being a Patient. $\theta_y$ with [caus] is then proved to be more prominent than $\theta_z$ with [af]

Her further derives the notion of markedness to account for some readings which are less accessible than others in zhui-lei ‘chase-tired’ example. For native speakers, the reading (63a) is the most instinctive, while the reading (63d) is almost unaccessible.

The degree of markedness results from the process of binding, suppression and linking during compounding. Basically, the more marked an argument-function linking is, the less accessible the reading will be.

First of all, because an independent role is guaranteed to receive a grammatical function, it is less marked than a composing role in a composite role which may be suppressed. For example, in $<x\ y-z>$, independent x is less marked than y-z.

Second, it will be the most unmarked if the more prominent $\theta_x$ ($x= ag$) stays independent and the less prominent $\theta_y$ and $\theta_z$ ($y, z = pt/th$) binds as a composite role. It will be less unmarked if the less prominent $\theta_y$ stays independent, and the more prominent $\theta_x$ is bound with the other less prominent $\theta_z$. To put another way, Dowtyan theory of proto-roles (1991) says that two roles with similar proto-role properties to be bound will be less marked than those with different proto-role properties to be bound. Therefore, $\theta_y$ and $\theta_z$, both with proto-Patient property, will form a less marked composite role than $\theta_y$ and $\theta_x$, which has a proto-Agent property. For instance, $<x\ y-z>$ will be less marked than $<x\ z\ y>$.

\(^9\) [af] refers to Affectee (Causee); [caus] refers to Causer. See Li 1999.
Third, in a composite role, since the more prominent role is less marked, it will be
less marked if the more prominent composing role links to a grammatical function,
and the less prominent composing role is suppressed. For example, <x-z y> will be
less marked than <x-z y>.

Let us see the four possible a-structures again:

(68) \( V_{\text{cause}} <x \ y> + V_{\text{result}} <z> \rightarrow V_{\text{cause}} V_{\text{result}} <\alpha \ \beta> \)

Reading corresponded
where \( <\alpha \ \beta> = (a) <x \ y-z> \) (63a)
(b) \( <x \ y-z> \) (63a)
(c) \( <x-z \ y> \) (63b)
(d) \( <x-z \ y> \) (63c)

(68a) will be the most unmarked combination since the composite role is composed
of two roles with proto-Patient property, and no prominent role is suppressed. (67b) is
because only less unmarked than (67a) because the role \( \theta_y \) is suppressed instead of
the least prominent role \( \theta_z \). (68c) is less unmarked than former two combinations due
to the undesirable binding of one proto-Agent role with one proto-Patient role. (68d)
will be the most marked due to binding of different proto-role properties and
undesirable suppression of the most prominent role. Therefore, (68a) is the most
instinctive reading, while (68d) is the most difficult reading that one can get.

In this section, Her incorporates the revised LMT theory into causativity in order to
account for semantic inversion and accessibility of its readings. Her offers a good
way to explain the inversed readings in zhuì-lei ‘chase-tired’ case, and it is also a
good method to explicate the relations between syntactic assignment and semantic
interpretation. He successfully accounts for the semantic inversion without
complicated movement-based analysis. However, some problems need to be
addressed regarding the LMT application. In next section, I will discuss some
remaining problems and solutions to Her’s analysis.
3.4 Solution to the remaining Problem of Her’s Analysis

The problem is that the possible a-structures originated by the LMT may not have corresponding semantic readings. But it does not mean the LMT application fails. I will argue that LMT exactly captures the possible a-structures, but the the original a-structures of $V_{cause}$ and $V_{result}$ need to remain in the a-structure of $V_{cause}$ and $V_{result}$ in the a-structures of resultative compounds after LMT to get the correct readings.

In Her’s analysis, he includes two most common combinations of resultative compounding—$V_{trans} + V_{int}$ and $V_{int} + V_{int}$, as the formulation below:

Resultative Compounding:

\[(69) \quad V_{cause} <x \ y> + V_{result} <z> \rightarrow V_{cause} V_{result} <\alpha \ \beta>, \quad \text{(Her 2007: 237)}\]

where $<\alpha \ \beta> = (a) <x \ y-z>

(b) $<x \ y-z>

(c) $<x-z \ y>

(d) $<y \ x-z>

\[(70) \quad V_{cause} <x> + V_{result} <z> \rightarrow V_{cause} V_{result} <\alpha \ (\beta)>, \quad \text{(Her 2007: 237)}\]

where $<\alpha \ (\beta)> = (a) <x-z>

(b) $<x-z>

(c) $<x \ z>

However, in most cases, semantic inversion will not occur, or even (68a & b) or (68c) will not happen, as the example (71):

\[(71) \quad Ta \ chi-bao-le \ fan. \]

He eat-full-ASP rice

a. ‘He ate the meal and made the meal full.’

b. ‘He ate the meal and he was full.’

c. ‘The meal ate him and made him full.’
In (71), θ₁ of *chi* ‘eat’ and θ₂ of *bao* ‘full’ are both assign to the argument *ta* ‘he’, and therefore θ₂ from *bao* ‘full’ need to remain at the subject position, and therefore, only (68c) is grammatical.

Recall the data in (72):

(72)   \textit{Youyou zhui-lei-le Taotao le.} (Li 1998: 297)
   
   \textit{Youyou chase-tired-ASP Taotao le}

a. ‘Youyou chased Taotao and as a result Taotao became tired.’

b. ‘Youyou chased Taotao and as a result Youyou became tired.’

c. ‘Taotao chased Youyou and as a result Taotao became tired.’

d. *‘Taotao chased Youyou and as a result Youyou became tired.’*

In (72), the ambiguity between subject and object orientation is actually due to the lexical content of *lei* ‘tired’. In Mandarin Chinese, *lei*¹⁰ ‘tired’ itself can have both agentive and patient-like properties. In analogy, it can bear opposite argument structures of psychological verbs (Grimshaw 1990) like fear and frighten:

(73) a. fear ( x ( y ) )

         \begin{tabular}{ll}
            Exp & Theme \\
         \end{tabular}

b. frighten ( x ( y ) )

         \begin{tabular}{ll}
            Theme & Exp \\
         \end{tabular}

The argument structures of *lei* ‘tired’ or ‘tiring’ is as following:

(74) a. ‘tired’ ( x )

         \begin{tabular}{ll}
            Exp \\
         \end{tabular}

b. ‘tiring’ ( x ( y ) )

         \begin{tabular}{ll}
            Theme & Exp \\
         \end{tabular}

¹⁰ Similar predicates are such as *fan* ‘bored’, *nao* ‘annoyed’, *ying* ‘win’, *shu* ‘lose’.
It is testified in Chinese data:

(75) \[ Ta \text{ fanbien-le beiren, danshi lei-le ta de qiating.} \]
He convenience-ASP others but exhaust-ASP he poss family
‘He made other people an easier way to do work, but tired his family.’

(76) \[ Ta \text{ yijing hen lei le.} \]
He already very tired ASP
‘He was very tired.’
*‘He was very tiring.’

Notice that in (76), if \textit{lei} ‘tired’ is object-less, it can only have the ‘tired’ interpretation instead of ‘tiring’ one. This further proves that \textit{lei} should have two argument structures.

The argument structures then can be applied to data (72). \( \theta_x \) of \textit{lei} ‘tired’ in (74a) is bound with \( \theta_x \) instead of \( \theta_y \), and so Youyou who chased Taotao was the person feeling tired. Subject-oriented reading is available. While in (74b), the argument structure \(<z_1 z_2> \textit{lei} ‘tiring’\) is mapped to \(<x y>\), \(z_1\) bound with \(x\), \(z_2\) bound with \(y\). This creates the reading that the teacher who scolded students also exhausted them by this action. Object-oriented reading then is available.

This alteration actually implies that the semantic interpretations of (72) remain the same while the argument structures are different. But if more precise predication is to be made, two argument structures of \textit{lei} ‘tired’ or ‘tiring’ should be preferred.

Let us turn to other combinations of V-V compounds, such as \( V_{\text{trans}} + V_{\text{trans}}, V_{\text{int}} + V_{\text{trans}}, V_{\text{dit}} + V_{\text{trans}} \). Though the quantity of these compounds is not in large proportion, they indeed exist and are not rare. The combinations are exampled below:

(77) \[ Lili \text{ bei-hui-le zheshou shi.} \]
Lili memorize-know-ASP this poem
‘Lili tried to memorize this poem and as a result she learned it.’
(78)  Xiaoli wan-wang-le huei-jia-zuo-ye.  \((V_{int} + V_{trans})\)
Xiaoli play-forget-ASP homework
‘Xiaoli played so much and as a result forgot doing his homework.’

(79)  Laoshi jiao-dong-le xuesheng zhege suanshi.  \((V_{dit} + V_{trans})\)
Teacher teach-understand-ASP student this equation
‘The teacher taught the students this equation and as a result they understood it.’

We can try to test on the possible a-structures of \(V_{trans} + V_{trans}\). Theoretically, the argument structure of \(V_{result}\) shall be maintained as \(<z_1 \ z_2>\). However, since in Chinese data, some \(V_{result}\) can bear an inversed argument structure, I shall take the inversed a-structure of \(V_{result}\) into consideration. If we examine \(V_{trans} + V_{trans}\), two possible a-structures are created, and then with two roles suppressed in each a-structure, eight possible a-structures are:

\[
V_{cause} <x \ y> + V_{result} <z_1 \ z_2> \rightarrow V_{cause} V_{result} <\alpha \ \beta>,
\]
where \(<\alpha \ \beta> = (a) <x-z_1 \ y-z_2>
(b) <x-z_1 \ y-z_2>
(c) <x\ y-z_2>
(d) <x\ y-z_2>
(e) <x-z_2 \ y-z_1>
(f) <x-z_2 \ y-z_1> = <y-z_2 \ x-z_1>
(g) <x-z_2 \ y-z_1>
(h) <x-z_2 \ y-z_1>

Actually, (80a)-(80d) have the same semantic interpretations, (80e), (80g) and (80h) are the same, and with one inverted a-structure (80f), there should be three readings. Let us apply to (77) first. Both Bei ‘memorize’ and hui ‘understand’ have only one argument structure, (80e) to (80h) are ruled out. Then the readings are as following:

(81)  Lili bei-hui-le zheshou shi.  \((76)\) repeated, Li 1990
Lili memorize-know-ASP this poem
‘Lili memorized this poem and as a result she learned it.’
(81a) corresponds to a-structures (80a)-(80d), and therefore the prediction is successful.

Consider the data (82) now:

(82)    Youyou da-shu-le Taotao.
        Youyou fight-defeated-ASP Taotao
a. ‘Youyou fought against Taotao and as a result Youyou was defeated.’
   (= (79a)-(79d))

b. ‘Youyou fought against Taotao and as a result Taotao was defeated.’
   (= (80e), (80g)-(80h))

c. ‘Taotao fought against Youyou and as a result Taotao was defeated.’
   (= (80f))

In Chinese, same as lei ‘tired’ or ‘tiring’, shu ‘defeat’ or ‘lose’ has two argument structures as in (83). All eight argument structures are possible, and attested. Note that (82d) is extremely difficult to be accessed for native speakers, according to the notion of markedness. Since the inversed a-structure of Vresult is more marked, and also more prominent roles z₁ and x are suppressed, therefore the reading is the most marked and the least accessible. The prediction, again, is successful.

(83) a. lose  ( x ( y ) )
      Exp  Theme

b. defeat ( x ( y ) )
      Theme  Exp

In this section, in addition to the machinery of LMT, the original argument structures of Vcause and Vresult should also be strictly obeyed in resultative compounding in order to predict the semantic interpretations correctly. The idea that one phonemic form
may bear two inversed argument structures implies that the semantic interpretations of its compounding with another predicate may be derived from LMT application twice, as the data *zhui-lei* ‘chase-tired’.

4. Overview of two Resultative Constructions and One Residue Issue

As recapped, V-*de* construction is obviously formed in syntax, and has two different structures in terms of transitivity of V_{cause}. V-V compounds are precisely captured by the LMT application, with the condition of original a-structures being maintained after compounding.

The differences of subject-oriented reading and semantic inversion between V-*de* construction and V-V compounds further prove that they are formed at different levels. Though the semantic inversion in V-*de* construction is not discussed on a syntactic basis, one evidence of semantic inversion can be considered:

(83)  
\[ Ta \text{ } ma-de \text{ } wo \text{ } dou \text{ } shenqi \text{ } le. \]
He scold-*de* me all angry ASP
a. He scolded me and as a result I was so angry.

b. I scolded him and as a result I was so angry.

(84)  
\[ Ta \text{ } shuo-de \text{ } wo \text{ } yia-ko-wu-jiang. \]
He say-*de* me speechless
a. He said (something) so sharply that I could not respond at all and was speechless.

b. (He was so stubborn.) I said so much to persuade him and I had nothing to say at the end.

(85)  
\[ Ta \text{ } cu-de \text{ } wo \text{ } xin-teng-bu-yi. \]
She cry-*de* me extremely compassionate.

a. ‘She cried so hard that I was extremely compassionate.’

b. ‘I cried so hard because of her, so I was extremely compassionate.’
The inversion is in fact quite abundant in V-de construction, providing the interpretation of the whole sentence makes sense. So, the issue here is how semantic inversion is formed at syntactic level and why the movement makes the inversion reading of V-de Construction so accessible. So, the issue here is how semantic inversion is formed at syntactic level and why the movement makes the inversion reading of V-de Construction so accessible. In contrast, in resultative compounds, the readings will be somehow more difficult to understand since V-V compounding involve the complicated process of binding, suppression and mapping from composite roles to arguments. In other words, V-de construction is more transparent and analytical, while V-V compounds are more opaque and non-analytical. In this sense, the properties of V-V compounds are nicely inflected by the notion of Lexical Integrity.

5. Conclusion

In summary, V-de construction and V-V compounds are reviewed, and the evidence of subject-oriented reading and semantically inversed case suggests that they are formed differently, the former syntactically, while the latter morphologically. Through reviewing Li’s and Her’s analysis, a better account of predicting semantic interpretation of V-V compounds is provided. One idea needs to be stressed: argument structure of one predicate may vary from language to language. In Chinese, one phonemic form may bear two inversed argument structures which causes semantic inversion. Therefore, before V-V compounding, one should consider carefully of the a-structures of V_{cause} and V_{result}. In addition, I further prove that the argument structures of V_{cause} and V_{result} should be maintained after LMT application for compounding to acquire the most precise interpretations of one resultative compound.

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